

**Project Report  
ATC-339**

**Operational Usage of the Route Availability Planning Tool  
During the 2007 Convective Weather Season**

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## EXECUTIVE SUMMARY

Efficient management of air traffic departing from metro New York (NY) airports during convective weather is one of the most difficult challenges facing the operators of the U.S. National Airspace System (NAS). The high air traffic demand in this complex, capacity-constrained terminal and en route airspace requires quick decisions and extensive coordination amongst multiple air traffic control (ATC) facilities in order to prevent rapid escalation in NY airport departure delays when convective weather occurs in the airspace within several hundred miles of the NY airports.

The Route Availability Planning Tool (RAPT) is an integrated weather / air traffic management (ATM) decision support tool that has been designed to help traffic managers better anticipate weather impacts on jet routes and thus improve NY departure route usage efficiency. RAPT uses deterministic precipitation and echo top forecasts, together with airspace usage and flight trajectory models, to forecast storm blockage for the various NY departure routes, assigning each a status of clear, partially-blocked, or completely blocked by weather as a function of departure time.

In the summer of 2007, MIT Lincoln Laboratory (MIT LL) and the Federal Aviation Administration (FAA) Aviation Weather Office conducted a field study in the NY airspace region to evaluate RAPT technical performance at forecasting route blockage, to assess RAPT operational use during adverse weather, to evaluate the RAPT benefits, and to better understand the overall NY airport departure decision-making environment during severe weather.

The operational test confirmed the validity of the initial operational vision for RAPT and found that RAPT guidance was operationally sound and timely in many circumstances. A technical performance review of the RAPT abilities to accurately determine when and where a route was blocked identified two primary improvement areas – the operational accuracy of the RAPT route blockage model and explicitly accounting for forecast uncertainty in generating route departure timelines.

Real-time RAPT field-use observations were used to estimate RAPT annual delay reduction benefits, as shown in Figure ES-1. RAPT operational benefits included increased departure route throughput, improved route impact timing leading to more efficient reroute planning, and more timely decision coordination. Estimated annual NY departure delay savings attributed to RAPT usage in 2007 totaled **2,300 hours, with a cost savings of \$7.5 M.**

The in-field RAPT usage observations also sought to develop a better understanding of NY traffic flow decision-making during convective weather since the RAPT operational benefits in 2007 were significantly limited by a number of decision-making environmental factors other than departure route blockage by weather. Real-time observations were made of the multi-facility departure management decision chain during convective weather, the ATC concerns, needs, and responsibilities (and how they differ) at specific FAA facilities, and the procedures and pitfalls of the current process for capturing and disseminating key traffic flow management (TFM) information such as route/fix availability and restrictions.

The estimated annual RAPT benefits in NY that should be achievable in the near-term through enhanced user training, route blockage forecast algorithm and display enhancements, and better operational user understanding of the use of RAPT in collaborative, tactical decision-making for NY departure management is on the order of 8,800 hours of delay saved, with a cost savings of \$28 M.

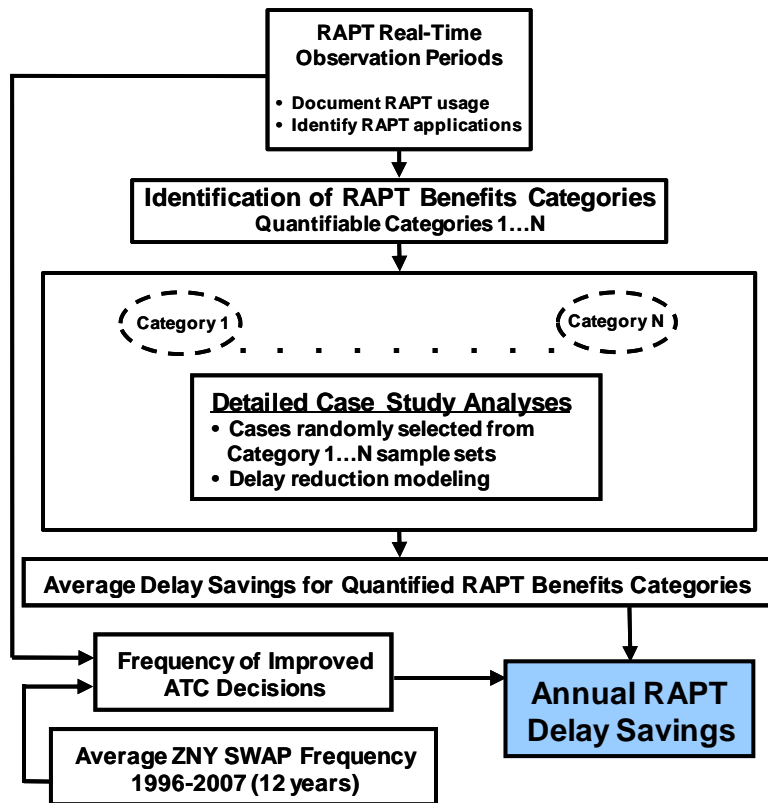


Figure ES-1. Methodology used to estimate annual RAPT delay reduction benefits (SWAP stands for “Severe Weather Avoidance Program”, which is implemented in NY airspace when convective weather causes significant air traffic disruptions).

## RAPT Evaluation Results

A RAPT operational-use assessment was conducted at 11 FAA and airline dispatch facilities during 11 convective weather Severe Weather Avoidance Program (SWAP) impact events. The principal results are as follows:

### *RAPT route blockage forecast algorithm and display enhancement opportunities were identified*

The RAPT performance evaluation focused on two critical areas: operational accuracy and improvements needed to increase the realization of RAPT benefits. Operational accuracy is the measure of the ‘correctness’ of the RAPT departure status; verifying that traffic could not flow when routes were forecast to be RED and that traffic should have been able to flow when the forecast route status was GREEN. Identifying potential areas of improvement in the operational accuracy required the consideration of several factors, including the timeliness, applicability, and reliability of RAPT guidance.

In general, the RAPT blockage algorithm performed best in circumstances where there was moderate or high weather coverage. Examples of such weather include solid or ‘gappy’ squall lines, low-topped stratiform weather, or convective cells embedded in regions whose weather was characterized by level 1 or 2 precipitation, even when the convection was unorganized and difficult to predict with a high degree of accuracy. During these types of weather impact events, numerous instances were observed where RAPT guidance played an important role in departure management (Figure ES-2).

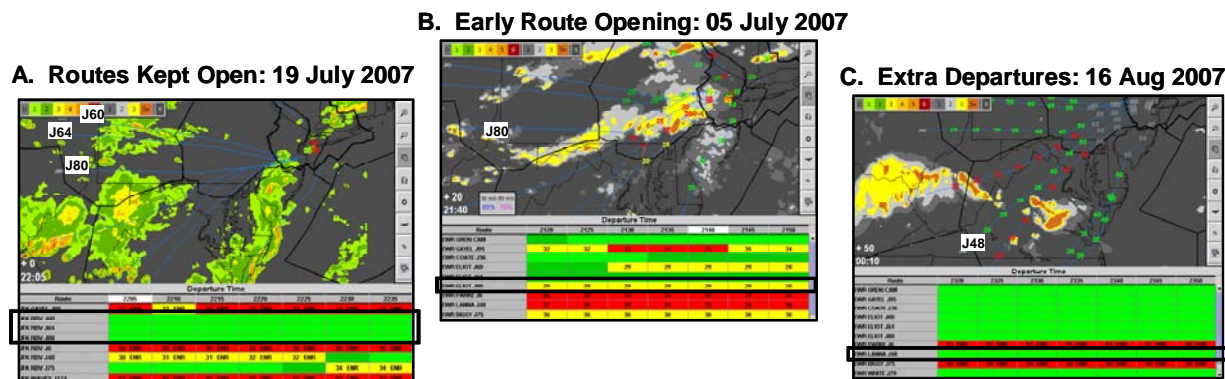


Figure ES-2. Illustrations of documented RAPT usage, demonstrating high RAPT operational accuracy. Black boxes highlight relevant RAPT departure status timelines. In figure (A), departure routes J60, J64 and J80 from JFK airport through the RBV departure fix are kept open since RAPT forecast minimal impact from decaying storm. In figure (B), departure route J80 is opened because RAPT shows YELLOW status with low echo tops (below 30 kft). In figure (C), three extra departures are released along J48 as RAPT predicts a gap between storm impacts.

The RAPT forecasts of route blockage were often inaccurate where route impacts were due to weather characterized by a large spatial gradient in the precipitation or echo top prediction fields caused by strong isolated cells or the leading edge of intense convection.

If RAPT is to be used to anticipate route openings and closings, users must develop confidence in the accuracy of its blockage model, and RAPT must provide users with the information they need to determine when to believe and when to ignore RAPT guidance. It also should provide the user with some objective measure of its performance. The 2007 implementation of RAPT was not particularly transparent; at times, it did not provide sufficient diagnostic information to support its guidance. Potential ways to explain RAPT guidance and to help inform operational users as to why a specific blockage forecast is predicted are to add the ability to show the route boundaries on the animation display and to identify where RAPT thought the blockage was occurring.

Real-time field observations of RAPT usage also demonstrated that some form of an explicit RAPT confidence metric is needed to help users quickly evaluate the quality of RAPT guidance. The accuracy of the convective weather forecasts is a key factor in the overall quality of the RAPT guidance. However, in 2007, there was no explicit consideration of forecast accuracy in providing RAPT guidance nor was there an explicit quantitative metric for the expected RAPT reliability<sup>1</sup>. Lacking a reliable measure of confidence, users in 2007 were required to develop their own rules of thumb to evaluate the quality of RAPT guidance, a difficult task for traffic managers still learning to use an unfamiliar tool.

<sup>1</sup> The weather forecasts provided by the Corridor Integrated Weather System (CIWS) do include a real-time performance metric which is the recent accuracy at predicting the spatial locations of high radar reflectivity cells. These CIWS weather forecast accuracy metrics were not translated into RAPT timeline accuracy metrics in 2007.



*Eleven unique RAPT operational benefits categories were identified*

Observed RAPT applications included quantifiable departure capacity enhancement benefits [e.g., more timely reopening of departure routes (RO)] and improved collaborative decision-making applications such as increased awareness of departure route impacts caused by weather. In all, 11 unique RAPT benefits categories were identified (Table ES-1).

**TABLE ES-1**  
**Observed RAPT Benefits Categories**

1.	<b>RO</b>	More timely departure route reopenings; eased departure restrictions
2.	<b>RRP</b>	More timely reroute planning or implementation; improved route impact planning
3.	<b>DP</b>	Directing pathfinder requests
4.	<b>DOL</b>	Keeping departure routes open longer
5.	<b>AHD</b>	More timely and proactive resumption of arrival flows; decreased airborne holding; potentially saved diversions
6.	<b>PRSA</b>	Proactive runway sequencing assistance
7.	<b>EP</b>	Enhanced decision-making productivity
8.	<b>I/IC</b>	Enhanced Inter/Intra- facility coordination
9.	<b>SA-1</b>	Enhanced common situational awareness
10.	<b>SA-2</b>	Improved awareness of evolving airspace impacts
11.	<b>SA-3</b>	Decision/plan/information confirmation or evaluation

Benefits categories 1-6 (above) directly result in RAPT-derived delay savings and are therefore considered quantifiable. Of these, four primary departure route management categories (RO, RRP, DP, and DOL) were the focus of the 2007 delay savings analysis. Though more difficult to translate into tangible delay and cost savings estimates, RAPT benefits categories 7-11 are critical to improving decision-making planning and coordination, which in turn increase the likelihood of achieving other RAPT-derived capacity enhancement decisions such as RO or RRP.

The frequency of each type of RAPT application was tabulated for each FAA and airline facility and rolled-up to an annual RAPT benefits frequency estimate based upon the historical average number of NY SWAP days per year (Table ES-2). Quantified RAPT delay savings estimates were determined for the four primary departure management benefits categories (red box, Table ES-2).

**TABLE ES-2**  
**Annual RAPT Benefits Frequency Per Category\***

1. RO	77
2. RRP	70
3. DP	70
4. DOL	19
5. AHD	6
6. PRSA	13
7. EP	410
8. I/IC	384
9. SA-1	717
10. SA-2	595
11. SA-3	480

*\*Benefit Categories in red box used to estimate annual delay savings*

***Estimated annual RAPT delay savings for 2007 were significant***

Several RAPT benefits case studies were analyzed in an effort to quantify the delay savings associated with the four primary RAPT departure route management benefit categories. Results show per-use RAPT benefits ranged from 0.9 to 26.7 hours of delay saved, with per-use cost savings ranging from \$2,900 to \$85,000. The large variation in case-to-case delay savings was not surprising given that NY departure delays arise from highly nonlinear queues.

Mean or median (where possible) case study delay savings per benefit category were multiplied by the estimated annual frequency of the various RAPT operational uses to determine the annual 2007 RAPT delay reduction benefits. **Annual RAPT benefits in 2007 totaled 2,300 hours of delay saved, with a cost savings of \$7.5 M.**

***Characteristics of the NY air traffic management environment have direct implications on RAPT usability and benefits***

Real-time observations of NY SWAP operations helped to better understand the RAPT case study results and highlighted opportunities for improvements in RAPT operational effectiveness, including improving route pathfinder procedures, increasing use of Coded Departure Routes (CDRs), and optimizing the use of miles-in-trails (MIT) restrictions for reopened departure routes.

“NAS Network” factors also had a significant impact on RAPT operational effectiveness. These factors included NY *arrival* flow management, the effect of active ZDC Warning Areas, and airport surface management complexity -- all of which were observed to impact the effective use of available NY departure capacity.

The decision-making environment for NY departure flow management was also very important to overall TFM effectiveness. The ZNY Area Supervisors at times appeared to be key decision-makers for NY departure route usage whose operational acceptance of RAPT will be critical to achieving higher RAPT operational benefits. ZNY Area Supervisors did not have access to dedicated RAPT displays prior to 2007 and training in 2007 for the Areas was limited. Airport surface management is also a key factor in

departure efficiency. Unfortunately, access to RAPT by decision-makers at two key airport towers (EWR and JFK) was quite limited in 2007.

The many lines of communication through which empowered decision-makers at several different FAA facilities coordinate and implement departure flow management decisions is an important factor that has not been considered previously. The capability of RAPT to provide a common awareness of proactive departure flow management opportunities during SWAP may ease planning and coordination complexities often found in this tactical decision-making environment.

A key finding during the RAPT field observations was that traffic managers were unsure of the status of NY departure airspace (i.e., open or closed) an estimated 440 times during the 2007 SWAP season. This airspace status uncertainty arises from the dynamic, ever-changing state of departure route/fix impacts during convective weather, poor information system infrastructure for route status data management, and the high workload associated with cataloguing available routes and tracking airspace status changes.

### ***Potential near-term RAPT benefits are expected to increase***

Several observations lead the authors to conclude that the RAPT operational benefits in 2008 and beyond should be higher than were observed in 2007. Increased RAPT usage and operational effectiveness is expected to increase RAPT benefits to over 8,000 hours of delay saved (with a cost savings exceeding \$28 M) in the near-term as the following occur:

#### **A. User experience increases**

Operational traffic managers and controllers often used RAPT in 2007 as a confirmation tool – both to help confirm decisions based upon other information and to verify the operational accuracy of RAPT guidance. As user confidence and expertise in the use of RAPT increases, traffic managers are expected to become more aggressive in making proactive NY departure flow management decisions based upon RAPT forecasts for route blockages.

#### **B. Identified RAPT enhancements and technical performance improvements are implemented**

Field observations of RAPT performance and user requests for specific enhancements are guiding RAPT algorithm and display enhancement and redesign efforts. By

- (i) improving RAPT route blockage forecasts and the operational accuracy of RAPT guidance,
- (ii) providing explicit information about forecast uncertainty,
- (iii) including additional departure routes deemed important by FAA and airline personnel in the RAPT database,

RAPT will become both more reliable and better tuned to operational needs.

#### **C. Access to RAPT at several FAA facilities improves**

RAPT access issues existed at EWR, JFK, and LGA towers in 2007. All three towers accessed RAPT via a thin-client display application installed on an Internet-ready PC in the tower cab, but the PCs were either poorly placed or hosted additional applications used for critical administrative tasks. This effectively reduced access to the RAPT products at the ATC towers, which in turn reduced the overall RAPT operational effectiveness there. Options are being explored for providing RAPT in the NY towers via dedicated displays (similar to how RAPT is accessed at the ARTCCs). This would greatly increase

RAPT usage at the metro NY towers, leading to improved coordination and enhanced collaborative decision-making for departure flow management.

Adding a dedicated RAPT display at the Teterboro airport (TEB) tower would also likely increase RAPT usage and the operational effectiveness of departure routing decisions for this airport. TEB departure delays during NY SWAP events can be severe. Route blockage forecasts for all nominal TEB departure routes are already available in RAPT, and with a RAPT display and training, controllers at TEB tower would have the same awareness of near-term departure route impacts derived from RAPT as those at all other NY ATC facilities.

RAPT product access should also be improved at the FAA Command Center (ATCSCC). Here, RAPT is available on the dedicated CIWS display provided in the National System Strategy Team (NSST) Unit. However in 2007, the CIWS/RAPT display was located on the other side of the Unit from the NY-desk. Therefore, an NSST traffic management specialist working the NY-desk would have to leave his / her position, walk across the Unit to review RAPT information, and then return to the NY position, attempting to coordinate NY departure decisions with the RAPT data now committed to memory. This was obviously not an ideal setup for RAPT usage within the ATCSCC. Redesign plans for the NSST in 2008 should significantly improve RAPT data access and tool usage at the FAA Command Center.

#### **D. Interactive user training and real-time in situ support continues**

RAPT will continue to be supported by a multi-faceted RAPT training program. As in 2007, RAPT training in 2008 will include small-classroom training and demonstration sessions for all FAA and airline dispatch personnel who may use RAPT. Real-time in situ RAPT training will also be provided at all RAPT-equipped facilities during the storm season, with particular focus on real-time RAPT training for ZNY Area Supervisors.

An important addition to the 2008 RAPT training plans will be the introduction of RAPT Operational Scenario Training (ROST). After each significant NY SWAP event where observers are in the field to study RAPT performance and usage, instances of potential missed opportunities to increase NY departure capacity or mitigate airspace complexity will be documented and presented to operational traffic managers for discussion.

#### **E. Recommendations for Post-2008 RAPT Capabilities**

##### **(i) Route status information**

Improved route status information is critical for achieving usage of the available departure capacity during severe weather. Work is underway to improve the real time acquisition of route status information. Displaying that information graphically (e.g., via the RAPT display) would significantly improve the overall situational awareness. The expected benefits of readily-accessible route status information for improved common situational awareness would be significant, not only in terms of RAPT effectiveness in particular but for improved convective weather TFM in general.

##### **(ii) Management of arrival route blockages**

The RAPT route blockage algorithms could readily be adapted to provide a forecast of arrival route blockages in space and time. By combining that information with information on the arrival aircraft, it should be possible to provide forecasts of situations in which arrivals are likely to deviate into departure airspace.

### **(iii) Improved decision support for blocked departures**

A particularly difficult departure management decision is determining a suitable alternative departure route when the filed route for an aircraft is blocked. The RAPT capability should be extended to include the presentation of decision support information on the utility of alternative routes [e.g., coded departure routes (CDRs and CDM playbook routes)] for the filed destination including:

- Takeoff times that would avoid severe weather encounters for each of the alternative routes,
- Additional flight time associated with use of each of the alternative routes, and
- Expected future congestion on each of the alternative routes (including congestion on departure fixes and in en route airspace).

It should be noted that this particular decision support needs to be aircraft specific. The near-term availability of high quality airport surface traffic information at the NY airport (from ASDE-X) makes providing this type of decision support potentially feasible (using prototype TFM systems) as soon as 2009.

# TABLE OF CONTENTS

	<b>Page</b>
Acknowledgements	iii
Executive Summary	v
List of Illustrations	xv
List of Tables	xvii
1. INTRODUCTION	1
2. RAPT ALGORITHM AND DISPLAY	3
3. 2007 RAPT PERFORMANCE AND BENEFITS ASSESSMENT METHODOLOGY	9
3.1 Tasks of RAPT Field Use Observers	11
3.2 Determining Quantitative RAPT Delay Savings	12
4. RAPT TECHNICAL PERFORMANCE EVALUATION RESULTS	15
5. RAPT BENEFITS EVALUATION RESULTS	25
5.1 RAPT Benefits Categories and Frequency of Use	25
5.2 RAPT Delay Savings Case Studies	27
5.3 RAPT Annual (2007) Delay Savings	30
6. NY SWAP TRAFFIC FLOW MANAGEMENT OBSERVATIONS	33
6.1 Observations of NY SWAP Traffic Management Details (TMD)	34
6.2 NY Airspace Availability Uncertainty Observations during SWAP (TMD-S)	39
6.3 TFM “Lack Of Understanding” Observations During NY SWAP	40
7. POTENTIAL NEAR-TERM RAPT BENEFITS	41
8. CONCLUSIONS	45
Glossary	47
References	49
APPENDIX A INDIVIDUAL RAPT CASE STUDY DESCRIPTIONS	A-1
APPENDIX B RAPT PERFORMANCE BENEFITS ASSESSMENT CAMPAIGN	B-1



## LIST OF ILLUSTRATIONS

<b>Figure No.</b>		<b>Page</b>
ES-1	Methodology used to estimate annual RAPT delay reduction benefits.	vi
ES-2	Illustrations of documented RAPT usage, demonstrating high RAPT operational accuracy.	vii
2-1	RAPT departure route definitions.	4
2-2	RAPT route blockage algorithm for the 2007 operational test.	5
2-3	The RAPT operational display.	6
2-4	FAA and airline facilities with access to RAPT in 2007.	7
3-1	Field-use observation periods for the 2007 RAPT performance and benefits assessment study.	9
3-2	FAA and airline facilities included in the 2007 RAPT field-use assessment experiment.	10
3-3	Methodology used to estimate annual RAPT delay reduction benefits.	11
4-1	Illustration of high operational accuracy in RAPT departure status.	16
4-2	Illustrations of documented RAPT usage, demonstrating high RAPT operational accuracy.	17
4-3	Illustrations of inaccurate RAPT guidance.	18
4-4	Departure status timeline instability as a result of forecast uncertainty.	20
4-5	Impact of small scale forecast intensity errors on RAPT guidance.	21
4-6	Illustration of risk mitigation in RAPT using echo top height information.	22
4-7	Using RAPT to identify opportunities for ‘2-as-1’ and ‘3-as-1’ operations.	23
6-1	Frequency and type of additional observations of the characteristics of NY air traffic operations during SWAP.	33
6-2	ZDC airspace showing the location of the primary NY WHITE and WAVEY departure routes (dashed red) in relation to Warning Areas (W-386, W-107) used for military exercises off the Mid-Atlantic coast.	37



**LIST OF ILLUSTRATIONS**  
(Continued)

<b>Figure No.</b>		<b>Page</b>
7-1	Estimates of the annual frequency of RAPT benefits for observed usage in 2007, full, near-term potential usage, and 40% of full potential RAPT usage.	43

## LIST OF TABLES

<b>Table No.</b>		<b>Page</b>
ES-1	Observed RAPT Benefit Categories	viii
ES-2	Annual RAPT Benefits Frequency Per Category	ix
5-1	Normalized RAPT Benefits Observations by Facility	26
5-2A	RAPT Benefit: More Timely Departure Route Openings; Eased Restrictions (RO) Case Study Delay Savings Results	29
5-2B	RAPT Benefit: More Timely Reroute Planning/Implementation (RRP) Case Study Delay Savings Results	29
5-2C	RAPT Benefit: Directing Pathfinder Requests (DP) Case Study Delay Savings Results	29
5-2D	RAPT Benefit: Keeping Departure Routes Open Longer (DOL) Case Study Delay Savings Results	29
5-3	Mean/Median RAPT Delay Savings per Departure Route Management Application	30
5-4	Annual NY Convective Weather SWAP Days	30
5-5	Annual RAPT Benefits Frequency per Category	31
5-6	Annual RAPT Delay Reduction Benefits	31
7-1	Observed vs. Potential RAPT Delay Savings per Benefits Case Study	44

# 1. INTRODUCTION

Efficient management of air traffic departing from metro New York (NY) airports during convective weather is one of the most difficult challenges facing the operators of the U.S. National Airspace System (NAS). The high air traffic demand in this complex, capacity-constrained terminal and en route airspace requires quick decisions and extensive coordination amongst multiple air traffic control (ATC) facilities in order to prevent rapid escalations in NY weather-induced air traffic delay and potential airport surface gridlock (e.g., Evans et al. 2007; Robinson et al. 2006; Davison and Hansman, 2001).

The Route Availability Planning Tool (RAPT) is an integrated weather / air traffic management (ATM) decision support tool that has been designed to help traffic managers better anticipate weather impacts on jet routes and increase NY departure route usage efficiency. RAPT uses deterministic precipitation and echo top forecasts, together with airspace usage and flight trajectory models, to forecast the availability of the various NY departure routes, assigning each a status of clear, partially-blocked, or completely blocked by weather as a function of departure time. The RAPT algorithm and display features are described in Section 2 of this report.

In the summer of 2007, MIT Lincoln Laboratory (MIT LL) and the FAA Aviation Weather Office conducted a field study in the NY airspace region to evaluate RAPT technical performance at forecasting route blockage, to assess RAPT operational use during adverse weather, to evaluate the RAPT benefits, and to better understand the effect of severe weather on the overall NY airport departure decision-making environment. Simultaneous real-time observations of operations at FAA and airline facilities were carried out on 11 days when convective weather impacted NY air traffic. A description of the design and methodology of this experiment is presented in Section 3 of this report.

Real-time field observations helped to validate RAPT route blockage predictions and expected operational uses during various types of weather and airspace management situations. The RAPT performance evaluation, presented in Section 4, examines the validity of RAPT guidance and discusses the strengths and shortcomings of the current route blockage algorithm. RAPT algorithm improvements and further research needs required to extend RAPT capabilities are also discussed in this Section.

Observed RAPT operational benefits included increased departure route throughput, improved route impact timing leading to more efficient reroute planning, and more timely decision coordination. Results demonstrating the various observed RAPT delay mitigation and decision coordination benefits, the frequency of RAPT use at each RAPT-equipped FAA and airline facility, and quantified delay savings (per use and as an annual estimate) are presented in Section 5.

Additional objectives of the in-field RAPT usage observations were to (1) develop a better understanding of NY departure management during convective weather in an effort to improve overall departure decision support, (2) identify cases for in-depth benefits analyses, and (3) support/refine the RAPT user training. Section 6 presents the results of observations of the multi-facility departure management decision chain during convective weather, the Air Traffic Control (ATC) concerns, needs, and responsibilities (and how they differ) at specific FAA facilities, and the procedures and pitfalls of the current process for capturing and disseminating pertinent traffic flow management (TFM) information.

Section 7 provides an estimate of RAPT usage and quantifiable benefits that should be achievable in the near term through enhanced user training, route blockage forecast algorithm and display enhancements, and better operational user understanding of the role of RAPT in collaborative, tactical decision-making

for NY departure management. The section concludes with specific near-term enhancements to increase RAPT usage and delay reduction benefits.

## 2. RAPT ALGORITHM AND DISPLAY

RAPT calculates route blockage along departure routes that are based on statistically averaged, 60 minute, four-dimensional (4D) departure flight trajectories. Trajectory points are calculated at one minute intervals. Flight trajectories have four phases – climb, transition, near en route (‘near’) and en route – that reflect flight altitude and airspace complexity. Routes are defined by boxes centered on the trajectory points, whose length and width are functions of the flight phase. The lengths are set to approximately two minutes flight distance and the widths reflect the route density and the ability of ATC to maneuver flights around convective weather in the region traversed during the flight phase. Typically, routes are wide during the climb and transition phases (inside the NY terminal airspace), become narrower in the near en route phase where departure and arrival routes are densely packed (inside NY and northern Washington D.C. ‘near’ en route airspace) and widen again in the en route phase where routes are not so densely packed (inside Cleveland and southern Washington D.C. en route airspace). Figure 2-1 illustrates the RAPT departure trajectory definitions.

Route blockage, a number between 0 and 1, is calculated for each box along a given route and thresholded to one of the four blockage status colors. The route availability status for a particular departure route at a given departure time is the highest blockage that would be encountered within nominally one hour of flight time by a flight that departs from the airport at the indicated time.

The following forecast grids, provided by the Corridor Integrated Weather System (CIWS), are used in the RAPT blockage calculation:

- (1) precipitation intensity based on Vertically Integrated Liquid (VIL)
- (2) echo top heights

VIL levels are mapped into Video Integrated Processor (VIP) levels of precipitation intensity for display (Troxel and Engholm, 1990), but the VIL forecast provides a higher resolution of precipitation intensity than the 6 levels of the VIP scale for internal use by the algorithm. The echo tops forecast predicts echo top heights at each pixel in the grid to the nearest 1000 feet. Forecasts have a spatial resolution of 1 km and a temporal resolution of 5 minutes. Forecasts are updated every 5 minutes. RAPT uses 90 minute weather forecasts to determine impacts along the 60 minute departure trajectory for departure times up to 30 minutes into the future.

Route blockage is calculated at each trajectory point based on the weather inside the route box centered on the trajectory point. It is a linear combination of three factors: VIL intensity (I), echo top height (H) and passable width (W) (Figure 2-2). Intensity is a spatially weighted average of all VIL pixels greater than or equal to VIP level 1, where the weights are higher toward the center of the route box and lower toward the edges.

$$I = \text{Sum (over all pixels with VIL } \geq \text{ level 1) [ P * ( VIL - L1 ) / ( L3 - L1 ) ]}$$

where P is the pixel weight based on its distance from the route centerline, VIL is the forecast value for VIL at the pixel, L1 is the threshold VIL value for VIP level 1 and L3 is the threshold VIL value for VIP level 3. Pixel weights (P) are algorithm parameters and thus can be readily adjusted.

The echo top height (H) is the median of all valid echo top pixels in the box in units of kft. The passable width (in km) is an algorithm parameter that was set to 10 km during the 2007 operational test. Its contribution to blockage is calculated as

W = Passable width – Greatest width between level 3 VIL pixels

The calculated blockage is

$$B = a * I + b * (H - H_0) + c * W, \text{ where } H < H_0$$
$$B = a * I + c * W, \text{ where } H_1 \geq H \geq H_0$$
$$B = a * I + b * (H - H_1) + c * W, \text{ where } H > H_1$$

where a, b and c are algorithm parameters that are functions of the departure trajectory phase, H0 and H1 are algorithm parameters (set to 32 and 36 kft, respectively, in 2007) and B is clipped to the [0,1] interval.

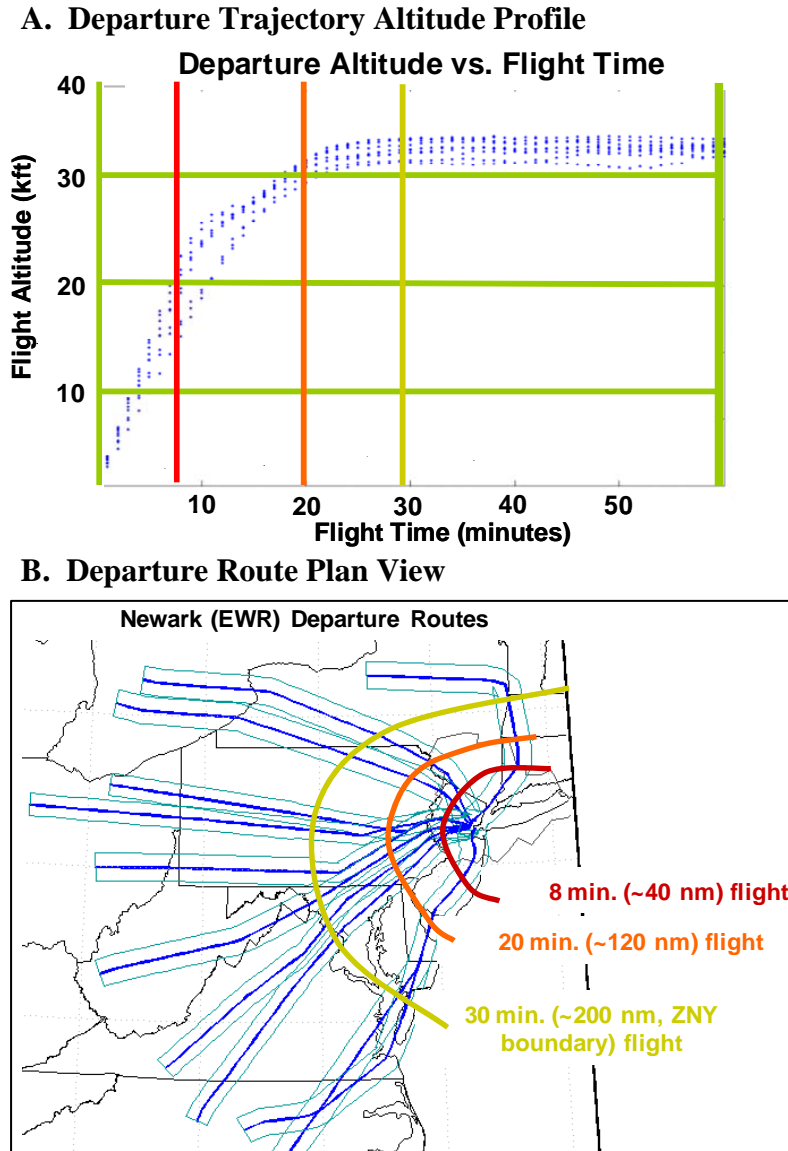


Figure 2-1. RAPT departure route definitions. (A) Departure trajectory altitude vs. time profile and (B) departure route plan view are illustrated.

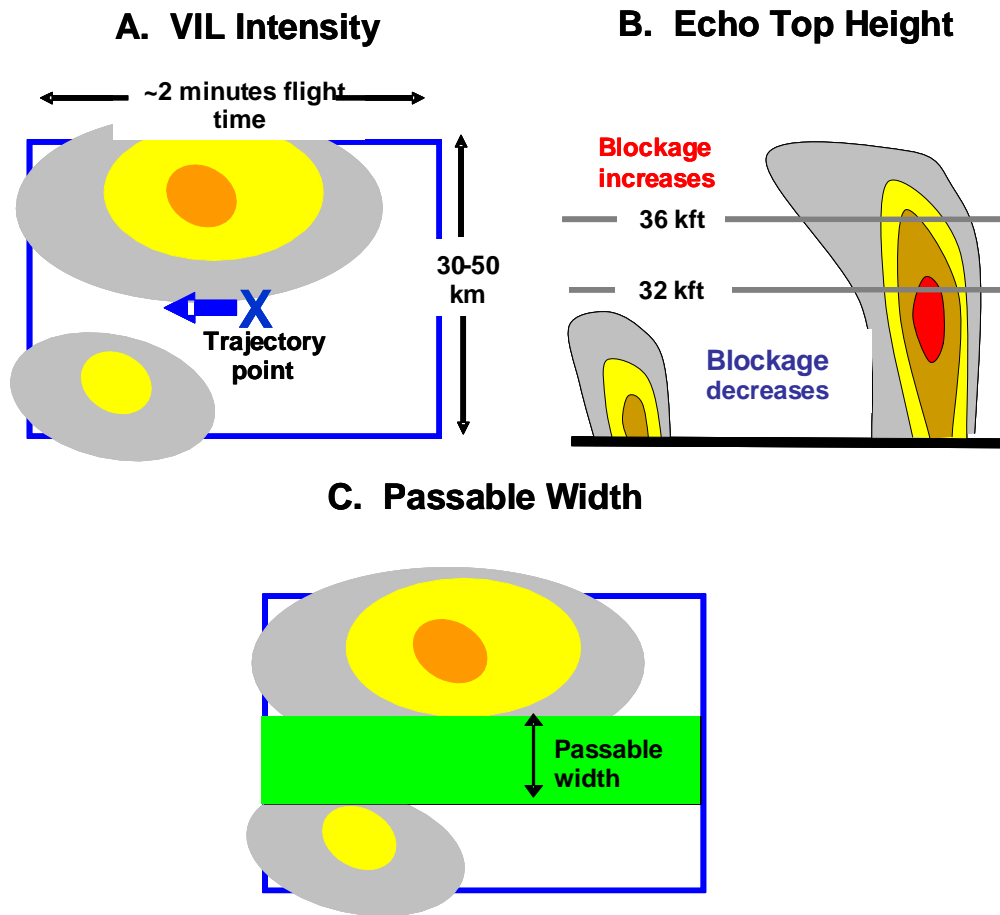


Figure 2-2. RAPT route blockage algorithm for the 2007 operational test. Figure (A) is an overhead view of the departure route box (blue box) that surrounds a single trajectory point in a RAPT departure trajectory (the blue X in the middle of the box). The VIL intensity term in the blockage score is a weighted average of the VIL values at each pixel in the box, with pixels near the center having higher weights than those near the edges. Figure (B) illustrates the concept for echo top height contribution. Route blockage decreases linearly with echo top height where echo tops are less than 32 kft and increases linearly where they exceed 36 kft. Between 32 and 36 kft, the echo tops contribution to blockage is nil and route blockage is solely a function of VIL intensity and passable width. Figure (C) illustrates the definition of the passable width, which is the widest longitudinal path that traverses the route box without any level 3 VIL pixels (shown as yellow regions in the figure).

The RAPT display, illustrated in Figure 2-3, provides a RAPT departure status table and a weather forecast animation window. Each row in the table (‘departure status timeline’) provides the forecast route availability for possible future departures along a particular route. The routes are ordered from north to south. Each column in the table represents a future airport-specific departure time. Each cell in the table is colored according to the departure status for a particular departure time and route as described above. YELLOW and RED cells include the median echo top encountered along the route at the point of blockage. These YELLOW and RED cells may also include an ‘ENR’ notation, which indicates that the blockage occurred beyond the first 30 minutes of flight time, during the ‘en route’ trajectory phase.





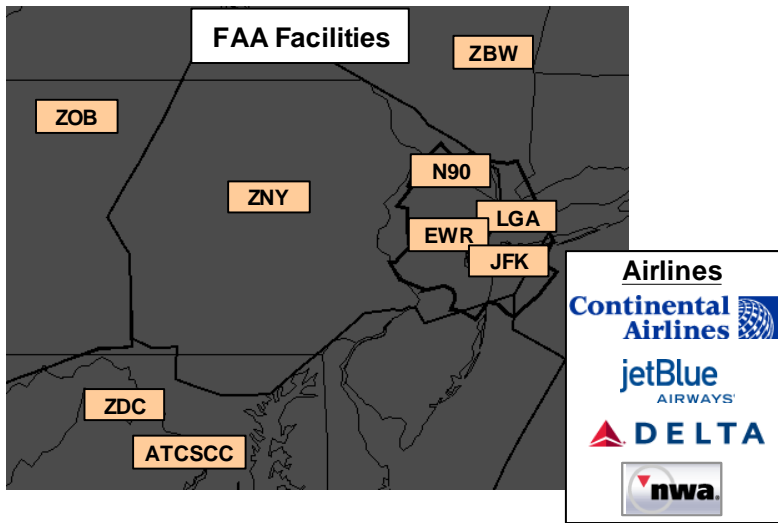


Figure 2-4. FAA and airline facilities with access to RAPT in 2007. Access to RAPT at Newark (EWR), LaGuardia (LGA), and John F. Kennedy (JFK) airport towers was available via thin-client applications installed on Internet-ready PCs. All other facilities accessed RAPT via dedicated CIWS situation displays.



### 3. 2007 RAPT PERFORMANCE AND BENEFITS ASSESSMENT METHODOLOGY

The RAPT operational benefits study was modeled after the Corridor Integrated Weather System (CIWS) delay reduction studies conducted in 2003 and 2005 (Robinson et al. 2004; Robinson et al. 2006). Knowledgeable observers were present at several FAA and airline facilities during convective weather events to observe the operational uses of RAPT and critique RAPT technical performance in real-time. Observations at each facility were made simultaneously in order to better understand the coordination and collaboration interactions associated with departure flow management.

Observations of RAPT use in the field were conducted on 11 convective weather days (120 hours of ATC operations) during the 2007 summer storm season. Snapshots of the convective weather coverage and intensity, on the dates on which observers were present in operational facilities, are shown in Figure 3-1. Convective weather coverage, location, storm type, intensity, and times of storm development and decay varied significantly across the 11 days of field observations, resulting in a large variety of air traffic impacts and subsequent traffic management initiatives to help mitigate delay. Therefore, these observation periods were considered representative of the convective weather events that can disrupt NY air traffic operations and specifically NY departure flow management.

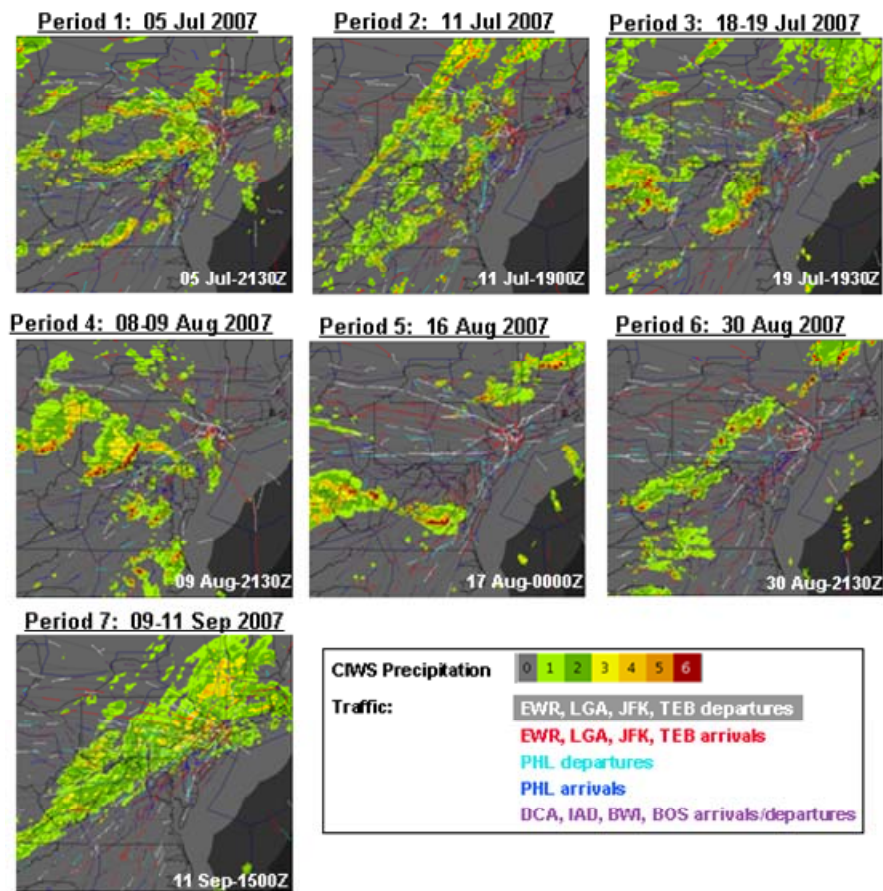


Figure 3-1. Field-use observation periods for the 2007 RAPT performance and benefits assessment study.

Observation teams from MIT LL and the FAA Aviation Weather Office were dispatched to major FAA and airline facilities involved in NY departure management (see Figure 3-2), including three control towers [Newark (EWR), LaGuardia (LGA), and John F. Kennedy (JFK) airports], the NY Terminal Radar Control (TRACON) facility (N90), several Air Route Traffic Control Centers (ARTCCs), including NY (ZNY), Cleveland (ZOB), Washington (ZDC), and Boston (ZBW), the Air Traffic Control System Command Center (ATCSCC), and airline operations centers for Continental (at EWR) and Jet Blue Airlines. Using the methodology summarized in Figure 3-3, the detailed observations of RAPT-derived departure flow management decisions at each of these facilities were used to determine the various operational benefits of RAPT, estimate the frequency of each benefit category, and obtain data used for RAPT delay saving case studies.

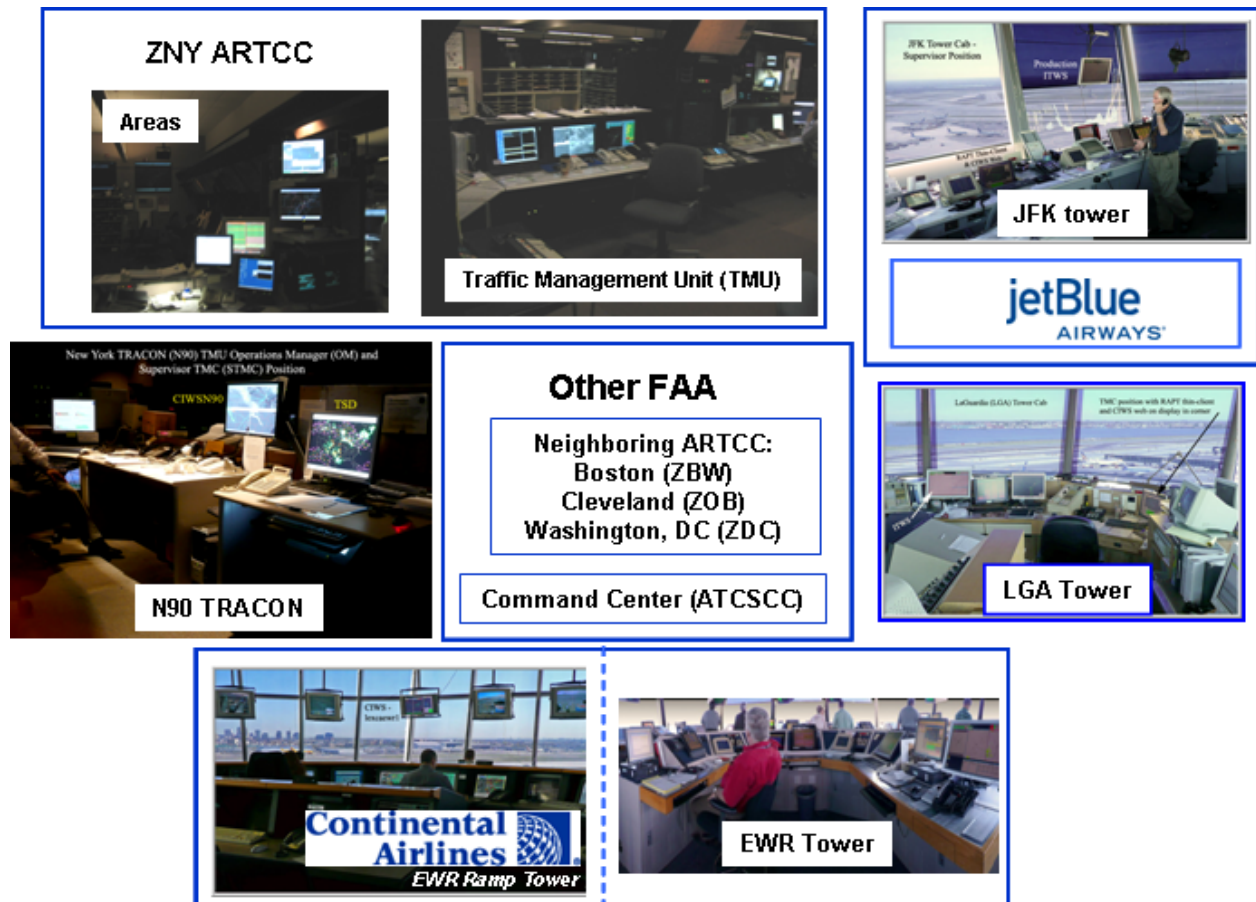


Figure 3-2. FAA and airline facilities included in the 2007 RAPT field-use assessment experiment. ARTCC observations included RAPT applications and weather-TFM decisions made by the Traffic Management Unit (TMU) and Area Supervisors.

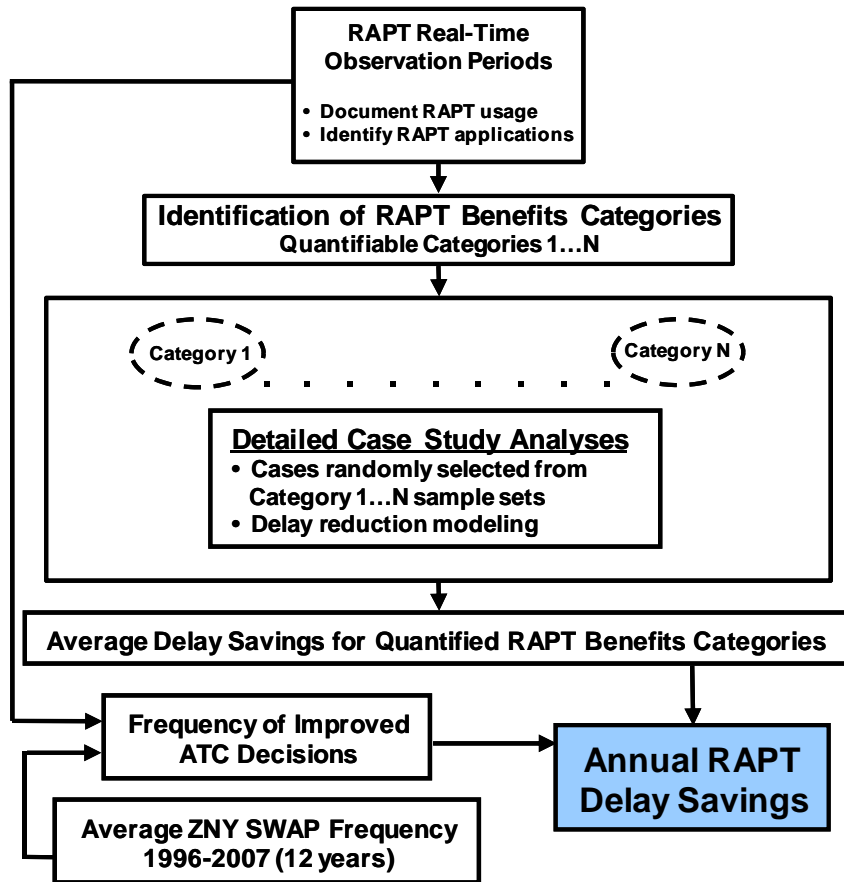


Figure 3-3. Methodology used to estimate annual RAPT delay reduction benefits (SWAP stands for “Severe Weather Avoidance Program”, which is implemented in NY airspace when convective weather causes significant air traffic disruptions).

### 3.1 TASKS OF RAPT FIELD USE OBSERVERS

During convective weather events, MIT LL and FAA Aviation Weather Office observers at each selected facility routinely documented the following:

- Weather characteristics/situation
- Weather impact on air traffic
- Weather impact mitigation decisions/plans
- What RAPT depicted
- RAPT operational uses (if any)
- If there were questions about RAPT from the operational users
- Other weather/ATC decision support tools used

Observations were made several times per hour as convective weather evolved, as impacts on NY departure traffic varied, and as traffic management decisions required reevaluation and revision. By focusing on both RAPT and the complete decision-making environment, detailed data were obtained on:

- A. RAPT route blockage forecast technical performance
- B. RAPT operational usage and the frequency of various uses of RAPT
- C. Support information for RAPT benefits case studies
- D. NY Severe Weather Avoidance Program (SWAP) TFM operations

RAPT observers received and documented a number of requests from the RAPT users to incorporate additional features into RAPT. Past experiences with fielding and supporting the CIWS prototype had shown that users will request additional features or display capabilities, and more willingly make suggestions for potential improvements to a demonstration system, when support personnel work with them during real-time weather events. Traffic managers and airline dispatch coordinators using RAPT during adverse weather this summer identified many additional features they felt would improve RAPT capabilities and increase potential benefits. All user requests and suggestions were forwarded to RAPT algorithm/display development teams.

The RAPT observers at FAA and airline facilities also supported ongoing RAPT training. In order to build user confidence in RAPT and increase user expertise, on-the-spot RAPT training was provided when questions arose. Observers took care to note all instances when RAPT training or additional assistance was provided, removing those events from the database in order to ensure that RAPT benefits calculations presented in this report are based only on unassisted usage of RAPT.

### **3.2 DETERMINING QUANTITATIVE RAPT DELAY SAVINGS**

The RAPT field-use observations were analyzed to determine the operational uses of the information provided. Each individual observation of a specific RAPT application was assigned to a RAPT benefits category. The frequency of each type of observed RAPT benefit was determined for each FAA facility and collectively across all facilities. Final estimates for the RAPT benefits frequency per facility were normalized to account for differences in the number of observed convective weather days at each facility. The historical average number of NY SWAP days was used to convert RAPT benefits frequencies per convective weather day to an annual RAPT usage estimate (see Figure 3-3).

Analyses of individual RAPT applications for each type of quantifiable benefits category were then conducted to determine hours of delay saved per operational use of RAPT. These delay savings were converted to cost savings using standard, FAA-supplied conversion metrics.

Departure delays from metro NY airports are incurred primarily on the ground, where a queue of departing aircraft can quickly build when the departure demand is very close to the fair weather departure capacity (e.g., Allan et al. 2001; Robinson et al. 2004). A queuing model was used to measure delay savings for each RAPT benefits case study<sup>3</sup>. The single server queue model requires only two input fields: air traffic departure demand and capacity as a function of time. The demand profile in the model was set to the scheduled departure rate from each NY airport averaged over two clear-weather weekdays in August 2007. The capacity profile in the model was derived from the departure rates actually achieved on the weather impact day for which RAPT applications were being reviewed. Inspections of flight track

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<sup>3</sup>The queuing delay model, developed by Evans (1997), is discussed in detail in Robinson et al. (2004). In 2007, the modeling group at the FAA William J. Hughes Technical Center examined the RAPT delay modeling approach and considered the queuing model and the design of the RAPT benefits experiment reasonable.

data, coupled with feedback from operational traffic managers, were relied upon to estimate differences in airport departure capacity if RAPT-derived traffic management decisions had not been made.

The RAPT delay reduction benefits expressed in hours of delay were then converted to airline Direct Operating Costs (DOC) and Passenger Value Time (PVT). The following cost conversions were used to estimate RAPT monetary operational benefits:

- 2007 airline DOC, incurred on-the-ground: \$1828 per hour (FAA, 2007)
- PVT cost: \$2173 per hour (Robinson et al. 2004; APO Bulletin, APO-03-01, 2003)

Final estimates of RAPT delay and monetary savings must also account for the ripple effect that arises when an aircraft is delayed on one leg of a flight (e.g., due to adverse weather) such that the subsequent legs flown by that aircraft that day are also delayed (e.g., DeArmon, 1992). In this study, downstream delay reductions are assumed to equal 80% of the initial delay (Boswell and Evans, 1997); however in estimating monetary savings associated with downstream delay reductions, only PVT-related savings are included (i.e., no downstream DOC savings appear in the results). Thus, these computations of downstream delay savings are considered very conservative (e.g., Hartman, 1993; Beatty et al. 1999; Robinson et al. 2004).





## 4. RAPT TECHNICAL PERFORMANCE EVALUATION RESULTS

The RAPT performance evaluation focused on two critical areas: operational accuracy and improvements needed to increase the realization of RAPT benefits. Operational accuracy is the measure of the ‘correctness’ of the RAPT departure status; verifying that traffic could not flow when routes were forecast to be RED and that traffic should have been able to flow when the forecast route status was GREEN. Identifying potential areas of improvement in the operational accuracy required the consideration of several factors, including the timeliness, applicability, and reliability of RAPT guidance.

Three factors contribute to the operational accuracy: the accuracy of the weather forecast, the accuracy of the RAPT blockage algorithm, and the coupling between the two. The accuracy of the weather forecast is a measure of how well the VIL and echo top forecasts predict the timing, location, and intensity of convective weather. The accuracy of the RAPT blockage reflects how well RAPT models pilot behavior (which weather pilots will avoid) and departure airspace usage (how much flexibility air traffic control has in vectoring pilots around weather). Determining the accuracy of the RAPT blockage model answers the question, “If RAPT status were based on a perfect weather forecast, would it accurately describe departure route availability?” The coupling between the forecast and RAPT blockage algorithm determines the robustness of the RAPT algorithm. RAPT guidance should accurately reflect the most important details of the weather forecasts, but should not be overly-sensitive to small-scale details and forecast errors that do not significantly affect the weather impact on departure operations. The technical evaluation addressed all of these factors and the examples provided below illustrate their effects on RAPT performance.

Operational accuracy was evaluated by comparing actual traffic – either individual departure trajectories or departure traffic flows – to the forecast RAPT departure timelines that were available to users in real-time operations. Although the analysis of actual traffic is a necessary part of the RAPT technical evaluation, it does not provide all the information needed to validate RAPT technical performance. In particular, the absence of departure traffic on a route may be due to several factors that are not directly related to the impact of convective weather on the availability of the route: there may be limited demand or no departure ready in the queue to fly the route, departure traffic may be limited due to downstream weather, congestion or arrivals deviating into departure airspace, etc. These factors are described in greater detail in Section 6.

The following examples illustrate in detail the relationship between RAPT guidance, observed traffic, and the state of departure flow management operations:

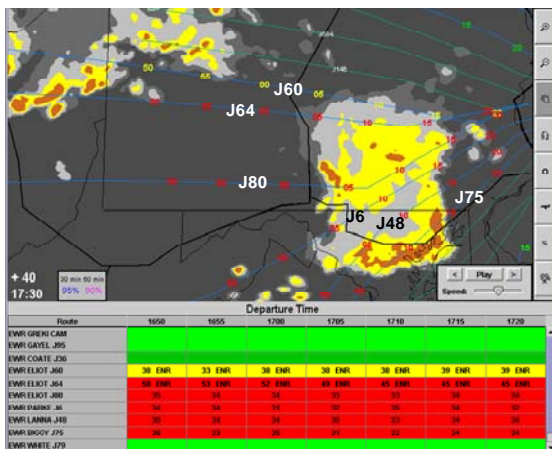
- RAPT shows RED, departure traffic is flowing steadily without deviation: RAPT over-warning.
- RAPT shows RED, departure traffic is flowing steadily with significant deviation: possible RAPT over-warning. However, if the deviation allowed in this particular instance is beyond typical operational limits, this could be a special case. Correlation with field observations may be necessary to correctly interpret this case.
- RAPT shows RED, departure traffic shuts down after a significant deviation: likely correct RAPT guidance.
- RAPT shows RED, no departure traffic observed: likely correct RAPT guidance. However, it should be verified that departure traffic was absent because of weather on the route and not due to other operational concerns.
- RAPT shows YELLOW, no departure traffic observed: unclear. Lack of traffic may be due to other operational considerations.

- RAPT shows YELLOW, limited departure traffic observed: likely correct RAPT guidance. However, it should be verified that the reduced traffic is not due to other operational considerations.
- RAPT shows YELLOW, departure traffic is flowing steadily: possible RAPT over-warning.
- RAPT shows DARK GREEN, no departure traffic observed: unclear. Lack of traffic may be due to other operational considerations.
- RAPT shows DARK GREEN, limited departure traffic observed: unclear. Lack of traffic may be due to other operational considerations.
- RAPT shows DARK GREEN, departure traffic is flowing steadily: correct RAPT guidance.

In the technical evaluation, observed traffic was correlated with field observations in order to properly account for these operational factors.

In general, the RAPT blockage algorithm performed best in circumstances where there was moderate or high weather coverage. Examples of such weather include solid or ‘gappy’ squall lines, low-topped stratiform weather, or convective cells embedded in regions whose weather was characterized by level 1 or 2 VIL, even when the convection was unorganized and difficult to predict with a high degree of accuracy (see Figure 4-1).

### A. RAPT – 1650 UTC



### B. CIWS Weather and Traffic – 1730 UTC

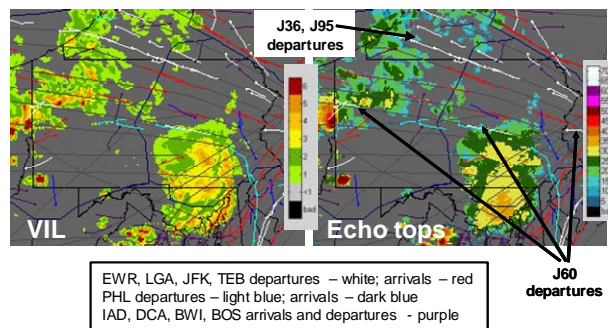


Figure 4-1. Illustration of high operational accuracy in RAPT departure status. (A) RAPT departure status forecasts at 1650 UTC and (B) observed weather and departure traffic at 1730 UTC on 09 August 2007. RAPT shows northern departure routes J95 and J36 as GREEN or DARK GREEN, indicating minimal impact due to convective weather; steady departure streams in (B) confirm the guidance. J60 is YELLOW, due to scattered convection in en route airspace; reduced departure stream in (B) confirms the guidance. J64 is RED, blocked by a large, intense cell in en route airspace; departure routes to the southwest (J80, J6, J48 and J75) are all RED due to convection in ZNY ARTCC; figure (B) shows PHL departures (light blue) avoiding blockage in ZNY and confirms that all southwest departures routes are closed.

The RAPT performance evaluation included many similar examples in which RAPT guidance matched operational decisions. In some instances, RAPT was consulted by users to confirm a decision already made. While no documented benefit arose in these cases (the decisions were made without RAPT usage), they provided important validation of the accuracy of RAPT guidance.

This report also documents several instances where RAPT guidance played an important role in departure management. Figure 4-2 presents three examples where beneficial traffic management decisions derived from RAPT usage confirmed high RAPT operational accuracy<sup>4</sup>. In Figure 4-2A, JFK air traffic control was concerned that the Robbinsville fix (RBV) was in danger of being closed by convective weather. If the fix were closed, they would have to move several queued departures off the runway to avoid stalling the departure queue. However, resequencing the departure queue is a costly operation that they would rather avoid. Controllers consulted RAPT to see that the RBV fixes were predicted to remain open. As a result, they avoided the need to resequence the departure queue and moved the departures out through RBV. Figure 4-2B presents an example where the New York TRACON, observing that the departure status on airway J80 has moved from RED to YELLOW and noting that the forecast echo tops along the route were below 30,000 feet, requested that the ZNY ARTCC reopen J80 and the route was reopened. In Figure 4-2C, ZNY saw an opportunity to release departures along J48 between impacts of moving storm cells, and three extra departures were successfully released into the gap.

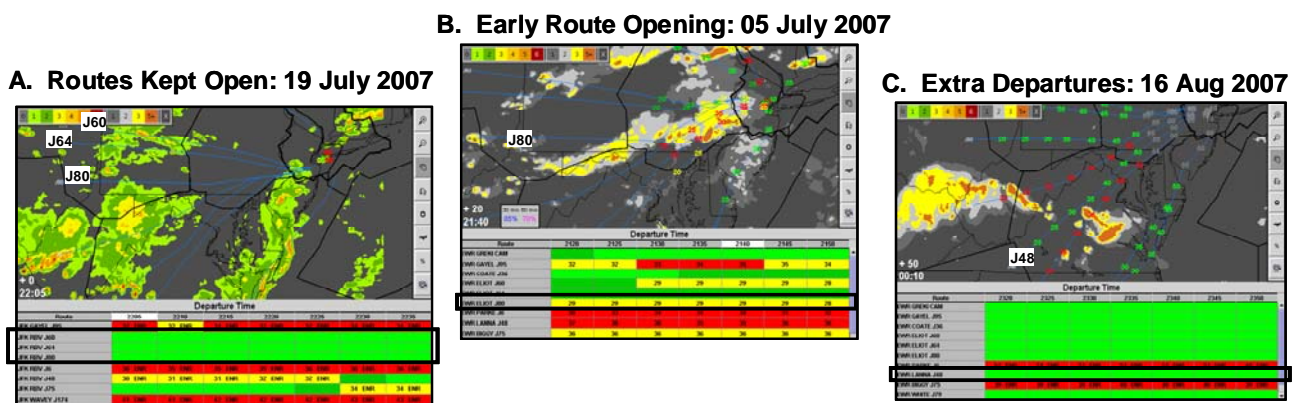


Figure 4-2. Illustrations of documented RAPT usage, demonstrating high RAPT operational accuracy. Black boxes highlight relevant RAPT departure status timelines. In figure (A), departure routes J60, J64 and J80 from JFK airport through the RBV departure fix are kept open since RAPT forecast minimal impact from decaying storm. In figure (B), departure route J80 is opened because RAPT shows YELLOW status with low echo tops (below 30 kft). In figure (C), three extra departures are released along J48 as RAPT predicts a gap between storm impacts.

RAPT was not always so accurate. A common failure mechanism was over-warning during weather events where small, strong isolated cells or high-gradient edges of larger cells were present near the edges of route boundaries. Since RAPT used only “valid” pixels to characterize weather in the route box (pixels that are ‘null’, indicating lack of radar return, valid forecast or edited data, are not included in the intensity or echo top height calculations), it often overestimated the impact of such weather. This failure mode became more evident with the introduction of wider routes in RAPT in 2007, as the route boundaries now extended several miles to either side of the center of the route and severe weather at greater distance influenced the route blockage calculation. Figure 4-3 illustrates this failure, where the leading edge of a strong, high-topped cell just crosses the route boundary, resulting in a predicted RAPT blockage on a route where traffic continues to run unimpeded. Even though only a small portion of the

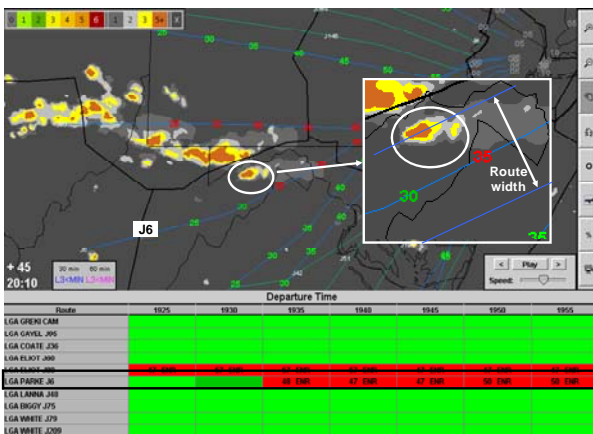
<sup>4</sup> See Section 5 for a complete description of RAPT operational uses and benefits observed during the 2007 storm season.

route was impacted by the weather, the contribution of the high echo tops and strong precipitation intensity dominated the blockage calculation.

If RAPT is to be used to anticipate route openings and closings, users must develop confidence in the accuracy of its blockage model, and RAPT must provide users with the information they need to determine when to believe and when to ignore RAPT guidance. RAPT must answer the two most commonly asked questions in the field, “Why is it telling me this?” and “How do I know it’s right?” RAPT must be transparent, readily providing information to the user that explains its guidance. It also should provide the user with some objective measure of its performance.

The 2007 implementation of RAPT was not particularly transparent; at times, it did not provide sufficient diagnostic information to support its guidance. The blockage score calculation is highly non-linear and is not easily approximated by any rule of thumb. In circumstances like those illustrated in Figure 4-3, users were confused as to why RAPT showed RED when the weather was so far from the route (RAPT did not provide any additional explanation to help them understand). Potential ways to explain RAPT guidance in such situations include the ability to show the route boundaries on the animation display and to identify where RAPT thought the blockage was occurring.

**A. RAPT – 1925 UTC**



**B. CIWS Weather and Traffic – 2010 UTC**

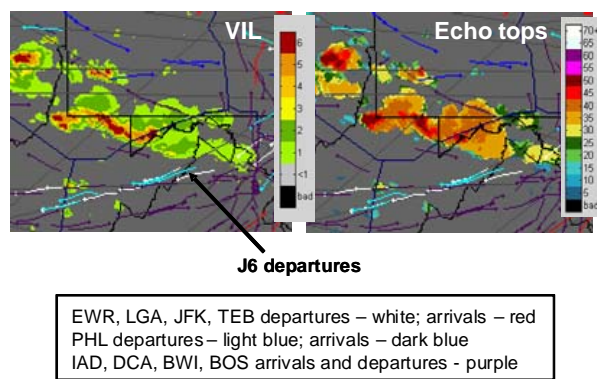


Figure 4-3. Illustrations of inaccurate RAPT guidance. At 1925 UTC on 08 August 2007, RAPT showed J6 departure route closing down at 1935 UTC as a small, intense cell crosses the route boundary (Figure A). Weather and traffic at 2010 UTC (Figure B) show the traffic stream on J6 continuing uninterrupted as there is still sufficient room to avoid the weather without deviating outside of route boundaries.

Some form of explicit RAPT confidence metric is needed to help users quickly evaluate the quality of RAPT guidance. In principal, it is straightforward to calculate a RAPT forecast score: compare the RAPT blockage calculated from the forecast with the blockage calculated from true weather. However, such a score has little value in real time operations because it provides a measure of past performance (these forecast scores could be up to 90 minutes old), not a prediction of future performance. Furthermore, the RAPT forecast performance was not that consistent over time, due to the dynamic nature of convective weather, particularly at the small scales involved in calculating RAPT route blockages. Lacking a reliable measure of confidence, users in 2007 were required to develop their own rules of thumb to evaluate the quality of RAPT guidance, a difficult task for traffic managers still learning to use an unfamiliar tool.

RAPT was also not sufficiently robust in the face of highly uncertain forecasts of small-scale weather features (on the order of route widths) in dynamically changing convective weather. The problem is illustrated in Figure 4-4. The leading edge of a cluster of strong, unorganized cells is impacting departure airways J48 and J75. There is significant forecast uncertainty, and as forecasts are updated, the position and motion of the cells change. Because of the location and strength of the cells, even small changes in the forecast resulted in significant changes in RAPT blockage, as the successive RAPT departure timelines illustrate. This forecast instability is a result of a ‘mismatch’ between the weather forecast and the RAPT algorithm: RAPT was overly sensitive to small changes in the forecast location and intensity of strong weather features whose precise location and intensity were difficult to forecast. This oversensitivity became more problematic in 2007, when RAPT departure routes were widened significantly and changes in the CIWS forecasts resulted in reduced correlation between features in successive forecasts. In any event, such instability has an easily predictable effect on user confidence – RAPT is less useful if the forecast route blockages for a given time in the future vary significantly from one time to the next.

Even when the weather forecast consistently locates the weather features correctly, the RAPT departure status prediction is also sensitive to errors in forecast intensity, as shown in Figure 4-5. In this example, the CIWS Echo Tops Forecast correctly located the cell responsible for the route blockage, but underestimated the echo top height by several thousand feet, resulting in significant RAPT under-warning.



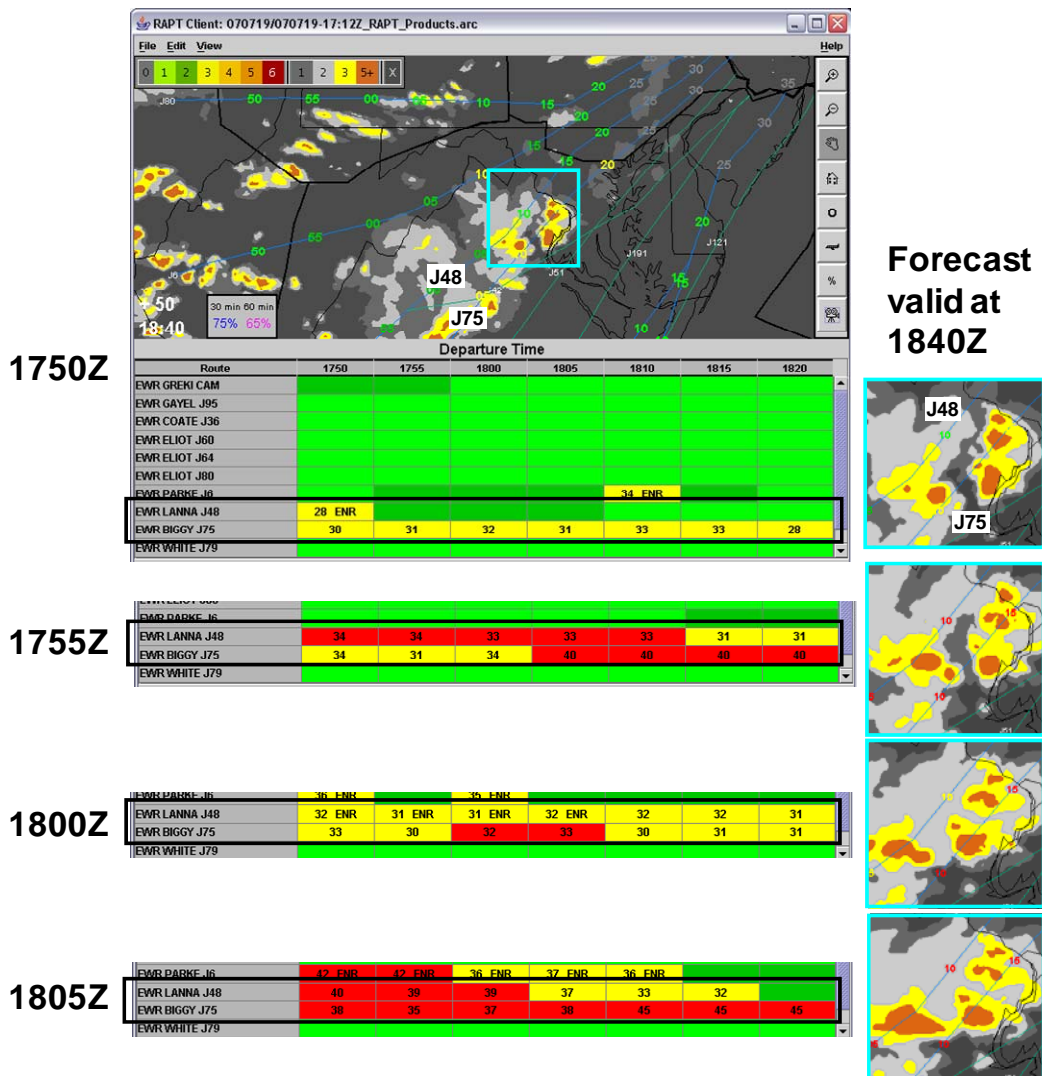


Figure 4-4. Departure status timeline instability as a result of forecast uncertainty. As weather features change unpredictably with successive forecast updates, RAPT departure status along routes J48 and J75 changes significantly. Example is from 19 July 2007.

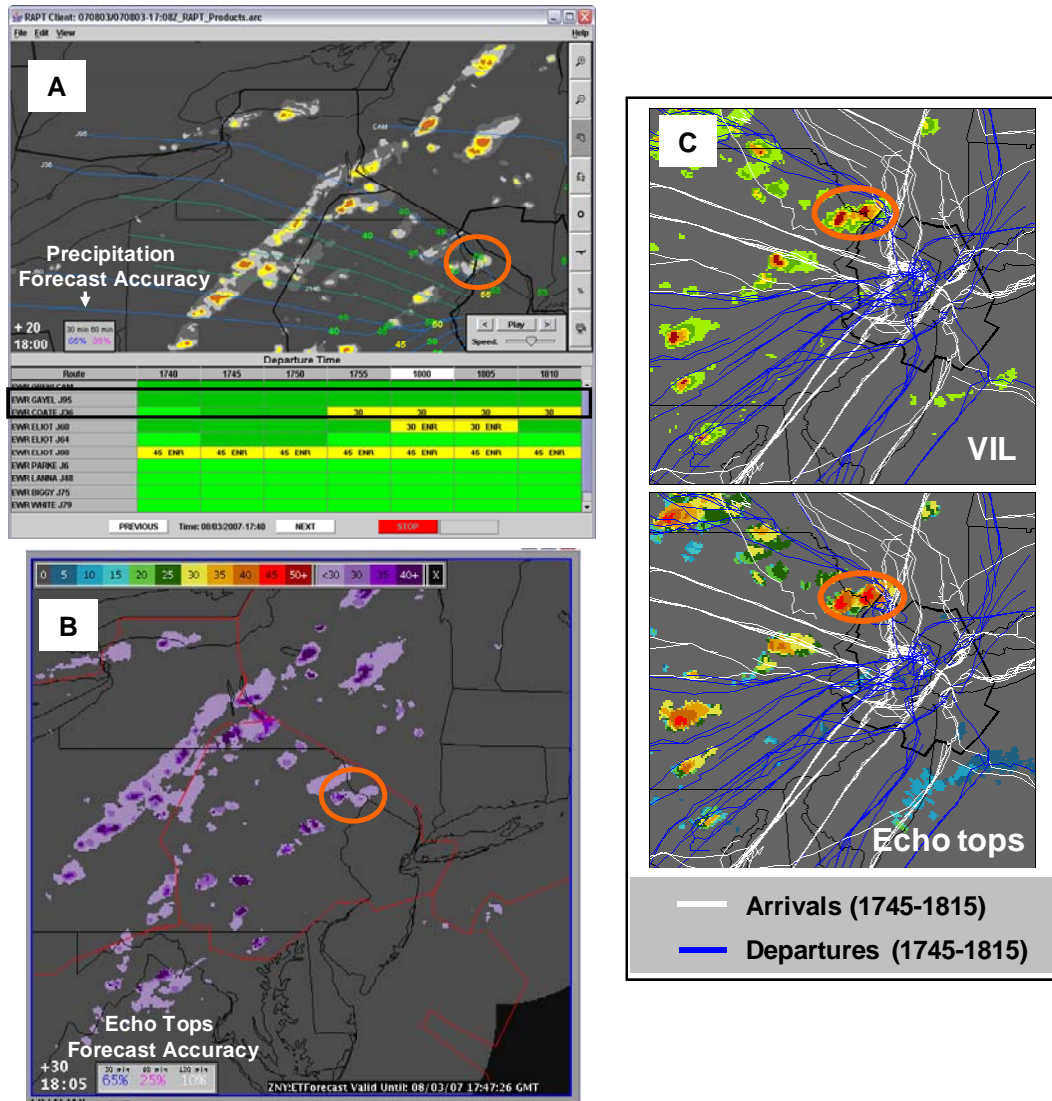


Figure 4-5. Impact of small scale forecast intensity errors on RAPT guidance. (A) RAPT timeline and CIWS Precipitation Forecast at 1740 UTC and (B) CIWS Echo Tops Forecast at 1735 UTC show small, low intensity cells impacting departure routes J95 and J36 (orange oval). Note the low forecast accuracy scores for the 30 minute (65% for both Precipitation and Echo Tops) and the 60 minute (35% and 25%, respectively) forecasts. Actual weather and traffic (C) show strong cells causing departure traffic to deviate to the north and east to avoid the convection. Example is from 03 August 2007.

RAPT did provide information that enabled users to reduce the risk associated with forecast uncertainty. The echo top altitudes in the RAPT departure timeline display provided information that enabled users to ‘smooth out’ variations in the RAPT departure status timelines, as illustrated in Figure 4-6. In this example, the decision was made to release a pathfinder along airway J95 based on RAPT showing GREEN at 1930Z. Two pathfinders were identified and given departure times in the range between 1950 – 2000Z. The RAPT forecast update showed J95 departures in the time range between 1950 and 2005Z had changed to YELLOW and later departures to RED, causing air traffic managers to reconsider the decision. However, the traffic manager also noted that RAPT was predicting low echo tops (around 30 kft) along the flight route, suggesting that the flights could successfully navigate the departure route. The decision was made to release the pathfinders as planned, and they departed successfully.

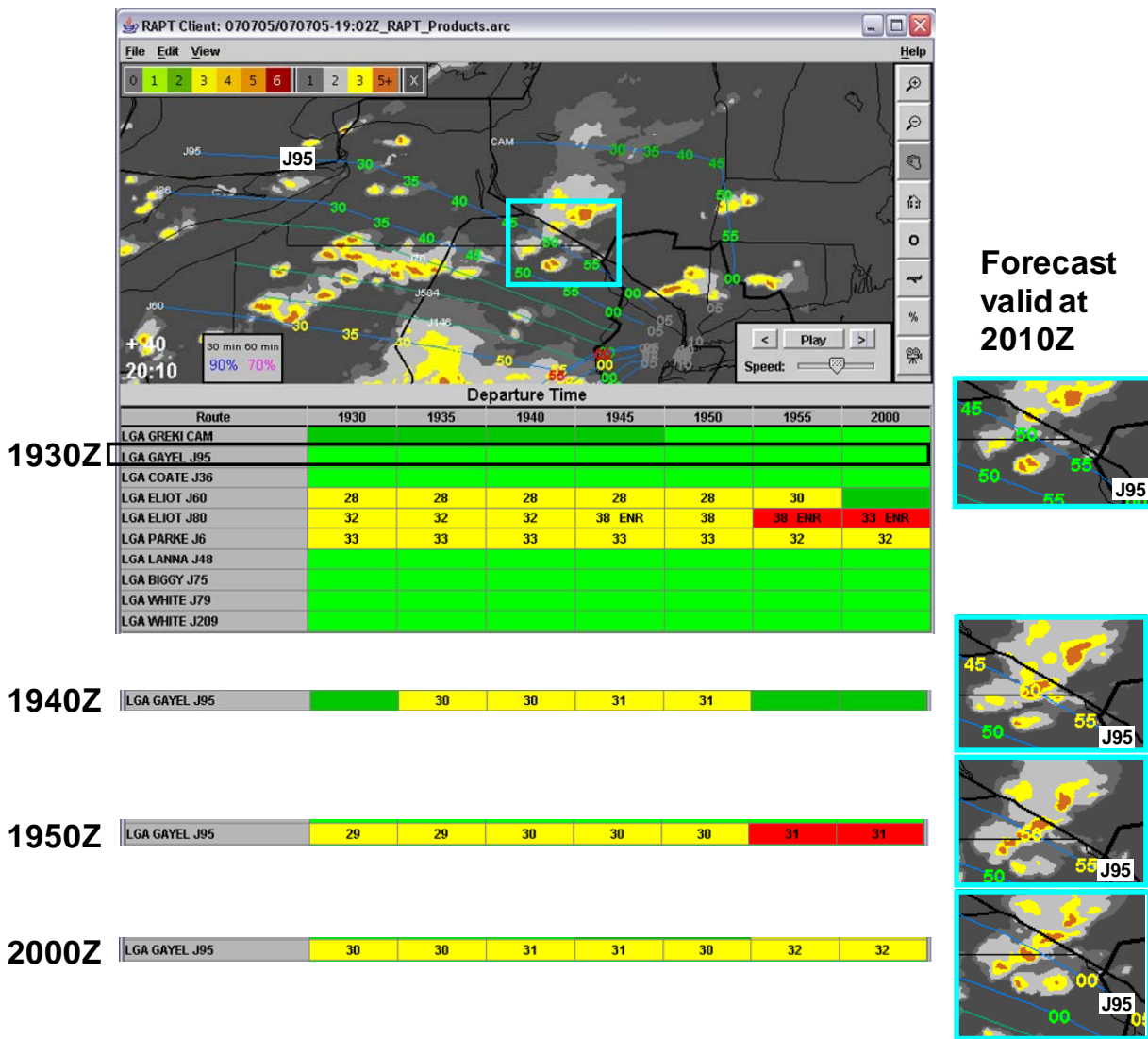
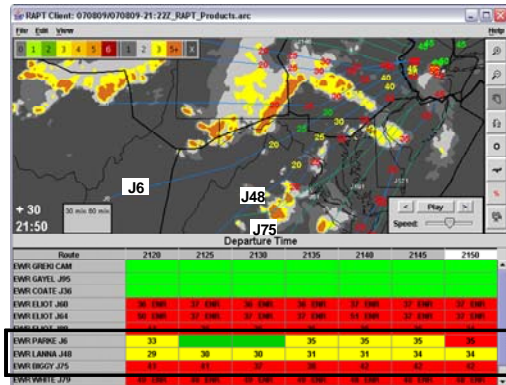


Figure 4-6. Illustration of risk mitigation in RAPT using echo top height information. A decision was made at 1930 UTC on 05 July 2007 to release a pathfinder along J95 from LGA some time between 1950 and 2000 UTC, based on GREEN RAPT status for the route (RAPT display at top). RAPT status from subsequent forecasts (1940, 1950 UTC) indicate first YELLOW and then RED status for the route. However, noting the consistently low echo top heights forecast (between 29 and 31 kft.), air traffic managers decided to stay with the plan, and pathfinders were successfully released from both LGA and EWR.

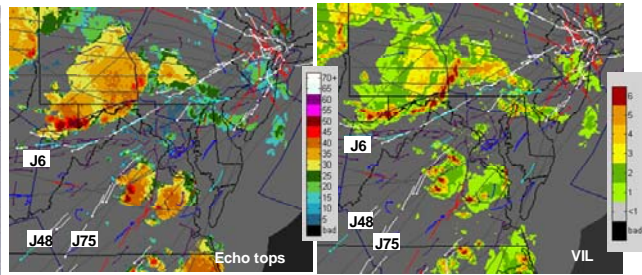


A second RAPT risk mitigation strategy was to mentally ‘average’ departure route status from adjacent routes when there was significant variation in their departure status timelines. RAPT timeline ‘signatures’, such as those illustrated in Figure 4-7, indicate opportunities for risk-hedging departure flow management strategies such as combined ‘two-as-one’ and ‘three-as-one’ departure operations. In these operations, two or three adjacent departure streams are merged into a single reduced-capacity traffic flow that is vectored around the storm. As departing flights clear the storm, they split from the merged flow to return to their filed flight plan. Two or three-as-one operations are frequently employed in the New York airspace to keep departures flowing when there are persistent gaps in local convective weather that can be exploited.

### A. RAPT – 2120 UTC



### B. Weather and Traffic – 2150 UTC



EWB, LGA, JFK, TEB departures- white; arrivals- red  
 PHL departures- light blue; arrivals- dark blue  
 IAD, DCA, BWI, BOS arrivals and departures purple

Figure 4-7. Using RAPT to identify opportunities for ‘2-as-1’ and ‘3-as-1’ operations. (A) RAPT status timeline ‘triplet’ for departures along J6, J48 and J75 show a mixture of GREEN, YELLOW and RED status for adjacent departure routes at 2120Z. (B) Observed traffic at 2150 UTC shows J48 and J75 departure flows running ‘as-1’ to avoid severe weather in northern VA before splitting apart in central VA. Example is from 09 August 2007.



## 5. RAPT BENEFITS EVALUATION RESULTS

RAPT operational benefits were identified directly from real-time observations of RAPT usage and traffic management decision-making at all visited FAA and airline facilities during the 2007 SWAP season (individual field observations are provided in Appendix B). From these observational data:

- RAPT benefits categories and frequency of use were identified (Section 5.1)
- RAPT delay savings case studies were conducted (Section 5.2 and Appendix A)
- RAPT annual (2007) delay savings estimates were made (Section 5.3)

### 5.1 RAPT BENEFITS CATEGORIES AND FREQUENCY OF USE

Usage of RAPT by FAA traffic managers and airline dispatch coordinators was partitioned into the following 11 benefits categories:

1. **RO** More timely departure route reopenings; eased departure restrictions
2. **RRP** More timely reroute planning or implementation; improved route impact planning
3. **DP** Directing pathfinder requests
4. **DOL** Keeping departure routes open longer
5. **AHD** More timely and proactive resumption of arrival flows; decreased airborne holding; potentially saved diversions
6. **PRSA** Proactive runway sequencing assistance
7. **EP** Enhanced decision-making productivity
8. **I/IC** Enhanced Inter/Intra- facility coordination
9. **SA-1** Enhanced common situational awareness
10. **SA-2** Improved awareness of evolving airspace impacts
11. **SA-3** Decision/plan/information confirmation or evaluation

Benefits categories 1-6 (above) directly result in RAPT-derived delay savings and are therefore considered quantifiable. Of these, four primary departure route management categories (RO, RRP, DP, and DOL) were the focus of the 2007 delay savings estimates. Results are presented in Section 5.2 and Appendix A.

Though more difficult to translate into tangible delay and cost savings estimates, RAPT benefits categories 7-11 are critical to improving decision-making planning and coordination, which in turn increase the likelihood of implementing other RAPT-derived capacity enhancement decisions such as RO or RRP<sup>5</sup>.

Common awareness of rapidly evolving convective weather impacts in the complex NY airspace region is extremely important. The ability of RAPT to calculate and depict the route impact status for specific airport departure times allowed traffic managers to (a) quickly digest the current and near-term status of departure routes (SA-1), (b) proactively ascertain when the availability of specific departure routes was

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<sup>5</sup>A study of decision-making productivity enhancements attributed to CIWS concluded that use of CIWS for improved common situational awareness and enhanced inter/intra-facility coordination resulted in more efficient use of available en route airspace capacity and increased ATC controller productivity during adverse weather (Robinson et al. 2006).

likely to change – open to impacted to closed, or closed to open (SA-2), and (c) evaluate departure flow management decisions and if needed, offer RAPT-derived alternatives (SA-3).

The frequency of RAPT benefits observations at each facility, normalized by the number of convective weather days on which observations were made, is shown in Table 5-1. Overall, the per-facility frequency of the most common quantifiable RAPT benefits categories – RO, RRP, and DP – ranged from once in two SWAP days to once in ten SWAP days. However, when one considers benefits for RO, RRP, and DP categories across all facilities, one finds that a RAPT-derived delay mitigation decision occurred roughly once per NY SWAP day. Case study results in Section 5.2 (and Appendix A) and extrapolations to annual estimates in Section 5.3 show that the observed frequency of RAPT usage provided significant operational benefits in 2007<sup>6</sup>.

At most facilities, 2007 was the first year that the majority of traffic managers attempted to use RAPT to improve NY departure flow management. Therefore, operational users often monitored RAPT to increase their awareness of pending route impacts and to confirm decisions made with other tools such as CIWS, the Enhanced Traffic Management System (ETMS), or their controller scopes. Because of this, instances of the RAPT decision coordination and confirmation benefit categories (EP, I/IC, SA) were more frequently observed than the quantifiable benefits categories (see Table 5-1). This was particularly true at ZNY, where Supervisor Traffic Management Coordinators (STMC) often consulted RAPT departure status timelines for quick updates on which routes may be blocked by convective weather.

**TABLE 5-1**  
**Normalized RAPT Benefits Observations by Facility\***

	LGA	EWR	JFK	N90	ZNY	ZDC	ZOB	ZBW	Airline	ATCSCC
RO	0.4	0.1	0.2	0.2	0.3	0	0	0	0	0
RRP	0	0	0	0.1	0.5	0	0	0.2	0	0.2
DP	0.1	0	0.2	0.3	0.3	0	0	0	0	0.2
DOL	0.1	0	0	0	0	0	0	0.2	0	0
AHD	0	0	0	0	0.1	0	0	0	0	0
PRSA	0	0	0.2	0	0	0	0	0	0	0
EP	1.3	0.5	0.7	0.3	1.9	0.2	0.3	0.4	0.4	0.4
I/IC	1.1	0.7	0.3	0.7	2.1	0.2	0.1	0.2	0.2	0.4
SA-1	2.5	0.7	0.2	1	3.5	0.4	0.7	1	0.6	0.6
SA-2	1.6	1.1	0.7	0.8	3.5	0.1	0.9	0.2	0.2	0.2
SA-3	2.3	1.1	0.8	0.9	1.1	0	0.7	0.4	0.2	0
# Days	11	10	6	11	11	10	7	5	5	5

RO	Route Reopenings; Eased Restrictions	EP	Enhanced Productivity; Reduced Workload
RRP	More Timely Reroute Planning/Implementation	I/IC	Enhanced Inter/Intra-Facility Coordination
DP	Directing Pathfinders	SA-1	Enhanced Common Situational Awareness
DOL	Departure Routes Open Longer	SA-2	Improved Awareness of Evolving Impacts
AHD	Proactively Resuming Arrival Flows; Decreased Airborne Holding	SA-3	Decision Confirmation/Evaluation
PRSA	Proactive Runway Sequencing Assistance		

\*Facility that used RAPT most frequently for each benefit category is shown in red

<sup>6</sup> In Section 7, we discuss why the RAPT benefits for 2008 and beyond should be significantly higher than that the observed 2007 RAPT benefits.

Controllers in the LGA Tower often used RAPT to support a “bottom-up-push” for departure management decisions (SA-3 category). Decreasing departure route capacity and increasing NY departure delay ultimately result in runway and taxiway backups at the airports. Therefore the tower controllers are often the first to recognize the need to search for options to release departure traffic. This motivated LGA to use RAPT route availability predictions to collaborate with N90 and ZNY for proactive delay mitigation solutions. Moreover, tower personnel, focusing on jet routes that only impact their operations, are likely able to use RAPT to more closely monitor the status of their departure routes than traffic managers at N90 TRACON and ZNY ARTCC, where the traffic management responsibilities and coordination requirements may be more extensive.<sup>7</sup>

Instances of similar RAPT usage were less frequent at JFK and EWR towers. Although all three towers accessed RAPT via a thin-client display application installed on an Internet-ready PC in the tower cab, the JFK and EWR PCs were either poorly placed or hosted additional applications used for critical administrative tasks. This reduced access to the RAPT products at the EWR and JFK towers, which in turn reduced the overall RAPT operational effectiveness there (see EWR and JFK RAPT EP, I/IC, and SA usage frequencies, compared to LGA, in Table 5-1). Improved access to RAPT information in the towers is considered a very important factor for increased RAPT usage and operational benefits (as will be discussed in Section 7).

## 5.2 RAPT DELAY SAVINGS CASE STUDIES

Case studies of observed RAPT operational usage allowed us to estimate the delay savings associated with the four primary departure route management benefits categories – RO, RRP, DP, and DOL. To prevent double-counting, care was taken when categorizing RAPT usage observations to ensure that only one quantifiable benefit category (see categories 1-6 in Section 5.1) was assigned to each observation. Details of each RAPT benefits case study are provided in Appendix A.

In each case, a queuing delay model was used to estimate delay savings at each of the metro NY airports (LGA, EWR, and JFK). Model results from each of the individual airports were then combined for total savings attributed to the RAPT application under study. In some cases, queuing delay estimates were required for the Philadelphia airport (PHL) as well. Even though PHL departure route guidance is not explicitly included in RAPT, traffic managers occasionally used PHL pathfinders to test the availability of previously-closed routes (used by PHL and NY airports) identified by RAPT as clearing (see Cases A-3-1 and A-3-2 in Appendix A).

A total of 11 RAPT benefits cases were analyzed. A summary of RAPT delay savings (hours of delay saved and cost savings) derived from these case studies, for each of the four primary departure route management categories, is provided in Tables 5-2A – 5-2D. The calculated delay reduction for an individual RAPT-derived decision ranged from 0.9 hours (20 July 2007 - RO case) to 26.7 hours (19 July 2007 – RRP case). This large case-to-case variability was not surprising given the sensitivity and nonlinear characteristics of NY queuing delays; in fact, it is the primary motivation for the multiple case study approach. However, since RAPT benefits often occurred over short “super-tactical” time periods,

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<sup>7</sup>This is similar to findings in the 2005 CIWS ATC productivity study, where Area personnel in an ARTCC, more acutely aware of weather impacts and the airspace availability status of their immediate region of responsibility, were able to use CIWS to help develop and refine traffic management initiatives and reduce the decision-making burden of Traffic Management Unit (TMU) personnel (Robinson et al. 2006).

and were applied to a smaller sub-region of the constrained NAS network than in the CIWS analysis, the variability in RAPT delay savings was not as great as previous CIWS case study results<sup>8</sup>.

Mean and median RAPT delay savings per quantified benefits category were computed to determine the average delay reduction per RAPT application<sup>9</sup> (Table 5-3). Mean delay estimates are likely the most appropriate measure for average delay but given the small case study sample sets, and the wide spread in benefit estimates, unacceptably high variability exists with the mean. Therefore median benefits results were preferred for estimating annual RAPT savings. Median results are currently available only for the RO benefits category. Mean results were used for the other benefits categories.

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<sup>8</sup>CIWS case study results often impacted larger airspace regions and traffic from more airports in en route airspace. They also often included a mix of linear “time-of-flight” delay savings (which were smaller) and nonlinear queuing delay savings (which were larger) that contributed to case-to-case delay reduction variability (Robinson et al. 2004).

<sup>9</sup>Median delay reduction statistics were computed only for the RO RAPT benefits category, which included six case studies (Median RO delay savings are an average of RAPT benefits results from the 16 Aug and 11 Sep case studies). Mean statistics were computed for RO, RRP, and DP benefits categories, which each contained at least two case studies. Mean/median statistics were not computed for the DOL category, which only contained one case study.

**TABLE 5-2A.**  
**RAPT Benefit: More Timely Departure Route Openings; Eased Restrictions**  
**(RO) Case Study Delay Savings Results**

Date	Time UTC	DELAY SAVED (hr)			SAVINGS (\$)			
		Primary	Downstream	Total	Direct Operating Costs (DOC)	Passenger Value Time (PVT)	Passenger Value Time Downstream (PVTd)	TOTAL
05 Jul	2120	7.7	6.2	13.9	14,076	16,732	13,473	44,281
05 Jul	2315	2.4	1.9	4.3	4,388	5,215	4,129	13,732
20 Jul	0040	0.5	0.4	0.9	951	1130	913	2,994
16 Aug	1740	2.5	2.0	4.5	4,515	5,367	4,302	14,184
30 Aug	2130	10.2	8.2	18.4	18,646	22,164	17,818	58,628
11 Sep	1815	4.4	3.5	7.9	8,043	9,561	7,606	25,210

**TABLE 5-2B.**  
**RAPT Benefit: More Timely Reroute Planning/Implementation**  
**(RRP) Case Study Delay Savings Results**

Date	Time UTC	DELAY SAVED (hr)			SAVINGS (\$)			
		Primary	Downstream	Total	Direct Operating Costs (DOC)	Passenger Value Time (PVT)	Passenger Value Time Downstream (PVTd)	TOTAL
19 Jul	1340	14.8	11.9	26.7	27,055	32,160	25,860	85,075
11 Sep	1630	7.7	6.2	13.9	14,076	16,732	13,473	44,281

**TABLE 5-2C.**  
**RAPT Benefit: Directing Pathfinder Requests**  
**(DP) Case Study Delay Savings Results**

Date	Time UTC	DELAY SAVED (hr)			SAVINGS (\$)			
		Primary	Downstream	Total	Direct Operating Costs (DOC)	Passenger Value Time (PVT)	Passenger Value Time Downstream (PVTd)	TOTAL
16 Aug	2325	1.6	1.2	2.8	2,797	3,325	2,651	8,773
30 Aug	2320	0.9	0.8	1.7	1,700	2,021	1,608	5,329

**TABLE 5-2D.**  
**RAPT Benefit: Keeping Departure Routes Open Longer**  
**(DOL) Case Study Delay Savings Results**

Date	Time UTC	DELAY SAVED (hr)			SAVINGS (\$)			
		Primary	Downstream	Total	Direct Operating Costs (DOC)	Passenger Value Time (PVT)	Passenger Value Time Downstream (PVTd)	TOTAL
11 Jul	1705	8.6	6.9	15.5	15,721	18,688	14,994	49,403

**TABLE 5-3****Mean/Median RAPT Delay Savings per Departure Route Management Application**

<b>RAPT Benefit Category</b>	<b>Delay Saved (hr)</b>	<b>Cost Savings (\$)</b>
<b>Mean RO</b>	<b>8.3</b>	<b>26,334</b>
<b>Median RO</b>	<b>6.3</b>	<b>19,697</b>
<b>Mean RRP*</b>	<b>20.4</b>	<b>64,678</b>
<b>Mean DP*</b>	<b>2.2</b>	<b>7,051</b>
<b>DOL<sup>†</sup></b>	<b>15.5</b>	<b>49,403</b>

*\*Only two case studies available for RRP and DP categories, so only mean statistics are listed*

*†Only one DOL case study conducted, so no mean/median statistics are available*

*NOTE: Statistics shaded in BLUE were used to estimate annual RAPT delay savings*

**5.3 RAPT ANNUAL (2007) DELAY SAVINGS**

The normalized frequency of observed RAPT benefits presented in Table 5-1, summed up across all operational facilities, yields the total observed benefits frequency per convective weather SWAP day. Multiplying observed daily RAPT departure route management benefits (RO, RRP, DP, and DOL) by the historical average number of declared NY SWAP days that occur in a year (Table 5-4, ZNY Traffic Management Officer, personal communication) yields the annual RAPT benefits frequency (Table 5-5).

**TABLE 5-4****Annual NY Convective Weather SWAP days**

<b>1996</b>	<b>41</b>
<b>1997</b>	<b>39</b>
<b>1998</b>	<b>54</b>
<b>1999</b>	<b>61</b>
<b>2000</b>	<b>85</b>
<b>2001</b>	<b>62</b>
<b>2002</b>	<b>66</b>
<b>2003</b>	<b>77</b>
<b>2004</b>	<b>82</b>
<b>2005</b>	<b>68</b>
<b>2006</b>	<b>72</b>
<b>2007</b>	<b>63</b>
<b>12 yr average</b>	<b>64</b>



**TABLE 5-5**  
**Annual RAPT Benefits Frequency per Category\***

1. RO	77
2. RRP	70
3. DP	70
4. DOL	19
5. AHD	6
6. PRSA	13
7. EP	410
8. I/IC	384
9. SA-1	717
10. SA-2	595
11. SA-3	480

*\*Benefit Categories in red box used to estimate annual delay savings*

Annual RAPT delay reduction benefits, computed from mean/median delay savings per RAPT use and the annual RAPT frequency of use, are presented in Table 5-6. Combined for the four primary departure route management benefits categories, annual RAPT benefits estimates, derived from real-time observations across all RAPT-equipped traffic management facilities during the 2007 convective weather season, were **2,300 hours of delay saved, with a cost savings of \$7.5 M.**

**TABLE 5-6**  
**Annual RAPT Delay Reduction Benefits**

RAPT Benefit Category	Hours			Monetary Value (\$)			
	Primary	Downstream	TOTAL	DOC	PVT	PVT downstream	TOTAL
RO	270	216	486	483,483	574,728	458,458	1,516,669
RRP	791	637	1,428	1,439,585	1,711,220	1,376,655	4,527,460
DP	88	70	158	157,395	187,110	149,065	493,570
DOL	163	131	294	298,699	355,072	284,886	938,657
<b>TOTAL</b>	<b>1,312</b>	<b>1,054</b>	<b>2,366</b>	<b>2,379,162</b>	<b>2,828,130</b>	<b>2,269,064</b>	<b>7,476,356</b>



## 6. NY SWAP TRAFFIC FLOW MANAGEMENT OBSERVATIONS

While documenting real-time RAPT usage during weather impact events, MIT LL and FAA Aviation Weather Office observers also identified other aspects of the NY departure flow management environment that significantly impacted the operational use of RAPT:

- TMD Traffic Management Details
- TMD-S TFM Airspace Status Uncertainty
- TMD-LOU TFM Lack of Common Awareness of Inter-Facility Constraints or “Lack of Understanding”
- EO RAPT Enhancement Opportunities
- UR RAPT User Requests
- PB Pilot Behavior

These ancillary observations, critical for understanding RAPT expectations and benefits scenarios, and improving RAPT guidance, were documented frequently during the RAPT benefits assessment field campaign (Figure 6-1). Observations of NY SWAP TFM operations (TMD observation categories), and their relationship to RAPT performance and operational usage, are discussed here.

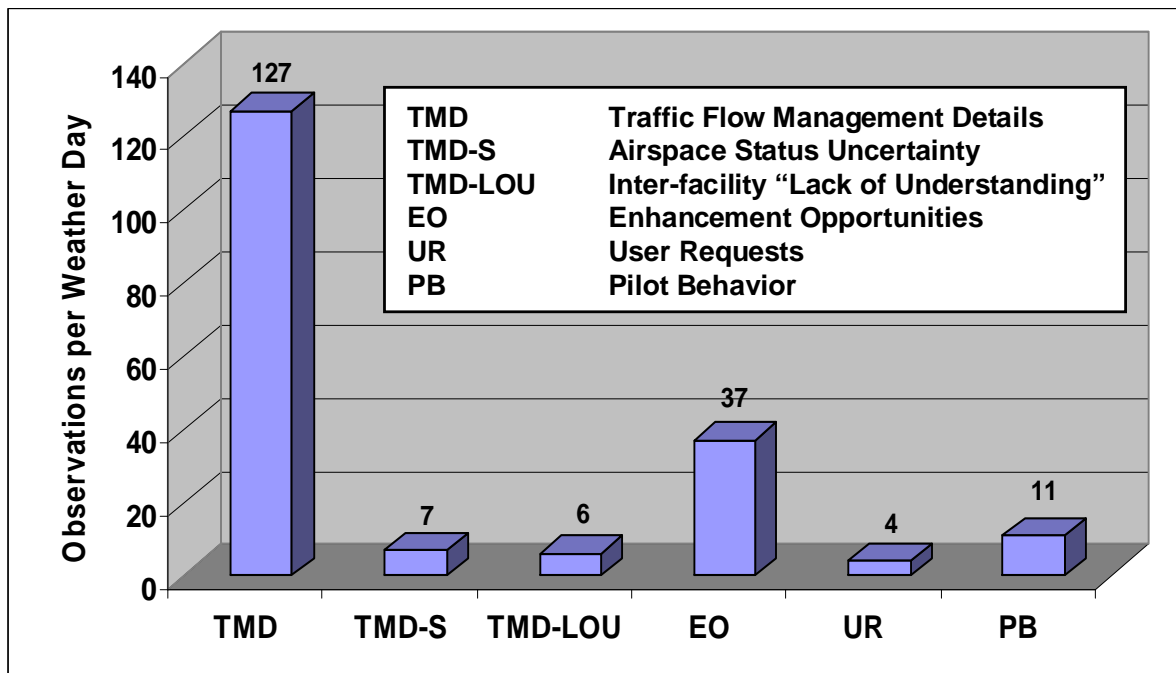


Figure 6-1. Frequency and type of additional observations of the characteristics of NY air traffic operations during SWAP.

## **6.1 OBSERVATIONS OF NY SWAP TRAFFIC MANAGEMENT DETAILS (TMD)**

TMD observations identified the following SWAP TFM elements that may affect the overall operational effectiveness of RAPT:

- Resource utilization for departure flow management - use of pathfinders, Coded Departure Routes (CDRs) and implementing MIT restrictions
- NAS Network issues – effect of NY arrival traffic, active ZDC military airspace, and airport surface management issues on departure flow management
- Collaborative Decision-Making – ZNY Area vs. TMU decision-making and multiple options for SWAP TFM decision coordination

### **6.1.1 Resource utilization RAPT TMD observations**

The common approach for reopening a departure route that had been closed due to convective weather is first to probe the conditions along the route with a pathfinder (also called a “route checker”). Often, a request is made by the ZNY TMU, N90 TRACON, or ATCSCC to the airport Tower controllers for a pathfinder volunteer. Once a pathfinder is identified, a new flight plan, that includes the currently closed route, is provided to the pilot and airline dispatch, and the flight awaits its turn in the airport taxi queue for departure. When the pathfinder flight is airborne and on the route in question, the pilot reports back on the weather conditions, while controllers and traffic managers monitor the progress of the flight, watching to see if the aircraft deviates significantly from its filed flight plan. If the pilot reports acceptable weather conditions and any pilot deviations are within the limits acceptable to ATC controllers, the departure route is reopened and flights are allowed to use this airspace.

Unfortunately, the pathfinder process for reopening a closed route often requires a considerable amount of time and coordination, resulting in delayed reopening of routes and missed opportunities to increase NY departure capacity and reduce delay. Occasionally, identifying pathfinder candidates from among the three metro NY airports and locating a pathfinder volunteer could take upwards of 20-30 minutes, and in a few instances, a pathfinder volunteer was never identified (and the departure route to be probed remained closed).

Once a pathfinder was identified, the flight was often buried in an airport taxi queue, behind aircraft with flight plans that had already been cleared by ATC. This occasionally resulted in an additional delay of 20-30 minutes or more before the pathfinder could take off on its route-probing flight. Finally, controllers and traffic managers had to wait to assess the progress of the flight on the departure route in question, along with waiting for the pilot to report back on encountered weather conditions, before the route could be reopened. All together, the entire pathfinder process for reopening a closed route could require 60 minutes or more, during which time convective weather impacts may have evolved to eliminate tactical opportunities to increase NY departure throughput.

One traffic manager suggested that the pathfinder process should be modified so that instead of looking for a pathfinder volunteer for flights that have not been cleared and therefore cannot depart until the queue of cleared flights is emptied, a short ground stop should be declared and pathfinders should be solicited from the pool of previously cleared flights at the head of the departure queue. The traffic manager noted however that it was unclear which approach would better serve to mitigate delay in the NY network.

Another complicating factor for the pathfinder process is that it often requires multiple coordination steps across several FAA facilities, (and controller/manager positions within a facility), airline dispatch, and finally pilots. Moreover, approval for pathfinder requests usually must be granted by almost every decision-maker in the coordination chain, and different decision-makers have the ability to modify, postpone, or deny the pathfinder request. Differences arise in coordinating pathfinders because of variations amongst the decision-makers' risk tolerance. For example, ZNY Area Supervisors managing en route air traffic controllers are particularly (and understandably) sensitive to the risk of deviating pathfinders because the resulting increase in ATC complexity increases the possibility for operational errors by controllers.

The pathfinder process for reopening closed departure routes has implications for RAPT usage and benefits realization. The long lead time required to release a pathfinder resulted in missed opportunities to reopen a closed departure route early and improve queued airport delays. On occasion, pathfinder delay eroded user confidence in RAPT. For example, if the pathfinder is unsuccessful once airborne (T+30 or more minutes after the original request is made), it may be that the convective weather (and subsequent RAPT guidance) has changed significantly from the situation at time T at which the initial decision was made. Even so, it may still be perceived that RAPT guidance is unreliable in this circumstance.

When normal departure routes are closed during convective weather, SWAP reroutes are required. RAPT provides guidance for Coded Departure Routes (CDRs) to assist traffic managers and airline dispatch coordinators in identifying viable departure reroutes. CDRs are predefined alternative routes to various destinations. Some operational users did examine CDR route blockages when searching for reroute opportunities. However, observations from the 2007 storm season showed that CDRs are often not considered for reroute options because they can require extensive coordination. During severe NY SWAP events, where the weather impacts are often dynamic and evolving, traffic managers informed observers that they do not have the time to coordinate CDR reroutes. Moreover, they understand that setting up a tactical reroute via a CDR may be counterproductive, given the extensive coordination required to reroute only a small subset of select city-pair departures. Traffic specialists at ATCSCC have also stated that they would prefer to coordinate reroutes for larger "flows" of traffic, rather than plan for reroutes for a handful of city-pair flights at a time.

The operational complications associated with coordinating and implementing NY CDR reroutes diminishes the operational utility of RAPT in providing guidance for user-selectable CDR routes. However, some operational users did request an expansion of the available CDR city-pair database in RAPT to at least improve awareness of route availability for these reroute options. The ability to quickly assess the viability of CDR routes via RAPT should facilitate identifying and coordinating reroutes when the filed route is blocked.

Miles-In-Trail (MIT) restrictions were used to manage air traffic volume and to maintain the orderly control of a reopening departure route. Reopened departure routes were often accompanied by MIT (or Minutes-In-Trail – MINIT) restrictions in order to manage TRACON volume and complexity as traffic managers from multiple airports each sought to increase throughput through use of the newly available airspace. The rationale for this use of MIT restrictions was generally understood by all coordinating decision-makers.

On occasion, however, observers noted departure routes reopening with accompanying MIT restrictions put in place as a cushion against potential deviations off the route. Traffic managers at some facilities stated that the value of the use of MIT restrictions in this manner was unclear, since route deviations had not yet occurred on the newly re-opened route. Other traffic managers argued that use of MIT restrictions to proactively guard against unexpected deviations is the proper way to avoid escalations in weather impacts and delay.

The questions concerning the proper MIT restriction assigned to reopening routes for reasons unrelated to volume management typically arose when restrictions were implemented for routes seemingly clear of significant weather. It is surmised that improved expertise and user confidence in RAPT may prove useful in refining procedures and standard practices for implementing MIT restrictions on reopening departure routes. One traffic supervisor suggested that RAPT route blockage status (all clear, clear of significant weather, partially impacted, or blocked, but with marginal echo top heights) may possibly be used to determine not only when a route may be opened or closed, but also whether a specific MIT restriction should be applied to the routes in question. If increased RAPT usage in 2008 were to result in smaller MIT restrictions applied to reopening routes, this would likely lead to increased RAPT delay/cost savings associated with the 'Route reopening' (RO) benefit category.

### **6.1.2 NAS network RAPT TMD observations**

During the 2007 summer storm season, airborne arrival demand often dictated NY departure route usage. This was especially true if either arrivals or departures on adjacent parallel routes were deviating. In those instances, arrival flows were given priority, and the adjacent departure routes (and sometimes even other additional routes) were closed. This problem became critical if Airspace Flow Programs (AFP) or Ground Delay Programs (GDP) in support of SWAP delivered too many NY and PHL arrivals during significant weather impact events. Under these circumstances, departure routes were forced to close to accommodate the excess arrival demand, which on occasion resulted in gridlock at the airport surface.

In these situations in which arrivals deviated into departure airspace, operational users questioned why the RAPT guidance, which showed GREEN, did not match the operational status of the route in question (closed to accommodate arrivals). This led to confusion about the meaning of the RAPT timelines and required additional real-time training to improve understanding of the route availability forecast. RAPT training in 2008 will help users better interpret RAPT timelines in operational contexts that include departure route closures not caused by weather on the route.

Some traffic managers recognized the importance of proactive anticipation of arrival route impacts to the overall performance of the NY airspace network. Though not under consideration for the 2008 RAPT deployment, forecasting NY arrival route availability is currently an active area of research.

Another en route airspace variable that is independent of departure route availability, but can directly affect NY departure capacity, is the status of active Warning Areas in eastern ZDC airspace. These Warning Areas, located just off the Mid-Atlantic coast and operationally off-limits to commercial aviation during military exercises and training, significantly reduce the airspace available for avoiding convective weather. Observations made during the RAPT field campaign noted that FAA controllers and traffic managers are much less tolerant of departure deviations along the southbound NY WHITE and WAVEY departure routes (Figure 6-2) when the ZDC Warning Areas are active.

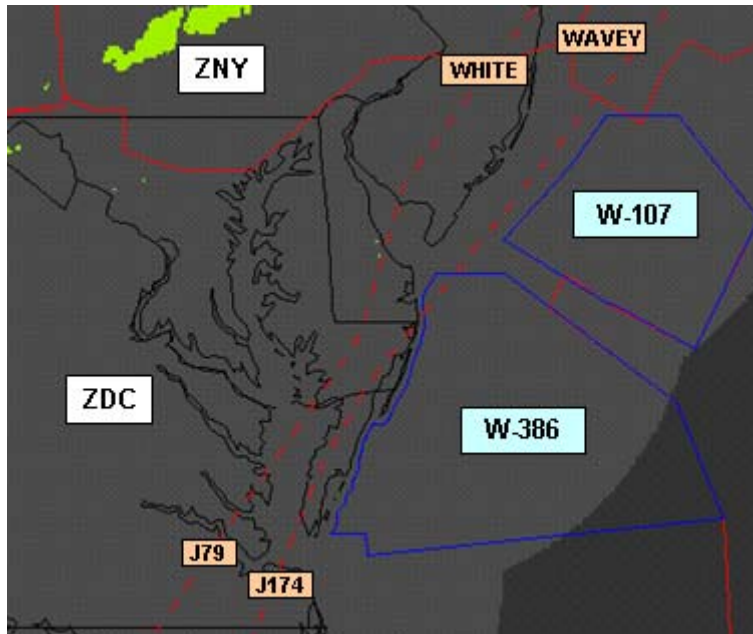


Figure 6-2. ZDC airspace showing the location of the primary NY WHITE and WAVEY departure routes (dashed red) in relation to Warning Areas (W-386, W-107) used for military exercises off the Mid-Atlantic coast.

Current RAPT guidance does not take the constraints introduced by active Warning Areas into account. Many times in 2007, RAPT predicted that the WHITE/WAVEY routes were unimpeded by weather. However, this forecast was based on allowing some local deviations, which RAPT assumed were within the acceptable width of the jet route, but which were too aggressive when ZDC Warning Areas were active. These situations eroded user confidence when expectations of available southbound departure routes, based on RAPT guidance, did not match the operational reality. Discussions are planned with ZDC, ZNY, and N90 traffic managers to determine how RAPT guidance for WHITE/WAVEY departures can best represent operational expectations.

Airport surface traffic management is a very important factor in departure route usage during SWAP. Several incidents were observed where opportunities to reopen NY departure routes were identified, but airport surface complexities and incompatibly-staged aircraft prevented the timely use of newly-available departure route capacity. As departure aircraft are delayed, taxi (and sometimes runway) backups build, effectively limiting maneuverability and surface management flexibility. This problem is exacerbated when arrivals substantially outpace departures to the point where airport surface gridlock occurs.

Improved airport tower access to RAPT (discussed in Section 5.1) and continued user training support are expected to increase RAPT operational usage for surface management. Some attempts were already made by traffic supervisors in JFK tower to apply RAPT departure route availability forecasts to assist with proactive departure runway sequencing (see PRSA category in Table 5-1; RAPT usage example in Figure 4-2C). We expect these types of surface traffic management applications of the RAPT information to be more extensive in the future.

### 6.1.3 Collaborative Decision Making RAPT TMD observations

Observations of SWAP operations in the ZNY ARTCC demonstrated that ZNY Area Supervisors and controllers are key SWAP decision-makers. As in other ARTCCs, TMU traffic managers and Area Supervisors in ZNY often coordinate on tactical TFM decisions (Robinson et. al. 2006). On a number of

occasions, it appeared that the Area Supervisors in ZNY significantly influenced the final decision regarding NY departure route usage.

During the 2007 storm season, RAPT usage by ZNY Area Supervisors, who were new users, was low compared to RAPT usage in the TMU. This limited the use of RAPT for improved common situational awareness of anticipated departure route impacts. In turn, this reduced the use of RAPT to proactively coordinate and implement departure flow management decisions within ZNY.

The summer of 2007 was also the first storm season that ZNY Area Supervisors had access to CIWS. Given that RAPT predictions are built upon CIWS Precipitation and Echo Tops Forecasts, it was deemed important that Area Supervisors first became accustomed to using the CIWS information before focusing on RAPT.<sup>10</sup> Interactive real-time RAPT training for ZNY Areas will be a high priority in 2008, and expectations are that this focused training will improve ZNY intra-facility coordination and increase the operational effectiveness of RAPT.

Simultaneous real-time observations at all NY FAA operational facilities, as well as at neighboring ARTCCs and the FAA Command Center (ATCSCC) revealed that NY departure route usage decisions can be made during convective weather by staff at many different traffic management positions. Moreover, these decisions follow many different coordination paths. The positions or facilities identified making NY departure route management decisions, and some of the observed interactions for coordinating and implementing these decisions, included:

- Towers to/from N90
- Towers to/from ZNY
- N90 to/from ZNY
- N90 to ATCSCC to ARTCC(s)
- ZNY TMU to/from ATCSCC
- ZNY TMU to/from neighboring ARTCC(s)
- ZNY Area Supervisor to/from ZNY STMC
- ZNY Area Supervisor to/from ZNY TMC
- ZNY Area to Area to TMU
- Areas to TMU in neighboring ARTCC(s) TMU
- ZNY STMC to/from TMC
- ZNY sector to sector (controllers)
- ZNY sector to ZDC/ZOB/ZBW sector
- ATCSCC to/from neighboring ARTCC(s) to ZNY
- N90 to/from neighboring ARTCC(s)
- Towers to/from airline dispatch
- ZNY TMC/STMC/Area Supervisors to NY TMU "Pit" personnel

Obviously, this NY decision-making network is very complex and decision outcomes varied depending on which decision-making chain of interactions was used. This is because the goals, needs, concerns, primary responsibilities, and priorities of those at the individual positions and airspace management facilities can vary substantially, resulting in different views as to what would be an optimum TFM SWAP decision.

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<sup>10</sup>CIWS had been available to the ZNY TMU since 2002, and most traffic management coordinators (TMCs) at ZNY are considered experienced CIWS users.



The organizational paths for coordinating and implementing NY departure flow management decisions during SWAP have implications for RAPT operational utility. RAPT can assist in the complex coordination tasks associated with numerous decision-makers involved in making SWAP departure decisions (or at least contributing to departure planning) by providing a common awareness of opportunities to increase NY departure route usage efficiency (either by increasing departure route capacity or recognizing potential deviation/holding situations before they occur). The large number of individuals at several FAA facilities involved in NY departure flow decisions also underscores the need for continued, interactive RAPT training and for improved access to RAPT information (e.g., NY towers). In addition, continued observations of the TFM SWAP environment will allow us to better understand the decision-making priorities and considerations for various decision coordination interactions. This information can be used to better tailor RAPT guidance and training to meet the needs of the operational users.

## **6.2 NY AIRSPACE AVAILABILITY UNCERTAINTY OBSERVATIONS DURING SWAP (TMD-S)**

On average, seven times per convective weather day (see “TMD-S” observations in Figure 6-1), traffic managers across all visited FAA facilities, operating in a fluid and complex NY SWAP environment, were observed to be unaware of the status of specific departure routes or fixes. On these occasions traffic managers thought a route or fix was closed when it was actually open or vice versa. Extrapolating these observations to an entire NY SWAP season, we conclude that instances of airspace status uncertainty occurred more than **440 times** during the 2007 storm season.

The confusion about which departure routes or fixes are available was primarily due to one of the following issues:

1. Numerous fixes and/or routes are often opened/closed for short periods in response to evolving convective weather impacts; some airspace changes apply to only select NY airports (and not all three metro airports).
2. Decisions to close or reopen a route or fix can come from many different facilities or positions within a facility.
3. Many route/fix status changes are disseminated via the NY SWAP Hotline and this information can be easily missed.
4. Each change in route/fix status is entered into the FAA National Traffic Management Log (NTML), and all traffic managers have access to these data. However, significant effort is required to scroll through often long lists of text describing route availability changes (entered in a nonstandard format) and attempt to mentally catalogue and track status changes.

Incidents where the status of NY departure routes was unknown had implications for effective RAPT usage. On several occasions and at more than one FAA facility, traffic managers did not consider the need to consult RAPT for opportunities to proactively reopen a closed route because they had believed that the particular route had already been reopened. In other instances, traffic managers questioned the validity of RAPT guidance because RAPT depicted a route they believed to be open as blocked, even though the route in question had actually already been closed.

It is no fault of the traffic managers that these episodes of airspace status uncertainty occur – the task of tracking, cataloguing, and updating ever-changing NY route/fix status conditions during fast-paced and dynamic SWAP conditions, without some sort of automated assistance, is monumental. The aviation community recognizes that this problem of airspace status uncertainty is a NAS-wide issue (though particularly difficult in the NY airspace region) and improving NAS status information was a high priority recommendation at the 2007 FAA-airline System Review Meeting. One of the options for

improving common situational awareness of route status would be for RAPT to ingest route status information (parsing the data from NTML logs, applying voice recognition technology to collect/parse hotline information, or a combination of the two) and graphically depict the NY departure route/fix status in conjunction with convective weather route blockage forecasts.

### **6.3 TFM “LACK OF UNDERSTANDING” OBSERVATIONS DURING NY SWAP**

Each of the facilities involved in NY SWAP TFM decision making oversees unique airspace regions that vary in terms of configurations, air traffic density, and sensitivity to convective weather. FAA Aviation Weather Office and MIT LL observers noted during the 2007 storm season that coordinating facilities often do not fully understand the airspace concerns and constraints of other facilities. When the information or knowledge is limited as to why a particular TFM decision has been made or as to what type of impacts a decision can have on other airspace operations, team collaboration and decision-making is not optimal. “Lack Of Understanding” (LOU) can hamper collaborative decision-making because it may negatively affect the cooperative effort of the decision-making team. This in turn can cause LOU to contribute to “Why fight the fight” sentiments among coordinating ATC facilities.

Some LOU examples observed in real-time included:

- Constraints are often assumed to result from conditions within ZNY airspace, when in fact airspace closures often occurred elsewhere
- Constraints introduced by N90 to control volume are not always well understood by other FAA facilities
- The severe disruption to tower operations caused by frequent departure fix stops and restarts (required by N90 to control volume) are not fully appreciated
- Increased constraints on WHITE/WAVEY departure route availability when ZDC Warning Areas are active are not always anticipated
- Constraints within ZNY are often not fully understood by other facilities

Increased understanding of the different TFM concerns amongst collaborating facilities could improve NY departure flow management. RAPT guidance may help to increase understanding of network-wide SWAP needs and constraints through explicit depictions and forecasts for weather-related departure flow impacts.

## 7. POTENTIAL NEAR-TERM RAPT BENEFITS

Annual RAPT delay reduction benefits in 2007 were significant (see Section 5.3). However, several observations lead the authors to conclude that the RAPT operational benefits in 2008 and beyond should be much higher than were observed in 2007. Increased RAPT usage and operational effectiveness is expected to increase in the near-term as the following occur:

### A. User experience increases

Operational traffic managers and controllers often used RAPT in 2007 as a confirmation tool – both to help confirm decisions based upon other information and to verify the operational accuracy of RAPT guidance. As user confidence and expertise in the use of RAPT increases, traffic managers are expected to become more aggressive in making proactive NY departure flow management decisions based upon RAPT forecasts for route blockages.

### B. Identified RAPT enhancements and technical performance improvements are implemented

Field observations of RAPT performance and user requests for specific enhancements are guiding RAPT algorithm and display enhancement and redesign efforts. By

- i. improving RAPT route blockage forecasts and the operational accuracy of RAPT guidance (discussed in Section 4),
- ii. providing explicit information about forecast uncertainty,
- iii. including additional departure routes deemed important by FAA and airline personnel in the RAPT database,

RAPT will become both more reliable and better tuned to operational needs.

### C. Access to RAPT at several FAA facilities improves

RAPT access issues at EWR, JFK, and LGA towers have already been discussed in Section 5.1. Options are being explored for providing RAPT in the NY towers via dedicated displays (similar to how RAPT is accessed at the ARTCCs). This would greatly increase RAPT usage at the metro NY towers, leading to improved coordination and enhanced collaborative decision-making for departure flow management.

Adding a dedicated RAPT display at the Teterboro airport (TEB) tower would also likely increase RAPT usage and the operational effectiveness of departure routing decisions for this airport. TEB departure delays during NY SWAP events can be severe. Route blockage forecasts for all nominal TEB departure routes are already available in RAPT, and with a RAPT display and training, controllers at TEB tower would have the same awareness of near-term departure route impacts derived from RAPT as those at all other NY ATC facilities.

RAPT product access should also be improved at the FAA Command Center (ATCSCC). Here, RAPT is available on the dedicated CIWS display provided in the National System Strategy Team (NSST) Unit. However in 2007, the CIWS/RAPT display was located on the other side of the Unit from the NY-desk. Therefore, an NSST traffic management specialist working the NY-desk would have to leave his / her position, walk across the Unit to review RAPT information, and then return to the NY position, attempting to coordinate NY departure decisions with the RAPT data now committed to memory. This was obviously not an ideal setup for RAPT usage within the ATCSCC. Redesign plans for the NSST in 2008 should significantly improve RAPT data access and tool usage at the FAA Command Center.

#### **D. Interactive user training and real-time in situ support continues**

RAPT will continue to be supported by a multi-faceted RAPT training program. As in 2007, RAPT training in 2008 will include small-classroom training and demonstration sessions for all FAA and airline dispatch personnel who may use RAPT. Real-time in situ RAPT training will also be provided at all RAPT-equipped facilities during the storm season, with particular focus on real-time RAPT training for ZNY Area Supervisors.

An important addition to the 2008 RAPT training plans will be the introduction of RAPT Operational Scenario Training (ROST). After each significant NY SWAP event where observers are in the field to study RAPT performance and usage, instances of potential missed opportunities to increase NY departure capacity or mitigate airspace complexity will be documented and presented to operational traffic managers for discussion. ROST is considered a key element to expanded RAPT training efforts because:

1. Recognition of RAPT missed opportunities is considered crucial to refining the Recognition-Primed Decision (RPD) model for NY SWAP decision-making (Evans et al. 2007)
2. Given that RAPT seeks to change long standing SWAP-TFM practice, it is hoped that ROST will help build acceptance and user understanding of RAPT
3. User discussions centered upon ROST may increase “Team Mind” decision-making for NY departures (Klein, 1998)
4. ROST discussions may contribute to RAPT development, as users identify other TFM-related issues that must be overcome or accounted for in order to take advantage of the SWAP departure opportunities identified by RAPT.

In order to estimate the potential increase in RAPT usage and benefits in the near term (e.g., 2008-2010), field observations were reanalyzed to identify “potential” benefits<sup>11</sup>. Potential benefits include instances where RAPT clearly showed that a departure route was available, but the route was not used in a timely manner, where missed opportunities for improved inter/intra-facility coordination occurred, or instances where more ready access to RAPT would have enhanced traffic management productivity. In some instances, potential benefits are identified under the assumption that RAPT improvements listed in A – D (above) have been implemented.

The annual frequency of potential RAPT usage for all FAA and airline facilities currently with access to RAPT is shown in Figure 7-1. Given that not all capabilities and usage enhancements outlined above in sections A – D may be fully achieved in the near-term (2008-2010), and inherent ATC/TFM constraints and NY decision-collaboration complexities will likely still limit RAPT usage in the near-term, 40% of full “potential” benefits is considered to be a more realistic estimate for the expected near-term increase in RAPT operational benefits (see Figure 7-1). The fact that the estimate of the annual frequency of RAPT benefits in 2007 exceeds the estimate of the near-term benefits frequency for one RAPT benefit category (SA-3 – see Figure 7.1) suggests that the 40% number is not only a reasonable, but possibly a conservative estimate for near-term increases in RAPT applications.

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<sup>11</sup> RAPT benefits categories assigned to observations in Appendix B in parentheses and with an asterisk are considered “potential” benefits

- RO Route Reopenings; Eased Restrictions
- RRP More Timely Reroute Planning/Implementation
- DP Directing Pathfinders
- DOL Departure Routes Open Longer
- AHD Proactively Resuming Arrival Flows; Decreased Airborne Holding
- PRSA Proactive Runway Sequencing Assistance
- EP Enhanced Productivity; Reduced Workload
- I/IC Enhanced Inter/Intra-Facility Coordination
- SA-1 Enhanced Common Situational Awareness
- SA-2 Improved Awareness of Evolving Impacts
- SA-3 Decision/Information Confirmation/Evaluation

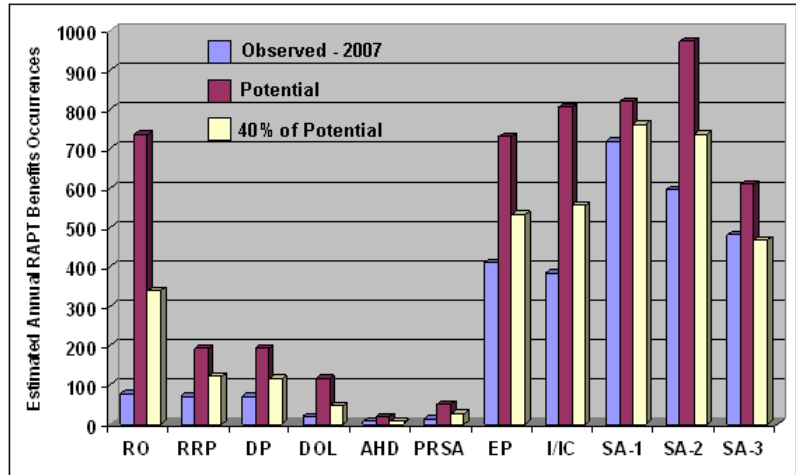


Figure 7-1. Estimates of the annual frequency of RAPT benefits for observed usage in 2007, full, near-term potential usage, and 40% of full potential RAPT usage.

Increased potential RAPT delay savings include both an expected increase in RAPT usage and greater delay reduction benefits on the occasions where RAPT is used (for example by making decisions earlier or implementing them more aggressively). Increased “potential” delay savings were found to exist for 4 of the 11 RAPT benefits case studies provided in Table 7-1. For those cases, more timely implementation of RAPT-derived decisions resulted in delay savings that were at least a factor of two greater than the delay savings in 2007. Using the estimated annual frequency of 40% of potential RAPT benefits (Figure 7-1), and mean/median case study delay savings that incorporate potential increased delay reductions, the estimated annual near-term potential RAPT benefit for NY is **8,800 hours of delay saved, with a cost savings of \$28.3 M.**

**TABLE 7-1**

**Observed vs. Potential RAPT Delay Savings per Benefits Case Study\***

Type	Date	Time UTC	OBSERVED RAPT Delay Savings		POTENTIAL RAPT Delay Savings	
			Delay Saved (Hours)	Cost Saved (\$)	Delay Saved (Hours)	Cost Saved (\$)
RO	05 Jul	2120	13.9	44,281	13.9	44,281
RO	05 Jul	2315	4.3	13,732	4.3	13,732
RO	20 Jul	0040	0.9	2,994	11.5	36,688
RO	16 Aug	1740	4.5	13,163	4.5	13,163
RO	30 Aug	2130	18.4	58,628	37.8	120,527
RO	11 Sep	1815	7.9	25,210	19.4	61,898
RRP	19 Jul	1340	26.7	85,075	26.7	85,075
RRP	11 Sep	1630	13.9	44,281	13.9	44,281
DP	16 Aug	2325	2.8	8,773	2.8	8,773
DP	30 Aug	2320	1.7	5,329	1.7	5,329
DOL	11 Jul	1705	15.5	49,403	41.0	130,772

*\*Case studies shaded in gray demonstrated increase potential delay savings for that event.*

## 8. CONCLUSIONS

RAPT is a pioneering automated integrated weather-ATM decision support tool designed to help traffic managers identify weather impacts on jet routes and increase the efficient use of available jet route capacity. RAPT combines a model for the usage of departure airspace in the New York area with CIWS forecasts of precipitation intensity, echo top heights, and a pilot weather avoidance model to predict the impact of convective weather on future departures in the first 60 minutes of flight time. A RAPT operational-use assessment was conducted in 2007 by MIT LL and FAA Aviation Weather Office observers at 11 FAA and airline dispatch facilities during 11 convective weather SWAP impact events. The assessment covered simultaneous real-time documentation of RAPT technical performance and operational usage. Detailed observations of NY SWAP TFM decision-making were also gathered to help support RAPT post-event studies and investigations into potential RAPT enhancements.

The 2007 field evaluation confirmed that RAPT guidance was useful for proactive departure flow management applications. Field observers noted successful RAPT usage at several facilities over the course of the study and found that RAPT guidance was operationally sound and timely in many circumstances. Overall, RAPT performance was best in circumstances where convection was embedded in larger regions of lower-level precipitation. The RAPT forecasts of route blockage were often inaccurate where route impacts were due to weather characterized by a large spatial gradient in the precipitation or echo top prediction fields caused by strong isolated cells or the leading edge of intense convection.

An evaluation of the RAPT technical performance identified three primary improvements required to increase the operational utility of RAPT: (1) improved operational accuracy in the weather situations discussed above, (2) a simplified route blockage algorithm whose outputs can be readily explained to users, and (3) more robustness in the face of forecast uncertainty and real-time estimates of route blockage forecast confidence. A near-term RAPT development goal is to simplify the route blockage algorithm and reduce its sensitivity to small changes in the precipitation and echo tops forecasts. This in turn should improve both the operational accuracy and the robustness of the RAPT blockage forecast algorithm.

Eleven unique RAPT benefits categories were identified during the operational test. Observed RAPT applications included quantifiable departure capacity enhancement benefits [e.g., more timely reopening of departure routes (RO)] and improved collaborative decision-making applications such as increased awareness of departure route impacts caused by weather. The frequency of each type of RAPT application was tabulated for each FAA and airline facility and rolled-up to an annual RAPT benefits frequency estimate based upon the historical average number of NY SWAP days per year.

Several RAPT benefits case studies were analyzed in an effort to quantify the delay savings associated with the four primary RAPT departure flow management benefit categories. Results show per-use RAPT benefits ranged from 0.9 to 26.7 hours of delay saved, with per-use cost savings ranging from \$2,900 to \$85,000. The large variation in case-to-case delay savings was not surprising given that NY departure delays arise from highly nonlinear queues.

Mean or median (where possible) case study delay savings per benefit category were multiplied by the estimated annual frequency of the various RAPT operational uses to determine the annual 2007 RAPT delay reduction benefits. **Annual RAPT benefits in 2007 totaled 2,300 hours of delay saved, with a cost savings of \$7.5 M.**

While documenting real-time RAPT usage, field observers also sought to better understand key aspects of the NY departure flow management environment in which RAPT was being utilized. Real-time observations of NY SWAP operations helped to better understand the RAPT case study results and highlighted opportunities for improvements in RAPT operational effectiveness, including improving route pathfinder procedures, increasing use of Coded Departure Routes (CDRs), and optimizing the use of MIT restrictions for reopening departure routes.

“NAS Network” factors also had a significant impact on RAPT operational effectiveness. These factors included NY *arrival* flow management, the effect of active ZDC Warning Areas, and airport surface management complexity -- all of which can impact the effective use of available NY departure capacity.

The decision-making environment for NY departure flow management is also very important. The ZNY Area Supervisors appear to be key decision-makers for NY departure route usage whose operational acceptance of RAPT will be critical to achieving higher RAPT operational benefits.

The many lines of communication through which empowered decision-makers at several different FAA facilities coordinate and implement departure flow management decisions is also a potentially important factor that has not been considered previously. The capability of RAPT to provide a common awareness of proactive departure flow management opportunities during SWAP may ease planning and coordination complexities often found in this tactical decision-making environment.

A key finding during the RAPT field observations was that traffic managers were unsure of the status of NY departure airspace (i.e., open or closed) an estimated 440 times during the 2007 SWAP season. This airspace status uncertainty arises from the dynamic, ever-changing state of departure route/fix impacts during convective weather, poor information system infrastructure for route status data management, and the high workload associated with cataloguing available routes and tracking airspace status changes. Improved route status information displayed graphically via the RAPT display is being explored. The expected benefits of readily-accessible route status information for improved common situational awareness would be significant, not only in terms of RAPT effectiveness in particular but for improved SWAP TFM in general.

As the operational user experience with RAPT increases, RAPT technical performance enhancements are implemented, RAPT access issues (at NY towers and ATCSCC) are addressed, and expanded interactive training occurs, the RAPT benefits should increase substantially. Assuming these expected improvements occur, the RAPT benefits frequency and per case study quantifiable benefits were recalculated in order to estimate RAPT operational benefits achievable in the near-term. We estimate the annual near-term “potential” NY RAPT benefits would be on the order of 8,800 hours of delay saved, with a cost savings of \$28 M.



## GLOSSARY

AFP	Airspace Flow Programs
ARTCC	Air Route Traffic Control Centers
ATC	Air Traffic Control
ATCSCC	Air Traffic Control System Command Center
ATM	Air Traffic Management
CDRs	Coded Departure Routes
CIWS	Corridor Integrated Weather System
ETMS	Enhanced Traffic Management System
EWR	Newark
FAA	Federal Aviation Administration
GDP	Ground Delay Programs
JFK	John F. Kennedy
LGA	LaGuardia
MIT	Miles-In-Trail
MIT LL	MIT Lincoln Laboratory
NAS	National Airspace System
NSST	National System Strategy Team
N90	NY Terminal Radar Control Facility
PHL	Philadelphia
RAPT	Route Availability Planning Tool
ROST	RAPT Operational Scenario Training
RPD	Recognition-Primed Decision
STMC	Supervisor Traffic Management Coordinators
SWAP	Severe Weather Avoidance Program
TEB	Teterboro
TFM	Traffic Flow Management
TMU	Traffic Management Unit
VIL	Vertically Integrated Liquid
VIP	Video Integrated Processor
ZBW	Boston
ZDC	Washington
ZNY	New York
ZOB	Cleveland



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## APPENDIX A INDIVIDUAL RAPT CASE STUDY DESCRIPTIONS

### RAPT Benefit 1: More Timely Departure Route Reopenings; Eased Departure Restrictions (RO)

#### CASE STUDY A-1-1

**Date:** 05 July 2007

**Facilities Using RAPT:** N90

**Benefit:** N90 used the RAPT forecasts for departure route status to anticipate improving conditions for the ELIOT-J80 jet route. With this information, N90 coordinated with ZNY to reopen ELIOT-J80 early, despite the presence of strong convection along the route at the time of the decision. Access to RAPT information provided increased confidence in this decision and the departure route was reopened without requiring that it first be probed with pathfinders.

- Without RAPT, the J80 route likely would have remained closed until convective weather cleared the route 40 minutes later.
- Three additional EWR departures and 4 additional LGA departures were released via the ELIOT-J80 route during benefit period.

**RAPT Delay Savings Calculations:**

Benefit Period: 0.67 hr (2120 – 2200 UTC)

EWR Primary Delay Reduction:	3.6 hr
Downstream Delay Reduction:	2.9 hr
Direct Operating Cost (DOC) Savings:	\$ 6,581
Passenger Value Time (PVT) Savings:	\$ 7,823
Downstream Cost Savings:	\$ 6,302

**EWR Total RAPT Delay Reduction:**

**6.5 hr**

**EWR Total RAPT Cost Savings: \$20,706**

LGA Primary Delay Reduction:	4.1 hr
Downstream Delay Reduction:	3.3 hr
Direct Operating Cost (DOC) Savings:	\$7,495
Passenger Value Time (PVT) Savings:	\$8,909
Downstream Cost Savings:	\$7,171

**LGA Total RAPT Delay Reduction: 7.4 hr**

**LGA Total RAPT Cost Savings: \$23,575**

**Total RAPT Delay Reduction: 13.9 hr**

**Total RAPT Cost Savings: \$44,281**

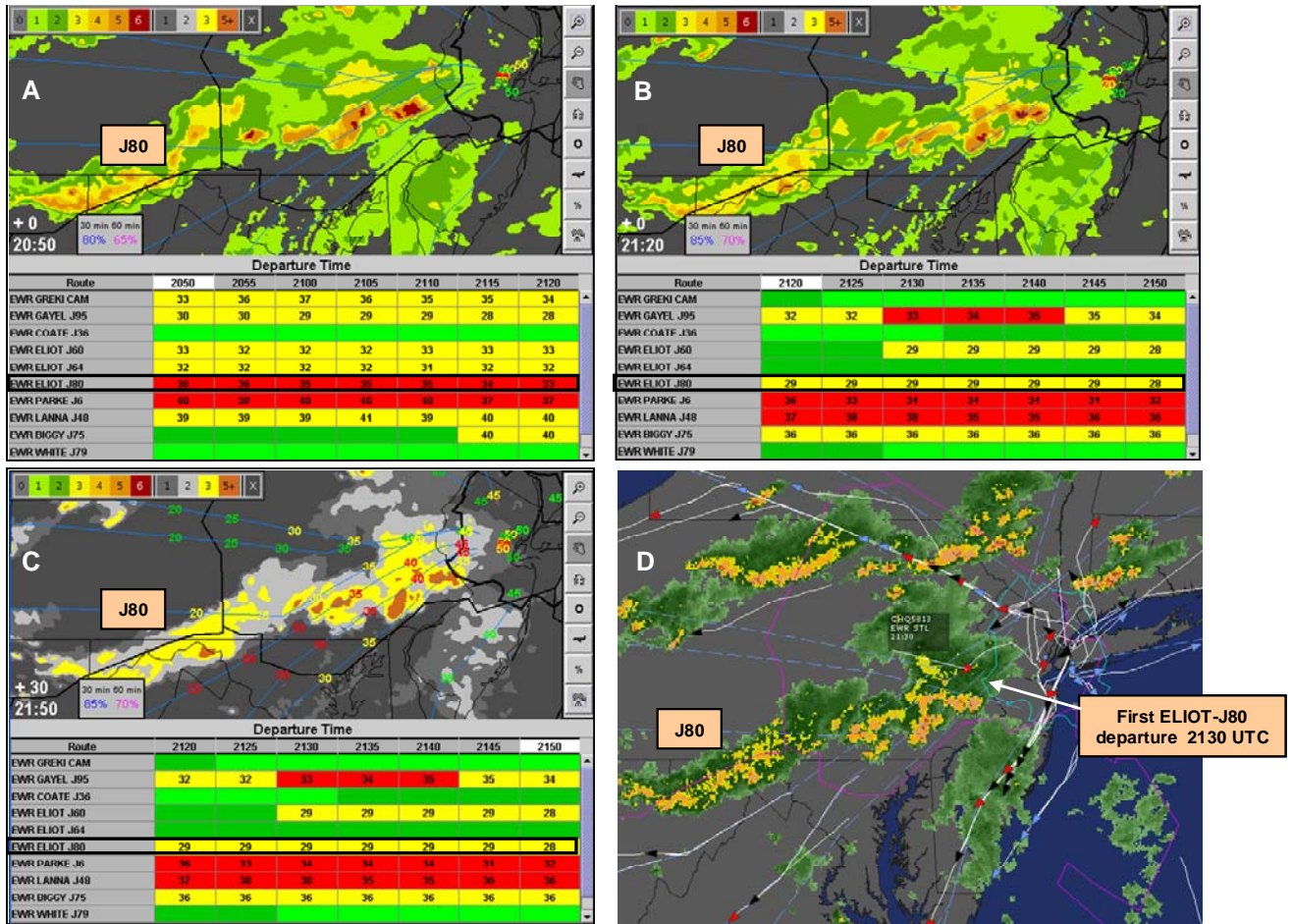


Figure A-1-1-1. (A) RAPT EWR departure route status at 2050-2120 UTC on 05 July 2007, when the J80 jet route was heavily impacted by thunderstorms and RAPT guidance accurately predicted the ELIOT-J80 route (timeline in black box) as blocked. (B) RAPT EWR departure route status at 2120-2150 UTC, when the current weather depiction showed strong convection still impacting J80 but the timeline forecast for this route (black box) predicted decreased echo top heights and overall reduced route impact as the convective line dropped slowly south of the route (see Figure (C), showing the graphical depiction of the 30-minute precipitation forecast). (D) Flight Explorer flight tracks and WSI composite reflectivity at 2145 UTC, showing EWR (red), LGA (black) and JFK (blue) departures. The first ELIOT-J80 flight after the route was reopened departed from EWR at 2130 UTC.

## CASE STUDY A-1-2

**Date:** 05 July 2007

**Facilities Using RAPT:** N90, Jet Blue Airlines, ZNY

**Benefit:** Despite level 4+ convection near RBV departure fix (key departure corridor for JFK westbound traffic), Jet Blue dispatch and N90 TRACON independently used RAPT forecast timelines to proactively identify improving conditions. With this information, N90 placed RBV-J60/J64 pathfinder request with ZNY. ZNY traffic managers were concerned that continued eastward movement of a level 3+ cluster of weather (discerned from the CIWS precipitation forecast product) would impinge on the route, forcing deviations if RBV departures were to resume. However, ZNY also used RAPT to note that RBV-J60/J64 timeline forecasts, accounting for both precipitation and echo top height, suggested that this weather would not impact these departures. ZNY reopened RBV J60 and J64 routes with 15 MIT (and without requiring a pathfinder) at 2326 UTC, based upon the RAPT-derived request from the TRACON and airline dispatch. The first RBV flight departed JFK at 2350 UTC.

Without RAPT, the gap in level 3+ weather along J80 likely not discernible as a viable routing option until 2345 UTC.

Since it took approximately 25 minutes for RBV traffic to resume after the route was reopened, it is assumed that without RAPT, RBV traffic would not have restarted until 0010 UTC (25 minutes after the available gap would have been visible without RAPT). This assumption is considered conservative because it also assumes that the route would have reopened without first testing its availability with a pathfinder.

Four additional JFK departures were released via RBV fix during benefit period.

### **RAPT Delay Savings Calculations:**

Benefit Period:	0.33 hr (2350 – 0010 UTC)	
JFK Primary Delay Reduction:		2.4 hr
Downstream Delay Reduction:		1.9 hr
Direct Operating Cost (DOC) Savings:		\$ 4,388
Passenger Value Time (PVT) Savings:		\$ 5,215
Downstream Cost Savings:		\$ 4,129
<b>Total RAPT Delay Reduction:</b>		<b>4.3 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$ 13,732</b>



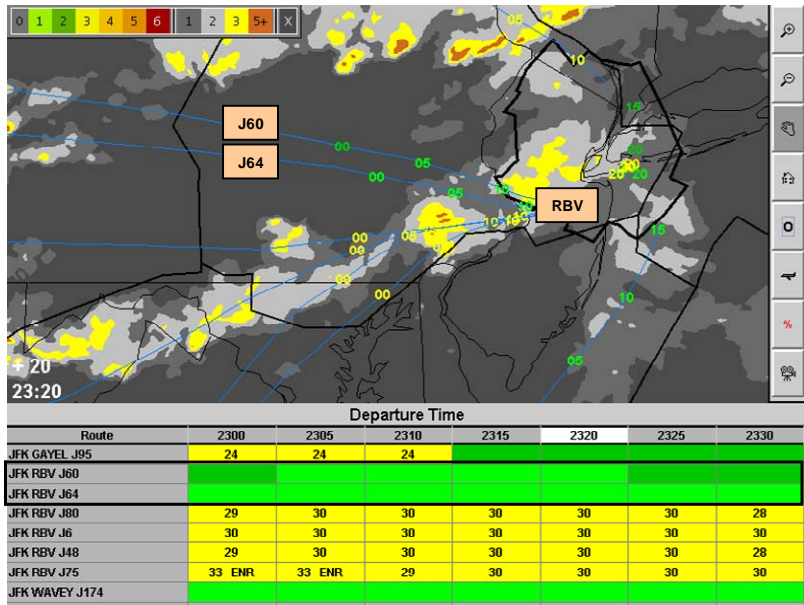


Figure A-1-2-1. RAPT JFK departure route status at 2300-2330 UTC on 05 July 2007. RAPT guidance shows negligible (dark green) and no (green) impacts anticipated on RBV-J60 and RBV-J64 departure routes (see timelines in black box). Dispatch at Jet Blue Airlines and N90 Traffic Managers used this RAPT guidance to request that ZNY reopen these routes. ZNY traffic managers used RAPT during this period to confirm that the cluster of level 3+ weather northwest of the RBV fix would not adversely affect released departures – and reopened the route.

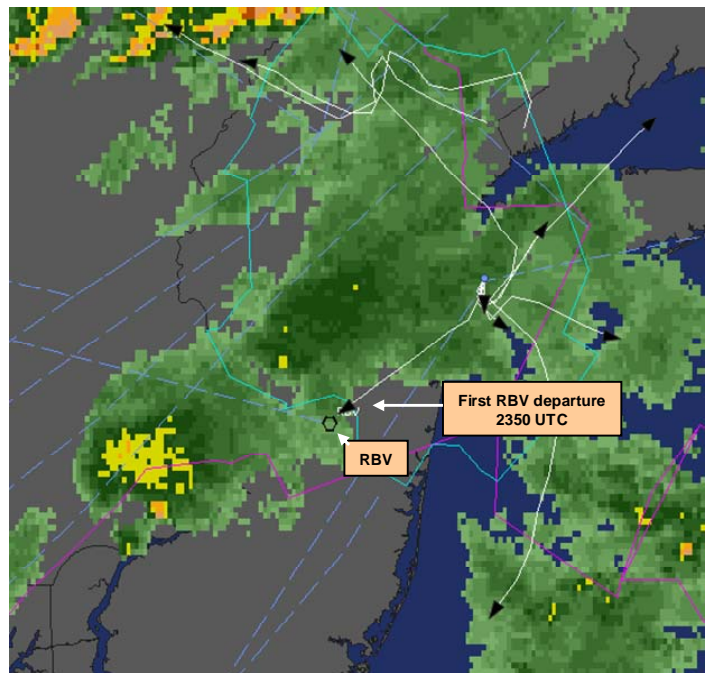


Figure A-1-2-2. Flight Explorer flight track and WSI composite reflectivity information at 0000 UTC on 06 July 2007. Black triangles denote airborne departures from JFK airport. The first of four JFK RBV departures to take advantage of the RAPT-derived early route reopening is approaching the departure fix at this time.



### CASE STUDY A-1-3

**Date:** 19-20 July 2007

**Facilities Using RAPT:** JFK

**Benefit:** Traffic managers at JFK Tower used RAPT guidance to identify improving conditions for the WAVEY departure route. At 0042Z, JFK used this RAPT information to request that WAVEY be reopened. The N90 TRACON and ZNY ARTCC reopened the route immediately (with 15 MIT restrictions) upon this request.

- Even though the route reopened at 0042 UTC, airport surface and coordination complexities resulted in only one JFK departure using WAVEY (departing 0159 UTC) before the route was forced to close again at 0200 UTC because of building convection in east-central ZDC.
- RAPT delay savings associated with reopening WAVEY for 1.3 hours longer equal the JFK delay reduction for releasing one extra aircraft during that period.

**RAPT Delay Savings Calculations:**

Benefit Period:	1.3 hr (0042 – 0200 UTC)	
JFK Primary Delay Reduction:		0.5 hr (31 min)
Downstream Delay Reduction:		0.4 hr
Direct Operating Cost (DOC) Savings:		\$ 951
Passenger Value Time (PVT) Savings:		\$ 1,130
Downstream Cost Savings:		\$ 913
<b>Total RAPT Delay Reduction:</b>		<b>0.9 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$ 2,994</b>

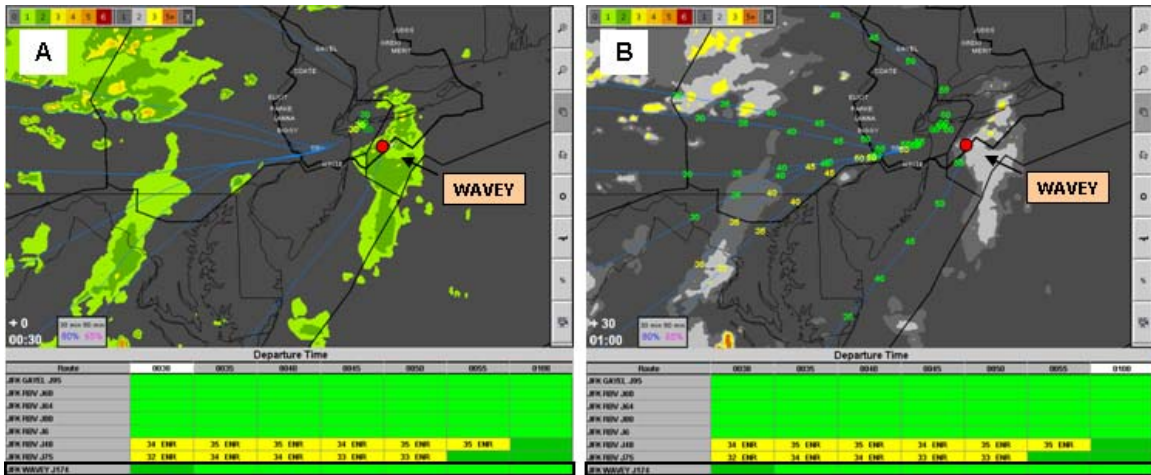


Figure A-1-3-1. RAPT guidance at 0030 UTC on 20 July 2007 showing (A) current weather impacting the WAVEY departure fix at 0030 UTC and (B) the 30-min forecast showing level 2 weather moving off the WAVEY fix and this key JFK departure route. RAPT timelines for anticipated JFK route conditions shows the WAVEY route (boxed) clear of significant weather for the next 30 minutes.

## CASE STUDY A-1-4

**Date:** 16 August 2007

**Facilities Using RAPT:** LGA

**Benefit:** At 1742 UTC, traffic managers at LGA Tower used the RAPT forecast to proactively identify improving weather conditions along the WHITE departure route (despite heavy weather near the WHITE fix at the time of this observation). At this time, WHITE departures were only being released with individual Approval Requests (APREQ). LGA used RAPT guidance to request that N90 decrease WHITE departure restrictions and open the route without APREQs. This request was approved and the route was reopened at 1750 UTC.

- Without RAPT, we assumed WHITE would have remained open only for APREQ flights until 1800 UTC.
- From 1750-1800 UTC, 2 EWR aircraft and 1 LGA aircraft departed via the WHITE departure route.
- We assumed that had the RAPT-derived decision to reduce WHITE restrictions (and open the route), one of these three flights still would have departed using this route; Model assumes that RAPT benefit increased EWR and LGA departure capacity by one flight each during the period from 1745 – 1800 UTC.

### RAPT Delay Savings Calculations:

Benefit Period:	0.25 hr (1745 – 1800 UTC)	
EWR Primary Delay Reduction:		2.0 hr
Downstream Delay Reduction:		1.6 hr
Direct Operating Cost (DOC) Savings:		\$ 3,656
Passenger Value Time (PVT) Savings:		\$ 4,346
Downstream Cost Savings:		\$ 3,477
<b>EWR Total RAPT Delay Reduction:</b>		<b>3.6 hr</b>
<b>EWR Total RAPT Cost Savings:</b>		<b>\$11,479</b>
LGA Primary Delay Reduction:		0.5 hr (28 min)
Downstream Delay Reduction:		0.4 hr
Direct Operating Cost (DOC) Savings:		\$ 859
Passenger Value Time (PVT) Savings:		\$1,021
Downstream Cost Savings:		\$ 825
<b>LGA Total RAPT Delay Reduction:</b>		<b>0.9 hr</b>
<b>LGA Total RAPT Cost Savings:</b>		<b>\$2,705</b>
<b>Total RAPT Delay Reduction:</b>		<b>4.5 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$14,184</b>

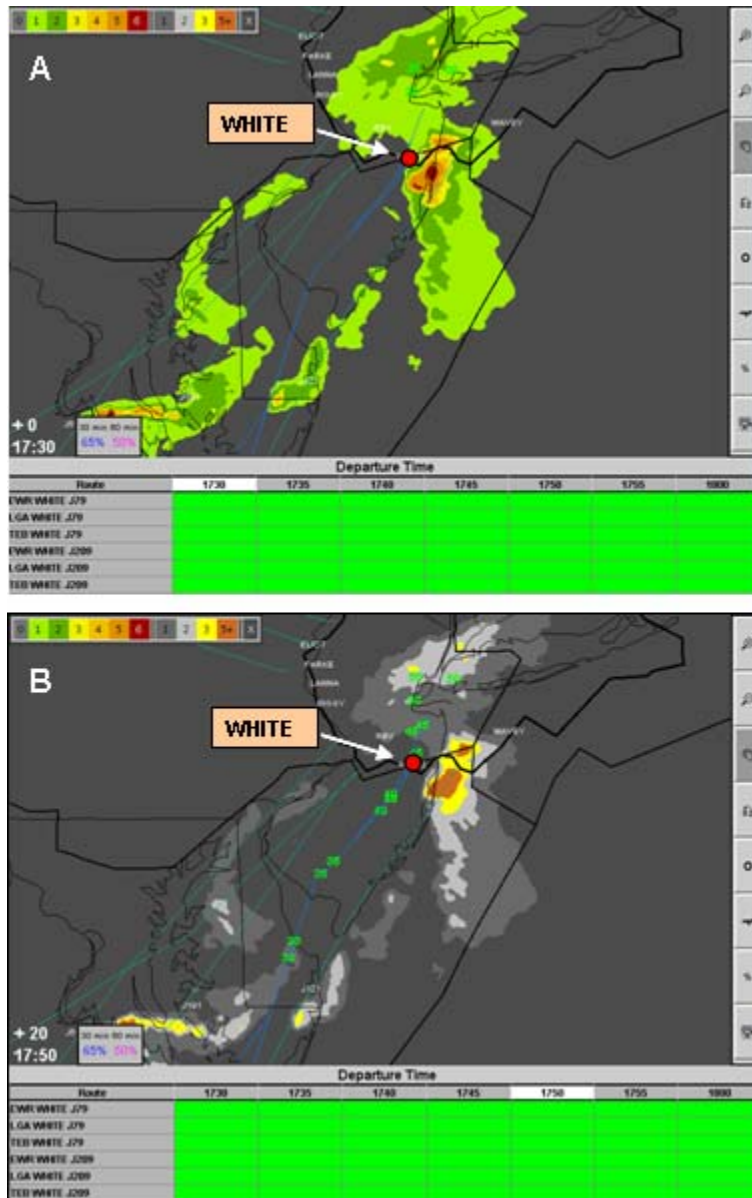


Figure A-1-4-1. RAPT guidance at 1730 UTC on 16 August 2007 is showing (A) a strong storm just east of the WHITE departure fix and (B) the 20-min forecast showing the level 5+ thunderstorms moving eastward and away from the WHITE route. RAPT timelines for WHITE departure routes from all NY airports correctly predicted that significant weather would clear the route and that the route would remain viable for the foreseeable future.

## CASE STUDY A-1-5

**Date:** 30 August 2007

**Facilities Using RAPT:** EWR

**Benefit:** Prior to 2130 UTC, the COATE/J36 departure route was closed for an extended period as a result of earlier pilot deviations around a large region of thunderstorm “blow-off”. At 2130 UTC, some blow-off was still present over J36, but EWR, citing “clear-route” status for COATE/J36 in the RAPT timeline guidance, requested of N90/ZNY that the route be reopened. Based on this RAPT-derived request, COATE/J36 was reopened at 2130 UTC. New, quickly developing convection along the route shortly after this reopening forced the route to close at 2200 UTC.

- With RAPT, COATE/J36 was opened for an extra 30 minutes (2130-2200 UTC).
- During the 30 minute RAPT benefits period, EWR, LGA, and JFK departure capacity was increased by 6, 2, and 4 aircraft, respectively.
- We assert that these 12 aircraft (and the subsequent reduction in airport queuing delay) benefitted from the RAPT-derived COATE reopening, even though without RAPT the weakening trend in convection was likely still visible, because:
  - Pilots had been unwilling to penetrate similarly weak precipitation during the previous 2+ hours, making controllers and en route traffic managers hesitant to reopen the route.
  - Once COATE/J36 reopened, a new small cell quickly developed and intensified along J36, but the flow of traffic on this route had resumed and the departure aircraft were effectively managed in the face of this weather until 2200 UTC. Had J36 remained closed beyond 2130 UTC, the new convective development would have continued to limit Northgate departure capacity.

### RAPT Delay Savings Calculations:

Benefit Period:	0.5 hr (2130-2200 UTC)	
EWR Primary Delay Reduction:		5.1 hr
Downstream Delay Reduction:		4.1 hr
Direct Operating Cost (DOC) Savings:		\$ 9,323
Passenger Value Time (PVT) Savings:		\$ 11,082
Downstream Cost Savings:		\$ 8,909
<b>EWR Total RAPT Delay Reduction:</b>		<b>9.2 hr</b>
<b>EWR Total RAPT Cost Savings:</b>		<b>\$29,314</b>
LGA Primary Delay Reduction:		1.4 hr
Downstream Delay Reduction:		1.1 hr
Direct Operating Cost (DOC) Savings:		\$2,559
Passenger Value Time (PVT) Savings:		\$3,042
Downstream Cost Savings:		\$2,390
<b>LGA Total RAPT Delay Reduction:</b>		<b>2.5 hr</b>
<b>LGA Total RAPT Cost Savings:</b>		<b>\$7,991</b>
JFK Primary Delay Reduction:		3.7 hr
Downstream Delay Reduction:		3.0 hr
Direct Operating Cost (DOC) Savings:		\$ 6,764
Passenger Value Time (PVT) Savings:		\$ 8,040
Downstream Cost Savings:		\$ 6,519
<b>JFK Total RAPT Delay Reduction:</b>		<b>6.7 hr</b>
<b>JFK Total RAPT Cost Savings:</b>		<b>\$21,323</b>
<b>Total RAPT Delay Reduction:</b>		<b>18.4 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$58,628</b>

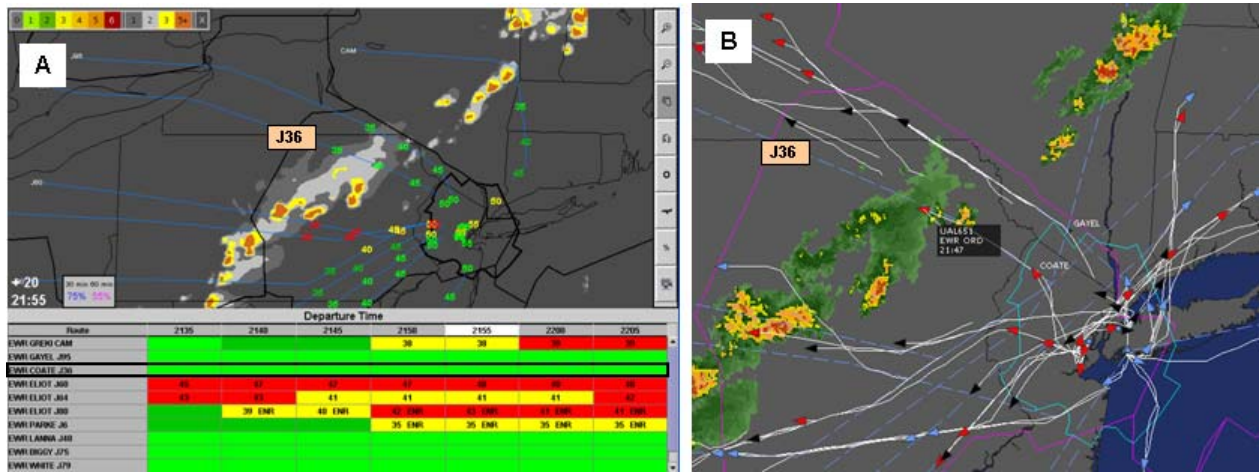


Figure A-1-5-1. (A) RAPT guidance at 2135 UTC on 30 August 2007. RAPT timelines show COATE/J36 (in box) clear of significant weather for near-term departures, while the animated precipitation forecast shows a strong persistent storm cell remaining south of the route. (B) Flight Explorer flights tracks and WSI composite reflectivity at 2155 UTC show NY departures actively using the COATE/J36 departure route.

## CASE STUDY A-1-6

**Date:** 11 September 2007

**Facilities Using RAPT:** ZNY

**Benefit:** The RBV departure route was closed at 1625 UTC because of a short line of strong thunderstorms directly impacting the route. At 1815 UTC, JFK and N90 requested that ZNY allow RBV departures to resume. At ZNY, the STMC had been routinely monitoring RAPT during this specific weather episode, and noted that RAPT had consistently predicted that the JFK RBV departure routes would be clear of weather by 1810-1815 UTC. With this information, the STMC quickly agreed to allow four JFK RBV departures to test the route (five RBV flights were released). These aircraft successfully navigated the routes which allowed RBV to reopen with a 10 MIT restriction at 1839 UTC.

- We assumed that without using RAPT, aggressive TFM by the ZNY STMC may still have allowed 1-2 RBV “route checkers”, but not 4-5 RBV flights. Therefore, we assumed that had RAPT not been available, JFK departure capacity between 1815-1840 UTC would have been decreased by 3 aircraft.
- Results are considered conservative because even without the successful passage of 5 RBV route checkers and accurate RAPT guidance, RBV would have likely been reopened at 1840 UTC – but with greater in-trail restrictions. This benefits case study did not analyze the RAPT delay savings attributed to decreased in-train route restrictions – only the savings resulting from the early release of 3 extra JFK departures.

### **RAPT Delay Savings Calculations:**

Benefit Period:	0.4hr (1815-1840 UTC)	
JFK Primary Delay Reduction:		4.4 hr
Downstream Delay Reduction:		3.5 hr
Direct Operating Cost (DOC) Savings:		\$ 8,043
Passenger Value Time (PVT) Savings:		\$ 9,561
Downstream Cost Savings:		\$ 7,606
<b>Total RAPT Delay Reduction:</b>		<b>7.9 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$ 25,210</b>



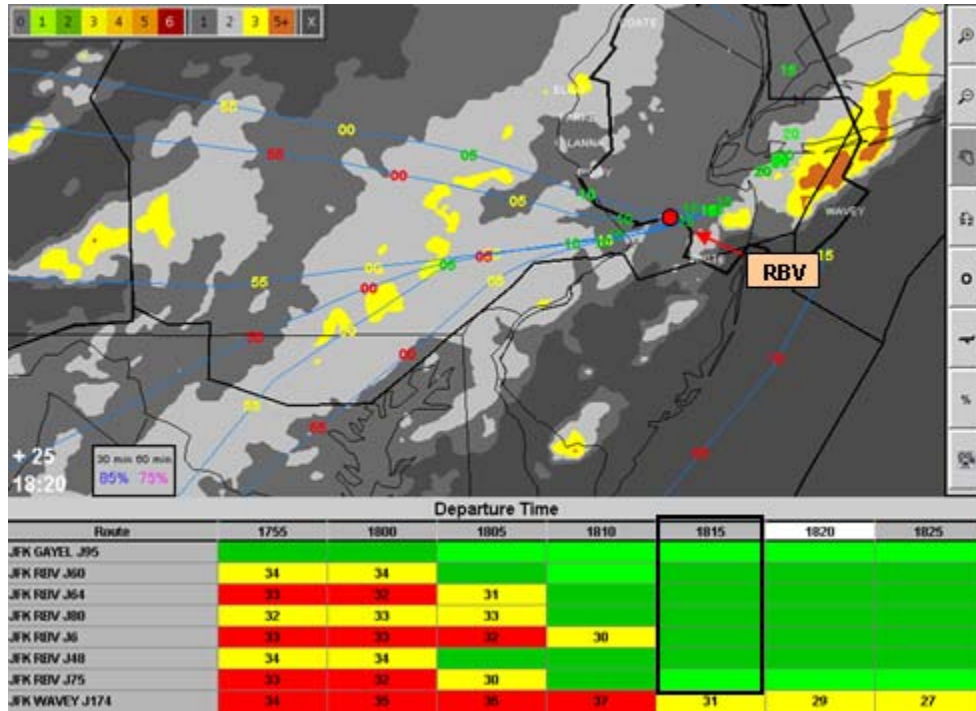


Figure A-1-6-1. RAPT guidance for JFK departure routes at 1755-1825 UTC on 11 September 2007, showing strong weather exiting the eastern N90 TRACON and heavy precipitation predicted to completely clear the RBV fix by 1815 UTC (see box in RAPT timelines).



*Figure A-1-6-2. Flight Explorer flight tracks and WSI composite reflectivity at 1840 UTC on 11 September 2007 showing JFK departures. At this time, all five JFK departures released via the RBV route between 1824-1837 UTC are airborne. ZNY used RAPT guidance (which predicted improving RBV conditions) to aggressively request five RBV departures at 1815 UTC.*



## RAPT Benefit 2: More Timely Reroute Planning or Implementation; Improved Route Impact Planning (RRP)

### CASE STUDY A-2-1

**Date:** 19 July 2007

**Facilities Using RAPT:** ZNY

**Benefit:** RAPT guidance used to anticipate impacts on J36 and J95 Northgate parallel departure routes. At the time of the decision, J36 was closed and J95 was open. RAPT predicted when, based on departure time, conditions would reverse and J95 would be blocked by weather. With this information, ZNY proactively planned a Northgate reroute – moving J95 departure traffic to J36. By planning for the reroute ahead of time, and using RAPT to anticipate when departures would require a move from J95 to J36, the reroute was quickly implemented, and no stoppage of Northgate departures occurred at the airports. J95 route was closed at 1306 UTC and J36 was opened as the reroute at 1307 UTC. The first J36 flight (after the RAPT-derived reroute became available) departed JFK at 1309 UTC.

- Without RAPT, an unplanned and uncoordinated departure route closure and reroute would likely have resulted in a 10 minute ground stop for N90 Northgate departures.
- The queuing model analysis was conducted over an hour, in order to represent an expected hold up in the airport departure lineups as pilots, dispatchers, and traffic coordinators and controllers react to the need for a new departure route. Moreover, without RAPT, it may not have been explicitly clear that J36 was immediately available as a viable reroute given convective weather was still present along the route.
- Additional Northgate departures via J36 during 1307-1407 UTC:  
EWR – 5, LGA – 3, JFK – 3.

**RAPT Delay Savings Calculations:**

Benefit Period:	10 min (queuing delay for 1.0 hr)	
EWR Primary Delay Reduction:		1.1 hr
Downstream Delay Reduction:		0.9 hr
Direct Operating Cost (DOC) Savings:		\$ 2,011
Passenger Value Time (PVT) Savings:		\$ 2,390
Downstream Cost Savings:		\$ 1,956
<b>EWR Total RAPT Delay Reduction:</b>		<b>2.0 hr</b>
<b>EWR Total RAPT Cost Savings:</b>		<b>\$6,357</b>
LGA Primary Delay Reduction:		10.6 hr
Downstream Delay Reduction:		8.5 hr
Direct Operating Cost (DOC) Savings:		\$19,377
Passenger Value Time (PVT) Savings:		\$23,034
Downstream Cost Savings:		\$18,471
<b>LGA Total RAPT Delay Reduction:</b>		<b>19.1 hr</b>
<b>LGA Total RAPT Cost Savings:</b>		<b>\$60,882</b>
JFK Primary Delay Reduction:		3.1 hr
Downstream Delay Reduction:		2.5 hr
Direct Operating Cost (DOC) Savings:		\$ 5,667
Passenger Value Time (PVT) Savings:		\$ 6,736
Downstream Cost Savings:		\$ 5,433
<b>JFK Total RAPT Delay Reduction:</b>		<b>5.6 hr</b>
<b>JFK Total RAPT Cost Savings:</b>		<b>\$17,836</b>
<b>Total RAPT Delay Reduction:</b>		<b>26.7 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$85,075</b>

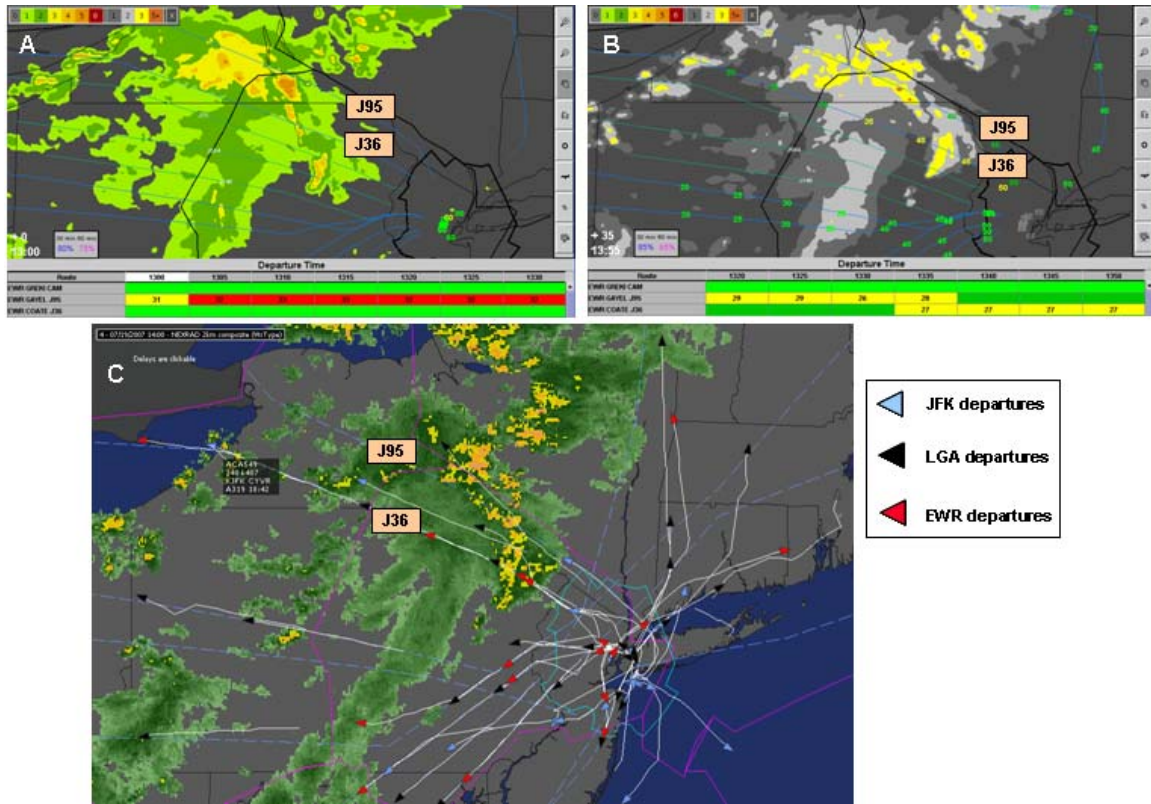


Figure A-2-1-1: (A) RAPT guidance issued at 1300 UTC on 19 July 2007 shows that the previously available (and in use) J95 jet route will soon be blocked by strong weather with moderately-high echo tops. Armed with this information, ATC quickly coordinated and implemented a reroute of Northgate departures from J95 to J36 and prevented a departure backlog at metro NY airports. (B) At 1320 UTC, level 3+ precipitation moved across the J36 jet route; but RAPT guidance accurately depicted minimal impacts as well as improving conditions along J95. (C) Flight Explorer flight tracks and WSI composite reflectivity at 1400 UTC on 19 July 2007, shows the flow of JFK (blue), LGA (black), and EWR (red) departures that had been using J36 since J95 was closed. Aircraft information is shown for the first flight to depart J36.

## CASE STUDY A-2-2

**Date:** 11 September 2007

**Facilities Using RAPT:** ZNY

**Benefit:** ZNY uses RAPT guidance at 1630 UTC to identify that the WHITE departure route will remain unblocked by weather for at least 30 min and agrees to rerouting NY to ATL traffic onto this route.

- LANNA/J48 jet route, the nominal route for NY flights to ATL, was impacted by a line of severe weather after 1600 UTC (Last NY-ATL flight, EWR TRS1695, departed on J48 at 1621 UTC).
- ATL reroute agreed to and implemented at 1630 UTC; ATL WHITE reroute open until 1730 UTC, when the route becomes blocked by convection.
- With RAPT-derived reroute implementation, three ATL flights depart N90 via the WHITE fix:
  - DAL513, LGA to ATL – departed 1649 UTC
  - COA1159, EWR to ATL – departed 1706 UTC
  - DAL1457, JFK to ATL – departed 1727 UTC
- At 1730 UTC, the WHITE reroute was closed and NY to ATL traffic returned to the J48 departure route.
- With RAPT, three additional ATL flights were able to depart N90 prior to 1730 UTC.

### RAPT Delay Savings Calculations:

Benefit Period: 1.0 hr (1630 – 1730 UTC)

EWR Primary Delay Reduction:	2.7 hr
Downstream Delay Reduction:	2.2 hr
Direct Operating Cost (DOC) Savings:	\$ 4,936
Passenger Value Time (PVT) Savings:	\$ 5,867
Downstream Cost Savings:	\$ 4,781
<b>EWR Total RAPT Delay Reduction:</b>	<b>4.9 hr</b>
<b>EWR Total RAPT Cost Savings:</b>	<b>\$15,584</b>
LGA Primary Delay Reduction:	2.6 hr
Downstream Delay Reduction:	2.1 hr
Direct Operating Cost (DOC) Savings:	\$4,753
Passenger Value Time (PVT) Savings:	\$5,650
Downstream Cost Savings:	\$4,563
<b>LGA Total RAPT Delay Reduction:</b>	<b>4.7 hr</b>
<b>LGA Total RAPT Cost Savings:</b>	<b>\$14,966</b>
JFK Primary Delay Reduction:	2.4 hr
Downstream Delay Reduction:	1.9 hr
Direct Operating Cost (DOC) Savings:	\$ 4,387
Passenger Value Time (PVT) Savings:	\$ 5,215
Downstream Cost Savings:	\$ 4,129
<b>JFK Total RAPT Delay Reduction:</b>	<b>4.3 hr</b>
<b>JFK Total RAPT Cost Savings:</b>	<b>\$13,731</b>
<b>Total RAPT Delay Reduction:</b>	<b>13.9 hr</b>
<b>Total RAPT Cost Savings:</b>	<b>\$44,281</b>

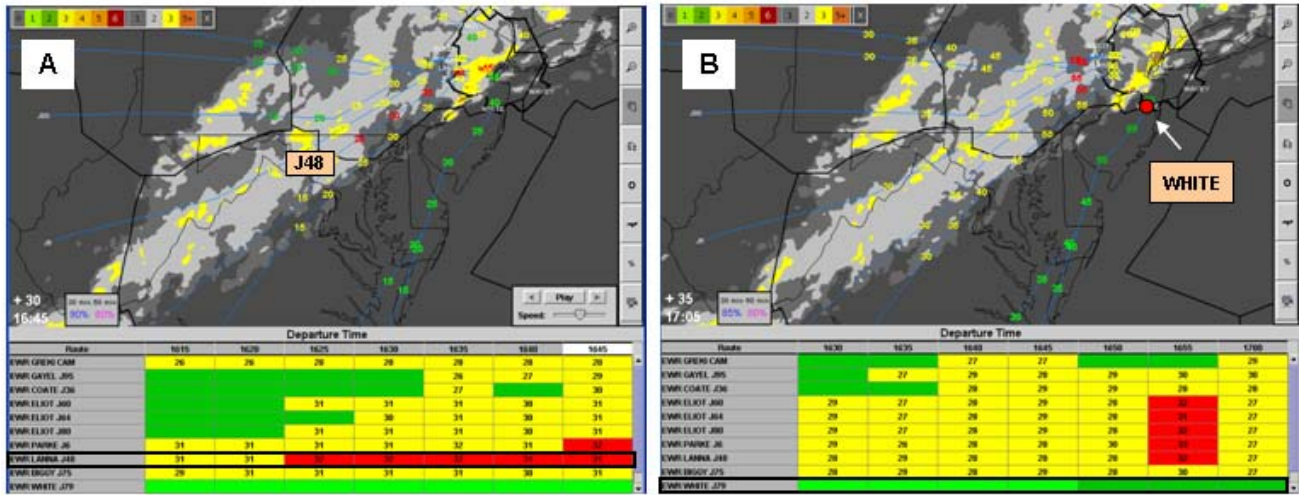


Figure A-2-2-1. RAPT guidance on 11 September 2007 at (A) 1615 UTC, accurately predicting when the J48 departure route (in box) would become blocked by weather, and at (B) 1630 UTC, accurately predicting that the WHITE fix and departure route (in box) would remain clear of weather and thus depicting a viable reroute for J48 NY-ATL traffic.

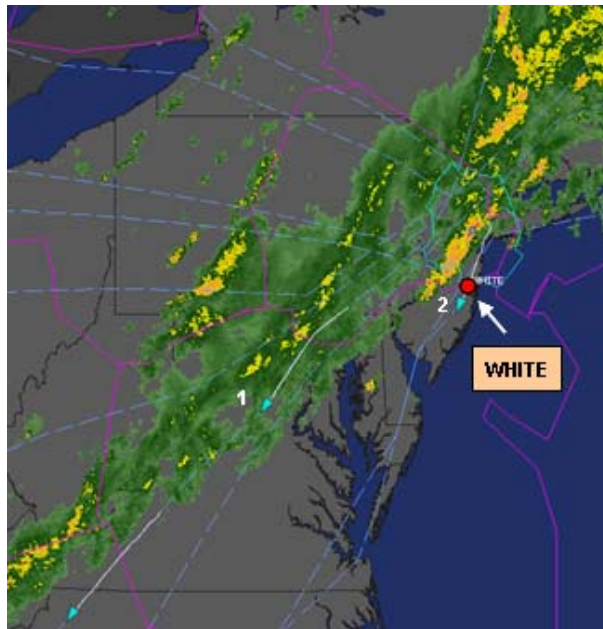


Figure A-2-2-2. Flight Explorer flight track and WSI composite reflectivity information at 1705 UTC on 11 September 2007, showing the last NY-ATL flight using the J48 jet route (see (1) - EWR TRS1695) and the first ATL flight rerouted via the WHITE fix (see (2) - LGA DAL513).

## RAPT Benefit 3: Directing Pathfinder Requests (DP)

### CASE STUDY A-3-1

**Date:** 16-17 August 2007

**Facilities Using RAPT:** ZNY

**Benefit:** ZNY used RAPT at 2325 UTC to convince ZDC to accept J48 pathfinders. At this time, strong convection was clearing the J48 route in ZDC airspace, and RAPT showed that a gap in weather would persist in the near-term.

- Three J48 pathfinders were released at 0000 UTC; one departure from EWR (COA1711 to IAH) and two departures from PHL.
- These three flights made it through ZDC via J48, but new convection developed along J48, eventually filling into a solid E-W line of severe weather across ZDC which kept the route closed.
- RAPT benefit for this application was in increasing EWR and PHL departure capacity by one and two flights, respectively, between 0000-0015 UTC. Without the request for pathfinders from ZNY, spurred on by “clear-route” guidance in RAPT, these three flights would not have departed and would have continued to contribute to the departure queue at each airport.

#### RAPT Delay Savings Calculations:

Benefit Period:	0.25 hr (0000 – 0015 UTC)	
EWR Primary Delay Reduction:		0.6 hr
Downstream Delay Reduction:		0.4 hr
Direct Operating Cost (DOC) Savings:		\$ 969
Passenger Value Time (PVT) Savings:		\$ 1,152
Downstream Cost Savings:		\$ 913
<b>EWR Total RAPT Delay Reduction:</b>		<b>1.0 hr</b>
<b>EWR Total RAPT Cost Savings:</b>		<b>\$3,034</b>
PHL Primary Delay Reduction:		1.0 hr
Downstream Delay Reduction:		0.8 hr
Direct Operating Cost (DOC) Savings:		\$1,828
Passenger Value Time (PVT) Savings:		\$2,173
Downstream Cost Savings:		\$1,738
<b>PHL Total RAPT Delay Reduction:</b>		<b>1.8 hr</b>
<b>PHL Total RAPT Cost Savings:</b>		<b>\$5,739</b>
<b>Total RAPT Delay Reduction:</b>		<b>2.8 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$8,773</b>



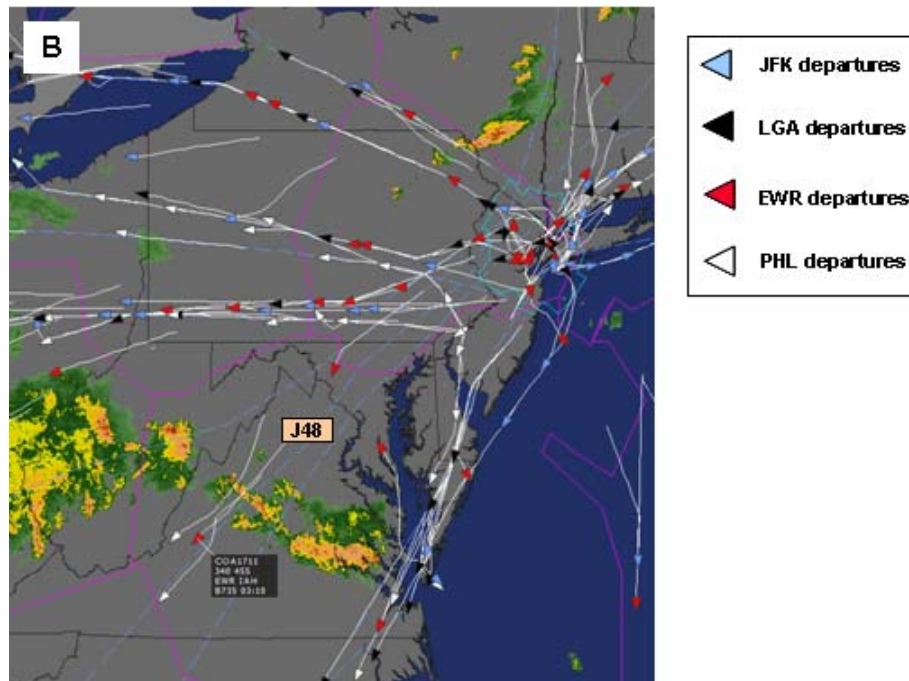
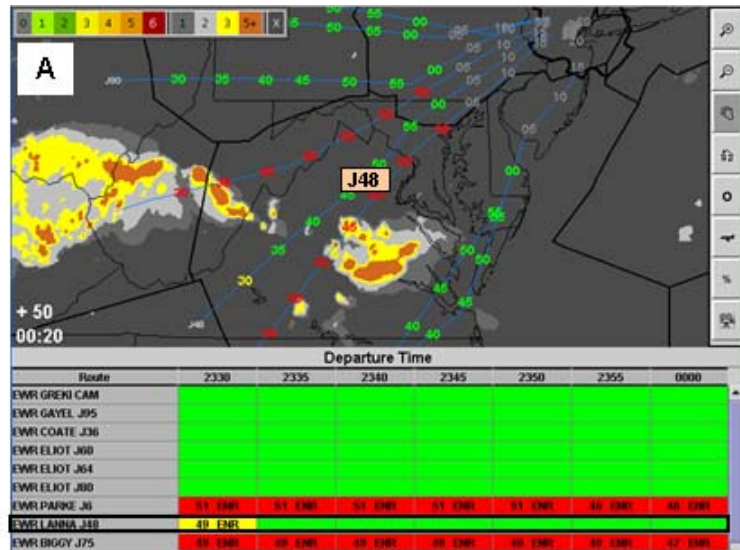


Figure A-3-1-1. (A) RAPT guidance at 2330 UTC on 16 August 2007, showing weather clearing the J48 departure route (in box) and a possibility to test the viability of this route via a pathfinder flying through a gap in severe weather. (B) Flight Explorer flight tracks and WSI composite reflectivity at 0100 UTC, showing the three pathfinder flights traversing ZDC airspace via J48. Strong convection began to fill in the previously available weather gap forcing J48 to remain closed after the pathfinders cleared the weather impact region.

## CASE STUDY A-3-2

**Date:** 30 August 2007

**Facilities Using RAPT:** ZNY

**Benefit:** ZNY notes that RAPT predicted improving conditions along the J64 departure route – J64 was impacted and partially blocked by high-topped precipitation and thunderstorm blow-off. At 2325 UTC, ZNY places an open request on the NY hotline for a J64 pathfinder, based upon the RAPT forecast.

- One pathfinder each from JFK and PHL tested J64 between 2330-0000 UTC; both pathfinders deviated and evaded storm blow-off. The route remained closed.
- RAPT benefit calculated for increasing JFK and PHL departure capacity by one aircraft during this 30 min period.

### RAPT Delay Savings Calculations:

Benefit Period: 0.50 hr (2330 – 0000 UTC)

JFK Primary Delay Reduction:	0.5 hr
Downstream Delay Reduction:	0.3 hr
Direct Operating Cost (DOC) Savings:	\$ 786
Passenger Value Time (PVT) Savings:	\$ 934
Downstream Cost Savings:	\$ 739
<b>EWR Total RAPT Delay Reduction:</b>	<b>0.8 hr</b>
<b>EWR Total RAPT Cost Savings:</b>	<b>\$2,459</b>
LGA Primary Delay Reduction:	0.5 hr
Downstream Delay Reduction:	0.4 hr
Direct Operating Cost (DOC) Savings:	\$ 914
Passenger Value Time (PVT) Savings:	\$1,087
Downstream Cost Savings:	\$ 869
<b>LGA Total RAPT Delay Reduction:</b>	<b>0.9 hr</b>
<b>LGA Total RAPT Cost Savings:</b>	<b>\$2,870</b>
<b>Total RAPT Delay Reduction:</b>	<b>1.7</b>
<b>Total RAPT Cost Savings:</b>	<b>\$5,329</b>

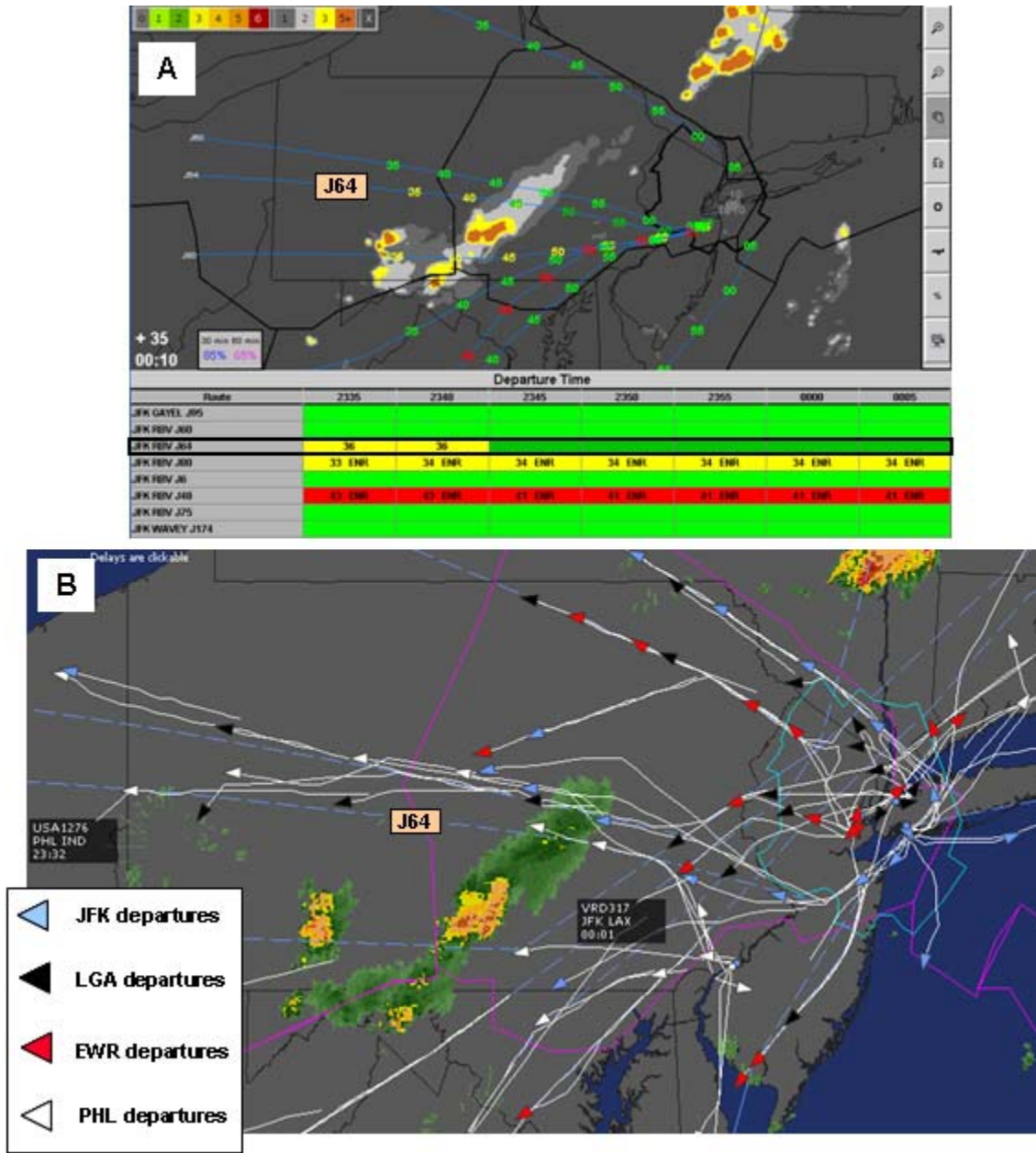


Figure A-3-2-1. (A) RAPT guidance at 2335 UTC on 30 August 2007 predicting weather blockages by high echo top precipitation becoming less severe for departures at 2345 UTC and beyond (see boxed timeline). (B) Flight Explorer flight tracks and WSI composite reflectivity at 0020 UTC showing the PHL (white) and JFK (blue) pathfinders (flights tagged with departure information) airborne and testing the route at this time.



## RAPT Benefit 4: Keeping Departure Routes Open Longer (DOL)

### CASE STUDY A-4-1

**Date:** 11 July 2007

**Facilities Using RAPT:** LGA

**Benefit:** LGA used RAPT timeline guidance, showing J75 unblocked by weather despite developing convection along the route in southern ZNY, as a basis for denying a request (assumed to have come from dispatch for a commercial airline) to close the route and offload traffic to another route.

- Decision to keep route open made at 1704 UTC
- LANNA/BIGGY fixes and J75 departure route closed due to weather at 1827 UTC
- Between 1705-1825 UTC, three additional LGA flights depart via J75
- We assumed that if LGA had not had access to RAPT timeline guidance and VIL precipitation/forecast in the RAPT animation, they likely would have passed concerns about the viability of J75 on to N90. The consequence would have been more stringent MIT restrictions or route closure; especially if ETMS weather depictions were used in the absence of RAPT (ETMS composite reflectivity typically looks more intense than VIL (RAPT) precipitation).

#### RAPT Delay Savings Calculations:

Benefit Period:	1.3 hr (1705-1825 UTC)	
LGA Primary Delay Reduction:		8.6 hr
Downstream Delay Reduction:		6.9 hr
Direct Operating Cost (DOC) Savings:		\$15,721
Passenger Value Time (PVT) Savings:		\$18,688
Downstream Cost Savings:		\$14,994
<b>Total RAPT Delay Reduction:</b>		<b>15.5 hr</b>
<b>Total RAPT Cost Savings:</b>		<b>\$49,403</b>

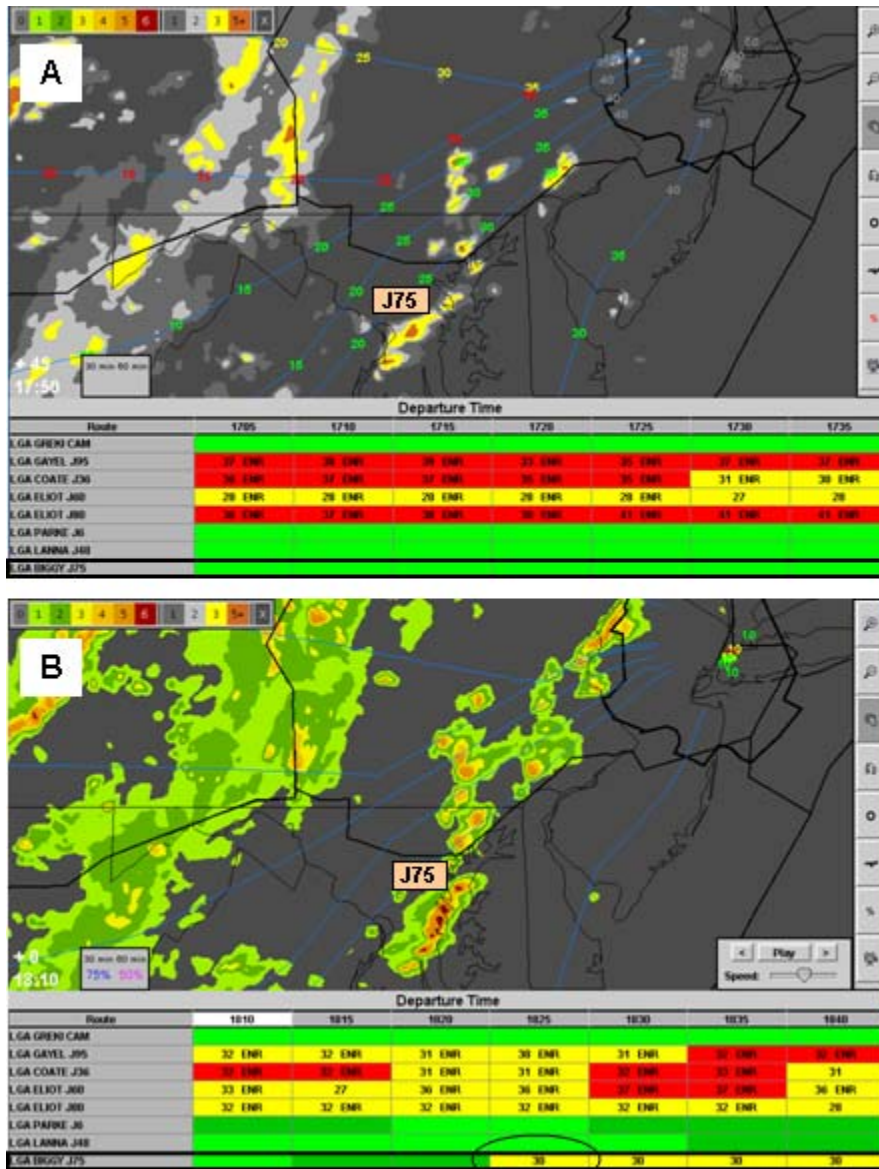


Figure A-4-1-1. RAPT guidance at (A) 1705 UTC and (B) 1810 UTC on 11 July 2007. At 1705 UTC, a cluster of storms was developing in southeast PA, but RAPT showed that J75, through this region, was unblocked by weather (in box in (A)) LGA traffic managers used this information to argue against a route closure and to keep the J75 departure route open. The cluster of storms slowly intensified and eventually caused pilot deviations large enough to close J75 at 1825 UTC. RAPT guidance at 1810 UTC correctly anticipated that conditions for J75 departures would deteriorate starting with 1825 UTC departures (circled). Note yellow timeline which indicates partial blockage or “caution”.

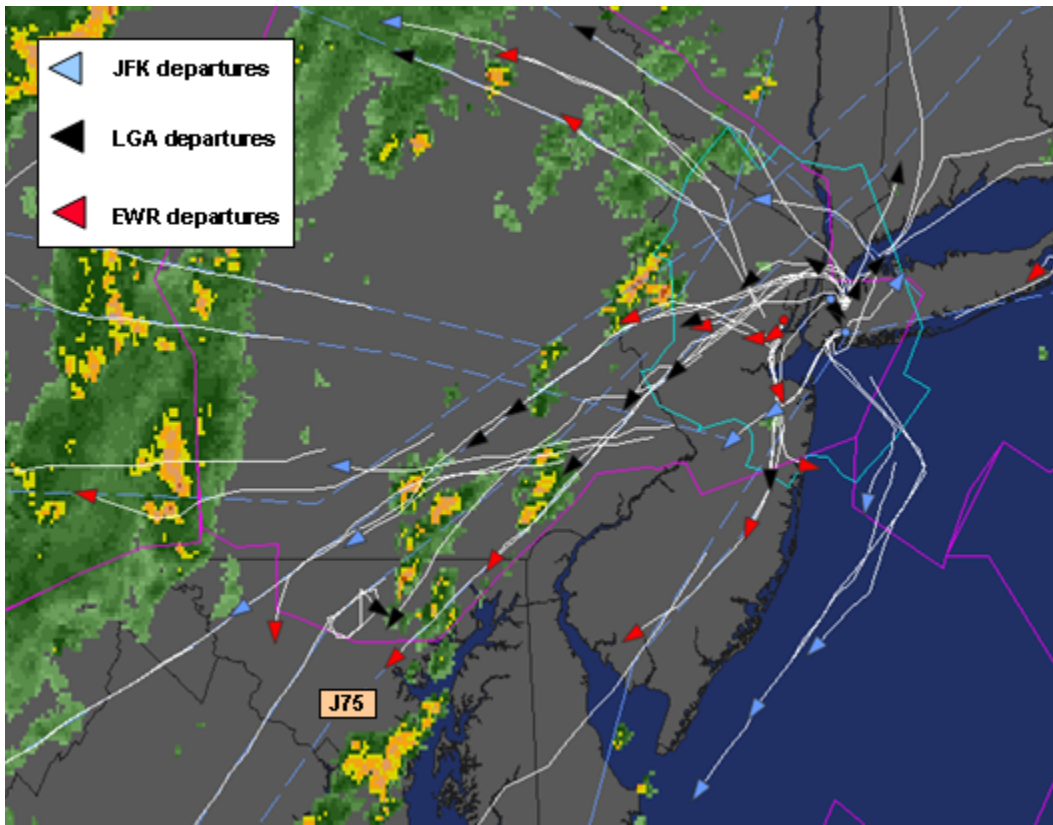


Figure A-4-1-2. Flight Explorer flight tracks and WSI composite reflectivity at 1705 UTC on 11 July 2007, showing the steady stream of J75 departure traffic (with more flights about to load onto the route) remaining on the route and overflying developing convection in southern ZNY airspace.



**APPENDIX B**  
**RAPT PERFORMANCE AND BENEFITS ASSESSMENT CAMPAIGNS**

**RAPT FIELD OBSERVATIONS: Periods 1 – 7**

**TABLE OF CONTENTS**

	<b>Page</b>
RAPT Observation Categories	B-2
PERIOD 1: 05 July 2007	B-3
PERIOD 2: 11 July 2007	B-35
PERIOD 3: 18-19 July 2007	B-67
PERIOD 4: 08-09 August 2007	B-115
PERIOD 5: 16 August 2007	B-165
PERIOD 6: 30 August 2007	B-197
PERIOD 7: 09-11 September 2007	B-218

<b><u>RAPT Benefit Categories</u> **</b>		<b><u>Key</u></b>
1	More timely departure <u>r</u> oute <u>o</u> penings; eased departure restrictions	<b>RO</b>
2	More timely <u>r</u> e <u>r</u> oute <u>p</u> lanning/implementation; improved route impact planning	<b>RRP</b>
3	<u>D</u> irecting <u>p</u> athfinder requests	<b>DP</b>
4	Keeping <u>d</u> eparture routes <u>o</u> pen <u>l</u> onger	<b>DOL</b>
5	More timely and proactive resumption of <u>a</u> rrival flows; decreased airborne <u>h</u> olding; potentially saved <u>d</u> iversions	<b>AHD</b>
6	<u>P</u> roactive <u>r</u> unway <u>s</u> equencing <u>a</u> ssistance	<b>PRSA</b>
7	<u>E</u> nhanced decision-making <u>p</u> roductivity	<b>EP</b>
8	Enhanced <u>I</u> nter/ <u>I</u> ntra- <u>f</u> acility coordination	<b>I/IC</b>
9	Enhanced common situation awareness	<b>SA-1</b>
10	Improved awareness of evolving airspace impacts	<b>SA-2</b>
11	Decision/Plan/Information confirmation or evaluation	<b>SA-3</b>

\*\* Benefits categorizations in parentheses, marked with \*, denote observations of “potential” near-term benefits discussed in Section 7.

<b><u>Observations Supporting RAPT Discovery Process</u></b>		<b><u>Key</u></b>
1	RAPT Technical Performance	<b>RP</b>
2	Traffic Flow Management Details	<b>TMD</b>
3	Airspace Status Uncertainty; Management Complexity	<b>TMD-S</b>
4	Inter-Facility “Lack of Understanding”	<b>TMD-LOU</b>
5	Enhancement Opportunities	<b>EO</b>
6	User Requests	<b>UR</b>
7	Pilot Behavior	<b>PB</b>

**RAPT Benefits Assessment  
BLITZ #1 Observations Summary  
Day 1 - July 5, 2007**

**Participating Facilities: LGA, EWR, N90, ZNY, ZDC, ZOB, ZBW, ATCSCC**

<i>Blitz Ob Identifier</i>		<i>Time (UTC)</i>	<i>ATC Weather-impact Mitigation Concern, Planning Decisions, RAPT Application (if applicable), and Comments</i>	<i>RAPT Benefits Category</i>	<i>Support RAPT Discovery Process</i>	<i>RAPT Training Support</i>	<i>Other Systems</i>
LGA-1-1-	1	1415	The TSD and RAPT displays are now up and visible. RAPT is running at the Supervisor desk. There are no significant problems yet. There are 17 planes in the take-off lineup. RAPT shows all LGA departures routes green. Convection is impacting arrival routes.		TMD		TSD
LGA-1-1-	2	1538	N90 questions LGA why they are using R22 for some departures. LGA explains that is it just more efficient and the winds allowed it.		TMD		
LGA-1-1-	3	1616	N90 notifies LGA to stop GAYEL departures. RAPT has shown this route red since 1525 departures but the route was open until now.		RP, TMD		
LGA-1-1-	4	1715	There is some MIT restriction for ELIOT, but RAPT shows the route green.		RP		
LGA-1-1-	5	1740	SWAP begins.				
LGA-1-1-	6	1748	The CIC has the TSD up with weather displayed. RAPT has shown ELIOT/J80 yellow for the past 30 minutes.				TSD
LGA-1-1-	7	1753	ELIOT is restricted 8 MINIT as one. RAPT shows the route yellow.				
LGA-1-1-	8	1810	The observer provided RAPT training to the CIC and noted that J80 is red for 1830 departures. The CIC asked for input regarding route fly-ability.		RP	Yes	
LGA-1-1-	9	1817	GAYEL is stopped. RAPT shows the route (J95) yellow.		RP		
LGA-1-1-	10	1845	ELIOT and PARKE are 7 MINIT as one. RAPT shows PARKE/J6 green and ELIOT/J60 and J80 yellow going to red for 1850 departures. Neither fix was completely closed, but the restriction slowed traffic considerably.		TMD, RP		

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LGA-1-1-	11	1852	ELIOT is stopped. RAPT still shows ELIOT/J60 and J80 yellow going to red for 1850 departures.				
LGA-1-1-	12	1910	Aircraft are backing up on LGA ramps and taxiways.				
LGA-1-1-	13	1921	The TMC says they will lose all west gates in about 20 minutes (1941) based on the TSD. He advises all controllers. The TMC did not use RAPT for this decision. The observer followed up with the TMC at 1929 and concluded that RAPT was accurately representing the situation.		TMD		TSD
LGA-1-1-	14	1931	ELIOT is stopped. A line of aircraft waiting to depart is forming. GREKI was closed earlier.				
LGA-1-1-	15	1953	RAPT shows GREKI open but it is currently closed. The TMC called N90 and offered a pathfinder to get aircraft moving again. N90 reports GREKI is closed because the sector is overloaded.		RP, TMD		TSD
LGA-1-1-	16	1956	RAPT, TSD, and ITWS show GREKI open. The TMC coordinated with ATCSCC using RAPT. ZBW will not open the route.	SA-3, I/IC	RP, TMD		
LGA-1-1-	17	2000	The TMC is very proactive in getting aircraft out (along with JFK) through GREKI. He is frustrated that he has to make several phone calls to get someone to reconsider the GREKI/CAM route. It appears usable but is officially closed. RAPT shows the route all green. The TMC used RAPT and stated that the route was OK. He used ITWS to check echo tops just west of GREKI (30 kft), low enough to over-fly. The problem is in ZBW.	SA-1	TMD-LOU, RP		TSD, ITWS
LGA-1-1-	18	2045	The observer overhears on the hot line that they are "losing the fix" (GREKI). RAPT shows GREKI red for 2045 departures.		RP		
LGA-1-1-	19	2120	The TMC says that ELIOT/J80 is going to open soon. (The route was closed by ZID.) RAPT shows the route yellow.		RP		TSD
LGA-1-1-	20	2132	J60 is closed for weather. RAPT shows the route yellow.		RP		TSD
LGA-1-1-	21	2135	Departures are stopped by N90. A user requested that RAPT have a mouse-over highlight capability on the web client similar to the TSD and CIWS.		UR		



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LGA-1-1-	22	2139	Departures are released.			
LGA-1-1-	23	2243	There are several delay/MIT programs in for ZDC volume. The convection in NY/PA is considerably weaker. RAPT shows no red on any LGA routes. A user requested that the BETTY, BAYYS, SHIPP, PENNS, and DIXIE fixes be added to RAPT.		UR	
LGA-1-1-	24	2248	It was announced on the hotline that RBV is expected to close.			
LGA-1-1-	25	2250	According to the hotline, GREKI traffic is rerouted over MERIT.			
LGA-1-1-	26	2251	J48 and J75 are still stopped. RAPT shows these routes yellow. Level 3/4 stratiform and thunderstorms are over NJ but cells are widely spaced.			
LGA-1-1-	27	2253	North gate departures are stopped due to lost frequencies.			
LGA-1-1-	28	2257	All west gate departures are as one with 5 MINIT.			
LGA-1-1-	29	2316	The observer overheard a reference to RAPT on the hotline.			
LGA-1-1-	30	2317	GAYEL is still stopped. COATE is open with 7 MINIT. RAPT shows GAYEL yellow. The Supervisor believes it should be open but did not take action to open it.		TMD, RP	
LGA-1-1-	31	2325	LGA ground stop is cancelled.			
LGA-1-1-	32	2339	The TMC referred to RAPT for COATE/J36 status. RAPT shows J36 green. The TMC questions N90/ZNY restrictions based on RAPT and calls N90. He receives no explanation for the restrictions. The TMC has given up trying to convince N90 and ZNY to be more aggressive in moving aircraft off LGA.	SA-1, I/IC	TMD-S, RP	TSD
LGA-1-1-	33	0012	The TMC is reviewing RAPT.	SA-1		
LGA-1-1-	34	0014	GREKI is stopped. The Supervisor said that today's weather was not bad. When temperatures are high and convection is of the random, pop-up variety, they have the worst flow problems.		TMD	
LGA-1-1-	35	0030	Volume is light because of the previous LGA ground stop. Now that the ground stop is cancelled, they are expecting a surge of traffic in the next hour. Without arrivals, no aircraft are being quick-turned for departure.		TMD	

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LGA-1-1-	36	0041	RAPT shows GREKI red beginning with 0050 departures; COATE is green. The TMC told the controllers that they might lose COATE and GREKI before the night is finished. He based this comment partially on RAPT.	SA-2			TSD
LGA-1-1-	37	0053	A thunderstorm with 34 kft tops is approaching GREKI/CAM. GREKI is open but RAPT shows the route red for 30 minutes. CAM is not being used. Weather is just west of the fix. Aircraft are flying east of the weather and turning north. The TMC looked at the TSD and noted that no one was penetrating the weather near GREKI, so RAPT is correct.		TMD, PB, RP		TSD
EWR-1-1-	1	1400	There is currently no weather impact on EWR operations. The TMC indicated that EWR wants the MERIT route displayable on RAPT. In 2007, these routes are been heavily impacted and/or are being used for reroutes.		UR		TSD
EWR-1-1-	2	1555	As convective weather moves east, level 3 is passing south of EWR. ELIOT and PARKE are impacted. RAPT is shows ELIOT/J64 red, GAYEL/J95 yellow and PARKE/J6 green		RP		
EWR-1-1-	3	1729	A SWAP is due to start at 1740Z. RAPT shows ELIOT/J64 red. The observer noted that there was no echo tops information on RAPT. The TMC indicated that he had never seen echo tops on RAPT. The observer demonstrated the echo tops product on CIWS and indicated how it should be available on RAPT.		RP, EO	Yes	CIWS
EWR-1-1-	4	1739	ELIOT is 5 MINIT as one. RAPT shows ELIOT yellow.		RP		TSD
EWR-1-1-		1740	SWAP is started.				
EWR-1-1-	5	1817	GAYEL/J95 is stopped due to weather and they are trying to reroute to J36. RAPT shows GAYEL yellow.		RP, EO		
EWR-1-1-	6	1819	BIGGY/J75 is stopped. DCA and IAD are ground stopped. RAPT shows J80 red.				
EWR-1-1-	7	1824	BIGGY is released. RAPT shows this route yellow.				
EWR-1-1-	8	1850	PARKE and ELIOT are stopped due to weather. RAPT shows ELIOT red and PARKE green.		RP		

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EWR-1-1-	9	1905	PARKE, LANNA, and BIGGY are 7 MINIT as one. RAPT shows LANNA green, PARKE and ELIOT yellow.		RP		
EWR-1-1-	10	1951	EWR is going to send a pathfinder over GAYEL. A Northwest flight was released at 1953. RAPT shows GAYEL going red for 2000Z departures.		RP		
EWR-1-1-	11	2017	ZNY declares GREKI released with 20 MINIT. RAPT shows GREKI going green.		RP		
EWR-1-1-	12	2022	ATC is planning to send all MERIT departures over GREKI. The RAPT window is now covered and remains so until 2052.		EO		
EWR-1-1-	13	2028	PARKE/LANNA/BIGGY is 7 MINIT as one. COATE and GAYEL are running with 5 MINIT. MERIT and ELIOT are stopped. BOS is ground stopped.				
EWR-1-1-	14	2045	GREKI is stopped. RAPT shows this route yellow.		RP		
EWR-1-1-	15	2052	RAPT is displayed and showing ELIOT/J80 and PARKE/J6 red. GREKI/CAM and GAYEL are yellow.				
EWR-1-1-	16	2058	GAYEL is stopped. RAPT shows this route yellow.		RP		
EWR-1-1-	17	2108	EWR departure delays are now over 45 minutes due to weather.				
EWR-1-1-	18	2119	The TMC is discussing opening ELIOT/J80. RAPT shows J80 yellow and the TMC noted this.	SA-2, SA-3	RP		TSD
EWR-1-1-	19	2121	The Supervisor and TMC are discussing J80 on the hotline and observing J80 on RAPT and the TSD. RAPT showed J80 as yellow at 2119Z. They offered to send a pathfinder over the route.	SA-2, SA-3	RP		
EWR-1-1-	20	2128	J80 is opening. The Supervisor and TMC are discussing how RAPT shows J80 green. The observer also heard this being discussed on the hotline.	SA-2, SA-3	RP		
EWR-1-1-	21	2143	GREKI is 5 MINIT for the next 30 min. RAPT shows GREKI/CAM green, GAYEL yellow going red for 2200 departures.		RP		
EWR-1-1-	22	2201	PHL is ground stopped. The RAPT window is obscured again.		EO		
EWR-1-1-	23	2335	GREKI and GAYEL are stopped. RAPT shows GREKI/CAM yellow going red for 0000Z departures.		RP		

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EWR-1-1-	24	0000	A line of level 4/5 weather 70 to 80 nmi north of EWR is moving east. GREKI and GAYEL are stopped. RAPT shows GREKI yellow and GAYEL turning green for 0020 departures.		RP		
EWR-1-1-	25	0021	EWR is out of delays. RAPT is obscured again.		EO		
EWR-1-1-		0042	GAYEL is the only remaining closure. RAPT shows GAYEL green.				
EWR-1-1-	26	0052	RAPT shows GREKI/CAM red for all departures. The observer determined from ATC that there were no restrictions on GREKI. EWR had no GREKI planes in the cue.		TMD-S, EO, TMD		
EWR-1-1-	27	interview	The TMC indicated that he would like to have RAPT on the ETMS because there are too many critical applications on the machine where RAPT is currently running.		UR, EO		
EWR-1-1-	28	Note	While having RAPT in the tower is nice for shared situational awareness, but the tower does not make the release/reroute decisions. Any decisions the tower might make based on RAPT could be overridden by the TRACON and Center.		TMD		
N90-1-1-	1	1400	Level 2/3 weather is located over WV and OH, with tops to 25 kft. A small area of level 5 weather is in eastern OH, moving south. A second area of level 2 -3 (with occasional 4) is moving west-to-east across VA. A third small area of level 2 - 3 activity is in southern NJ and off the coast southeast of Long Island. RAPT shows J64 yellow for 10-25 minutes after the hour. The other routes are green.		RP		
N90-1-1-	2	1420	ELIOT is 30 MIT. The TMU is anticipating a stop for ELIOT to accommodate ZOB. RAPT shows all routes green. The STMC compared RAPT findings to TSD display. He wanted to know why J6 was green when the TSD showed convection beside the route. The observer explained that with tops at 25 kft, the algorithm assumed that aircraft could get above the weather.	SA-3	TMD, RP	Yes	TSD
N90-1-1-	3	1448	Trying to modify RBV to 20 MIT. ELIOT is 20 MIT.				

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N90-1-1-	4	1507	The STMC is comparing the TSD, CIWS, and RAPT. He asks the observer why RAPT is showing routes green when the TSD shows tops to 33 kft and area of level 4/5 just off J6.	SA-3	RP		TSD, CIWS, RAPT
N90-1-1-	5	1515	AFP005 and AFP008 are in place.				ACD, ITWS, ADDS
N90-1-1-	6	1530	The TMC and STMC are looking at LGA arrivals, planning for the 24 aircraft that are expected to arrive within a half hour time span. There are five areas of weather; over WV, eastern OH/western PA, southern Long Island, east-central to southwest NJ, and eastern Great Lakes. RAPT is all green.		TMD		TSD, CIWS
N90-1-1-	7	1533	The north gates (COATE and GAYEL) are 10 MIT and 15 MIT respectively. RAPT shows J95 yellow.		RP		
N90-1-1-	8	1544	There is possible holding for LGA for the next 45 minutes due to volume. RAPT shows J95 red. RAPT was used to validate the decision to hold.	SA-3	RP		
N90-1-1-	9	1605	SHAFT is 15 MIT. RAPT shows J95 and J64 red, while other routes are yellow or green.		RP		
N90-1-1-	10	1633	The NY hotline is activated. There is level 4/5 weather in southwest NY near the PA border. In southwestern PA, level 4/5 weather is near J60 and J80. North-central VA is covered with level 2/3. A large area of level 1/3 weather stretches from central NJ to the outer tip of Long Island. RAPT shows J95 and J64 yellow and all other routes green.				
N90-1-1-	11	1700	ELIOT is 10 MIT. COATE/GAYEL is 10 MIT. RAPT shows the routes mostly green.		RP		
N90-1-1-	12	1703	RBV is 10 MIT until 2200Z. ELIOT is 10 MIT until 2200Z. The weather is slowly moving to the east with building storms between J60 and J80.				
N90-1-1-		1737	Route J64 is closed by ZOB. RAPT shows the route red.				
N90-1-1-	13	1740	Entered SWAP.				
N90-1-1-	14	1754	Haze issues at LGA. N90 is looking for a pathfinder.				

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N90-1-1-	15	1813	IAD is ground stopped. Storms are intensifying and moving east at about 20 kn. Level 3 with embedded level 4 weather stretches from the intersection of J6/J64 to eastern OH.				
N90-1-1-	16	1817	GAYEL departures are stopped. Reroutes over J36 are expected. RAPT routes are mostly yellow and red.		RP		ITWS, TSD
N90-1-1-	17	1819	DCA is ground stopped, void 1900Z. RAPT is used to judge the impact of the weather on J75.	SA-1			TSD
N90-1-1-	18	1823	The EWR ground stop over BIGGY is lifted. RAPT shows J95 red, J64 yellow, and J80 red.		RP		
N90-1-1-	19	1833.	Despite widespread areas of convective activity, reroutes and deviations are keeping the traffic flowing. RAPT shows J95 yellow. RAPT is used to validate decisions made using other tools.	SA-3			ACD, TSD, ITWS
N90-1-1-	20	1841	GREKI and MERIT are stopped, void 1930Z. BOS is ground stopped void 1900Z due to weather. The traffic cannot get to SHAFT. DCA and IAD are ground stopped void 1900Z. J60, J64, and J80 are nearly stopped. (RAPT shows these routes red.) WAVEY is 25 MIT until 2300Z.		TMD, RP		
N90-1-1-	21	1851	PARKE and ELIOT are stopped due to weather. RAPT shows J80 red.		RP		
N90-1-1-	22	1854	GAYEL is stopped; rerouting over COATE. ELIOT/J60 is still a good route. RAPT shows J60 yellow.		RP		
N90-1-1-	23	1906	GREKI and MERIT are still stopped. RAPT shows J95, J60, and J64 yellow. J80 is yellow-red.				
N90-1-1-	24	1910	BIGGY, PARKE, and LANNA are 15 MIT as one. J64 and J80 are still not being used. There is level 4/5 weather with tops to 45 kft on J60 north of MIDST. There is eastward-moving, level 4/5 weather with tops to 45 kft from J60 to J36 (northwest PA) to KELIE to north of VANCE.				
N90-1-1-	25	1922	AFP005 and AFP008 are in place. RBV is 15 MIT due to deviations and volume.				
N90-1-1-	26	1926	TMU is considering a GDP for JFK around 2300Z.				CIWS, TSD, ACD

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N90-1-1-	27	1930	All ELIOT traffic is stopped due to weather. J60/J64 over RBV is stopped. There are scattered areas of level 4/5 weather from the NY/PA border, to NJ westward across PA and OH to the Great Lakes.				
N90-1-1-	28	1945	ZNY stopped WAVEY traffic. RAPT shows J64 red and J80 yellow - red.		TMD-S		
N90-1-1-	29	1950	A pathfinder off LGA over GAYEL has been requested.				
N90-1-1-	30	1955	WAVEY released. RAPT shows J80 red.				
N90-1-1-	31	2004	The BOS ground stop entry in NTML is incorrect. There is no BOS ground stop.		TMD-S		NTML
N90-1-1-	32	2005	J80, J60, and J64 are still stopped. RAPT shows J64 yellow.		RP		
N90-1-1-	33	2013	Two pathfinders for GAYEL have launched. MERIT is stopped. GREKI is on DSP. ZBW reports that BOS is ground stopped due to gridlock.				
N90-1-1-	34	2023	WAVEY is 25 MIT with normal exclusions. MERIT is 15 MIT with normal exclusions. GREKI is 20 MIT. COATE/GAYEL is 10 and 15 MIT respectively. WHITE is 15 MIT with normal exclusions.				CIWS, TSD
N90-1-1-	35	2028	SRMN north is approved. RAPT shows J60/J64 red, J80 yellow, and the rest mostly green. Scattered areas of level 1/3 weather are located in NY, PA, CT, and MA with widely scattered level 4/5 cells entering NJ- while ELIOT, PARKE, LANNA, and BIGGY are covered by this weather.				
N90-1-1-	36	2038	EWR is complaining about deviations at GREKI and is estimating that GREKI will be lost in 30 to 60 minutes. They are trying to get approval for BETTE and/or HAPPI departures for international reroutes. N90 is looking at RAPT to determine if BETTE and/or HAPPI might work for departures.	SA-1	EO		ACD, CIWS
N90-1-1-	37	2043	ZDC is holding for EWR. RAPT shows J60 and J64 red.				
N90-1-1-	38	2049	RAPT shows J60, J64, and J80 mostly red. The TMC is watching RAPT for possible route openings.	SA-2			ITWS, CIWS, TSD
N90-1-1-	39	2050	SOARS traffic is stopped by N90 Liberty Sector due to volume.				

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N90-1-1-	39	2058	GAYEL/J95 is stopped by ZNY. RAPT shows J95 yellow. The TMC and STMC are brainstorming ways to handle the JFK departures in the 30 to 60 minute interval.		RP		CIWS, TSD
N90-1-1-	40	2058	All west gate departures are stopped.				
N90-1-1-	41	2101	An area of convective activity extends from east-central PA westward to the southwest corner of PA. Echo tops are as high as 51 kft in the J6/J48 area. Airborne aircraft are refusing the GREKI route because it goes into Canadian airspace. All GAYEL departures are stopped. EWR arrivals are holding at PENNS. GREKI DSP is stopped. The east gates are impacted by weather but continue to operate. RBV is stopped.		PB		
N90-1-1-	42	2110	Aircraft filed over BIGGY are being held on the ground to avoid airborne holding. WHITE is 15 MIT, no exclusions. RAPT shows most of the routes yellow and J64 red.		TMD		
N90-1-1-	43	2112	DIXIE/SHIPP is stopped. WHITE is 7 MINIT-out of EWR and 9 MINIT for HPN. EWR is ground stopped at 2200Z and running 45 minute departure delays. AFPs are still in place with AFP005 revised, and AFP008 running heavy. ATC is anticipating a PHL ground stop. RAPT shows J95, J60, J64, and J80 intermittent red and yellow.		TMD		ACD, TSD
N90-1-1-	44	2123	The TMC is looking for a release on J80, but is not getting an answer from ZNY. He used RAPT to look at the forecast for J80. ELIOT is reopened for J80 only. RBV/J80 is still closed. RAPT shows J95 yellow and all other westbound routes red.	RO, I/C			
N90-1-1-	45	2137	There is an area of convection on the north, west, and south sides of the NY metro area. An east-west line runs through MA, CT, and into north NY. Another east-west line runs from western NY into PA and down into WV.				
N90-1-1-	46	2146	The STMC is questioning why RAPT shows the routes red when traffic is obviously using the routes.		RP, EO		CIWS, TSD



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N90-1-1-	47	2147	ZDC asks how long YRDLY will stay open. N90 suggests bringing traffic in single stream with LGA traffic. ATCSCC prefers a ground stop to single stream.		TMD		TSD, ACD
N90-1-1-	48	2150	NY traffic is being held at PENNS due to volume.				
N90-1-1-	49	2154	N90 advises ATCSCC that traffic over YRDLY can deviate 4 to 5 miles to avoid weather. RAPT is consulted for the placement of the storms relative to the fix. The weather is pushing into northern NJ/NY metro areas. ITWS, CIWS, and RAPT indicate that the weather is decreasing in intensity. RAPT shows J95 yellow and all other routes red-yellow.	SA-1, SA-2	RP, TMD		CIWS, ITWS, TSD
N90-1-1-	50	2155	ELIOT/J60 and J64 are open. J80 is open. RAPT shows J60 and J64 red-yellow. During the TMC hand-off briefing, the relief TMC questions opening J60 and J64 if RAPT shows them closed.	SA-2, RRP	RP, EO		
N90-1-1-	51	2201	MERIT is open only for departures to BOS. RBV is still stopped. GREKI is 10 MIT for international flights. RAPT shows J95 yellow and all other routes red.				ACD, TSD
N90-1-1-	52	2219	WHITE is 15 MIT with normal exclusions. MERIT is for BOS traffic only.				TSD, CIWS, ITWS, ACD
N90-1-1-	53	2232	An Eagle flight landing CLE and filed on J36 is being held. The TMC uses RAPT to help determine a route for him. ZNY rerouted the Eagle flight to ELIOT with instructions to expect further clearance. RAPT shows all routes yellow, except J60. Level 2/3 weather is over northern NJ and western Long Island. A line stretches west-southwest through PHL, southern PA, and into northern MD.	SA-2, I/IC, RRP	RP		CIWS, TSD
N90-1-1-	54	2238	HPN, EWR, and LGA departures over WHITE are stopped. WAVY is stopped by ZDC due to volume. No JFK departures may file over MERIT or GREKI. MERIT is stopped with the expectation that it is short term. They are trying to get departures out over BETTE or HAPPI.				
N90-1-1-	55	2239	GREKI/MERIT as one with 10 MIT after 3 GREKI departures in lineup at EWR.				TSD, ACD

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N90-1-1-	56	2243	The sector advises the TMC that there are only 2 to 3 minutes left on WHITE departures. WHITE is 20 MIT. RAPT shows routes yellow.		RP, TMD		
N90-1-1-	57	2253	ZNY has stopped north gate departures because all frequencies have been lost.				
N90-1-1-	58	2301	ELIOT is 20 MIT. PARKE/LANNA/BIGGY is as one with 7 MINIT, no exclusions.		TMD		TSD
N90-1-1-	59	2303	ZNY advises that the north gates will open in 5 to 10 minutes.				
N90-1-1-	60	2304	Much of the weather is not below level 3. A line of level 3/4 with tops to 40 kft stretches from the MA/NY/CT border into northwestern PA.				
N90-1-1-	61	2315	The TMC uses RAPT to determine that he can ask ZNY to entertain a pathfinder over RBV. RAPT shows RBV yellow.	DP, I/IC, SA-1			
N90-1-1-	62	2322	During the SPT, Jet Blue requested that ZNY allow a pathfinder over RBV. Jet Blue based this request on RAPT.	I/IC, SA-1			
N90-1-1-	63	2329	RBV is 10 MIT until 0230Z. Though a pathfinder was never sent out, ZNY did re-evaluate the route and opened RBV with restrictions.		RP		
N90-1-1-	64	2334	All north gates are stopped. RAPT shows the north gates red-yellow. An east-west line of level 4/5 weather is over NY north of GAYEL and parallel to and west of J80.		RP		
N90-1-1-	65	2356	LANNA/BIGGY is "as one." (N90 determination.)				TSD, ITWS, ACD
N90-1-1-	66	0013	GREKI is stopped, but ZNY is using the fix in reroutes.				
N90-1-1-	67	0031	JFK is 20 MIT off COATE. ZNY wants a single stream on COATE departures.				
N90-1-1-	68	0034	GAYEL is open. A NE/SW line of level 3/5 weather in western MA-northwestern CT is stretching westward across the NY metro area into northeast PA. Another area in southeastern PA (west of PHL) is stretching southward into MD then westward across northern VA and WV.				

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N90-1-1-	69	0038	The RBV and north gate restrictions are cancelled. RAPT shows the routes yellow and green.		RP, TMD		
N90-1-1-	70	0047	N90 is requesting that ZNY slow approaches into EWR. The sector is holding for NY and aircraft are deviating into LGA airspace. RAPT is obscured.		EO, TMD		
N90-1-1-	71	0118	ZNY reports that traffic is clearing. ZBW is in the ground stop for EWR and LGA. They are bringing them down one at a time because they are holding in turbulence.		TMD		
N90-1-1-	72	0130	JFK dropped off the hotline. Aircraft are backed up all over the tarmac and runways. Areas of convective weather are dissipating. The SWAP remains in effect until 0230Z.				
ZNY-1-1-	1	1315	An embedded cluster of level 5-6 cells with tops to 43 kft is located in west/central ZOB. A weaker area of embedded storms (no lightning, level 3, tops to 35kft) is in ZDC near J6. All NY departure routes are open at this time. The RAPT window is displayed by the observer. RAPT is green. CIWS is being used for situational awareness.				CIWS
ZNY-1-1-	2	1325	On-position CIWS and RAPT training was provided to the Area B Supervisor. The RAPT display and potential uses were discussed extensively.			Yes	
ZNY-1-1-	3	1415	RAPT display requests: When routes are selected by jetway, only one airport or "home" is needed. Also, the option to NOT show some departure routes and timelines was requested. For example, when the Area B Supervisor is viewing EWR timelines, he does not want to see routes that do not use his Area.		UR		
ZNY-1-1-	4	1420	ATCSCC decided on the 1315Z SPT to implement AFP005 (ZOB) and AFP008 (ZDC) for 1700 - 0300Z. Rates at this time are set for 80 (AFP005) and 125 (AFP008), with modeled average delay of 76 min and 20 min, respectively. Also, a EWR GDP, with a rate of 38, is planned for 1700 - 0300 because of haze and wind.				

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ZNY-1-1-	5	1430	The Area A Supervisor opens J80 traffic with a 30 MIT restriction off every fix.		TMD		
ZNY-1-1-	6	1430	The CWSU briefs the STMC on expectation for the SWAP. He uses WARP and says that a SWAP is expected.				WARP
ZNY-1-1-	7	1520	Level 5, 37 kft-top weather is building in ZOB on J95. Lightning is increasing. The route is still open without restrictions. RAPT shows the route green with the exception of one yellow (31 kft). The STMC consults CIWS to note weather on the route, highlighting J95 to aid him.		RP		CIWS
ZNY-1-1-	8	1525	Even though there is weather on J95 in ZOB, the route is open. The DSP was used to confirm that GAYEL flights are routinely getting out without delay. RAPT shows J95 yellow (31 ENR). The STMC consulted CIWS and RAPT for situational awareness.	SA-1			CIWS Forecast, VIL
ZNY-1-1-	9	1527	Weather is on GAYEL. The STMC consulted RAPT for situational awareness.	SA-1			TSD
ZNY-1-1-	10	~1530	J64 was closed by ZOB due to weather. Traffic was swapped to J60, running 2-as-1. This is a good opportunity for blockage-by-gate. RAPT shows J64 red-yellow-red (ENR).		EO		
ZNY-1-1-	11	1535	The intensity of the weather on J95 has increased to level 5/6 with 38 kft tops. RAPT shows the route red-yellow-red (ENR 33). The STMC noted the increased RAPT severity, confirmed that J95 was open in ZOB; but took no further action.	SA-2			
ZNY-1-1-	12	1549	RAPT shows some red on ELIOT/J64. J64 is closed by ZOB for weather and swapped to J60 (2 as 1) until 1830Z. The STMC is reviewing RAPT for situational awareness, looking at different views to the west and north by fix, particularly GAYEL.	SA-2			
ZNY-1-1-	13	1615	Level 5 weather with tops from 34 kft to 49 kft is located just south of J64. J64 is still stopped (swapped to J60) by ZOB. RAPT shows J64 red with 36 ENR.				

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ZNY-1-1-	14	1618	<p>The STMC is watching a NY-to-MSP flight on J95 to assess route availability. He indicated that this was a good flight to watch because most of the previous flights were destined for YYZ and were descending through weather on the route rather than traversing the weather. RAPT shows J95 red (ENR 32), changing to yellow (ENR 31) at 1620Z. The observer asked the STMC the status of J95. The STMC consulted RAPT and stated that, based on RAPT, he was surprised that the route was still open.</p> <p>The MSP flight stayed on the route, flying at FL360 to get over the level 5 weather.</p>	SA-1	PB, RP		DSR, CIWS Echo Tops
ZNY-1-1-	15	1630	<p>The STMC used RAPT and CIWS for a hand-off briefing. He explained that the only route closure was J64. The STMC used RAPT to show that this route was yellow with one red (ENR 35). He indicated that the stoppage was in ZOB and he thinks conditions might be improving.</p>	SA-1 SA-2			CIWS VIL
ZNY-1-1-	16	1639	<p>RAPT shows J95/GAYEL red. Aircraft are getting over the tops at the moment.</p>		RP, PB		
ZNY-1-1-	17	1653	<p>RAPT shows ELIOT/J64 red. Weather is moving east-southeast and is starting to build a little. Echo tops are increasing. The STMC reviewed CIWS and RAPT for situational awareness.</p>	SA-2	RP		CIWS, TSD
ZNY-1-1-	18	1659	<p>Aircraft are still not deviating around the weather on J95. RAPT shows J95 yellow (31 ENR) and has "flickered" between red and yellow for the past hour.</p>		RO, EO, PB		DSR
ZNY-1-1-	19	1740	<p>The SWAP starts. The storm cluster in ZOB is expanding into ZNY. A weaker cluster still persists on the north gates. J36/J95 are open with only minor restrictions; RAPT shows J95 dark green. J64 is closed; RAPT shows J64 red then yellow (ENR 32). J80 is open; RAPT shows J80 yellow. J152 is closed to PHL arrivals. The STMC consulted RAPT for route status, noting that J80 was yellow. The forecast shows weather moving rapidly toward the route. The STMC commented that it "looks like J80 is next to close."</p>	SA-2	RP		

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ZNY-1-1-	20	1740	The STMC looked at RAPT to determine if J80 would be impacted in the future.	SA-2, EP			
ZNY-1-1-	21	1741	The STMC is using CIWS for situational awareness.				CIWS
ZNY-1-1-	22	1743	There are storms on the north gates in ZOB. RAPT shows J95 dark green. The STMC noted the route status in RAPT and consulted CIWS for echo tops on J95.	SA-1			CIWS
ZNY-1-1-	23	1750	The CWSU briefs the STMC using CIWS to illustrate expected impacts later in the evening.				CIWS
ZNY-1-1-	24	1755	Weather is developing along J80. RAPT shows the route yellow (ENR 32). The Area B Supervisor consulted RAPT and noted that J80 was yellow. His reaction was to close J80 before deviations occurred. The observer pointed out that the storm motion vectors and CIWS Forecast showed weather moving east, staying north of J80. The Supervisor noted that, according to CIWS, weather forming in ZNY may be a bigger concern for J80. The observer asked the Supervisor what the TMC would think about closing the route. The Area Supervisor visited the TMU to find out. The STMC consulted RAPT and CIWS to see that the weather is forecasted to stay off the route and that impacts do not seem severe. The STMC keeps the route open, requesting that the Area Supervisor report any deviations.		TMD	Yes	CIWS VIL, Forecast, Echo Tops
ZNY-1-1-	25	1759	The Area Supervisor wants to proactively close J80, referencing RAPT. The STMC wants to wait until there are deviations, referencing CIWS. RAPT shows J80 yellow. The observer helped the Area Supervisor interpret RAPT.		TMD	Yes	CIWS
ZNY-1-1-	26	1804	ZNY and ZDC want PHL incorporated into RAPT.		UR		
ZNY-1-1-	27	1805	The Area B Supervisor again approaches the STMC, expressing concern about J80 departures. The STMC consults RAPT, noting that J80 is yellow. He acknowledges the potential impact, but keeps the route open.	SA-2, I/IC			

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ZNY-1-1-	28	1809	The Area Supervisor again urges the STMC to "do something" about J80. The Area Supervisor uses RAPT to determine that the route is yellow with tops up to 38 kft ENR.	SA-1	TMD		
ZNY-1-1-	29	1810	RAPT shows J80 yellow with red for 1835 departures. The STMC calls the Area D Supervisor to ask about deviations (none yet) and tells the Area Supervisor that, according to RAPT, problems might be expected starting with 1835Z departures. The red cell in the RAPT timeline turns yellow with the next RAPT update.	SA-2, I/IC, EP			
ZNY-1-1-	30	1810	RAPT shows J80 red. The STMC consulted RAPT for J80. He wants to keep the route open as long as possible. Now that J80 is red, the STMC is more amenable to closing it. The STMC called the Area Supervisor to let him know that 1835 departures on J80 may be impacted. The observer answered a RAPT question from the Area Supervisor at 1759Z. This seems to have encouraged the Area Supervisor to use RAPT unassisted.				CIWS VIL, Echo Tops
ZNY-1-1-	31	1817	Weather is beginning to move into ZNY from the west and south. RAPT shows J80 yellow. This "flicker" is causing the STMC to question making a call using RAPT.		RP, EO		CIWS
ZNY-1-1-	32	1820	RAPT shows J80 red again. The STMC expresses frustration with the "flicker" on RAPT and questions whether to close J80 or keep it open. Subsequently, J80 is closed to enroute traffic (BOS) in anticipation of greater impacts.		RP, EO		
ZNY-1-1-	33	1820	The level 6, 35 kft top weather cluster on J95 is causing deviations into J36. As a result, J95 is closed and J36/J95 traffic is combined as one. RAPT shows J95 yellow to red, changing to all red. The STMC references RAPT to see if the J95 status corresponds to the current traffic situation and comments that RAPT looks reasonable.	SA-3	RP, EO		
ZNY-1-1-	34	1823	The STMC is using CIWS for situational awareness.				CIWS
ZNY-1-1-	35	1824	J95/J36 are "as one" due to weather and deviations. RAPT shows J95 yellow-red, which agrees with current operations.				

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ZNY-1-1-	36	1825	The Area A Supervisor requests 15 MIT on J80. The TMC does not expect to need further restrictions because the weather is moving east and isn't forecast to directly impact the route soon. RAPT shows the route red-yellow-red.		TMD, RP		
ZNY-1-1-	37	1827	The Area A Supervisor requests 15 MIT out of ELIOT on J80. Area A is okay, but Area B may have a problem.		TMD		
ZNY-1-1-	38	~1830	The east-west extension of the convection along and north of J80 is extending/growing eastward into ZNY. ZBW to DCA traffic is moved east out of ZNY to prevent deviations into NYC departures. The Area A Supervisor used CIWS to determine that a proactive reroute was needed. CIWS showed that the weather was not dissipating, as evidenced by growth in the area of interest.				CIWS Growth and Decay Trends
ZNY-1-1-	39	1831	The weather on J80 may stay to the north but will impact Area B. The observer notes "flickering" on J80. CIWS is being used a lot and RAPT is being used a little.		RP		CIWS
ZNY-1-1-	40	1834	The CIWS Growth and Decay Trends product is being used to proactively shut off PHL arrivals on J220.				CIWS
ZNY-1-1-	41	1840	The STMC received an update. J64 is still closed and swapped to J60. J95 is closed and swapped to J36. J220 is closed from ZDC to ZNY by Area A.				
ZNY-1-1-	42	1845	There is weather on J60/J64 and just north of J80. The cluster continues to impact the north gates. New storms are developing in southern NY near GREKI. Another cluster of storms is forming on J75 in central ZDC. The Area A Supervisor notes that the weather impact on J80 is probably not as severe today as it would be normally because the 4th of July holiday has resulted in lighter traffic demand. RAPT shows J60/J64 yellow and J80 yellow to red.		TMD		
ZNY-1-1-	43	1855	The east-west line of weather near J80 is pushing further east into ZNY. ELIOT, PARKE, and LANNA are closed and swapped to BIGGY. The Area A Supervisor confirms that they can return to normal routes in ZDC. This decision is made by the Area Supervisor, who is not using RAPT.		TMD		CIWS, TSD



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ZNY-1-1-	44	1856	ELIOT, PARKE, and LANNA are closed. All traffic is routed over BIGGY, single stream. Aberdeen is closed. RAPT is yellow and red. The observer notes CIWS use.				CIWS
ZNY-1-1-	45	1904	The Area A Supervisor reports deviations on J80 and states it is not "working anymore." A check on the route status at 1915Z shows that J95, J64, and J80 are closed. RAPT shows J80 red-yellow-red, J95 yellow, J64 yellow (turning to red at 1920Z.)		RP		
ZNY-1-1-	46	1904	Area B requests no more J80 traffic.		TMD		
ZNY-1-1-	47	1920	Weather is impacting PTW. The PTW departure fix for PHL is closed by Area D. The STMC consults CIWS to understand why PTW is closed.		TMD		CIWS VIL, Echo Tops, Storm Motion
ZNY-1-1-	48	1928	Area D closed J60. The TMU did not know.		TMD-S		
ZNY-1-1-	49	1930	The weather on J60/J64 is causing departures to deviate into arrivals. J64 is already closed. Area D closed J60. RAPT shows J60 yellow.		TMD, RP		
ZNY-1-1-	50	1932	A pathfinder off GAYEL has been requested. The CWSU reports that the weather is clearing; tops are decreasing over Binghamton. Area C will accept a GAYEL pathfinder. RAPT shows J95/GAYEL green.		RP		CIWS CWSU
ZNY-1-1-	51	1939	The pathfinder over GAYEL is a LGA-to-DTW flight. The CWSU uses WARP to assess the echo tops. NEXRAD tops are 29 kft, CIWS tops are 32 kft.				CIWS CWSU
ZNY-1-1-	52	1945	ZDC shut off WAVEY due to volume.		TMD		
ZNY-1-1-	53	1948	Area C shut off PHL and Area D shut off BOS.		TMD		
ZNY-1-1-	54	1951	A second pathfinder has been accepted for GAYEL. The first pathfinder launches at 1953. RAPT shows J95 red with tops between 34 kft and 39 kft. CIWS shows peak echo tops of 37 kft.		RP		
ZNY-1-1-	55	2006	A pathfinder has been launched to test J95. The STMC is worried about J95 as the pathfinders approach the weather. The observer pointed out that RAPT shows red. The pathfinder was at FL300 and requested FL360. At 2020Z, J95 is open at or above FL320 as a result of the pathfinder.		RP		

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ZNY-1-1-	56	2015	The pilot of the first pathfinder reports tops of 32 kft. RAPT indicates echo tops of 29 kft along J95. CIWS indicates 35 kft.		RP		
ZNY-1-1-	57	2020	There is an east-west line of storms over the north gates, a strong cluster near GREKI, and very strong embedded storms impacting J64/J80/J6 region of ZNY. RAPT shows GREKI yellow-red-yellow-red, J60 green, J64 yellow, J80 red, J6 yellow-red, and J48 yellow. The TMC is consulting CIWS to work out a RAVINE to AIR route.				CIWS
ZNY-1-1-	58	2020	J95 is open at or above FL320 as a result of the pathfinder. RAPT shows the route is green.		RP		CIWS CWSU
ZNY-1-1-	59	2030	The east-west line is intensifying in southern ZNY. The Desk STMC thought J6 was open and had to confirm with the other STMC that the route is closed. This instance highlights the need for more efficient, accurate communications.		TMD-S		
ZNY-1-1-	60	2057	Level 5/6 storms with 34 kft to 40 kft tops are on J36/J95. GAYEL is closed by the Area Supervisor. Another strong cluster in southern ZDC is moving east and impacting BIGGY, which is being used to swap LANNA, PARKE, and ELIOT. RAPT shows J95 yellow and J75 green-yellow. The OMIC consults the DSR and asks why BIGGY is not available. It appears they still have room. RAPT suggests that departures are clear for 10 more minutes. Perhaps this was a proactive closure to avoid bigger problems.		RP, TMD		DSR
ZNY-1-1-	61	2057	GAYEL/J95 is closed again. WHITE/WAVEY/COATE is still open.				
ZNY-1-1-	62	2105	J75 is closed due to weather south of COATE.				
ZNY-1-1-	63	2107	J48 is closed due to weather in Area A.				
ZNY-1-1-	64	2108	The Area Supervisor confers with the OMIC using the DSR. They agree that using BIGGY with 30 MIT is likely feasible. RAPT shows BIGGY/J75 green to yellow, with yellow beginning with 2120Z departures.		RP, TMD		DSR

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ZNY-1-1-	65	2110	An Area A controller reports problems with ZOB accepting traffic. ZOB shut off ZNY because ZID is not accepting traffic from ZOB and ZOB does not want to hold. ATCSCC is attempting to coordinate a route. At 2119Z, ATCSCC tells ZNY to use J80. There is a huge coordination effort taking place between ZID, ZOB, ZNY, N90, and ATCSCC. RAPT shows J80 yellow. The Area A Supervisor changed the CIWS Forecast window to be able to look at weather in ZOB and confirm there should be no problem.		TMD, RP		CIWS
ZNY-1-1-	66	2110	Traffic is deviating on J75 at DuPont, so BIGGY needs to be closed. RAPT shows this route green.		RP		DSR
ZNY-1-1-	67	2111	GREKI is closed due to weather.				
ZNY-1-1-	68	2112	ZOB will not accept traffic on J80 because J80 is closed in ZID. ZOB does not want to hold. ZNY wants to open J80, but ZID refuses. ATCSCC is asked to negotiate a resolution. CIWS is used to confirm that ZOB can take traffic on J80.				CIWS
ZNY-1-1-	69	2115	The only departure routes open are J36, WHITE, WAVEY. RAPT shows that these are the only clear routes.		RP		
ZNY-1-1-	70	2119	ATCSCC says to use J80.				
ZNY-1-1-	71	2122	STMC - J36/WHITE/WAVEY. All that is open w/ J80 30 MIT. RAPT shows J36, WHITE, and WAVEY green, and J80 yellow.				CIWS
ZNY-1-1-	72	2140	There are primarily two lines of east-west oriented weather; one over then north gates into the arrival flows and the stronger near J6/J80 to LANNA. RAPT shows J95 (which is closed) yellow. J80 is yellow and open, J36, J60, and J64 are green but J60 is closed, and J64 is closed due to weather (though not en route). J6 and J48 are red and closed. J75 is yellow and closed. RAPT is not being used, but the observer pointed out that, in conjunction with CIWS, RAPT shows J60 and J64 green. The STMC checks CIWS and DSR to check the J60/J64 availability, trying to reopen J60.	*(RO, SA-2)		Yes	CIWS DSR
ZNY-1-1-	73	2149	The STMC is looking at J60/J64 and considering requesting a pathfinder. The observer points out that RAPT is green.			Yes	CIWS DSR

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ZNY-1-1-	74	2156	J60/J64 is opened with no restrictions.				CIWS DSR
ZNY-1-1-	75	2220	There is broken level 3-6 weather along MHT-GREKI-State College, a second line from PHL to ZOB/ZDC/ZNY boundary, and a third line in central ZDC. ZDC has restrictions for WHITE. ZNY and N90 are unclear why this is needed, but believe it may be due to the weather in central ZDC. RAPT shows WHITE as clear.		TMD		
ZNY-1-1-	76	2230	Area D does not want traffic routed J49 via Phillipsburg because of deviations. Area D shut off Area C, so ZBW traffic was shut off.		TMD		
ZNY-1-1-	77	2240	WHITE is stopped by ZDC because they cannot accept this traffic and hold for JFK at the same time. RAPT shows WHITE clear. WHITE was stopped due to volume, not weather.		TMD		
ZNY-1-1-	78	2240	There are embedded level 6 cells in southern NY. GREKI departures are stopped but MERIT is running with 10 MIT. RAPT shows GREKI yellow.		RP		
ZNY-1-1-	79	2245	The STMC uses CIWS to determine the availability of J95. RAPT shows J95 green and weather is impacting the north gates.		RP		
ZNY-1-1-	80	2255	After consulting CIWS, the AREA B Supervisor tells the TMU he can accept PARKE/J6 traffic as one with ELIOT. "As one" is needed because he can't have PARKE traffic deviating into ELIOT. RAPT shows PARKE/J6 green and ELIOT clear, with ZNY forecast accuracies of 90/75. However, RAPT was not used in the Area to make this decision.	*(RO, I/IC)	RP		CIWS
ZNY-1-1-	81	2255	Area B will take traffic on J6 with ELIOT and PARKE as one.				CIWS
ZNY-1-1-	82	2300	PARKE and ELIOT are normal. J48/J75 are routed over PARKE then fan out. The Area B Supervisor determined this routing without the aid of RAPT. RAPT shows J48/J75 yellow.  The STMC asked for PHL departure timelines in RAPT.		UR		
ZNY-1-1-	83	2300	J6 is back to normal over PARKE and ELIOT				

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ZNY-1-1-	84	2320	Weather west of PHL is weakening and ATC is considering using RBV/J64. The Area Supervisor is concerned that the forecast shows level 3 weather over RBV in one hour. The Observer pointed out to the STMC that the weather has no lightning, top are collapsing, and it appears that it is only heavy rain. The STMC is convinced to try RBV/J64. The observer selected JFK on RAPT to show the STMC that RBV J60/J64 is green. RAPT is not used in the decision. CIWS is used to identify an opportunity to reopen this route.	*(SA-2, RO, I/IC)	TMD	Yes	CIWS
ZNY-1-1-	85	2320	Weather to the north of ZNY and N90 is impacting J95/GREKI. RAPT shows this route red. There is some weather along the southeast ZNY boundary.		RP		CIWS
ZNY-1-1-	86	2323	Jet Blue is using RAPT for RBV departures. RAPT shows the fix yellow.				
ZNY-1-1-	87	2335	North gates are stopped by Area C. The Area Supervisor reports deviations.		TMD		
ZNY-1-1-	88	2340	J48 is reopening. This was initiated by the TMU Departure Desk (DD) position and allowed by the Area. RAPT shows J48 green, but RAPT was not used for this decision.	*(RO)	TMD		
ZNY-1-1-	89	2340	J48 is open per en route desk.				
ZNY-1-1-	90	2342	North gates will open via COATE - as one - with 25 MIT.				
ZNY-1-1-	91	2350	The STMC requested the capability to move the RAPT route-selector box to different locations on the weather area of the RAPT window, rather than have it either opened or closed. He wants to have it open to quickly make selections, but wants to be able to move it so it doesn't obscure weather in the northeast portion of the window.		UR		
ZNY-1-1-	92	2351	J48/J75 over Sparta from ZBW can go normal routes, per Area B. RAPT is green.		TMD		
ZNY-1-1-	93	0011	Pathfinder on J95. RAPT shows J95 yellow-red.		RP		CIWS

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ZNY-1-1-	94	0015	CIWS shows growth to the south along J6/J80. RAPT shows J6 green and-yellow.		RP		CIWS Growth and Decay Trends
ZNY-1-1-	95	0030	The line over the north gates is weakening and the STMC reopens GAYEL/J95. RAPT shows J95 green.				
ZNY-1-1-	96	0052	Weather is building along J75 in ZDC. RAPT shows blockage with tops 32 kft ENR.				
ZNY-1-1-	97	0145	There is level 5 weather with 35 kft to 41 kft tops and minimal lightning on J80, J6, and J48 in southern ZNY. The observer asked the STMC why traffic is running smoothly now when, at 2PM, similar weather closes routes. The STMC suggests that this may be due to lower demand, weather close enough to the airports that aircraft are beneath it, and the lack of lightning implies a lack of severity. Also, pilots expect weather to be intensifying at 2PM and one deviation often leads to more. At 9PM a deviation does not necessarily mean that conditions are getting worse so the Areas are more tolerant.		TMD, PB		
ZDC-1-1-	1	2010	RAPT shows J75 red (41 ENR). A cell southeast of ROA has a top of 47kft and it is moving east.		RP		
ZDC-1-1-	2	2024	ZDC requests pathfinders; one from ZNY for J220 and one from ZOB for J518.				
ZDC-1-1-	3	2105	J6 and J48 are closed after a telecon with ZNY. J75 is expected to close soon. RAPT shows mostly red on J6 and J48. BIGGY/J75 is yellow with 38 kft tops.		RP		
ZDC-1-1-	4	2120	The TMC is monitoring two cells near Flatrock. They are routing numerous aircraft through a hole based on CIWS.				CIWS
ZDC-1-1-	5	2120	Aircraft are being routed through holes in the weather to the south.				
ZDC-1-1-	6	2145	A small level 3 cell is over WHITE. -RAPT shows the fix green.		RP		
ZDC-1-1-	7	2200	RAPT shows WHITE/J209 green. A ground stop for EWR and LGA is implemented due to thunderstorms, void 2300Z.				

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ZDC-1-1-	8	2236	RAPT shows TEB routes WHITE/J79 and WHITE/J209 yellow for 2255 and 2300Z departures. There is a cell south of SBY. The observer asks why there is no ENR impact statement in RAPT at this time.		RP, EO, TMD		
ZDC-1-1-	9	2325	LGA ground stop is cancelled. J75 and J14 are closed due to weather south of CLT.		TMD		
ZDC-1-1-	10	2352	RBV and JFK/J75 are stopped but RAPT is showing all routes green.		RP, EO, TMD		
ZDC-1-1-	11	2354	JFK RBV is still stopped but the STMC questions why RAPT shows all routes green.		RP, EO		
ZOB-1-1-	1	1420	The Host computer is down; ZOB is "dark." J64 traffic is swapped to J60. An area of weather with 50kft tops is located in southwest ZOB on ZID border. Light precipitation is located in northeast ZOB. There is no real impact on traffic at this time, with the exception of J64/J60. RAPT shows all routes green.		RP		
ZOB-1-1-	2	1435	Two cells are moving through ZOB from west to east. One is to the north on the border between ZOB, ZNY, and ZBW and has 30+kft tops. The second cell is in the south-eastern part of ZOB airspace along J64. It has some level 5 precipitation and 50+ kft tops. RAPT shows all routes green.				
ZOB-1-1-	3	1510	The Host computer is back on line and ZOB is handling traffic.				
ZOB-1-1-	4	1518	The PHL/CLE TMC used CIWS Growth and Decay, and Forecast to assess the impact of weather on J152 arrivals to PHL. RAPT shows that J95 is yellow (ENR) for 1531Z departures.				CIWS Growth and Decay Trends, Forecast
ZOB-1-1-	5	1524	The PHL TMC uses CIWS to estimate when the cell in southern ZOB will impact the route.				CIWS Forecast
ZOB-1-1-	6	1550	J64 is currently closed for weather. The STMC and CP TMC looked at RAPT and CIWS and decided to "just leave it closed." RAPT shows J64 red and J95 yellow.	SA-1, SA-3			CIWS

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ZOB-1-1-	7	1550	The CP TMC uses RAPT to determine if J64 can open. The J64 closure is extended to 1830Z. RAPT is showing some red for J64.				
ZOB-1-1-	8	1553	The PHL TMC used CIWS for J152 situational awareness. He was timing the impact of storms on the route.				CIWS
ZOB-1-1-	9	1559	The PHL TMC used CIWS Growth and Decay Trends, and Forecast for situational awareness.				CIWS Growth and Decay Trends, Forecast
ZOB-1-1-	10	1715	J64 is still closed. RAPT shows J64 yellow. The weather is moving very slowly.		RP		
ZOB-1-1-	11	1806	NY arrivals on J146 are deviating too far north. J146 is closed. The airborne inventory is being rerouted into ZBW. The Area Supervisor came to TMU to notify the unit, so this decision was made in the Area.		TMD		
ZOB-1-1-	12	1812	The CP TMC is discussing closing J80 and reopening J64 with the STMC. The TMC coordinated then with ZNY. The STMC used CIWS for situational awareness during the discussion. J64 is opened. J80 is left open to NY but ZOB expects ZNY to close J80.		TMD		CIWS
ZOB-1-1-	13	1825	Traffic is still moving on J80. RAPT shows J80 red ENR.		RP		
ZOB-1-1-	14	1833	ZDC is closing J220. The CP TMC uses CIWS to find a new route: J518/Elwood City/BUR/SYR low altitude, 20 MIT.				CIWS
ZOB-1-1-	15	1854	CIWS is used during a hand-off briefing at the Coordinator TMC position and for situational awareness.				CIWS
ZOB-1-1-	16	1856	J80, J518, and J211 are all closed by Area 6. ZDC called to ask that PIT flights be allowed to continue. RAPT shows J80 yellow ENR @ 5 – 15 minutes, red after. PIT flights are allowed.		RP		
ZOB-1-1-	17	1904	J80 is closed by Area 6.				
ZOB-1-1-	18	1941	The CP TMC uses CIWS to estimate that NY will close Keeting in 25 minutes. He alerted the CLE TMC.				CIWS
ZOB-1-1-	19	1943	NY closes Keeting. ZOB is holding for ZNY/PHL. (No notice?) The CLE TMC is asking if this is due to volume or weather. He can't get an answer out of NY or ATCSCC.		TMD-S, EO		



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ZOB-1-1-	20	1947	The route to PHL is closed. PHL is ground stopped until 2045.			
ZOB-1-1-	21	1956	PHL traffic is moved in response to holding.			
ZOB-1-1-	22	2000	ZBW needs help getting traffic west. They ask ZOB for a route out. ZOB offers J36. The STMC and CP TMC use WARP. RAPT shows J36 green and all other routes through ZOB yellow, but it is not used to help make the decision	*(RO,SA-2, I/IC)	RP	WARP
ZOB-1-1-	23	2019	CIWS is used for situational awareness and coordinating arrivals with CLE TMC.			CIWS
ZOB-1-1-	24	2024	The ZOB users feel that RAPT is a tool for N90. They feel it will not be useful because it will show all red even if weather is not in ZOB. They can get their information from CIWS and WARP.		TMD, EO, RP	
ZOB-1-1-	25	2025	The CP TMC is trying to open J80; coordinating with ZID. J80 is closed in ZID. RAPT shows J80 all red (due to weather in ZNY).		RP	
ZOB-1-1-	26	2058	J95 traffic is stopped by ZNY. RBV departures are stopped. EWR, LGA, TEB west gate departures are stopped.			
ZOB-1-1-	27	2228	Weather in ZOB is dissipating.			
ZOB-1-1-	28	2245	RAPT is clearing. There has been no RAPT usage and unit is getting quiet.			
ZOB-1-1-	29	2316	RAPT is no longer displayed at the STMC desk.		RP	
ZOB-1-1-	30	~1915	The observers visit the Areas to determine if RAPT is being used. No Supervisors had RAPT displayed. Those interviewed indicated that they did not use it. One Supervisor said they "use CIWS all the time."		RP	
ZOB-1-1-	31	Interview	The CP TMC reports that he used RAPT "this morning" to determine which routes were closed and to help close J64 by moving traffic to J60.	SA-1, SA-3		
ZBW-1-1-	1	Note	ZBW is not able to use J6 due to storms in ZID or J29 due to storms in ZFW and ZKC. Also, J29 is used as part of the GREKI off-load. NavCanada denied a request for a CAN-7 routing (due to staffing issues). BOS traffic can't get out.		TMD	

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ZBW-1-1-	2	Note	At 1700Z, the TMC consulted CIWS and compares it to the CCFP 2-hour forecast (valid 17Z). He noted that the CCFP did not forecast any of the storms that had developed in western ZBW. He said CIWS was important because it helps them prepare for the loss of J29.		TMD		
ZBW-1-1-	3	1700	Storms in northeast ZOB are concerning the ZBW TMC. Their ability to use GREKI as an off-load may be blocked. The RAPT window is closed. CIWS is displayed.				CIWS
ZBW-1-1-	4	1800	The TMC stated that they would not use the GREKI off-load unless ZNY requested it. Currently, J80 and J64 are closed. RAPT shows GREKI green, J80 and J64 mostly red, and J60 yellow. The TMC used RAPT to see that N90 was going to start losing routes. They are thinking of offering GREKI.	SA-2, RRP	TMD, RP		WARP, CIWS
ZBW-1-1-	5	1830	Storms are approaching GREKI. RAPT shows the route green. ATC is trying to move a few flights out of N90 on the GREKI off-load.		RP		
ZBW-1-1-	6	1850	The GREKI off-load is closed due to volume. Four or 5 aircraft tried to use the route but deviated into the JFK holding pattern. RAPT shows GREKI still green. Weather is not close enough to the route to generate RAPT impacts, but the combination of volume and weather is causing problems.		TMD, RP, PB	Yes	CIWS
ZBW-1-1-	7	1900	The STMC came on duty and obscured the RAPT window in preference to CIWS.				
ZBW-1-1-	8	1910	Area A has RAPT displayed on the situation display.	SA-1			
ZBW-1-1-	9	1920	ZID opens J29 for ZBW traffic to MEM. J60, J64, J80, and J95 are closed due to weather in ZNY airspace.				
ZBW-1-1-	10	2000	BCT TRACON expresses concerns about gridlock at BOS and the rate is lowered to 32. BOS tower did not share this concern.		TMD		

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ZBW-1-1-	11	2010	The observer spoke with the STMC, explaining that he was at the Center to assess RAPT benefits. The STMC displayed RAPT and stated that he has looked at it from time to time during past weather events. However, the STMC soon closed the RAPT window to better view the CIWS Forecast window.				CIWS
ZBW-1-1-	12	2022	GREKI is opened for N90 traffic to BOS. There is too much weather en route to allow offloads from N90 westbound. The STMC state that even if they were able to take N90 offloads, they would still have to work out spacing to merge the N90 traffic into the westbound flow out of BCT. This would result in a GDP at BOS.		TMD		
ZBW-1-1-	13	2040	The STMC reports a problem with the NEXRAD weather representation on the DSR. Aircraft are deviating around an area of weather that has no corresponding signal on the DSR. After checking CIWS satellite, it became apparent that pilots are avoiding thunderstorm anvils.		PB, TMD		DSRD, CIWS
ZBW-1-1-	14	2053	GREKI is also used for traffic from N90 to BOS. That route is open, though RAPT shows GREKI red.		RP, EO		CIWS
ZBW-1-1-	15	2055	GREKI traffic to BOS is deviating to the east as storms track east. GREKI has been blocked for offloads since 20Z.		TMD		
ZBW-1-1-	16	2055	The observer convinces the STMC to leave the RAPT window on the SP situation display. He is looking at N90 departure routes but has not used RAPT for decision making.	SA-1			
ZBW-1-1-	17	Note	The STMC requested BOS departure routes on RAPT.		UR		
ZBW-1-1-	18	2122	ZID is open for ZNY and ZOB but ZBW traffic is not allowed to depart.		TMD		

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ZBW-1-1-	19	Note	The STMC is using CIWS Forecast to determine when westbound departures might start and when BOS will be impacted by a line of storms. He used RAPT as a forecast window until storms moved east of the RAPT domain, then he used storm motion vectors. The CWSU also provides considerable support to the STMC and "outer" TMC. They did not make a decision based on CIWS without consulting the CWSU.	SA-1			CIWS Forecast, Storm Motion  CWSU
ZBW-1-1-	20	2158	CIWS predicted that the storms in eastern MA would track southeast into the BOS TRACON. However, storms were moving due east and continued to slide north of the TRACON along the MA/NH border. The observer believes that this incorrect forecast prevented the STMC from proactively opening routes later when the storms started to decay.		TMD		CIWS
ZBW-1-1-	21	2303	The observer pointed out to the STMC a large area of decay in storms north and northwest of BOS. At 2340, the CWSU came to the unit to inform them that the weather was decaying. CIWS provided about 35 minutes of lead time, but the STMC waited to hear from the CWSU before changing plans.				CIWS
ZBW-1-1-	22	2310	The GREKI offload from JFK is blocked and RAPT shows it red. The LGA portion of the route is yellow. Thus, the departure times are confusing.		RP, EO		
ZBW-1-1-	23	0000	RAPT shows all NYC routes green and traffic is flowing on J60, J64, and J80. RAPT shows J60 and J64 green in 10 minutes. The STMC noted that the routes were green after hearing that the routes were open from N90.	SA-1, SA-3	RP		
ZBW-1-1-	24	0000	The STMC consulted RAPT to check the status of N90 departures. He was told they were on normal routes. He confirmed that RAPT supported this.				
ZBW-1-1-	25	0015	GREKI is open to BOS with 20 MIT, but GREKI was never opened for N90 offloads after the one attempt at 1830.				

**RAPT Benefits Assessment  
Blitz #2 Observations Summary  
Day 1 – July 11, 2007  
Participating Facilities: LGA, EWR, N90, ZNY, ZDC, ZOB, Jet Blue**

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LGA-2-1-	1	1440	Weather is already impacting routes. LGA is landing 22 and departing 13. Convection and rain in west-central PA, western NY is moving east. RAPT is not running at this time.				
LGA-2-1-	2	1452	The observer started RAPT, which shows J36 COATE red and yellow, J60 ELIOT yellow and green.				
LGA-2-1-	3	1454	An ELIOT restriction of 7 MINIT is already in place. This is reasonable given the line of weather in western PA (ZOB). RAPT shows J60 ELIOT yellow.		RP		
LGA-2-1-	4	1543	The LGA Supervisor asks the observer when LGA and its routes will be directly affected since the timeline is showing en route impacts only. RAPT shows all routes alerting with tops ENR so it is not an LGA problem. The observer showed the RAPT forecast to the Supervisor and they determine that impact will occur in about 45 minutes. COATE J36 should have problems when convection first hits the border of ZNY airspace.		RP, TMD	yes	
LGA-2-1-	5	1620	The observer opened the CIWS web site for the Supervisor and set up routes and fix overlays. Weather is still enroute.				
LGA-2-1-	6	1640	The Supervisor indicated surprise that there aren't more stops in affect now.				
LGA-2-1-	7	1645	ATL is ground stopped. LGA is holding within 2 mile final. Aircraft are not to cross the runway.		TMD		
LGA-2-1-	8	1700	A very long squall line extends from Ottawa through PA and OH and southward. All LGA routes are impacted ENR.				

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LGA-2-1-	9	1704	Low-topped convection is southwest. A call was placed to LGA that J75 needs to be rerouted. The Supervisor checked route status on RAPT. He doesn't believe the reroute is needed because RAPT shows the route green. The observer did not help at this time but subsequently conducted a conversation with the Supervisor and Cab Coordinator discussing conditions under which RAPT may perform poorly (air mass versus line storms).		TMD- LOU, RP, EO		
LGA-2-1-	10	1719	J80 ELIOT is yellow for 1730 departures and this impact is not ENR.				
LGA-2-1-	11	1745	SWAP started at 1745Z. The ATL ground stop is ended. The observer demonstrated to the Supervisor CIWS with lightning, growth and decay, and forecast. The Supervisor liked what he saw.				CIWS, TSD
LGA-2-1-	12	1751	ELIOT and PARKE are combined two as one with 8 MINIT. RAPT shows ELIOT yellow ENR and PARKE green. The Supervisor checked RAPT for status and agreed with the restriction.	SA-3	RP, EO	yes	TSD
LGA-2-1-	13	1852	At a shift change, the incoming TMC checked weather on the TSD and route status on RAPT. He then gave a heads up to other controllers that WHITE may be impacted and that stops are likely. RAPT shows no problems for the southern routes at this time.	SA-1	RP, TMD		
LGA-2-1-	14	1852	An aircraft had to execute a go-around due to a runway issue. The TMC consulted RAPT after stopping departures for the go-around. RAPT shows WHITE (J79 and J209) green. The TMC called out "heads up" on WHITE.)	*(SA-2)	RP, TMD	no	TSD
LGA-2-1-	15	1938	Queues are building on the ramps and taxiways.		TMD		
LGA-2-1-	16	1940	West gates are released seven as one.		TMD		
LGA-2-1-	17	2009	J209 WHITE is stopped but RAPT shows the route green. The TMC noticed the discrepancy and disagreed with the call based on the TSD. The observer checked with another observer at ZNY who explained that the problem was probably due to thunderstorm overhang. The LGA observer passed this information to the Supervisor, who was unable to get an explanation from N90 or ZNY.		RP, TMD, EO, TMD-S		TSD
LGA-2-1-	18	2029	LGA is stopped north and south. There is potential for gridlock if arrivals are not stopped or reduced significantly.				

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LGA-2-1-	19	2031	An Air Traffic user is viewing ITWS TCWF to determine when the large cluster of thunderstorms will impact LGA.				ITWS, TSD
LGA-2-1-	20	2035	Air Traffic is trying very hard to get aircraft out west with all of the west restrictions in place.				
LGA-2-1-	21	2040	A ground controller questioned why one aircraft was sequenced the way he was. LGA AT is trying to make the take off queue sequence more efficient given the current restrictions. The controller did not get a satisfactory answer from N90/ZNY.		TMD, TMD-LOU		
LGA-2-1-	22	2044	The N90 TMC called to inquire how west departures are running. RAPT shows all routes red. Aircraft are running 10 MINIT with large deviations. Some are going between the strongest returns, some north and some south at pilot discretion.		RP, PB, TMD, EO		
LGA-2-1-	23	2050	A thunderstorm is 18 nmi west moving to LGA. ITWS shows wind shear in this cell. There are about 21 aircraft waiting to depart.		TMD		ITWS
LGA-2-1-	24	2055	Twenty five more aircraft are inbound to LGA. Departures are backing up.		TMD		
LGA-2-1-	25	2100	All west departures are stopped.				
LGA-2-1-	26	2100	There is rain 5 nmi west and a thunderstorm 8 nmi west. The takeoff sequence is confused. The TMC made some arrangement to get some aircraft out to the north via GREKI.		TMD		
LGA-2-1-	27	2105	The TMC told the Class B Airspace position TMC to advise EWR about a 30 kn microburst overhead (based on the LGA ITWS). EWR was already aware of the problem.		TMD		ITWS
LGA-2-1-	28	2115	They are looking for a GREKI pathfinder, but those are buried in the takeoff sequence. N90 or ZNY refuses to clear them because they are not ready to depart now.		TMD		
LGA-2-1-	29	2122	Some aircraft are departing east to go north to GREKI and Minneapolis. Some aircraft are departing south to WAVEY.		TMD		
LGA-2-1-	30	2125	ITWS shows a gust front 13 minutes out with winds of 310/30. This will require turning the airport around, at least for departures with wet runways. Departures are currently using runway 13.		TMD		

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LGA-2-1-	31	2133	ITWS, TSD, CIWS, and RAPT are in use.	SA-1			ITWS, TSD, CIWS
	32	2137	The GAYEL pathfinder did not work so no more are released.		TMD, PB		
LGA-2-1-	33	2139	The TMC states that winds were changing to northwest. LGA just went IFR.		TMD		
LGA-2-1-	34	2144	WAVEY is released but lightning is visible to the west over Manhattan.				
LGA-2-1-	35	2150	Airport winds: 240 at 7 kn. The ITWS shows a gust front on the approach to runway 13. ITWS gust front winds estimate: 310 at 20 kn. EWR winds: 010 at 5 kn.				ITWS
LGA-2-1-	36	2153	Twenty five aircraft are holding on the tarmac. Winds are 270 at 8 kn. The gust front is near midfield. A United flight is on approach. Air Traffic is expecting a go-around.		TMD		
LGA-2-1-	37	2156	The United flight landed. Winds are 310 at 7 kn. An aircraft departed on runway 13 with a 10-kn tail wind. It used nearly the entire runway.		TMD		
LGA-2-1-	38	2157	Winds are 330 at 13 kn with gusts to 18. The airport is still set up for departures on runway 13, but no aircraft are departing.		TMD		
LGA-2-1-	39	2210	A line of thunderstorms stretches from southwest MA to NY City to southern NJ. A 51 kft-top thunderstorm is over LGA. Visibility is 2 miles.				
LGA-2-1-	40	2216	According to RAPT, the first departure routes to open will be LANNA J48 for 2230 departures. Air Traffic is still waiting for the thunderstorm to move away. Thirty one planes are grounded by the weather at LGA.		RP, TMD		
LGA-2-1-	41	2225	All operations at LGA are stopped. RAPT shows COATE and ELIOT will open first for 2225 departures.		RP, TMD		
LGA-2-1-	42	2230	The observer comments that he must be careful not to bias the observations, but the thunderstorm is about to move east of LGA and departures can resume within about 10 minutes.		*(RO,EP)		
LGA-2-1-	43	2234	The observer hears on the hotline that the north gates are open. RAPT shows J36 COATE yellow.		RP, TMD		
LGA-2-1-	44	2236	Winds are calm at LGA and the line of weather is east of the airport.				



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LGA-2-1-	45	2243	A United flight filed over ELIOT is cleared to taxi to runway 13. RAPT shows ELIOT yellow. This flight departed 2245.		TMD, RP		
LGA-2-1-	46	2320	LGA departure delays are +120 minutes.				
LGA-2-1-	47	2322	The Local Controller (not TMC or Sup) looked at RAPT and suggested that a pathfinder be sent to check on GREKI routes. RAPT had GREKI/CAM yellow then red at 2345Z. The suggestion was to others in the tower cab but was not passed on. He is using all the weather tools available.	SA-1, SA-2	RP, TMD		
LGA-2-1-	48	2336	Aircraft are deviating. Departures are stopped.		PB		
LGA-2-1-	49	0000	Nearly all aircraft are cleared from the ramps and taxiways. Though traffic is nearly normal again, there is still some problem north and east.		TMD		
LGA-2-1-	50	0005	A question was raised about sending a pathfinder (out of LGA) for GREKI. The TMC looked at RAPT to determine if a comment he heard on the hotline was correct. RAPT indicated red at 0010Z but there was talk of getting him off the ground in 6 minutes. The outcome was not noted, but the TMC is getting in the habit of using RAPT when questionable restrictions are announced over the hotline.	SA-1, SA-2, SA-3			
LGA-2-1-	51	Note	RAPT was prominently displayed on the Supervisor and TMC monitors most of the day.				
EWR-2-1-	1	1600	COATE is restricted 8 MINIT. RAPT shows GAYEL, COATE J36, and ELIOT (J60) red; ELIOT J64, J80 yellow ; echo tops 32 - 36 kft. The TMC stated that RAPT was not projecting accurate information because COATE is still being used while RAPT shows COATE "shutdown." Also, RAPT shows tops on COATE J36-at 35 kft while the TSD shows tops of 45 kft.		RP, EO	Yes	TSD
EWR-2-1-	2	1645	COATE is restricted 8 MINIT. RAPT shows the route red.		EO		
EWR-2-1-	3	1725	The RAPT window is obscured.				
EWR-2-1-	4	1738	PIT is stopped until 1845 due to weather. The RAPT window is obscured.				

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EWR-2-1-	5	1741	The SWAP will begin at 1745. The RAPT window is obscured.				
EWR-2-1-	6	1744	DCA is stopped. RAPT shows J64 ELIOT red.				
EWR-2-1-	7	1755	ELIOT/PARKE are 8 MINIT as one. Scatter convective cells are 50 to 60 nmi west of EWR. Another line of storms is 150 to 200 nmi west of EWR. RAPT shows J95 GAYEL, J36 COATE, and J64 Eliot red.		RP		
EWR-2-1-	8	1807	LANNA, BIGGY are 7 MINIT as one. The RAPT window is obscured.		EO		
EWR-2-1-	9	1813	RAPT shows LANNA/BIGGY green. The TMC called to question the 7 MINIT restriction when RAPT shows the route green. He was told that traffic was single stream due to weather over LANNA and BIGGY.	SA-3, I/IC	RP		
EWR-2-1-	10	1815	LANNA/BIGGY is single stream due to weather. RAPT shows the route yellow for departures in the next five minutes, green after that.				
EWR-2-1-	11	1826	COATE J36 is closed. RAPT shows COATE red with tops 33 kft. The Supervisor asked the observer the meaning of ENR on RAPT. The observer explained the tag.		RP	Yes	
EWR-2-1-	12	1829	LANNA/BIGGY is stopped but RAPT shows the routes green.		RP		
EWR-2-1-	13	1840	RAPT is showing J80 red; everything else is either yellow or green. At the next update, RAPT showed red on several routes with only J79 WHITE green. The observer noted a drastic change in appearance of RAPT with the update.		RP, EO		
EWR-2-1-	14	1854	All west gates are stopped due to volume. RAPT shows ELIOT routes red, GAYEL and BIGGY yellow.		RP		
EWR-2-1-	15	1859	EWR is ground stopped. The RAPT window is obscured.		EO		
EWR-2-1-	16	1907	The TMC is negotiating with ZNY to open the west departure gates. ZNY tells him to expect two to three minutes.				
EWR-2-1-	17	1909	West gates are released.				
EWR-2-1-	18	1910	West gates are released. ELIOT/PARKE and BIGGY are 8 MINIT. The RAPT window is obscured.				
EWR-2-1-	19	1914	North and south departures are stopped due to loss of radar. PIT is stopped. The RAPT window is obscured.				

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EWR-2-1-	20	1917	LANNA/BIGGY is still shown as stopped by ZNY, even though they were released at 1909. This highlights a problem with communication and coordination between facilities.				
EWR-2-1-	21	1921	South departures are released without restriction. North departures are released 8 MINIT as one. The RAPT window is obscured.				
EWR-2-1-	22	1925	West gates are stopped due to volume. North and south gates were released previously. The RAPT window is obscured.				
EWR-2-1-	23	1927	All departures are stopped. The RAPT window is obscured.				
EWR-2-1-	24	1931	South and east departures are released. EWR will send traffic over WHITE. The RAPT window is obscured.				
EWR-2-1-	25	1932	ZNY attempts to release north gates with 10 MINIT, but N90 denies the request.				
EWR-2-1-	26	1938	West gates are closed; all others are open. Fast moving convective weather is 50 nmi west of EWR. RAPT shows LANNA and WHITE routes green, all other routes are yellow or red.		RP		TSD, ITWS
EWR-2-1-	27	1948	West gates are released 8 MINIT as one. RAPT shows only LANNA green on the west routes. J36 COATE has tops of 50 kft.		RP		
EWR-2-1-	28	2000	North gates are stopped. RAPT shows GAYEL J95 yellow, going red for 2015Z departures with tops 40 to 41 kft. The observer noted that RAPT appeared to be "right on."		RP		
EWR-2-1-	29	2007	The observer notes that all routes being released at this time are red on RAPT.				
EWR-2-1-	30	2008	COATE, WHITE, and north departures are stopped. RAPT shows WHITE red with 47 kft tops and COATE red with tops 40+ kft.		RP		
EWR-2-1-	31	2011	PIT is stopped. North and LANNA departures are stopped.				
EWR-2-1-	32	2018	An Air Traffic user noted that RAPT shows WHITE open for 2045Z departures when it was yellow for 2040Z departures with tops 40 kft. He questioned the sudden change. The observer noted the storm moving quickly into the EWR area.		RP, TMD	Yes	TSD, ITWS
EWR-2-1-	33	2048	South departures are released. RAPT shows WHITE, BIGGY, and LANNA green.		RP		

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EWR-2-1-	34	2048	Aircraft are departing on a heading of 280 to avoid the cell that is nearly overhead. Weather southwest of EWR will soon impact J79. RAPT shows the route green at this time.				
EWR-2-1-	35	2058	EWR arrivals and departures are stopped due to a thunderstorm on the airport. Lightning and windshear/microburst activity are indicated on the ITWS.				ITWS
EWR-2-1-	36	2103	Storms are directly over EWR. EWR is stopped. RAPT shows all routes red; except WHITE routes which are green to yellow. The observer took the opportunity to show the users the difference between local impact and en route impact.		RP, EO, TMD	yes	ITWS
EWR-2-1-	37	2114	All routes except J79 are red. Weather is at the airport now. RAPT shows WHITE green then yellow.				
EWR-2-1-	38	2118	The Supervisor asked the observer to compare the ETMS and RAPT forecast products.			yes	ITWS
EWR-2-1-	39	2131	RAPT shows ELIOT, PARKE, LANNA, and BIGGY yellow for 2145 - 2150 departures. The observer noted an apparent inconsistency. WHITE is yellow with tops of 40+ and no ENR tag. All other routes are red with tops 35+.		RP, EO		
EWR-2-1-	40	2140	EWR is stopped. RAPT shows routes opening for 2205 departures. All routes are turning yellow/green except WHITE which is red. GREKI/CAM is still red (north and south routes). The observer pointed this out to the TMC.		RP	yes	
EWR-2-1-	41	2153	RAPT shows that the west routes will clear within 15 minutes. Controllers are advising pilots to expect releases soon.	*(SA-2)			
EWR-2-1-	42	2205	All west and COATE routes are open. The TMC noted "Just like you said RAPT was telling us."		RP		
EWR-2-1-	43	2205	West routes are closed, confirming a RAPT forecast.				
EWR-2-1-	44	2232	EWR requests to release two aircraft over WHITE. RAPT shows WHITE routes red. The TMC consults the TSD and coordinates 3 WHITE departures and advises the aircraft to stay west of the airway to avoid the weather.		RP, EO, TMD		TSD

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EWR-2-1-	45	2245	Delays at EWR have reached two hours due to the aircraft in the queue filed for WHITE. GAYEL traffic is released. RAPT supports the release as it shows GAYEL yellow for 2240 departures and green for 2245 departures.		RP, TMD		
EWR-2-1-	46	2247	Traffic is refusing GAYEL. WHITE departures are 15 MINIT.	*(RO)	PB		
EWR-2-1-	47	2300	Five aircraft are sent over WHITE, flying west of the weather. RAPT shows WHITE red with tops of 48 kft.		RP, EO		
EWR-2-1-	48	2302	WHITE is stopped after five departures.				
EWR-2-1-	49	2307	EWR is preparing to send a flight over MERIT. RAPT shows the north routes red.		EO		
EWR-2-1-	50	2312	MERIT is released.				
EWR-2-1-	51	2351	GREKI, GAYEL, and south departures are stopped. EWR gets one GREKI flight released.				
EWR-2-1-	52	2354	EWR sends one flight over GREKI at 2355Z. RAPT shows GREKI red.				
EWR-2-1-	1	0001	East departures are stopped.				
EWR-2-1-	2	0017	GAYEL and south departures are stopped. West gates are 6 MINIT due to volume.				
EWR-2-1-	3	0022	GREKI is released with 10 MINIT. At 0025, RAPT shows J79 red and J209 yellow.				
EWR-2-1-	4	0023	WHITE is released. RAPT shows J79 red, J209 yellow then green.				
EWR-2-1-	5	0036	GAYEL is open. All routes have been green on RAPT for some time now.				
N90-2-1-	1	Note	The observer arrived around 1800Z. Most route stops prior to this were due to volume. N90 requested J70 for departures but the request was denied by ZNY. Some convective activity developed just south of EWR around 1730 and quickly dissipated between 21 and 23Z, hardly impacting the TRACON. N90 used RAPT to monitor route blockage but no decision was made because it was up to ZNY.		TMD, TMD-LOU		

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N90-2-1-	2	1840	RAPT shows COATE red for 1840 departures. The TMC says they don't use RAPT to make a decision because COATE is closed due to volume.		RP, EO, TMD		TSD
N90-2-1-	3	1853	West departures are stopped. WHITE is 7 MINIT. RAPT shows J64 blocked but most routes available.		RP, EO, TMD		
N90-2-1-	4	1900	The Watch Desk TMC indicated that they were going to get shut down soon because the second line "looked strong." The observer showed him the CIWS forecast showing dissipation of the second line but intensification of the line in western NJ. The observer indicated that the two lines were merging. A TMC states "We are going to get shut down soon." RAPT shows ELIOT blocked, RBV open. EWR west departures are released.	*(SA-2)	TMD, RP	Yes	CIWS, TSD
N90-2-1-	5	1915	All J75 traffic is stopped due to equipment malfunction at N90.				
N90-2-1-	6	1921	RBV/WHITE south departures released.				
N90-2-1-	7	1930	Weather is now inside the TRACON boundary. EWR north gates are stopped. There are numerous departure restrictions until the line passes.		TMD		
N90-2-1-	8	2000	All north gates are stopped. The users consult the TSD and CIWS forecast for situational awareness. It appears that the gates will be stopped for about 45 minutes. RAPT shows J60 and J80 all red.				TSD, CIWS
N90-2-1-	9	2009	WHITE is stopped due to deviations and weather. RAPT shows most routes partially to fully blocked.		PB		
N90-2-1-	10	2025	EWR is shut due to weather. RAPT shows partial blockage on most routes.				
N90-2-1-	11	2055	RBV is stopped. RAPT shows most routes blocked.				
N90-2-1-	12	2058	A GAYEL pathfinder is requested. RAPT shows most routes blocked with 42 to 48 kft tops. The Departure TMC looked at RAPT and mentioned that it was "all going red," but no decisions were made. He consulted ITWS and CIWS for the forecast.	SA-2			ITWS, CIWS
N90-2-1-	13	2137	The west line of weather is merging with the east line.				
N90-2-1-	14	2145	RAPT shows the west gates opening for EWR for 2205 departures.		RP		

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N90-2-1-	15	2155	While opening the west gates for EWR, the TMC consulted RAPT for situational awareness, but the decision (no back-go-back gates) came after consulting the TSD. The observer demonstrated some of the RAPT features.	SA-1		Yes	TSD
N90-2-1-	16	2253	A line of thunderstorms stretches from VT to eastern NJ. Only JFK: RBV J64 shows blockage with tops 36 kft on RAPT. The observer displayed different RAPT routes at the watch desk.		RP	Yes	TSD
N90-2-1-	17	2300	GREKI and WHITE departures are stopped but west gates are open. RAPT shows GREKI and WHITE blocked. The RBV pathfinder was successful.				
N90-2-1-	18	2334	GREKI pathfinders are requested from EWR.				
N90-2-1-	19	2340	West gates for EWR are stopped due to volume. East gate are open.				
N90-2-1-	20	0004	The observer demonstrated to a TMC that RAPT shows GREKI blocked for LGA but with low echo tops. At this time, the TMC is considering requesting a pathfinder out of LGA for GREKI, using the TSD.	*(DP, RO)			TSD
N90-2-1-	21	0050	Most of the convection is over western MA. GREKI and WHITE are open. RAPT shows WHITE blocked ENR.				
ZNY-2-1-	1	1640	A strong squall line is present in eastern ZOB, BUF to west of PIT. Tops are 30 kft to 42 kft with embedded level 5 and electrically active east of the main line in ZOB. Isolated cells are developing in southern ZNY (level 5 with 28 kft tops). All routes are currently open, though J36 is restricted with MIT in ZOB. RAPT shows J95 red ENR, J36 red to yellow, J60 yellow, and J64 green. RAPT was opened by the observer on the STMC display.		RP		
ZNY-2-1-	2	1645	Small level 5, 25 to 28 kft cells are developing between J6 and J48 in southern ZNY. Expecting impacts and deviations on the route, a proactive reroute using J75 is requested by the Area A Supervisor expecting impacts on PHL departures. RAPT shows J48 green. The STMC consulted CIWS to assess the current impact. Echo tops are relatively low, so they will "wait and see."		TMD, RP		CIWS VIL, Echo Tops

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ZNY-2-1-	3	1650	The line of weather in ZOB is building onto J80. There is no impact on air traffic yet. RAPT shows J80 yellow ENR. During a hand-off briefing, the incoming STMC looked at RAPT, noticed that J95 was red, and asked the outgoing STMC if J95 was running. There are currently no restrictions on J95.	SA-2	RP, TMD-S		
ZNY-2-1-	4	1650	A squall line extends from western PA along the OH border north above the Lakes, south through Kentucky. A less intense front (mostly level 1/2) leads the squall line. RAPT shows J90 GAYEL red ENR, J36 COATE yellow ENR, J80 ELIOT yellow ENR, J60 ELIOT green/yellow ENR.		RP		
ZNY-2-1-	5	1700	PHL J48 departures are rerouted to J75, as implemented by Area A. RAPT shows J48 clear and the route is still running.		TMD, RP		
ZNY-2-1-	6	1700	Level 5 weather with tops to 43 kft extends from J60 to J80 in ZOB. RAPT shows J64 and J80 mostly red due to blockage ENR and tops up to 35 kft.		RP		
ZNY-2-1-	7	1705	A cluster of weather is located along A-761 off the NC coast. The STMC consults CIWS to determine whether A-761 can be opened for NY departures. If A-761 is used, traffic will not be able to deviate east because there is not radar coverage there. CIWS storm motion shows storms with significant growth and high tops over the route. CIWS forecast shows the route impacted for at least 2 hours. The STMC decides that traffic cannot use A-761 in the present situation.		TMD		CIWS VIL, Storm Motion, Echo Tops, Growth and Decay Trends, Forecast.
ZNY-2-1-	8	1720	The line of weather on J95 in ZOB displays level 5 and tops to 42 kft. RAPT shows J95 red 34 ENR. The STMC consults RAPT and asks why J95 is still open. He noted that the tops (according to RAPT) on the route are relatively low.	SA-2,	EO		
ZNY-2-1-	9	1726	EWR traffic from ZOB is stopping because ZOB has no where to hold. PENNS is closed. RAPT shows J64 ELIOT and J80 ELIOT red, J60 yellow.		TMD		
ZNY-2-1-	10	1735	Weather is worsening along J95. Traffic is deviating a little, but no real issues so far. RAPT shows J95 red. ELIOT is closed and PARKE is next. PARKE is now 15 MIT as one. ZNY SWAP starts at 1745.		PB, RP		CIWS



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ZNY-2-1-	11	1737	Weather near ELIOT in ZNY is level 5 with tops of 35 kft. Area B requests that ELIOT departures be moved to PARKE as one beginning 1745Z when the SWAP begins. RAPT shows ELIOT yellow/red/yellow.		TMD, EO, RP		
ZNY-2-1-	12	1740	Area D is closing J60, J64, and J73. RAPT shows J64 ELIOT red ENR, J60 green, J80 ELIOT yellow ENR.		TMD, RP		
ZNY-2-1-	13	1743	The SPT is ongoing. The STMC needs to talk to ZOB about J80 reroutes but the phone is tied up with the telecon and ZOB is not on the hotline.		TMD, RP, EO		
ZNY-2-1-	14	1752	ZOB has restricted J80 30 MIT per strat. A strong line of weather is impacting the route, but the route is still open. RAPT shows J80 yellow/red/yellow enroute.		TMD, RP		
ZNY-2-1-		1754	RBV restriction is 20 MIT. RAPT shows route J80 red.				
ZNY-2-1-	15	1755	ZOB is requesting a J80 restriction of 30 MIT per strat due to weather enroute. RAPT shows J80 yellow/red/yellow.				
ZNY-2-1-	16	1759	J80 is closed by ZOB. RAPT shows J80 yellow with tops 33 kft enroute.		RP		
ZNY-2-1-	17	1800	A growing cell over Stillwater is causing JFK arrivals to deviate. COATE is closed to accommodate arrivals. COATE and GAYEL are as one. RAPT shows COATE/J36 and J95 red enroute.		PB, RP, EO, TMD		DSR
ZNY-2-1-	18	1801	J80 is closed. RAPT shows J80 yellow ENR.				
ZNY-2-1-	19	1805	A cell is growing rapidly toward JFK along J70 over Stillwater. ZNY is stopping COATE. A controller called the Area Supervisor to identify the weather area.				DSR
ZNY-2-1-	20	1805	Strong storms are building in a broken line east of BWI in ZDC. These storms are impacting BWI arrivals from and through ZNY. They are trying to work out a reroute, but it is difficult because they do not want to interfere with a string of IAD international arrivals. RAPT has no information on this arrival route, but J48 and J75 are green.		TMD, RP		TSD

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ZNY-2-1-	21	1808	Weather is everywhere. The Area A Supervisor uses CIWS for situational awareness. He is concerned about three lines coming in for the night.		TMD		CIWS VIL, Forecast
ZNY-2-1-	22	1816	BWI is stopped by ZNY until 1900Z.				
ZNY-2-1-	23	1817	The Area A Supervisor tells the STMC that traffic on J48 and J75 are deviating and criss-crossing on the routes. He tells the Area B Sector 42 controller not to allow side-by-sides at the same altitude. Both routes are still open. RAPT shows J48 and J75 green, then green/yellow with the next update in ZNY.		PB, TMD, RP		
ZNY-2-1-	24	1817	Strong weather is located in southern ZNY. The Area A Supervisor stops PHL arrivals over BUNTS because of extreme deviations. SPUDS is needed.		PB, TMD		
ZNY-2-1-	25	1818	Sector 42 will no longer accept side-by-side traffic because J75 and J48 traffic are deviating into each other.		PB, TMD		
ZNY-2-1-	26	1820	The two STMCs review what is open and closed to ensure that they are both on the same page.		TMD-S		
ZNY-2-1-	27	1828	Area A is closing J48/J75 due to the strong cluster of weather in southern ZNY. The Area Supervisor used CIWS for situational awareness. Departures are deviating. J230 is closed as well. All RBV traffic is stopped due to weather. RAPT shows J48 clear and J75 green.		PB, RP, EO		DSR for deviations, PIREPs, CIWS in Area A
ZNY-2-1-	28	1830	J6, J60, J64, and J95 are open. RAPT shows J95 red to yellow ENR, J60 red to yellow ENR, J64 yellow ENR, J6 yellow to green.				
ZNY-2-1-	29	1835	A solid squall line stretching from ART to PIT contains strong cells in central PA. The strongest convection is in a cluster in northwest <del>NYNJ</del> south to southern MD. RAPT shows J60 red, J36/95 yellow with J36 changing to red with the next update, J64 yellow ENR, J80 yellow ENR going red with the next update, and J48/75 green. WHITE is open.		RP		

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ZNY-2-1-	30	1848	A line of weather is building west of New Jersey, running from northern New Jersey to southwest of Delaware. RAPT shows J36 ELIOT yellow then red ENR, J60/64 ELIOT red/yellow/red, and J80 ELIOT with tops 35 kft ENR.		RP		
ZNY-2-1-	31	1857	The line of weather continues to impact J80 in ZOB. ZOB extends the 30 MIT per strat restriction until 2100Z. RAPT shows J80 red ENR, then yellow in ZNY starting with the 1910 departures.		RP		
ZNY-2-1-	32	1902	The STMC opens all airport routes in RAPT for an overview of the current route conditions. He highlighted J80 and J64 in the CIWS window to cross-reference against RAPT.	SA-1	EO		
ZNY-2-1-	33	1902	A small line of weather is west of New Jersey. The front is from Watertown, southwest of BGM through southwestern corner of PA and west. RAPT shows J60/64 red, ELIOT red. The STMC used RAPT for situational awareness, rotating through the departure routes for all four airports.		RP		
ZNY-2-1-	34	1908	The STMC provided a route status briefing at the stand-up briefing. J95, J6, WHITE, and WAVEY are open, J60/J64 is as one with restrictions. WHITE traffic is starting to deviate. RAPT shows J60 red ENR changing to yellow with the next update, J64 red, J6 green, J48 clear/green, J75 yellow, and J80 yellow ENR.		RP		
ZNY-2-1-	35	1915	N90 is stopped "south" due to a lost radar.				
ZNY-2-1-	36	1915	The STMC is working out a plan to restart RBV/J230 or another RBV route. An area of level 5 is near RBV, but there is no lightning in it. They are opening RBV J6/J48 with MIT; no RBV J75. PARKE/ELIOT (J6/J80) is as one. RAPT shows RBV (JFK) J6/J48 green to yellow. The observer opened RBV departures in RAPT for the STMC. The STMC notes that the routes are primarily yellow. He noted this before making the decision to open RBV.	*(RO)	RP	yes	
ZNY-2-1-	37	1915	The Area C Supervisor stopped the north gates due to weather. GAYEL was running at the time. RAPT shows GAYEL-J95 yellow to red.		RP, TMD		

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ZNY-2-1-	38	1925	Traffic is still running with restrictions. North gates are open with 10 MIT as one. RAPT shows J95 yellow and J36 yellow/red. The STMC consults RAPT for situational awareness and the status of J95.	SA-2, SA-3, I/IC	RP, EO, TMD		CIWS
ZNY-2-1-	39	1932	North gates are now 10 MINIT as one.				
ZNY-2-1-	40	1935	LANNA/J48 is clear according to RAPT and has been for some time. There have been no attempts to try opening LANNA.	*(RO)	RP, TMD		
ZNY-2-1-	41	1940	RAPT/CIWS training was provided to the TMC working the arrival position. The TMC says he uses RAPT at the position, extrapolating blockage status at the departure route nearest the arrival route. The TMC studied RAPT then closed it to view CIWS.		EO		CIWS
ZNY-2-1-	42	1941	ATCSCC is attempting to find a pathfinder for A761, per Area E Supervisor. The weather on the DSR was used to determine that A761 was opening.		TMD		DSR
ZNY-2-1-	43	1959	A pathfinder for A761 could not be found.				
ZNY-2-1-	44	2001	ATCSCC is concerned that EWR will shut off ZOB.				
ZNY-2-1-	45	2004	J95 traffic is deviating into ZBW.		PB		
ZNY-2-1-	46	2005	Area B reports that WHITE may close soon.		TMD		
ZNY-2-1-	47	2006	The Area closed J95. RAPT shows GAYEL yellow but traffic is deviating into ZBW.		RP, EO, TMD		
ZNY-2-1-	48	2008	ZDC closes WHITE.				
ZNY-2-1-	49	2010	J95 is closed by the Area due to a level 6, high-topped cluster of weather. Departures are deviating into ZBW. RAPT shows J95 yellow.				
ZNY-2-1-	50	2010	EWR is ground stopped until 2100Z. ZNY weather is causing EWR arrivals to deviate significantly.		PB		
ZNY-2-1-	51	2011	EWR is ground stopped. LGA is still running.		TMD		

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ZNY-2-1-	52	2015	The STMC says the DD TMC is not asking for the GREKI route because of weather in ZBW. RAPT shows GREKI red ENR. The STMC consults RAPT and identifies that GREKI is blocked. He agrees with the TMC assessment.	SA-3, I/IC	RP, TMD		
ZNY-2-1-	53	2020	ZDC stopped WHITE. LGA is unhappy with this. The ZDC STMC explains that the route is closed due to volume (PHL arrivals). RAPT shows WHITE/J209 clear.		RP, EO, TMD-LOU		
ZNY-2-1-	54	2025	LANNA/J48 is still clear, according to RAPT. LANNA and BIGGY are running with 10 MIT as one.		RP		
ZNY-2-1-	55	2026	Area A is holding for PHL.				
ZNY-2-1-	56	2040	There is a large cluster of strong cells just west of EWR. Traffic Management is concerned about the impact on JFK arrivals in that region. The Area Supervisor confirms that one flight made it around the weather but by the time the next arrival reaches ZNY and the region of interest, weather will be over the arrival fix. Traffic Management is planning to shut off the fix now in anticipation of the impact. The Area C Supervisor consulted CIWS to decide to stop the fix before the expected impact and subsequent deviations. CWF forecasts the fix impact for 15 to 30 minutes later.		TMD		CIWS Forecast
ZNY-2-1-	57	2045	Heavy storms are impacting N90. The ZNY STMCs say things are quiet because traffic cannot get to the N90 fixes. The STMC confirms that only WAVEY and east gates are open. RAPT shows that only GREKI/north gates are red; all else are yellow (west) to green (south). This is an example of how RAPT may be too aggressive when significant storms are within N90, where we assume "large routes" to accommodate what we assume are more fluid routing capabilities.		TMD, EO RP		
ZNY-2-1-	58	2052	A761 is open with no deviations				
ZNY-2-1-	59	2053	Area B reports that they are losing RBV. Traffic is stopped.		TMD		

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ZNY-2-1-	60	2055	Weather is in N90 impacting the north gates. N90 asked ZNY for GAYEL pathfinders. RAPT shows J95 mostly red with tops 40 to 42 kft. The STMC consults RAPT for the GAYEL status. He notes that the route is red, but agrees to try a pathfinder anyway. He says it will take at least 20 minutes to launch the pathfinder anyway. JFK sends a pathfinder at ~2127Z.	SA-1	RP, TMD		
ZNY-2-1-	61	2057	The TRACON initiated a pathfinder for JFK-via J95 GAYEL.				
ZNY-2-1-	62	2105	All west departures for EWR, LGA, and TEB are stopped. Weather with very high tops is bearing down on the NY metro area at 2105Z. RAPT shows all west routes red.		RP		
ZNY-2-1-	63	2115	ZBW will not take GREKI traffic from ZNY.				
ZNY-2-1-	64	2127	The pathfinder was released at 2127Z, deviated well north of GAYEL, returned to J95 and got out. However, weather is now on the terminal and the route must remain closed.		RP, TMD, PB		
ZNY-2-1-	65	2130	The STMC states that the pathfinder didn't work because he came out well north of GAYEL, and the weather changed in the 35 minutes it to get the pathfinder launched.		TMD		
ZNY-2-1-	66	2130	The observer provided a quick RAPT tutorial for the STMC. RAPT shows the routes are red, but the west and south gates are yellow beginning with the 2150Z departures. The observer pointed out to the STMC that RAPT suggested improving conditions for the west and south gates.	*(RO)		Yes	
ZNY-2-1-	67	2131	The PHL ground stop is cancelled.				
ZNY-2-1-	68	2132	Departure routes south and west are starting to turn yellow on RAPT beginning with 2150 departures.				
ZNY-2-1-	69	2141	J75 and J6 are green for 2155 departures.	*(RO)			
ZNY-2-1-	70	2147	The observer visited Area C and provided a brief CIWS/RAPT tutorial.				CIWS

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ZNY-2-1-	71	2150	Storms are crossing the terminal. The STMC gives N90 a heads-up that he is preparing PIT with west gates and COATE routes once the weather clears. N90 told ZNY that COATE/west would be the first to clear. RAPT shows the west and south gates for EWR green starting with 2205Z departures. The observer, upon request, explains using RAPT that EWR COATE/west gate will be clear for departures starting around 22Z.	*(RO)	TMD, RP	Yes	
ZNY-2-1-	72	2154	They are trying to start EWR west departures, but ITWS shows that lightning is within 20 miles of EWR.		TMD-LOU		ITWS
ZNY-2-1-	73	2159	The STMC carried on a discussion with someone on the phone in reference to EWR departures. He said that both ZNY and N90 were using "the tool" and determined that J36 was the only way out.				
ZNY-2-1-	74	2204	Weather is impacting the airports. EWR is about to clear. The STMC consults RAPT and notes that EWR routes are clearing.	SA-2			
ZNY-2-1-	75	2204	The STMC notes that weather is clearing out of EWR. He is anticipating that the west routes are opening via J36. He reviewed RAPT, which showed all gates mostly green with some yellow.		RP		
ZNY-2-1-	76	2206	The first COATE flight departs EWR. This agrees with previous RAPT guidance. RAPT now shows J36 yellow then green. There are two more requests by users for PHL departures to be depicted in RAPT.		RP, UR		
ZNY-2-1-	77	2220	Weather is clearing the terminals. The next concern is international flights departing JFK and EWR. ZNY calls N90 and asks for their best guess as to when the MERIT fix will clear. N90 estimates 30 minutes. The STMC is looking for MERIT in RAPT, but RAPT does not cover MERIT, as explained by the observer. After N90's estimate of 30 minutes, the STMC checks RAPT and comments that the N90 estimate is good based on what GREKI is showing. The STMC also consults CIWS for MERIT impacts.	SA-1, SA-3, I/IC	EO, TMD, UR		CIWS VIL, Echo Tops, Lightning, Storm Motion

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ZNY-2-1-	78	2227	ZDC stops WAVEY departures from ZNY to accommodate international arrivals. According to RAPT, WAVEY (EWR/J79) has been red ENR for some time.		TMD		
ZNY-2-1-	79	2229	ZDC asks WHITE departures to stay west of the weather. The STMC at N90 agrees. WHITE pathfinders are sent. RAPT shows WHITE red ENR. This is a good example of extra info on east side vs west side blockage; info on n-s routes may enhance blockage info and make RAPT more usable.		EO, RP, TMD		
ZNY-2-1-	80	2229	Traffic on J75 is deviating into J48. Area B requests the routes be combined as one. The observer notes that PHL needs to be added to RAPT which may be helpful to ZDC as well.		PB, EO		
ZNY-2-1-	81	2230	A small cell is impacting J75 in extreme southern ZNY. The Area B Supervisor reports that aircraft on J75 are deviating onto J48. He asks for "two as one" for 10 to 20 minutes until the cell moves. RAPT shows J48 and J75 yellow for 10 minutes.		RP		
ZNY-2-1-	82	2233	N90 calls ZNY to ask about north gate availability, including COATE. The STMC reminds N90 that COATE has been open. (In fact, COATE was the first to open at 2205 once weather cleared EWR.) This is an example of the how it is difficult for multiple facilities to keep track of what is open and what is closed.		TMD-S		
ZNY-2-1-	83	2310	The line in NYC/NJ is slowly weakening as it exits metro NY. West and south gates are open. WHITE is open. One north gate is open and another is poised to open soon. JFK is currently trying a RBV pathfinder. RAPT shows RBV red to green by 2320 departures. According to the 2315 SPT, EWR and JFK ground delay programs are in until 03Z. AFPs are void 03Z, but ATCSCC is looking to end the AFPs, but ZDC does not support this. AFPs are canceled.	*(RO, DP)	TMD, RP		
ZNY-2-1-	84	2320	There is a cluster of level 3-5 convection with tops to 40 kft. GREKI is closed. RAPT shows GREKI yellow		RP, EO		



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ZNY-2-1-	85	2330	The observer checked the status of CIWS/RAPT in the Areas. A: CIWS 4-panel. B: Maximized ETF window. C: CIWS with RAPT. D: WARP. E and F: Default CIWS. Arrival position: maximized RAPT. Departure position: nominal CIWS with RAPT. The current concern is the large holding stack of international traffic over deep ocean. There are six or seven flights for JFK that are on the wrong side of the weather. The STMC comments that three planes are shutting down east coast operations.		TMD		
ZNY-2-1-	86	2340	International arrivals are holding offshore on the wrong side of the weather. The STMC quickly consults CIWS for situational awareness, looking for options for the arrivals.				CIWS
ZNY-2-1-	87	0015	There is a cluster of weather east of NYC, primarily in ZBW. RAPT shows WHITE red ENR, WAVEY red to yellow ENR, and GREKI red. The STMC consults RAPT/CIWS and notes that few routes are red. Precipitation is weakening according to CIWS and the STMC is confident that improvement will continue.	SA-1, SA-2	RP, TMD		CIWS Precip, Echo Tops
ZNY-2-1-	88	1650 Note	The weather on J36 and J95 is comparable. RAPT shows more blockage on J95, but J36 has restrictions. Does J95 have more along-route room for deviations than J36, allowing it to run with little or no restriction? Does J36, which usually handles ORD traffic, have more volume, requiring early MIT restrictions to handle deviations on a higher volume route?		RP, TMD, EO		
ZNY-2-1-	89	Note	The Area B Supervisor said he "uses CIWS all the time" and is getting used to using it to make decisions.				
ZNY-2-1-	90	Note	Does the J95 route width (which is wider) straddle the ZNY/ZBW boundary? If so, it shouldn't because of the sector-to-sector, Center-to-Center coordination complexity.		RP, EO		

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ZNY-2-1-	91	Note	The STMC, discussing the pathfinder process, says it is a flawed system. For example, if 12 planes are already lined up, they typically have been cleared for takeoff and N90 does not want to offer them up as pathfinders because reroute will have to be entered in the system. N90 is afraid that this will hold up the queue. In this scenario, the first possible pathfinder would be the 13th plane and it would have to wait for the cleared flights. The STMC believes that for pathfinders, a departure stop should be declared and the flights at the front of the line should be rerouted as pathfinders.		TMD, TMD-LOU		
ZDC-2-1-	1	1830	Weather is beginning to impact BIGGY/J75 and LANNA/J48. RAPT shows these routes yellow, but the routes are closed. The STMC stated that the routes are closed because the weather is close to the airport and possibly due to volume concerns.		TMD, RP		
ZDC-2-1-	2	1832	J48 and BIGGY/J75 are closed by ZNY but RAPT shows the BIGGY/J75 route green, changing to yellow for 1840 departures.		RP		
ZDC-2-1-	3	1847	RAPT shows J75 green now, but echo tops of 33 kft to 38 kft are just right of the departure route. CIWS indicates that the storm motion is to the northeast and parallel to J75.		RP		CIWS
ZDC-2-1-	4	1954	All WHITE traffic is stopped due to volume. At 1950Z, RAPT showed WHITE/J79 departures red for 1945 - 2010Z.		TMD, EO		
ZDC-2-1-	5	2004	All WAVEY traffic is stopped due to volume.		TMD, EO		
ZDC-2-1-	6	2010	Ground stops are issued for JFK, PHL, and Woodstown. The observer overhears the STMC say "We will have not routes available in 15 to 20 minutes."				
ZDC-2-1-	7	2015	J75 is open in ZDC.		TMD		
ZDC-2-1-	8	2030	WHITE is still shut off due to volume, primarily in Area 5. RAPT shows the route green.		TMD		
ZDC-2-1-	9	2050	WHITE is still stopped due to volume. Traffic is being off-loaded to WAVEY.		TMD		

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ZDC-2-1-	10	2102	The STMC notes that it should be "More important to ATCSCC-that WHITE be opened as the real route impacts/issues are way further south on the route.		TMD-LOU		
ZDC-2-1-	11	2105	J75 has been open for about 45 minutes but RAPT shows the route red. The STMC states that RAPT is useful for J48/Montabello departures south. The tool is good for planning.	SA-2	RP		
ZDC-2-1-	12	2115	The STMC says that they could open WHITE for about 8 minutes. RAPT at 2117Z shows WHITE mostly green and yellow.		TMD, TMD-LOU		
ZDC-2-1-	13	2129	The WAVEY restriction is increased to 20 MIT with exclusions.				
ZDC-2-1-	14	2231	WAVEY is stopped. RAPT shows WAVEY/J174 (JFK) yellow changing to red starting with 2235Z departures.		RP		
ZDC-2-1-	15	2232	ZNY and EWR say can do departures staying on the west side of WHITE. RAPT shows WAVEY/J174 red and yellow. A pathfinder is requested.		TMD, EO		
ZDC-2-1-	16	2247	WHITE was closed for weather about 2.5 hours ago and remained closed due to volume.				
ZDC-2-1-	17	2307	WAVEY is closed due to volume. RAPT shows all WHITE and WAVEY routes red.		RP		
ZDC-2-1-	18	2232	TEB is ground stopped. RAPT shows WAVEY/J174 red (46 to 48 kft) then yellow for 2225 departures and beyond.		RP		
ZDC-2-1-	19	2245	EWR ground stop is canceled. WHITE and WAVEY operations are being squeezed by weather on the west and military operations on the east. RAPT shows WHITE and WAVEY red.		RP, TMD		
ZDC-2-1-	20	0015	A pathfinder for WAVEY is released off JFK. RAPT shows WAVEY/J174 red until 0020 departures for JFK; green for 0035 departures.		RP		
ZDC-2-1-	21	0018	JFK is releasing one WAVEY pathfinder.				
ZDC-2-1-	22	0020	WHITE departure routes are opened with 20 MIT.				
ZDC-2-1-	23	0022	ZDC reopened WHITE departures with 20 MIT.				
ZDC-2-1-	24	0025	ZDC requests that WAVEY departures be swapped over WHITE due to weather in southern-ZDC.		TMD		

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ZDC-2-1-	25	0030	RAPT shows White/J209 (for EWR) green for 0035 and later departures.		RP		
ZDC-2-1-	26	Interview	The STMC requested that the J75 and J48 routes on RAPT be extended into Greensborough an additional few miles. He indicated that RAPT is most useful when weather is building, to determine what the weather might do. He said RAPT is a "great tool. I use it all the time."		EO, UR		
ZOB-2-1-	1	1515	Scattered weather stretches northeast to southwest across ZOB. Reroutes are in place and CAN routes will be used. There is now a 20 MIT restriction on J36 for NY departures due to weather. It is unlikely that NY can deliver traffic at 20 MIT; it is too hard for them to monitor. RAPT is not displayed on any of the TMU machines at this time. The TMC requested that Airways Facilities staff work to display CIWS on the overhead screen.		TMD		
ZOB-2-1-	2	1527	The Coordinator Position (CP) TMC is on the phone looking for a SWAP route out of DTW. He looked at CIWS throughout the conversation. Traffic going east is deviating north when it reaches the weather. The TMC asked DTW to look for an alternate route.				CIWS
ZOB-2-1-	3	1527	The Area 3 Supervisor visited the TMU to request a restriction on J29 due to weather west of SYR. She asked that the TMU coordinate with ZBW and ZID. She indicated the CIWS echo tops (39kft) and told the TMC she did not want to close J29 entirely. She suggested a restriction of 20 MIT regardless of altitude for traffic over SYR. ZBW asked that ZOB deal with the aircraft tactically rather than implement the restriction.		TMD		CIWS

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ZOB-2-1-	4	1545	The DTW TMC discussed DTW routes using CIWS G&D and echo tops. He discussed gap availability and spacing. There are three eastbound routes from DTW. One east-then-north, one east, and one east-then-south. The southbound traffic has a gap in the line they can use and could get by with a smaller restriction than the "20 MIT regardless of altitude" currently in effect. However, any gap created in the southbound traffic would be used up by the eastbound traffic.		TMD		CIWS Growth and Decay, Echo Tops
ZOB-2-1-	5	1545	The CIWS display at the CP TMC position is being rebooted for overhead projection. The Tech suggested taking CIWS down completely to work on the projector. The Coordinator TMC strongly disagrees and is emphatic in getting CIWS back.				CIWS
ZOB-2-1-	6	1606	RAPT is displayed at the STMC position. There is a line of storms covering the eastern third of ZOB. Level 4/5 is located in the northern half of the line, with echo tops reaching 48 kft. RAPT shows J95 and J36 red and J60 and J64 yellow. All other routes are green.		RP		
ZOB-2-1-	7	1629	The STMC and CP TMC discuss restrictions on J29. They are going to let the eastbound restriction of 20 MIT regardless of altitude expire at 1740Z and extend the restriction on westbound traffic (SYR 20 MIT RALT). They used CIWS to discuss this plan.		TMD		CIWS
ZOB-2-1-	8	1631	J80 is restricted 10 MIT per strat due to deviations, but it is still open. The TMC used the CIWS forecast to determine if the hole in the weather on J80 will stay open. The observer displayed RAPT at the CP TMC desk during the shift change.		TMD, PB		CIWS Forecast
ZOB-2-1-	9	1700	CAN-E and CAN-3-E are running. AFPs are in effect.				
ZOB-2-1-	10	1715 SPT	The CAN1E playbook will be used for PAC west, CAN3E for ORD TRACON departures with 50 MIT. The ZOB STMC expects it to get really slow in ZOB due to the playbook routes and AFP.		TMD		
ZOB-2-1-	11	1727	A thunderstorm is impacting PIT. A first tier ground stop is called. The CP TMC used CIWS to find a hole to the north and will send six to ten eastbound aircraft through it to approach PIT from the west.		TMD		CIWS
ZOB-2-1-	12	1730	Ground stop PIT void 1830Z.				
ZOB-2-1-	13	1753	J80 is restricted 30 MIT. RAPT shows J80 yellow.		RP		

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ZOB-2-1-	14	1822	The CP TMC coordinated with STMC using WARP.				WARP
ZOB-2-1-	15	1826	J36 is closed due to weather (overheard on hotline). They are not accepting traffic on COATE. It sounded like this has been the case for some time but no one knew.		TMD-S		
ZOB-2-1-	16	1827	The CP TMC uses CIWS to reroute NY and DC departures south around a storm.	*(RRP)	TMD		CIWS
ZOB-2-1-	17	1832	STMC (CIC) reports that the AFP rate is coming down due to concerns about volume and weather.		TMD		
ZOB-2-1-	18	1857	The J80 restriction (30 MIT per strat) is extended until 1930Z.				
ZOB-2-1-	19	1900	A long line of storms with scattered cells is covering the eastern quarter of ZOB. There are some level 4/5 cells with tops at 40+ kft. One cell with an echo top of 50 kft is approaching metro NY. ZOB is holding for all NY airports except LGA. The EWR ground stop is extended to 2030. The 30 MIT restriction on J80 is extended to 1930. RAPT shows J95, J64, and J60 red, J36 and J80 yellow.		TMD, RP		
ZOB-2-1-	20	1910	The CLE/PHL TMC used CIWS to determine it might be possible to open a route over Phillipsburg. He requested a pathfinder from DTW to open Phillipsburg and asked it to "go now." He also called Toronto to request a pathfinder to PHL over Phillipsburg. Phillipsburg opened with 40 MIT.		TMD		
ZOB-2-1-	21	1915	The STMC asked the CP TMC if J60/J64 was still open, in preparation for the SPT. Those routes are open.		TMD-S		
ZOB-2-1-	22	1920	The CP TMC discussed the weather situation with DTW using CIWS. DTW is looking for a route to NY.				CIWS
ZOB-2-1-	23	1938	J95 and J36 are as one; J60 and J64 are as one. RAPT shows J95 and CAM yellow; J36, J60, J64, and J80 red.		RP, EO		

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ZOB-2-1-	24	2000	RAPT windows are covered at all positions except the STMC. The route impact portion of the RAPT window is visible at the STMC desk. The observer periodically exposed the RAPT windows on various machines in the TMU throughout the day for personal information and to see if the TMCs would use it. They repeatedly fronted the CIWS windows and obscured the RAPT window.				
ZOB-2-1-	25	2020	All routes on RAPT are showing some red. ZOB is still holding traffic for all NY airports except LGA. Some pathfinders are being released to ZBW for EWR and TEB. All traffic to NY is expected to stop within 20 minutes as a level 4 cell passes over.		EO, TMD		
ZOB-2-1-	26	2028	LGA and TEB are ground stopped.				
ZOB-2-1-	27	2040	There is not much activity in the unit at this time. NY airports are ground stopped.				
ZOB-2-1-	28	2100	All RAPT routes turned red as the cell impacted the NY area.		RP		
ZOB-2-1-	29	2111	The unit is quiet due to ground stops. All EWR jet routes on RAPT are red.				
ZOB-2-1-	30	2133	RAPT shows the southern jet routes starting to clear from red to yellow.	*(RO, I/IC)	RP		
ZOB-2-1-	31	2145	RAPT shows routes starting to clear.				
ZOB-2-1-	32	2150	Hotline: The observer overheard a question about which airports and fixes would be open first. EWR west gates and COATE are expected to clear first. Users are beginning to try to open airports.	*(SA-2, EP)	TMD		
ZOB-2-1-	33	2150	There is talk of opening EWR in less than 15 min. All of the weather is out of the ZOB area.		TMD		
ZOB-2-1-	34	2158	EWR ground stop canceled.				
ZOB-2-1-	35	2210	EWR is expected to open in about 20 min.				
ZOB-2-1-	36	2226	The CP TMC zoomed the CIWS window on the NY metro area and highlighted routes. He is trying to determine the order and time of weather clearing the NY airports. He also used CIWS for a hand-off briefing.	*(SA-2, SA-3, EP, I/IC)	TMD		CIWS

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ZOB-2-1-	37	2228	The TMC indicated that he was observing RAPT and attempting to anticipate when flights could begin going to NY, rather than wait for NY to initiate something.	SA-2			
ZOB-2-1-	38	2230	ZOB clear of weather. No CIWS or RAPT use at this time.				
	39						
ZOB-2-1-	40	Interview	A TMC stated, "We don't use RAPT."		EO		
ZOB-2-1-	41	Interview	The STMCs use RAPT when weather starts to impact NY departures. (This is not currently happening.) When suggested as a possible RAPT use during an interview, they agreed that they use RAPT to deny route requests from NY if the blockage is in ZOB airspace.				
ZOB-2-1-	42	Interview	The acting STMC indicated that he has not yet found a good use for RAPT. He looked at J60 and J64. He is trying to determine if NY would use the routes. RAPT shows J95, J60, J64 red; J36, J80, J75 yellow.		EO		
JB-2-1-	1	1530	AFP 5 and 8 are in place to slow traffic to the northeast--Jet Blue uses Flight Explorer for their primary weather information, but also uses weather.com, CIWS, and RAPT.		TMD		
JB-2-1-	2	1615	Weather is starting to build along the cold front. An OAK-JFK flight, tight on fuel before being dispatched, is trying to determine if CAN1E or AFP8 with delay is the better option. It accepted AFP8 with delay. CIWS CWF was used to confirm weather movement.		TMD		CIWS Forecast
JB-2-1-	3	1715 SPT	A large NY metro impact is expected later. A761 is closed due to weather and military operations. Jet Blue requested that Air Traffic hold off on the GDP, push the hold for now then ground stop later.		TMD		Flight Explorer, FSM
JB-2-1-	4	1715 SPT	J80 is impacted by a thunderstorm. ZID reports that aircraft are beginning to deviate. ZID may have to move traffic to J184 and expand MIT. ATCSCC tells ZID to keep traffic moving because it is going to get bad on the east coast later. ATCSCC wants to run as many flights as possible before the impact.		PB		CIWS Echo Tops, VIL, Forecast



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JB-2-1-	5	1830	Weather is beginning to form three lines in NY. The AFP rates were lowered at 1840. RAPT shows all west departures yellow and red.		TMD		CIWS VIL and Forecast, Flight Explorer flights and precipitation
JB-2-1-	6	1915 SPT	Weather with high echo tops (40+ kft) is developing in three lines; one in west NJ, one in NY, and one west of that. ZOB and ZDC are running EWR, JFK, and LGA arrival flows as one to allow for deviations. ZID references CIWS echo tops on the telecon. This is causing problems for Jet Blue; they need to add fuel. RAPT shows west departures yellow or red.		TMD		CIWS Echo Tops, Flight Explorer
JB-2-1-	7	2028	JB1044 bound for JFK is diverting to PIT due to fuel issues. The weather lines continue to grow but there is still no GDP or ground stop for JFK. EWR is ground stopped because of weather enroute and volume. RAPT shows all west departure routes red; only north and south are green. However, the problem with north/south gates now is volume.		TMD		FSM, CIWS VIL and Forecast, Flight Explorer
JB-2-1-	8	2039	Weather is growing and getting closer. JFK is ground stopped. Jet Blue has many aircraft holding for JFK. RAPT shows all west departures red.				CIWS VIL and Forecast, Flight Explorer
JB-2-1-	9	2045	Three lines of weather are approaching JFK. Jet Blue already pre-cancelled 40 flights. They are hoping this and the ground stop help.		TMD		CIWS VIL, Flight Explorer
JB-2-1-	10	2110	The initial squall line is dissipating but the remaining two lines west of NY are growing. Jet Blue is taking a wait-and-see position. They are prepared to cancel more flights. WAVEY is the only fix open but volume from all airports is hurting. LGA always has priority.		TMD		CIWS Forecast, Flight Explorer

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JB-2-1-	11	2115 SPT	The first weather line is arriving and the second could wreck evening operations. Jet Blue has no international flights, but Jet Blue is concerned because international flights mess up taxiways. ZNY reports that VSCAPE and WAVEY are the only options for departing NY traffic. RAPT shows WAVEY green. A761 is opened. ZNY references CIWS frequently during the telecon regarding international departures from DC, NY, and PHL.		TMD		CIWS, Flight Explorer
JB-2-1-	12	2130	Weather continues to grow in the immediate vicinity of JFK. The JFK ground stop is extended. However, increasing departure queue is becoming a concern.				
JB-2-1-	13	2200	A weather briefing for Jet Blue senior management is conducted. All in the operations area are pleased and surprised that traffic has been moving so well. RAPT shows all departure routes red, except WAVEY.			YES	CIWS, CCFP, FSM, Flight Explorer
JB-2-1-	14	2240	There is weather all around JFK. The GDP has produced an average 169 minute delay. Jet Blue is rerunning all flights to check crew time-outs. RAPT shows all west routes red.		TMD		CIWS VIL, Flight Explorer
JB-2-1-	15	2328	The weather is dissipating and moving east. The third line is decaying rapidly and is still west of JFK. West departures are beginning, Departure delays: JFK: +150, EWR: +135, LGA: +120. RAPT shows routes opening.				CIWS, Flight Explorer
JB-2-1-	16	0027	Weather northeast of NY is causing problems for international departures. There are big ramp/taxiway problems at JFK. JFK is having trouble moving the international flights out of the way so other traffic can depart. RAPT shows routes nearly all green, but there is no coverage east where the weather is located.		TMD, EO		CIWS, Flight Explorer
JB-2-1-	17	0115	Weather is between NY and BOS. BOS still can't get flights to NY. RAPT shows all routes green, but does not cover the airspace currently impacted by weather.		EO		CIWS

**RAPT Benefits Assessment  
BLITZ #3 Observations Summary  
Day 1 - July 18, 2007**

**Participating Facilities: LGA, JFK, EWR, N90, ZNY, ZDC, ZOB, ZBW, Continental Airlines**

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LGA-3-1-	1	Note	<p>The observer met with the AT Manager, who was reviewing the day using CIWS and RAPT archives. From 11Z to 15Z, strong level 5/6 weather moved across LGA from southwest to northeast. These storms produced very heavy rain and frequent lightning at the airport. Departures routes were mostly open, but there was no way to get to them. Delays reached almost three hours by 1600Z.</p> <p>The AT Manager requested that a page or product be created for RAPT that shows a graphical depiction of which cells were forecast correctly and which cells were missed. The accuracy scores do not tell exactly where the forecast has verified. A case in point was earlier in the day when storms redeveloped over the same area southwest of the LGA. Although the scores were high, the forecast did not show LGA getting pummeled by weather for nearly four straight hours. The observer explained the intent of the ITWS and CIWS verification contours, CCFP verification, the Growth and Decay feature on CIWS, and the new REPEAT page. The AT Manager specifically wants higher resolution images and the ability to zoom in and to right-click the mouse to save multiple archive increments into a single smooth .avi movie – similar to the movie maker in the CIWS playback page.</p> <p>ITWS was used extensively during the morning to monitor the passing of successive thunderstorms over the airport. The AT Manager used ITWS storm cell information to determine that one particular storm over Long Island indicated severe storm circulation. The same super cell eventually produced a tornado near Islip.</p>		UR, RP, EO		

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LGA-3-1-	2	1647	LGA is landing runway 22 and departing runway 13. RAPT is running at the TMC/Supervisor position. ITWS shows the most significant weather over central and eastern Long Island, CT, and eastern MA. Isolated cells are developing to the west.			
LGA-3-1-	3	1728	BIGGY is stopped due to weather.			
LGA-3-1-	4	1738	BIGGY is released.		TMD-LOU	
LGA-3-1-	5	1750	A new version of RAPT was installed. RAPT shows all LGA routes green. A line of weather is build rapidly across southeast PA/NJ.			
LGA-3-1-	6	1751	ZMA, ZJX, ZTL, and ZDC are ground stopped for LGA. RAPT shows WHITE J70/J209 yellow for 1805 departures. The TMC requested that the RAPT client be moved from the Supervisor position to the ITWS.		UR, RP	
LGA-3-1-	7	1840	WHITE is stopped. RAPT shows WHITE yellow for 1845 departures and red for departures at and after 1850, 42-47 kft echo tops.		RP	
LGA-3-1-	8	1850	PHL is ground stopped until 20Z.			
LGA-3-1-	9	1855	Thunderstorms are blocking the south/southwest routes. RAPT shows J79 and J209 red for the next 30 minutes. WHITE is already stopped (1840Z).		RP	
LGA-3-1-	10	1906	The TMC questioned the status of J75 which RAPT shows green for the next 30 minutes. The strongest cells are east of the route but convection is on or near the route just to the west. The observer did not participate in the discussion.		RP	TSD
LGA-3-1-	11	1908	North gates are restricted 5 MINIT until 22Z.			
LGA-3-1-	12	1914	West gates are stopped. A RBV pathfinder was successful.			
LGA-3-1-	13	2000	The Tower Supervisor noted that WHITE routes are yellow but the fix itself is closed for weather. RAPT suggests that it is possible to deviate around the weather and remain on the route. No other weather decision aid was used. The Supervisor indicated to the observer that RAPT shows J209 and J79 are closed and implies that they should not be. He did not ask N90 or ZNY to reconsider opening WHITE.	SA-2, SA-3, *(RO)		
LGA-3-1-	14	2000	WAVEY is stopped. Both primary south fixes are now closed.			

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LGA-3-1-	15	2007	Arrivals are routed over WHITE and WAVEY. These fixes are closed to departures so arrivals can land.		TMD, EO		
LGA-3-1-	16	2024	North gate traffic is stopped because there were too many planes airborne. There is one cell over NEON (just northeast of COATE) and the TMC did not understand the restriction given that other north gates are good.		TMD		
LGA-3-1-	17	2045	North departures are release with 5 MINIT as one until 2330Z.				
LGA-3-1-	18	2051	PHL is released on EDCTs. RAPT shows all LGA routes green.				
LGA-3-1-	19	2100	Weather in south/central NJ is moving very slowly. WHITE and WAVEY are stopped for weather, even though RAPT shows the routes through the gates green. WAVEY opens 11 minutes later with 20 MINIT. Level 6 weather is nearby, so RAPT may be overly optimistic.	*(RO, I/IC)	RP,EO		
LGA-3-1-	20	2111	WAVE opens with 20 MINI, no exclusions. RAPT shows WAVEY green.				
LGA-3-1-	21	2125	The TMC viewed RAPT and commented to the Supervisor that he was surprised that ZNY was sending planes through WAVEY instead of WHITE, which was green. Weather is headed toward WAVEY.	SA-2, SA-3			
LGA-3-1-	22	2326	The TMC receives approval to launch an unofficial pathfinder via GAYEL J95. The decision is based primarily on the TSD, with a just a glance at RAPT. The TMC knew there was no weather to deal with and he just wanted to get the Spirit Airlines plane off the airport. He said a SWAP was not warranted at this time and that it is not always clear why N90 implements stops. RAPT was showing all green.	SA-1	TMD-S		
JFK-3-1-	1	1715	JFK departures are backlogged. There are approximately 30 aircraft waiting to depart. RAPT is not being used. RAPT shows all routes green.		TMD, EO		ETMS, TSD
JFK-3-1-	2	1831	RBV departures are stopped. RAPT shows RBV yellow.		RP		
JFK-3-1-	3	1910	RBV is still stopped. GAYEL and WAVEY are open. Many aircraft are shut down on taxiways and runway 13L. RAPT shows RBV mostly red.		TMD, RP		TSD

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JFK-3-1-	4	1945	The evening TMC advises the observer that RAPT must be moved back to the TMC computer. It is currently on the Supervisor's computer.		UR, EO		
JFK-3-1-	5	1946	RBV traffic is released. Some aircraft are beginning to depart on runway 31L. RAPT shows all routes green.		RP		
JFK-3-1-	6	2000	The departure backlog is beginning to improve. RBV is restricted 15 MIT as one. RAPT shows all routes green.		TMD, RP		
JFK-3-1-	7	2043	North departures are released with 15 MIT as one.				
JFK-3-1-	8	2105	Weather impacts on WAVEY appear to be getting worse. RAPT shows WAVEY yellow then red.		RP, TMD-S		
JFK-3-1-	9	2112	WAVEY is released. RAPT shows the route red for 2130 departures.		RP		
JFK-3-1-	10	2145	RBV is stopped. Departure delays are about 30 minutes. The Supervisor is coordinating an increase in the AAR to 44.		TMD		
JFK-3-1-	11	2203	The observer notes that as RAPT updated over the past half hour, it pushed the blockage (red) out in time. WAVEY was never blocked.		EO, RP		
JFK-3-1-	12	2206	One GAYEL flight is airborne. A second is approved. GAYEL is currently closed. RAPT shows the route green.		RP		
JFK-3-1-	13	2224	WAVEY is stopped. RAPT shows the route yellow.		RP		
EWR-3-1-	1	1620	Current restrictions are due to volume. BIGGY, LANNA, WHITE, and ELIOT are 7 to 8 MINIT. RAPT is open in movie mode.				
EWR-3-1-	2	1718	ITWS shows scattered cells around EWR. The current restrictions are due to volume. The RAPT window is obscured.		EO		
EWR-3-1-	3	1728	BIGGY J75 is stopped. There are scattered cells along J75. The RAPT window is obscured.				ITWS, TSD
EWR-3-1-	4	1734	RAPT shows BIGGY J75 green. The TMC says that the TSD is showing that the arrivals are deviating around the weather in this area.		TMD, RP		
EWR-3-1-	5	1738	BIGGY is released. RAPT shows the route still green.				
EWR-3-1-	6	1752	WHITE is stopped. RAPT shows WHITE dark green.		RP		

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EWR-3-1-	7	1816	No fixes are stopped. RAPT shows WHITE red for 1900 departures. The Supervisor consulted RAPT and agreed with the call.	SA-2, SA-3, *(EP)	RP		
EWR-3-1-	8	1844	The Supervisor commented that WHITE departures would not be good for a long time. RAPT shows WHITE red. There is weather along the WHITE routes only.	SA-2			TSD, ITWS
EWR-3-1-	9	1909	The TMC requested that MERIT be added to RAPT.		UR		
EWR-3-1-	10	1914	West gates are stopped. The Supervisor displayed RAPT and consulted the TSD and stated that the problem was not due to weather.	SA-3			TSD
EWR-3-1-	11	1923	The Supervisor notes upcoming north restrictions. RAPT shows COATE J36 yellow. The Supervisor asks N90 if WAVEY is available. It is not.		TMD-S, RP		
EWR-3-1-	12	1930	All EWR departures are stopped.				
EWR-3-1-	13	1941	The Supervisor consults RAPT and noted that COATE is going yellow. The observer did not have the opportunity to show him that the route was going green again as the cell moved towards J95 GAYEL.	SA-2, *(RO)			
EWR-3-1-	14	1945	The Supervisor notes that WHITE is yellow for 2010 departures.	SA-2, EP			
EWR-3-1-	15	1959	The Supervisor called N90 to discuss that RAPT shows WHITE going yellow. N90 indicated that traffic couldn't get there. With the next update, WHITE is red and this is noted by the Supervisor too. WHITE is stopped still.	I/IC, SA-2	RP, EO		
EWR-3-1-	16	2023	North departures are stopped. The RAPT window is obscured. The TMC called for release on BIGGY J75 for EWR. There is level 4 weather south of EWR; 50 nmi out on ITWS. The RAPT window is obscured. The observer ascertained that RAPT shows WHITE routes yellow.		EO		
EWR-3-1-	17	2040	East departures are stopped. RAPT shows WHITE routes turning red.		RP		
EWR-3-1-	18	2045	North departures are released 5 MINIT as one.				
EWR-3-1-	19	2051	WHITE is stopped. BIGGY and LANNA are as one, ELIOT is 7 MINIT. RAPT shows WHITE yellow.		RP, EO		

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EWR-3-1-	20	2109	WHITE, north and east are stopped. RAPT shows WHITE dark green. The TMC, Supervisor, and Controller consult RAPT. EWR calls to request J209 be released. The request is denied.	I/IC, SA-3			
EWR-3-1-	21	2112	There is confusion about which routes are stopped. The RAPT window is obscured.		TMD-S		
EWR-3-1-	22	2119	Only WHITE is stopped. The RAPT window is obscured.				
EWR-3-1-	23	2121	North is stopped. The RAPT window is obscured. The TMC opens the RAPT window. All routes are green.				ITWS
EWR-3-1-	24	2128	WHITE and GAYEL are stopped. RAPT shows GAYEL green then yellow for 2155 departures.		RP		
EWR-3-1-	25	2131	WHITE, GAYEL, and west are stopped. The controllers are confused by this decision and consult RAPT. RAPT shows routes green.	SA-2, SA-3	RP		
EWR-3-1-	26	2140	RAPT shows all route green/yellow except WHITE which is all green. COATE is released 7 MINIT. RAPT shows the west gates turning yellow for 2200 departures.		RP, EO		
EWR-3-1-	27	2148	West is stopped. Weather cell. The Supervisor says less than 5 minutes for west. The Supervisor is trying to get re-routes over WAVEY.WAVEY open. Got one west released.		TMD, TMD-LOU		
EWR-3-1-	28	2158	COATE J36 is stopped. RAPT shows the route yellow.		RP		
EWR-3-1-	29	2202	The Supervisor says they are trying to coordinate with ZNY to open up north departures. RAPT shows the routes green.  All departures are stopped due to arrival volume.		RP, TMD		
EWR-3-1-	30	2208	EWR was able to get one departure out over WHITE. This opened the fix with 5 MINIT.		TMD		
EWR-3-1-	31	2215	WHITE, GAYEL, COATE, DIXIE, and west departures are stopped.		TMD-LOU		
EWR-3-1-	32	2217	WHITE and north are open with 7 MINIT. N90 releases ELIOT and PARKE. LANNA, DIXIE, and BIGGY are stopped. The RAPT window is obscured.				



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EWR-3-1-	33	2223	ZNY says that WHITE is still closed. Three departures got off before the call. ZNY will reroute the three flights. There is confusion and frustration over which routes are open and closed.		TMD-S		
EWR-3-1-	34	2230	There is weather on the GREKI/CAM route. RAPT shows the route yellow/red.		RP		
EWR-3-1-	35	2247	The TMC noted that RAPT shows GREKI/CAM yellow going to red for 2255 departures, yet EWR had no restrictions on the route. TMC noted that RAPT shows weather on Greki/CAM route, but TSD shows <b>no</b> weather on the route.	SA-2, EP	RP		
EWR-3-1-	36	2316	The Supervisor notes that N90 declares they can't get to GAYEL J95 due to weather but RAPT shows no weather on the route. N90 cannot get to GAYEL or COATE. RAPT shows COATE yellow/red.		RP		
EWR-3-1-	37	2346	There is a level 3-4 cell 30 nmi northwest of EWR. RAPT shows GAYEL J95 and COATE J36 green. N90 says they cannot get through on the routes.		TMD, RP		ITWS
N90-3-1-	1	1620	The observer arrives and opens the RAPT window at the watch desk. RAPT shows all routes green.				
N90-3-1-	2	1655	The observer opens RAPT at the TMC desk.				
N90-3-1-	3	1707	A level 5 cell is located near LANNA and BIGGY. RAPT shows the route green even though level 5 is on the route. The cell is small enough to deviate around.		RP		
N90-3-1-	4	1726	BIGGY/LANNA are as one with 10 MIT. RAPT shows the route green.		RP, EO		TSD
N90-3-1-	5	1731	There is a line of weather developing from northern NJ to southern PA. RAPT shows RBV green.				

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N90-3-1-	6	1738	BIGGY is released. RAPT shows RBV J60 yellow.				
N90-3-1-	7	1756	ZNY stops RBV. RAPT shows WHITE yellow but RBV green. The TMC consulted RAPT and disagreed with the ZNY decision. There are cells over RBV. The observer was asked if RAPT was doing a good job. The observer pointed out that RAPT shows RBV clear but there are cells over some routes. RBV was showing green b/c the route was only partially blocked by the cells. Had to describe to the TMC how the color coding of RAPT depicts route blockage.	SA-3, EP	RP, EO, TMD-LOU, PB	Yes	TSD
N90-3-1-	8	1817	A telecon is conducted to discuss arrival rates for a GDP (34-38-40). JFK departures are an issue. RAPT shows RBV going yellow and WHITE clearing.		RP		CIWS
N90-3-1-	9	1830	RBV is closed by ZNY. RAPT shows R BV yellow and WHITE green then red for 1855 departures.		RP		
N90-3-1-	10	1840	The WHITE reroute is stopped. RAPT shows RBV and WHITE going red.		RP		
N90-3-1-	11	1915	A pathfinder for RBV is rerouted to WAVEY by ZNY. RBV open? They are trying to get a plane to the runway. RAPT shows WHITE red.		TMD-S, RP		TSD
N90-3-1-	12	1930	Larger cells now in NJ, White routes still red on RAPT				
N90-3-1-	13	1935	Storms are building near the west departure fixes. RBV is open with 15 MIT as one.				
N90-3-1-	14	1943	West gates are slowed due to volume. Traffic Coordinator uses RAPT to request pathfinders from time to time.				
N90-3-1-	15	2001	WAVEY is stopped. RAPT shows WHITE changing from yellow to red. There is some instability in the impact statements.		EO		TSD
N90-3-1-	16	2003	WAVEY opening? RAPT shows WHITE yellow.		TMD-S, RP		
N90-3-1-	17	2041	N90 wants to open WHITE and is looking for a pathfinder. RAPT shows WHITE yellow. The TMC glances at RAPT but mostly uses the TSD.	SA-1, SA-3	TMD, RP		TSD

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N90-3-1-	18	2048	RAPT shows most routes green but many are stopped. A TMC notes that RAPT shows WHITE yellow but the TSD/FTMS indicates high storms. Maybe they could request a pathfinder for WHITE? The observer notes that RAPT is not performing well.	SA-3	RP, EO	Yes	TSD
N90-3-1-	19	2132	EWR west gates stopped due to weather over LANNA and BIGGY routes.		TMD-S		
N90-3-1-	20	2135	There is confusion about what routes are open and which are closed.		TMD-LOU		
N90-3-1-	21	2145	RBV is stopped. Cells are developing. RAPT shows all RBV routes green.		RP, EO		TSD
N90-3-1-	22	2148	All west departures are stopped. Storms a building over LANNA/BIGGY. WHITE is stopped. RAPT shows all routes green.		RP		
N90-3-1-	23	2154	A pathfinder for WHITE off EWR? RAPT shows the route green.		RP		
N90-3-1-	24	2201	N90 requests more fixes to alleviate the volume on COATE. RAPT shows WAVEY yellow, all others green.		TMD		TSD
N90-3-1-	25	2228	GAYEL is open after a pathfinder successfully uses the route.		TMD		
N90-3-1-	26	2230	LANNA and BIGGY are still closed. ELIOT and PARKE are open. There are two pathfinders for LANNA. RAPT shows the GREKI will be impacted for 2245+ departures.				
ZNY-3-1-	1	1740	Weather is west of the NY metro area. A small line stretched from west of NY through central NJ, west of PHL and into extreme southeast PA. Weather impacted the regions earlier in the morning, resulting in 2 1/2 to 3 hour delays. RAPT is not currently displayed.				
ZNY-3-1-	2	1747	There is concern about NY metro impacts. CIWS is used for precip and forecast information				CIWS VIL, Forecast
ZNY-3-1-	3	1808	A line of weather, oriented east-west, is approaching JFK and southern Long Island. The weather is moving along the ZDC/ZNY border. RAPT is not displayed and the STMC prefers CIWS.				

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ZNY-3-1-	4	1815	Weather is moving toward RBV and JFK. Aircraft are starting to deviate. RAPT shows the route green. The STMC asks why RAPT shows the route open when aircraft are deviating. The observer explained the route blockage algorithm and suggested that pilots may be getting nervous even though the algorithm does not indicate an impact.	SA-3	PB, RP, EO	Yes	CIWS
ZNY-3-1-	5	1821	RAPT shows the routes going yellow.		RP		
ZNY-3-1-	6	1825	Weather is growing rapidly along the ZDC/ZNY border. Areas A, B, and C have the CIWS forecast and echo tops forecast windows displayed. Area D is using WARP.				
ZNY-3-1-	7	1828	Cells with high tops are moving towards RBV, WHITE, and WAVEY. RAPT shows JFK: RBV yellow; RBV, J80, J6, J48, J75 red; WHITE J79/J209 red.		RP		
ZNY-3-1-	8	1840	ZDC stops all WHITE departures at 1840. One minute later, RAPT shows the routes red.		RP		
ZNY-3-1-	9	1843	Area B stops DITCH departures from PHL due to weather. RAPT is not being used in Area B.		TMD		
ZNY-3-1-	10	1846	A shift change brings a new crew to the TMC. The STMC and crew are willing to leave RAPT displayed, but they rely on CIWS. RAPT shows RBV and WHITE red.		RP, TMD		
ZNY-3-1-	11	1854	The observer discussed the southward moving weather with the STMC and noted that WHITE and WAVEY were going red.		RP	Yes	
ZNY-3-1-	12	1857	Area B is using CIWS echo tops and forecast to put sector 55 traffic over LANNA as one. RAPT shows LANNA J48 green.	*(RRP)			CIWS
ZNY-3-1-	13	1859	Area E requests 15 MIT over WAVEY since weather is moving east. RAPT shows the route red.	*(I/IC, EP, RRP)			
ZNY-3-1-	14	1909	WARP is used during the stand-up briefing.				WARP
ZNY-3-1-	15	1912	N90 requests a pathfinder. The STMC reviewed RAPT before calling the Area for approval. RAPT shows RBV yellow to green.	I/IC, EP, DP	RP, TMD		
ZNY-3-1-	16	1915	A RBV pathfinder from JFK is approved through ZNY> RAPT shows WHITE red, RBV green.	RO, *(RO)			

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ZNY-3-1-	17	1916	ZNY is holding for LGA.			
ZNY-3-1-	18	1918	Weather is in N90.			
ZNY-3-1-	19	1927	The STMC uses CIWS to try to mitigate some oceanic problems.			CIWS VIL, Satellite
ZNY-3-1-	20	1935	No RBV pathfinder has been released yet.		TMD	
ZNY-3-1-	21	1959	LANNA and BIGGY are as one with 10 MIT. RAPT shows WHITE J79/J209 yellow.			
ZNY-3-1-	22	2001	WAVEY departures are stopped by ZDC. RAPT shows the route green, but a cell is moving over WHITE toward WAVEY.	*(DOL), I/IC	RP, TMD	
ZNY-3-1-	23	2010	Pathfinders from NY metro airports take too much time. Area Supervisors are using CIWS but they almost never make a decision until pilots start deviating or sector controllers start complaining. CIWS is used for support data or situational awareness after the fact.		TMD	
ZNY-3-1-	24	2038	The Oceanic TMC looks at CIWS to determine where they can put flights from the south.			CIWS VIL
ZNY-3-1-	25	2040	There is a cluster of weather south of N90. Area E requests 25 to 30 MIT to handle arrival traffic coming north and east of the weather. The STMC and Area Supervisor confer using CIWS to determine the potential route impacts.		TMD	CIWS
ZNY-3-1-	26	2040	WHITE, WAVEY, and CAMRN are closed. VACAPES was active earlier and may still be. This may contribute to limited capacity. RAPT shows EWR: WHITE/WAVEY red for 1 segment, then yellow.		RP, EO, TMD	
ZNY-3-1-	27	2043	The STMC on the hotline inquires about restarting north gate departures. There is confusion as to what is open and who stopped them.		TMD-S	
ZNY-3-1-	28	2055	The CWSU provides a weather briefing to the STMC using CIWS to orient and describe the weather.			CIWS

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ZNY-3-1-	29	2105	A cluster of weather in southern NJ is moving east. WAVEY is reopened by ZDC with 20 MIT. RAPT shows WHITE J79 green, J209 clear, JFK: WAVEY J174 clear/green/yellow. The timing of WAVEY reopening matches RAPT guidance. The observer pointed this out to the STMC. The STMC request DITCH departures (PHL) be added to RAPT.	*(RO, I/IC, EP)	RP, UR	Yes	
ZNY-3-1-	30	2109	ZDC opens WAVEY with 20 MIT. RAPT shows the route yellow, going red for 2125 departures.				
ZNY-3-1-	31	2115	Weather is impacting near DITCH. There is concern about when to restart DITCH departures going east then north. The observer added the DITCH fix to the CIWS and showed the STMC how the CIWS forecast shows the weather clearing DITCH in 30 to 45 minutes. In addition, weather further west may not be as serious as it appears because there is no lightning and Growth and Decay Trends shows decay. DITCH opened shortly thereafter.			Yes	CIWS VIL, Forecast, Growth and Decay, Lightning
ZNY-3-1-	32	2120	COATE is stopped by N90. There are scattered level 3-5 cells in northern NJ.				
ZNY-3-1-	33	2122	N90 stops WHITE departures.				
ZNY-3-1-	34	2130	A broken line of level 6 storms is forming in northern NJ within N90. The weather is intensifying. RAPT shows J36 yellow and all other routes green with spotty yellow. This is difficult for RAPT because all weather impacts are in N90.		RP, EO		
ZNY-3-1-	35	2145	N90 stops RBV, excluding J60/J64. J230/J80 is closed for ZDC. RAPT shows RBV J80 clear. Weather is very close to JFK (RBV split). The observer speculates that the stoppage may be due to thunderstorm overhang. The observer comments that RAPT may be too aggressive with weather in this area.		PB, RP, EO		
ZNY-3-1-	36	2148	The west gates are stopped by N90.				
ZNY-3-1-	37	2150	N90 is stopping WAVEY due to weather. N90 did not know that WAVEY was opened at 2108.				

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ZNY-3-1-	38	2153	N90 is unclear if WAVEY is open. The STMC explains on the hotline that WAVEY has been open since 2108Z. This illustrates the communication complexity issues.		TMD-S		
ZNY-3-1-	39	2155	On the hotline, N90 says then can get to WHITE and asks ZNY for a pathfinder. The ZNY STMC looks at the DSR and says it doesn't look good. On the hotline, ZDC states that they are willing to try the route. The STMC calls Area B for permission. At 2203, Area B agrees to accept a pathfinder. RAPT shows WHITE clear.	*(DP, I/IC, EP)	RP, TMD		DSR
ZNY-3-1-	40	2200	N90 stops COATE. RAPT shows COATE J6 green. This decision was made by N90 and ZNY was not involved.		RP, TMD		
ZNY-3-1-	41	2200	N90 asks for more relief by opening the north gates. Currently only COATE is open. The STMC agrees to check with Area C and calls the Supervisor about using J95. The Area Supervisor agrees to try two GAYEL pathfinders. RAPT shows J95 and J36 green.	*(DP, EP, I/IC, SA-2)	RP, TMD		
ZNY-3-1-	42	2203	Area B will send a pathfinder for WHITE. RAPT shows the route green.		RP		
ZNY-3-1-	43	2218	Area B opens WHITE with 20 MIT.	*(RO)	TMD		
ZNY-3-1-	44	2220	Area B opens WHITE. The pathfinders were never released. The route was opened without them. RAPT shows WHITE clear. The Area B Supervisor used CIWS to reopen WHITE earlier. He noted gaps in the echo tops. Storm Motion and Forecast shows the weather moving east. It is likely that this resulted in reopening the fix 30 minutes earlier.		TMD		CIWS Echo Tops, Storm Motion, Forecast
ZNY-3-1-	45	2220	J36 is not a viable route because apparently ZOB is concerned about potential deviations. The weather in ZOB is near Detroit. The STMC says it is a shame that weather so far west dictates NY departure route usage. The STMC checked with ZOB and found that the route was not closed; it is open with 20 MIT.		PB, TMD, TMD-S		
ZNY-3-1-	46	2222	ZOB will only accept traffic on J95, not on J36. ZNY J36 traffic is deviating into ZOB airspace. RAPT shows the route green.		RP		

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ZNY-3-1-	47	2224	ZDC stops WAVEY departures due to weather. RAPT shows the route green to yellow.		RP, EO		
ZNY-3-1-	48	2225	ZDC stops WAVEY due to weather near the route in northeast ZDC airspace. RAPT shows JFK: WAVEY green to yellow but not ENR. The observer notes that the correct N90 boundary is now being used in RAPT.		EO		
ZNY-3-1-	49	2235	ZOB requests 20 MIT on J36 due to weather.		TMD		
ZNY-3-1-	50	2240	Sector 75 (Area D) has too much traffic even with the 20 MIT restriction on J220. The Area D Supervisor demands 25 MIT on J220. The STMC passes the restriction to ZDC via the hotline.		TMD		
ZNY-3-1-	51	2240	The Area C Supervisor visits the unit to discuss restrictions. The result is 20 MIT on J36 per Tran (?), 20 MIT on N90, JFK COATE departures are moved to GAYEL with 15 MIT. COATE is used exclusively for LGA and EWR. RAPT shows J36/J95 clear. There is a 20 MIT restriction on J36 from ZOB.		TMD, RP		
ZNY-3-1-	52	2246	Area B opens BIGGY, LANNA, and RBV as separate routes (previously as one) with 15 MIT. CIWS was used to verify the weather and insure it was moving off. No growth was indicated, so it was decided to open the routes.		TMD		CIWS Echo Tops, Forecast
ZNY-3-1-	53	2248	BIGGY, LANNA, and RBV are restricted 15 MIT. Area B issued the restrictions. There is a level 5 cell with 42 kft tops just east of BIGGY which is likely affecting arrivals. LANNA/RBV is clear in ZNY, but there may be problems getting departures to the fixes due to weather near the NY metro airports. The routes are reopened by the Area. RAPT shows BIGGY, LANNA, and RBV clear. The Area B Supervisor used CIWS to verify that the weather was moving off and there was not growth behind it.	*(RO, EP, SA-2)	TMD		CIWS Forecast, Growth and Decay
ZNY-3-1-	54	2250	N90 stops COATE.				



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ZNY-3-1-	55	2320		TMD-S		
		N90 inquires about increased use of the north gates. Reported that ZNY Areas did not want to take GAYEL traffic due to weather, but N90 convinced them to take a couple. The STMC checks with the Area Supervisor who is unaware that there are problems with GAYEL. N90 reports that the controller is turning GAYEL traffic into COATE. The observer notes that weather is completely within N90 and is unsure why ZNY sector controller actions are so important. It turns out that the controller was not briefed that ORD traffic from LGA/EWR, which is typically filed over COATE, is rerouted to GAYEL. RAPT shows these routes clear. This is a communication problem, not a weather problem.				
ZNY-3-1-	56	2340		RP, EO		
		ZDC stops WHITE due to a level 5, 40 kft, electrically active storm on WHITE J209 in ZDC. RAPT shows WHITE J209 clear. RAPT suggests that departures at 2345 and 2350 may encounter the weather. The observer suggests that RAPT may be too aggressive in this instance.				
ZDC-3-1-	1	1720		RP, EO		
		The CWSU provides a briefing using the CIWS display. The STMC reports that RAPT was highly inaccurate last night with respect to J48 and J75. Storms developed and decayed several times, but RAPT shows the route green and yellow.				
ZDC-3-1-	2	1728		RP, EO		
		The STMC asks why cells are northwest of RBV with tops to 40kft but RAPT is entirely green.				
ZDC-3-1-	3	1757		TMD		
		ZDC tells ZNY to cancel the WAVEY restriction and increase the WHITE restriction from 10 to 15 MIT.				
ZDC-3-1-	4	1809		RP, EO		
		The STMC notes that weather is forecasted to move west over J75. However, RAPT only shows some yellow for WHITE.				
ZDC-3-1-	5	1820		TMD		
		The observer notes fluctuations in RAPT timelines for WHITE. RAPT indicates that all routes are open, but CIWS shows a cell with 55 kft tops near RBV.				
ZDC-3-1-	6	1840		RP, EO		
		The STMC indicates that he likes RAPT but it has some issues with accuracy.				

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ZDC-3-1-	7	1844	The Observer notes that the STMC RAPT display is configured for AIRPORT with only EWR selected [which may partly explain why STMC is witnessing mostly Green]		RP, EO	
ZDC-3-1-	8	1920	The STMC indicates that LANNA J48 is questionable based on CIWS weather and echo tops but WHITE and WAVEY are good. He earlier coordinated with an Area Supervisor using ITWS and DSR.			ITWS, DSR
ZDC-3-1-	9	1948	ZDC requests a pathfinder from EWR to BOS over Yardley.			
ZDC-3-1-	10	2041	WAVEY is stopped. RAPT shows WAVEY green; WHITE J79/J209 red for 2035 departures yellow otherwise.		RP	
ZDC-3-1-	11	2054	The STMC notes that WAVEY was closed about 50 minutes ago due to weather. The DSR shows WHITE "with tops," but RAPT shows the routes green. The STMC comments that RAPT has not been performing well the past two days. It seems particularly bad when storms are within 10 to 15 minutes of departure airports and tops are 25 to 28 kft. At those ranges and with those tops, the routes should be closed.		RP, EO	
ZDC-3-1-	12	2109	ZDC tells ZNY to release WAVEY departures with 20 MIT no exclusion RSTN. RAPT shows JFK: WAVEY J174 green to yellow to red for 2125+ departures.		RP, TMD	
ZDC-3-1-	13	2152	LGA is ground stopped due to weather. RAPT shows JFK: WAVEY J174 yellow to red.			
ZDC-3-1-	14	2156	ZDC requests a pathfinder for WHITE. RAPT shows all WHITE routes green.	*(DP, RO)	RP	
ZDC-3-1-	15	2205	The STMC asks ZNY if they can get to WAVEY. ZNY did not know the route was open.		TMD-S	
ZDC-3-1-	16	2207	ZDC tells ZNY to open WHITE departures.			
ZDC-3-1-	17	2208	ZNY is sending a pathfinder over WHITE.			
ZDC-3-1-	18	2215	The Area Supervisor asks that WAVEY be stopped due to weather and deviations and that traffic be routed west. They consulted the DSR. RAPT shows WAVEY J174 mostly yellow.		RP, TMD, EO	DSR
ZDC-3-1-	19	2220	The STMC says they are trying to open Yardley because CIWS indicates that weather is starting to break up.			CIWS

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ZDC-3-1-	20	2245	STMC notes WAVEY has been closed due to deviations to the east. RAPT shows WAVEY J174 Red at 2240 – 2250Z, Yellow 2250 – 2310Z.				
ZOB-3-1-	1	1540	<p>There is no weather in ZOB at this time. Weather is on Long Island. There are GDPs in effect for LGA 1500 – 0259 due to weather and for EWR 1630-0359 due to weather. All arrivals for JFK are ground stopped 1501-1600 due to weather. RAPT shows all routes for all airport green. RAPT is not displayed in the TMU at this time.</p> <p>The CCFP shows weather over NY at 6 hours. The TMU is planning to ground stop and hold traffic in western ZOB because there is no CCFP coverage in that area.</p>		RP, TMD		
ZOB-3-1-	2	1756	Routes to NY from the south over WHITE are impacted by weather. ATCSCC called to try to work out a route, suggesting a playbook for FL to NY traffic. ZOB requested normal routes. Normal routes plus the AFP should make the flow manageable.		TMD		
ZOB-3-1-	3	1806	The TMC warns to expect a possible hold for LGA in the next 10 minutes due to weather. It is currently quiet in ZOB. Departure routes through ZOB are clear. Any problems with NY departures cannot be helped by ZOB.		TMD		
ZOB-3-1-	4	1840	The CP TMC coordinated with ATCSCC concerning EWR and LGA traffic 6 hours from now. He is concerned about excessive holding in ZOB. The CP TMC looked at CIWS throughout the conversation. They decided to use standard routes with 30 MIT per airport from ZAU. The program "is working, don't mess with it."		TMD		CIWS

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ZOB-3-1-	5	Interview	When the observer asked about NY departures, the CP TMC stated that there is often 30 to 40 minutes between the time they open a NY departure route and when they start seeing traffic on it. They no longer request pathfinders. They have enough faith in CIWS, after years of experience, that they simply open a route with 40 MIT and reduce the restriction as needed. The CP TMC said that CIWS was their second best tool, after the FCA.		TMD		CIWS
ZOB-3-1-	6	1915	<p>Prior to the SPT, the STMC and CP TMC coordinated westbound traffic from ZBW to ORD. They are trying to keep J95,/J64/J60 open as long as possible then move traffic north into Toronto, north of the weather over DTW.</p> <p>There are problems on J36 to ORD. ZOB reports (on SPT) that ORD flow is deviating on J36 into Canada. Canada has requested a single stream with MIT.</p> <p>ATCSCC is proposing new rates for the AFP. They are revising the program to smooth the flow. The AFP reduces arrivals into NY, providing wiggle room for departures. The directive is "no restrictions on NY departures."</p>		PB, TMD		CIWS, CCFP
ZOB-3-1-	7	2124	One TMC commented that the echo tops shown on one CIWS display were different than on the other display. The observer checked. The difference was due to Surround vs. Left selection in the Echo Tops dialog box.				
ZOB-3-1-	8	2150	<p>Overheard on hotline: lost west departures. The Observer was asked to show a visitor the ELIOT route on RAPT so the observer changed the display. RAPT shows ELIOT yellow for 2200 departures.</p> <p>The STMC used CIWS G&amp;D for situational awareness.</p>		RP		CIWS Growth and Decay

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ZOB-3-1-	9	2206	The CP TMC used CIWS G&D for situational awareness.				CIWS Growth and Decay
ZOB-3-1-	10	2220	ZNY called ZOB asking if J36 was usable in ZOB. The CP TMC checked traffic and CIWS. RAPT doesn't go far enough forward in time to answer this question. J36 in ZOB was never officially closed, though traffic was not filed on it. ZOB offered J36 with 20 MIT regardless of altitude due to weather.		TMD-S		CIWS
ZBW-3-1-	1	Interview w - 1830	The observer interviewed the STMC who indicated that they were watching the storms in eastern NY but they were not using RAPT. They were using CIWS forecast to track the line of storms. At this time, storms are not causing problems for ZBW.				CIWS Forecast
ZBW-3-1-	2	Interview w - 2130	ZBW/BCT traffic was having difficulty departing southbound due to storms on J174 in ZDC airspace. The STMC stated that CIWS was helpful because the forecast helped them put pressure on ZDC and ATCSCC to open routes.		TMD		CIWS Forecast
COA-3-1-	1	1806	This is possible holding for LGA because of storms moving in over Manhattan and blocking arrival routes. The ground stop for LGA is extended to allow extra spacing for deviations. A dispatcher commented that RAPT was showing the routes green but they were shut down.		RP, EO		CIWS
COA-3-1-	2	1842	A north-south line of thunderstorms is located in NY state and across the Ohio Valley. Ground stops for EWR and LGA are extended. Delays are increasing. COA is planning for cancellations. RAPT shows WHITE yellow/red and all others green.		TMD		CIWS VIL, Growth and Decay, Forecast
COA-3-1-	3	1915	RBV is still closed. A pathfinder was sent over RBV and the route looks good. RAPT shows WHITE yellow and others green.				CIWS VIL, Growth and Decay, Forecast

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COA-3-1-	4	1919	COA is trying to stay ahead of the operations problems by pre-canceling flights.		TMD		
COA-3-1-	5	2016	Weather is approaching EWR from the west. ZNY warns of a possible EWR shutdown and holding. Most of the traffic is headed south now so there are no real departure delays. RAPT shows west routes red and south routes green.		RP, TMD		ITWS, CIWS
COA-3-1-	6	2037	The COA EWR operations manager called the COA HOU ATC desk. Today is a case where everyone looked at the weather forecast and went overboard with GDPs and cancellations. As a result, there is not much COA EWR traffic.		TMD		FSM
COA-3-1-	7	2045	There is spotty weather all around with a larger line forming in the Ohio Valley. The EWR and LGA ground stops are cancelled. RAPT shows all routes green but the north and south fixes are stopped.		RP, TMD-LOU		CIWS Forecast, ASR-9, Flight Explorer
COA-3-1-	8	2113	COA wonders why there is not traffic on WHITE yet. They estimate that the fix has been open for 30 minutes. RAPT shows the routes all green.	SA-3, SA-2, EP	RP, TMD-LOU, TMD-S		CIWS Forecast, Flight Explorer, ITWS
COA-3-1-	9	2116	The SIA page from IDS4, which is directly from EWR tower and shows fix closures, shows WHITE, GAYEL, DIXIE, and all west departures closed. RAPT shows all route green, except COATE yellow. There is still no traffic on WHITE. The observer speculates that arrivals are deviating into departure routes.		TMD		Flight Explorer, ITWS
COA-3-1-	10	2202	The taxiways are beginning to fill with departures. COA881, filed EWR to BOG cannot accept a different route due to fuel concerns. EWR tower wants to use this flight as a pathfinder, but the flight cannot accept the reroute.		TMD-LOU, TMD		

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COA-3-1-	11	2217	WHITE is open. It has been free of weather since 2045.		TMD-LOU, EO		Flight Explorer, ITWS, CIWS VIL, Growth and Decay
COA-3-1-	12	2237	More weather is approaching from the west. They are going to try and flush EWR departures. Southbound traffic is moving again.				ITWS winds, TRACON precipitation, wind shear, CIWS VIL, Growth and Decay Trends

**RAPT Benefits Assessment  
BLITZ #3 Observations Summary  
Day 2 - July 19, 2007**

**Participating Facilities: LGA, JFK, EWR, N90, ZNY, ZDC, ZOB, ZBW, Continental Airlines**

Blitz Ob Identifier		Time (UTC)	ATC Weather-Impact Mitigation, Concern, Planning Decisions, RAPT Application (if applicable), and Comments	RAPT Benefits Category	Support RAPT Discovery Process	RAPT Training Support	Other Systems
LGA-3-2-	1	1524	The observer starts RAPT, which currently shows GREKI yellow and all others green. There are no closures or restrictions on GREKI. There are no closures on any LGA routes.		RP		
LGA-3-2-	2	1722	The TMC notices that ZNY has closed J6. No reason was given. RAPT shows the route green.	SA-3	TMD-S, RP		
LGA-3-2-	3	1730	The TMC said GAYEL and COATE were going to close by 1800Z (along with J95 and J36). RAPT shows both fixes and routes green but the TMC disagrees with the RAPT forecast based on his experience and what the TSD showed. The routes stayed open and the TMC acknowledged his mistake.  It is suggested on the hotline that BIGGY J75 will close. The TMC does not agree. RAPT shows the route red then yellow. THE TMC notes that it is +40 minutes until impact on J75.	SA-1, SA-2, SA-3, EP	TMD, RP	Yes	TSD
LGA-3-2-	4	1820	LANNA and BIGGY are stopped. RAPT shows BIGGY J75 red for 30 minutes, LANNA J38 yellow then green.		RP		
LGA-3-2-	5	1826	WAVEY and DIXIE are stopped				
LGA-3-2-	6	1845	GREKI is stopped				
LGA-3-2-	7	1900	There is a line of thunderstorms moving from W to E through CT. and S. Mass.				
LGA-3-2-	8	1903	LGA departures are stopped.				
LGA-3-2-	9	1907	North gate departures are 7 MINIT.				



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LGA-3-2-	10	1920	The tornado icon appears on ITWS near GREKI. The TMC calls N90 to notify.				
LGA-3-2-	11	1930	J48 is closed but RAPT shows the route green. The TMC does not understand why J48 was closed when RAPT shows it green. ZNY and possibly ZDC want to move J48 traffic over to J6, which has more weather and is red. The observer at ZNY said ZDC made the decision to close J48 without explanation.	SA-3	TMD-LOU, EO, RP		TSD
LGA-3-2-	12	2007	ITWS shows 25 kts wind shear loss on runway 13A. Visibility very low, AMASS in limited mode.		TMD		
LGA-3-2-	13	2010	An aircraft used almost the entire runway for takeoff.				
LGA-3-2-	14	2012	Showers now E. of airport, winds 270 10G22. Problem departing R13				
LGA-3-2-	15	2017	There is a request to depart R31				
LGA-3-2-	16	2027	Twenty six aircraft are waiting to take off.		TMD		
LGA-3-2-	17	2030	PARKE, MERIT, BIGGY, and north gates are closed. ELIOT and WHITE are open. RAPT shows PARKE red; BIGGY, GREKI, and GAYEL green.		RP		
LGA-3-2-	18	2036	WHITE is restricted 7 MINIT. LGA is running out of room on R31 to queue departures.		TMD		
LGA-3-2-	19	2043	32 aircraft are awaiting departure. There is no more room on R31 to hold aircraft.		TMD		
LGA-3-2-	20	2045	No pilots are accepting departures on R13, so departures are stopped by the LGA supervisor. LGA is approaching gridlock and can only accept about 15 more arrivals. They need PARKE open.		TMD		
LGA-3-2-	21	2057	LGA is reconfiguring the runways.		TMD		
LGA-3-2-	22	2101	LGA is departing and landing on runway 22.		TMD		
LGA-3-2-	23	2114	PARKE J6 and WHITE are stopped. RAPT shows the routes red.		RP		
LGA-3-2-	24	2127	LGA requests that WHITE traffic be routed over WAVEY. ZNY is not answering the phone.		TMD		

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LGA-3-2-	25	2129	The TMC requests a pathfinder to BOS via GREKI, which RAPT shows green. The request is based mostly on what the TSD shows but also partly on RAPT guidance.	DP, EP, SA-3 (partial benefit)			TSD
LGA-3-2-	26	2130	East departures are stopped.				
LGA-3-2-	27	2134	LGA requests again that WHITE traffic be routed over WAVEY.		TMD		
LGA-3-2-	28	2145	The LGA ground stop is extended until 2215. There are still many departures waiting to leave.				
LGA-3-2-	29	2151	Airport Winds 290 26G30				
LGA-3-2-	30	2152	Wind Shear Alert - 15kts on runway 22 departure				
LGA-3-2-	31	2153	The TMC does not agree that GREKI should be opened and calls ZNY to voice his concern. It turns out that the ZNY Sector made the decision to open the gate, which should never happen. RAPT was used tangentially.	SA-1	TMD		
LGA-3-2-	32	2156	The TMC uses the TSD and RAPT to request that J75 be opened to Florida. RAPT shows J75 green, yet the route is closed.	SA-3, I/IC, EP			
LGA-3-2-	33	2208	GREKI is released with 10 MINIT. RAPT shows the route green.		RP, TMD		
LGA-3-2-	34	2221	LANNA and BIGGY are stopped to non-metro traffic due to weather. RAPT shows LANNA green, BIGGY yellow to red.		RP, EO		
LGA-3-2-	35	2223	ELIOT is stopped due to volume. Only the north gates are open.		TMD		
LGA-3-2-	36	2247	The GREKI pathfinder for BOS is launched from LGA. The pathfinder was requested at 2129. The TMC requested that MERIT be added to RAPT.		TMD, UR		
LGA-3-2-	37	2316	Only 20 aircraft are waiting to depart. Aircraft landing on R22, departing on R31.				
JFK-3-2-	1	1445	JFK visibility is 1/4 mile with fog. A SWAP is in effect. There is a large backlog of departures due to fog. RAPT is not displayed		EO		
JFK-3-2-	2	1450	Stop Departures. No reason given. RAPT not running due to internet access problem.				

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JFK-3-2-	3	1454	With permission of the Supervisor, the observer initiated the RAPT client. RAPT shows J6 red and GAYEL green				
JFK-3-2-	4	1455	Departures released				
JFK-3-2-	5	1511	Tower visibility 1/2 to 1 mile at best.				
JFK-3-2-	6	1516	RBV 10 MIT for volume, weather not a factor. Restriction: no back to back J6's. RAPT shows J6 dark green				
JFK-3-2-	7	1522	COATE and GAYEL are 15 MIT each. RAPT shows the routes green. Visibility continues to be an issue.		RP		
JFK-3-2-	8	1820	JFK is now landing on both 22 runways, including 22R which is the departure runway. Departure delays are 30 minutes. RAPT shows J6, J48, and J75 red.		TMD		
JFK-3-2-	9	1848	GAYEL, J48, and J75 are stopped. RAPT shows J48 green and J75 red until 1900Z.		RP		
JFK-3-2-	10	1936	The TMC requests that GREKI, MERIT, and COATE be depicted on RAPT for JFK.		UR		
JFK-3-2-	11	1958	J6 and J48 are stopped. RAPT shows J6 green then yellow, J48 green.		RP		
JFK-3-2-	12	2008	MERIT is stopped. MERIT is not depicted in RAPT.		EO		TSD, CIWS, ITWS, ACD
JFK-3-2-	13	2024	RAPT shows J6 yellow for first 4 segments, then turns red.				
JFK-3-2-	14	2034	J75 is stopped. RAPT shows the route green.		EO, RP		
JFK-3-2-	15	2105	J48 is released. RAPT shows the route yellow/green/yellow/green.		RP		
JFK-3-2-	16	2115	J6 is stopped. RAPT shows J6 red and WAVEY yellow going red for 2130 departures.		RP		
JFK-3-2-	17	2127	RAPT shows WAVEY red, but the route is open. LGA is gridlocked and will start taking WAVEY traffic from JFK.		RP, TMD		
JFK-3-2-	18	2131	East Gates are stopped, GREKI, MERIT, BAYYS and BDR				
JFK-3-2-	19	2140	The Supervisor is attempting to get traffic that is stopped for WAVEY rerouted via RBV.		TMD-S		
JFK-3-2-	20	2153	Stop RBV. Apparently not weather related. Surface map shows no change to frontal boundaries and center of low pressure.				

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JFK-3-2-	21	2205	The Supervisor consults RAPT concerning the decision to disallow rerouting of traffic over RBV and using runway 31L for departures. He is concerned that RBV will be stopped for weather and departures will be stuck waiting at 31L. RAPT shows that two airways "look good" and two "look questionable." As the Supervisor watched, RAPT updated and changed the routes from red to yellow. This did not instill confidence in the Supervisor.	SA-1, PRSA, EP	RP, EO, TMD		TSD
JFK-3-2-	22	2222	J48 and J75 are stopped. RAPT is showing some yellow no red.				
JFK-3-2-	23	2236	Over 20 aircraft are waiting to depart at JFK. Delays are 15 minutes +.				
JFK-3-2-	24	2244	Departure delays are 45 minutes +. RAPT is showing J75 going red.				
JFK-3-2-	25	2333	RAPT is showing J75 going yellow at 2345				
JFK-3-2-	26	2342	RAPT showing J75 yellow and green at 0000				
JFK-3-2-	27	2354	WAVEY is stopped. RAPT shows WAVEY green.				
JFK-3-2-	28	0025	WAVEY is still stopped but RAPT indicates that the route should be useable. J75 is still stopped. RAPT shows J75 yellow and green.	*(SA-2, DP)	RP		
JFK-3-2-	29	0035	The Supervisor is watching the TSD for the combination of weather and traffic information.		TMD, EO		TSD
JFK-3-2-	30	0040	RAPT shows WAVEY green. The Supervisor made a call to open WAVEY based on RAPT.	SA-2, SA-3, DP,EP,RO	TMD, RP		
JFK-3-2-	31	0041	WAVEY released based on RAPT.				
EWR-3-2-	1	1445	SWAP began at 1345. GAYEL is stopped. RAPT shows J6 PARKE red ENR. The EWR runway configuration will change in about 15 minutes due to weather.		TMD		
EWR-3-2-	2	1526	PARKE is 10 MINIT, ELIOT is 8 MINIT, GAYEL is stopped. RAPT is closed.		EO		

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EWR-3-2-	3	1609	GAYEL is released. RAPT is showing PARKE and LANNA green. A level 3/4 cell is moving off J6 PARKE towards LANNA.		RP		
EWR-3-2-	4	1645	The TMC shows the observer the RAPT playback and comments that it is very useful.		RP		
EWR-3-2-	5	1707	Weather is on J6. RAPT shows the route yellow. J6 is open, but traffic is being moved over to J48.		RP		
EWR-3-2-	6	1753	J48 LANNA is stopped. RAPT is covered.		EO		
EWR-3-2-	7	1811	The TMC is looking at RAPT. RAPT shows PARKE, LANNA, and BIGGY red. LANNA is stopped. BIGGY is 8 MINIT due to weather and WHITE is 7 MINIT due to volume.	SA-2	RP, TMD		
EWR-3-2-	8	1817	GREKI is stopped. RAPT shows GREKI CAM green. PARKE is 8 MINIT. RAPT shows PARKE red ENR.		RP		
EWR-3-2-	9	1854	PARKE is 8 MINIT; RAPT shows the route yellow ENR. BIGGY is 8 MINIT; RAPT shows the route red.	*(RO)	RP		
EWR-3-2-	10	1942	A pilot reports wind shear on final approach. There is no alert on ITWS		TMD		
EWR-3-2-	11	1949	LANNA and GREKI are stopped. PARKE is 8 MINIT. RAPT shows PARKE red, LANNA green.		RP		
EWR-3-2-	12	1957	PARKE is stopped, RAPT is red.		RP		
EWR-3-2-	13	2022	GREKI is stopped. RAPT shows GREKI green.		RP		
EWR-3-2-	14	2023	BIGGY is stopped. RAPT shows the route green for 2025 departures. Weather is moving toward WHITE. RAPT shows WHITE red for 2030 departures. WHITE is currently 5 MINIT.		RP		
EWR-3-2-	15	2034	PARKE is 8 MINIT. RAPT shows the route red with tops to 42 kft. Air traffic wants to send traffic over PARKE at 8 kft.		RP, TMD		
EWR-3-2-	16	2052	The CIC is trying to get reductions on PARKE and ELIOT. RAPT shows the routes red. GREKI is released with 12 MINIT. The Supervisor and Controllers are making calls for reroutes. They are not using RAPT.		TMD, RP		
EWR-3-2-	17	2101	The Supervisor asks the observer what RAPT is showing for LANNA. RAPT shows the route green, but LANNA is closed.	*(DP, RO, SA-2, SA-3)	RP	Yes	

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EWR-3-2-	18	2131	All east departures are stopped because they cannot make the turn due to weather. They are seeking a pathfinder east.		TMD		
EWR-3-2-	19	2150	EWR is sending a pathfinder over GREKI. RAPT shows the route green.		RP, TMD-S		
EWR-3-2-	20	2153	BIGGY is released. There has been no weather near BIGGY for a while. The observer wonders if BIGGY was being used for reroutes.	*(RO)	RP, TMD		
EWR-3-2-		2158	EWR experiencing 75 - 90 min. delays.				
EWR-3-2-	21	2207	Following the success of the GREKI pathfinder, GREKI is opened with 7 MINIT. The RAPT window is obscured.		EO		
EWR-3-2-	22	2247	RAPT shows GAYEL, PARKE, and BIGGY red; LANNA green. LANNA is stopped. GAYEL is open with 5 MINIT. PARKE and BIGGY are stopped.		RP		
EWR-3-2-	23	2257	EWR pushes to open GREKI to BOS. RAPT shows GREKI green. GREKI is opened with 8 MINIT.	*(RRP)	RP, TMD		
EWR-3-2-	24	2258	WHITE, LANNA, BIGGY, PARKE, and east departures via GREKI are stopped. ELIOT is 8 MINIT; north, BOS, and GREKI are 7 MINIT. EWR is reaching gridlock. It would be worse if COA had not cancelled many flights.		TMD		
EWR-3-2-	25	2304	ZDC calls to say that WHITE will open in about 10 minutes.		TMD		
EWR-3-2-	26	2311	RAPT appears to be finding holes in the weather. RAPT shows BIGGY red, GAYEL yellow, and all other routes are green.		RP		
EWR-3-2-	27	2330	There are two releases on LANNA, 7 minutes apart. RAPT shows BIGGY and GAYEL red/yellow. All others are green.		RP		
EWR-3-2-	28	2341	DIXIE, WHITE, BIGGY, PARKE, GREKI, and east departures are stopped. ELIOT is 8 MINIT, GREKI is 7 MINIT. The RAPT window is obscured.		EO		
EWR-3-2-	29	2348	The restriction on ELIOT is lifted. WHITE is going to open with 5 MINIT. DC metro traffic will use BIGGY. LANNA is 6 MINIT.	*(RO)	RP		
EWR-3-2-	30	0004	LANNA is stopped due to volume. The RAPT window is obscured.		TMD,EO		
EWR-3-2-	31	0008	EWR stops all departures.		TMD		

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EWR-3-2-	32	0012	All departures are released except LANNA.				
EWR-3-2-		0013	Controller asking for relief on MERIT (they have 10 planes in cue for MERIT) TMC called and was told that other airports have MERITs in cue as well. RAPT window is obscured.				
EWR-3-2-		0014	EWR departure delays are 90 minutes +.				
EWR-3-2-	33	0032	Restrictions: GREKI, LANNA, and SERMN 7 MINIT. WHITE and MERIT 5 MINIT. DIXIE is stopped, BIGGY and PARKE are stopped except for DC metro traffic. RAPT shows LANNA and BIGGY yellow ENR; all others green. Weather is outside the RAPT domain.		RP		
N90-3-2-	1	1430	Most of the storms are in upstate NY. CAM J95 in ZBW is affected by storms. RAPT shows RBV J6 yellow.				
N90-3-2-	2	1515 SPT	EWR, JFK, and LGA are experiencing low ceilings. GDPs are in effect.		TMD		CIWS
N90-3-2-	3	1550	GREKI CAM is still impacted. RAPT shows the route with ENR tops of 29.		RP		
N90-3-2-	4	1627	Weather in WV is impacting J6. RAPT shows PARKE and RBV J6 yellow.		RP		
N90-3-2-	5	1700	Weather is developing just north of GAYEL. RAPT shows BIGGY and RBV impacted for 1745 departures.		RP		
N90-3-2-	6	1800	Storms are approaching J48 and J75. RAPT shows BIGGY, LANNA, and RBV red. The TMC glanced at RAPT for situational awareness.	SA-1			
N90-3-2-	7	1812	EWR traffic is deviating in N90.		PB		
N90-3-2-	8	1819	LANNA and BIGGY are closed by ZNY. RAPT shows J48 clearing.		RP		ITWS
N90-3-2-	9	1824	RBV is stopped for IAD. RAPT shows J75 still blocked.		RP		
N90-3-2-	10	1844	GREKI departures are stopped due to weather. RAPT shows GREKI red.		RP		
N90-3-2-	11	1907	A level 5 cell is northeast of BREZY. RAPT shows J6 red ENR.		RP		

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N90-3-2-	12	1935	Storms are passing through the north gates. RAPT shows J6 red ENR.				
N90-3-2-	13	2019	EWR is ground stopped due to level 3/4 weather on final approach 15 nmi north of EWR.		TMD		TSD
N90-3-2-	14	2021	The TMC commented that BIGGY is wider than PARKE. RAPT shows PARKE J6 yellow, BIGGY green. The TMC consulted RAPT for situational awareness.	SA-3			
N90-3-2-	15	2101	LANNA is open. They are trying to flush PARKE and ELIOT departures from LGA to help relieve the gridlock. They want to move PARKE to LANNA. RAPT shows all routes yellow and red.		RP, TMD		
N90-3-2-	16	2113	ZNY stops PARKE.		TMD-LOU		
N90-3-2-	17	2122	WHITE is stopped. RAPT shows WHITE and WAVEY red.		RP		
N90-3-2-	18	2129	Storms are now moving through EWR. More storms are in western PA. ITWS displays a tornado detection in southern CT.				ITWS
N90-3-2-	19	2150	The TEB ground stop is extended. BIGGY is open. RAPT shows GAYEL GAYEL J95 opening, J6 ENR, J48 red ENR, WHITE and WAVEY impacted ENR.		RP		
N90-3-2-	20	2210	GREKI is released.				
N90-3-2-	21	2216	PARKE J6 is still stopped. RAPT shows PARKE J6 red ENR. TRACON confirms with ZNY that weather is impacting route in W. VA and N. MD		RP		
N90-3-2-	22	2221	LANNA and BIGGY are stopped. RAPT shows WHITE and WAVEY opening, J6 red, and J45 ENR.				
N90-3-2-	23	2225	RBV is stopped.				
N90-3-2-	24	2235	ELIOT is open. RAPT shows J80 and J60 clear.	*(RO)	RP		
N90-3-2-	25	2246	A line of strong storms extends from central ?? to MD and VA, impacting J6 and J48. RAPT shows J6 and J48 red.		RP		



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ZNY-3-2-	1	1330 Note	The STMC stated that he used RAPT around 1330 - 1340. ZOB had closed J36 until 1400Z. The STMC noted that RAPT showed J36 clearing. This prompted him to call ZOB to request that airborne traffic be moved from J95 to J36. ZOB quickly agreed. Just after this decision, RAPT showed J95 going yellow, but the proactive move of some traffic from J95 to J36 had already occurred.	SA-2, RRP, I/IC, EP	RP, TMD		
ZNY-3-2-	2	1400	Low-topped storms with embedded regions of level 5 are in northern ZNY and southern ZBW. Weaker and more scattered cells are in ZOB. Only COATE is restricted. RAPT shows J95 yellow and J36 and J6 green to clear.		RP, TMD		
ZNY-3-2-	3	1410	None of the Areas are displaying RAPT and AREA D is using WARP.		EO		
ZNY-3-2-	4	1415	Comparing the TSD and CIWS for ZBW weather, the TSD shows a large area of embedded level 4-5 weather near ART/SYR. CIWS shows a large area of level 3-4 near ART/SYR.		TMD		
ZNY-3-2-	5	1419	The observer noted the J6 restriction in the STMC NTML log. Only JFK J6 traffic is moved to J80 due to strong but scattered storm cells in ZID. Moving JFK off J6 allows ZNY to meet ZDC restrictions of 15 MIT per strat. The STMC says this is a significant restriction. RAPT showed J6 green but changed to red ENR with the 1415 update. The ENR restriction is due to weather in ZID, but ZDC is restricting ZNY (pass back?). The observer notes that because of the change in status on J6, increased restriction might be expected.		TMD, RP		
ZNY-3-2-	6	1424	There is a cluster of storms in ZID. RAPT shows J6 yellow ENR. The observer notes that this matches operations better than the earlier red status, given that the route is still open.		RP		
ZNY-3-2-	7	1450	The cluster of weather in ZID is intensifying. ZDC tells ZNY that ZID is shutting off traffic on J6. The No_J6_1 playbook route is implemented beginning 1430. The STMC tells ZDC that he has already moved JFK and EWR traffic off J6 and convinces ZDC to continue running some traffic on J6 with heavy restrictions. RAPT shows J6 red ENR.		RP, TMD		

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ZNY-3-2-	8	1505	The weather cluster in ZID shows some growth. RAPT shows J6 yellow ENR the yellow x 1 to green with the next update. The forecast shows the cluster sliding east of J6.	*(EP, RO-MIT)	RP		
ZNY-3-2-	9	1520	The STMC consults CIWS and the CWSU during the SPT to check weather impacts after 17Z.		TMD,		CIWS, CWSU
ZNY-3-2-	10	1520	The cluster of storms continues to near J6 in ZID/ZDC. RAPT shows J6 green to clear.		RP		
ZNY-3-2-	11	1550	ZNY is putting ZDC in the hold for JFK/HPN arrivals. The STMC calls ZBW to confirm that they are still taking HPN traffic. The STMC tells ZDC that only short holds are expected.		TMD		
ZNY-3-2-	12	1552	The HPN ILS has failed and weather conditions preclude visual approaches. Only GPS aircraft are allowed now and holding is expected.		TMD		
ZNY-3-2-	13	1555	CIWS shows that the weather along the ZID/ZDC border has tops to 44 kft and decreasing. The TSD shows tops to 35 kft.				
ZNY-3-2-	14	1620	Storms embedded in the cluster in western ZDC are intensifying along J6. RAPT shows J6 yellow ENR.		RP, EO		
ZNY-3-2-	15	1700	A small cluster of storms is located in northeast ZOB north of J95. Embedded level 3-5 weather is in ZBW near ALB. A cluster of storms is in western ZDC between J6 and J48. There are airway restrictions on J48 from ZDC. The J6 reroute is still running on J48. RAPT shows GREKI yellow to green, north gates green, J6 is yellow ENR, and J48 clear.		RP		
ZNY-3-2-	16	1710	DFW traffic is on J48 instead of J6 due to the NO_J6_1 playbook. RAPT shows J6 yellow to green with 1730 departures, J48 clear. The STMC consults RAPT to determine when DFW can return to J6 (~1730Z).	SA-2, EP	RP, TMD		CIWS Forecast Contours
ZNY-3-2-	17	1717	The STMC requests that A-761 and ocean en route fixes (e.g., AZEZU) be added to CIWS. This is the third request.		UR		
ZNY-3-2-	18	1724	Storms are developing explosively in ZID. RAPT shows J48 green then clear.		RP		
ZNY-3-2-	19	1730	The STMC notices that RAPT is showing J75 red ENR beginning with 1750 departures.	SA-2	RP		

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ZNY-3-2-	20	1732	ZDC calls ZNY to move NY departures for FL off J75 to WHITE/WAVEY. RAPT shows J75 red beginning with 1750 departures. The STMC anticipated problems with J75, based on RAPT. Perhaps could have run for 15 minutes (ZDC).	RRP, SA-2, EP, I/IC	TMD		
ZNY-3-2-	21	1732	ZDC is moving FL flights over WHITE/WAVEY due to problems on J75. The ZNY STMC expected this because about 3 minutes ago RAPT showed the route red for 1750 departures.				CIWS
ZNY-3-2-	22	1743	ZDC reports losing J48 and says J75 will be lost in 45 to 60 minutes. RAPT shows J48 clear and J75 clear to green.		RP, EO		
ZNY-3-2-	23	1759	ZDC is losing J75 and is routing traffic over J6. RAPT shows J75 yellow. The STMC used RAPT and CIWS for situational awareness.	SA-2, SA-3	RP		CIWS
ZNY-3-2-	24	1800	ZDC tells ZNY that they are losing J75. CLT traffic departing ZNY and ZBW is moved to J6. RAPT shows J6 clear, J48 red to yellow, J75 yellow to red. The observer notes that the ENR tag is missing.		RP, EO, TMD		
ZNY-3-2-	25	1803	The STMC is reviewing RAPT for situational awareness. He is waiting for approvals to move J75 traffic for CLT to J6.	SA-1, EP, RRP			
ZNY-3-2-	26	1810	The CIWS echo tops product indicates that the tops on individual cells in the weather cluster near J75 are increasing. RAPT shows J75 yellow to red, then completely red with the next update. The observer notes that "flip-flopping" is a result of strong echo tops gradients in the storms.		RP, EO		
ZNY-3-2-	27	1812	J75 is closed by ZDC.		TMD		
ZNY-3-2-	28	1819	N90, TEB, EWR, and LGA are stopped on LANNA/BIGGY. The ZNY Area Supervisor stopped the traffic. N90 asks for clarification. RAPT shows all impacts ENR.		RP, TMD, TMD-S		
ZNY-3-2-	29	1820	N90, TEB, EWR, and LGA are stopped on LANNA/BIGGY by N90 (?) for DC metros on J48/J75. The STMC states some confusion may be ongoing because these should have already been rerouted. Three flights departed. RAPT shows J75 red (missing ENR tag), J6 red ENR, and J48 red-yellow-green-clear.		RP, EO, TMD		

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ZNY-3-2-	30	1900	A strong line of storms lies along J75 in ZDC; a strong cluster covers ZID; isolated level 6 cells are in central and western ZOB, and a strong line is along the cold front in southern Canada. GREKI, J60, J64, J48, and J75 are closed due to weather in neighboring Centers. RAPT shows GREKI red, J60 clear, J64 green, J48 yellow-green-clear, J75 red, and J6 red ENR.	*(RO)	RP, EO		
ZNY-3-2-	31	1910	The STMC requests that ZDC open J48. ZDC denies the request. RAPT shows J48 yellow-green-clear.	*(I/IC, RO)	RP, TMD		
ZNY-3-2-	32	1915	The STMC requests that ZOB open J60/J64. He is told that the coordination to reopen the routes took place on the "other line." Both routes are open without restrictions. RAPT shows both routes clear. The observer showed the STMC that RAPT showed the routes clear and this prompted the call to ZOB. The decision was worked out with the DD position.	*(RO)	TMD-S, EO	Yes	
ZNY-3-2-	33	1923	J60 and J64 are reopened by ZOB. RAPT shows the routes clear.				
ZNY-3-2-	34	1928	The observer visited the Areas to check on RAPT use. Weather does not appear to be affecting ZNY airspace yet. The Areas are holding for other Centers due to weather en route. GREKI and J6 are closed and RAPT shows them red.				
ZNY-3-2-	35	1935	The STMC expresses concern with impacts on A-511/A-761, which are open. He checks CIWS for A-761 weather and asks the observer's opinion. The observer consulted Growth and Decay Trends which showed growth in the cell just east of ZDC.			Yes	CIWS
ZNY-3-2-	36	1936	The STMC is concerned about weather impacts on A761. CIWS is showing growth near this route.		TMD		CIWS Growth and Decay Trends

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ZNY-3-2-	37	1943	J48/J75 is being reopened by ZDC over MRB (via J6). Weather is clearing the route. This is the same weather that was over MGR an hour ago when the request to reopen J48 was denied. The STMC says this is not a "real opening" because it puts traffic completely on J6 in ZNY. RAPT shows J48 clear and J75 green.	*(RO)	TMD, RP		
ZNY-3-2-	38	1943	ZDC opened J48 and J75 over Martinsburg. RAPT shows the routes have been green for quite a while.				
ZNY-3-2-	39	1950	ZDC allows J75 to open. RAPT shows J75 clear.	*(RO)	RP, TMD		
ZNY-3-2-	40	2000	PARKE is closed by N90 due to volume. RAPT shows PARKE clear. The observer notes that level 4/5 cells are along J80, J6, and J48 in southern ZNY. RAPT shows these routes green.		RP, TMD		
ZNY-3-2-	41	2009	N90 stops MERIT. Weather on GREKI is moving onto MERIT. RAPT shows GREKI dark green.		TMD, EO		
ZNY-3-2-	42	2009	ZDC is increasing the restriction on the east coast. RAPT shows WHITE J79 going yellow to red ENR for 2025 departures. CIWS is used for situational awareness.	*(DOL)	TMD,RP		CIWS
ZNY-3-2-	43	2015	ZDC places a 15 MIT per strat restriction on J174 for ZBW. RAPT shows WAVEY J174 red.		RP		
ZNY-3-2-	44	2018	ZDC is losing east coast routes. RAPT shows WHITE/WAVEY J79 J209 yellow then red for 2025 departures.	*(DOL)	TMD, RP,		
ZNY-3-2-	45	2025	BIGGY is stopped by coordination between Area A and Area B. There are embedded weak cells with low tops just west of the fix. This was communicated to the DD and the STMC had difficulty finding out the reason for the closure. The STMC is surprised that this weather forced the closure but does not approach the Area on this decision.	*(I/IC, SA-3, DOL)	TMD, RP, EO		
ZNY-3-2-	46	2025	BIGGY is stopped by Area A. RAPT shows the route green.		RP, TMD		
ZNY-3-2-	47	2035	An east-west line of weather is in southern ZNY just north of ZDC. RAPT shows BIGGY J75 yellow to dark green with departures going through the center of high-topped cells.	*(RO)	RP, EO, TMD. PB		

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ZNY-3-2-	48	2043	A weakening but persistent cluster of weather is in eastern ZID/western ZDC airspace. The TMC consults CIWS to note tops, trends and lightning.		TMD		CIWS Echo Tops, Growth and Decay Trends, Lightning
ZNY-3-2-	49	2050	GREKI is reopened. J6 is closed (according to ZDC. ZNY states they are running PARKE J6 and confirmed that the route was only open to "Charlie West". There is confusion on route status and who is opening and closing routes. RAPT shows GREKI clear, J6 red ENR, and J48 clear.	*(RO)	TMD-S, RP		
ZNY-3-2-	50	2052	GREKI is open with 7 MINIT and LANNA is open. RAPT shows the routes green.	*(RO)	TMD, RP		
ZNY-3-2-	51	2055	ZNY hears that J6 is closed but did not know it until now. RAPT shows PARKE J6 red ENR.		TMD-S		
ZNY-3-2-	52	2100	The STMC performs a route status check. WHITE is still open. The STMC consults CIWS and is surprised WHITE is still running. He noted that RAPT shows WHITE J209 red in 10 minutes. He states that he likes RAPT better and better for quick look information. RAPT shows WHITE J209 yellow to red then yellow with the next update.	SA-2, SA-3, EP	TMD-S, EO, RP		
ZNY-3-2-	53	2113	The WHITE restriction is increased to 30 MIT due to deviations into WAVEY, then WHITE is stopped completely. RAPT shows WHITE almost completely red.		PB, RP, TMD		
ZNY-3-2-	54	2115	RBV J6 is stopped. RAPT shows RBV J6 red ENR,		RP		
ZNY-3-2-	55	2118	WHITE is stopped by ZDC due to weather. RAPT shows the route yellow.		RP, EO		
ZNY-3-2-	56	2120	Area B has combined BIGGY and LANNA as one. Small level 5 cells are just outside BIGGY on the route and causing deviations. RAPT shows EWR: BIGGY clear.		RP, TMD, EO		DSR
ZNY-3-2-	57	2122	Area B uses the DSR and deviations to restrict BIGGY and LANNA as one. RAPT shows the route green.		TMD		
ZNY-3-2-	58	2125	ZDC is allowing EWR WHITE traffic swapped to WAVEY. N90 stops JFK WAVEY to favor EWR WAVEY. RAPT shows JFK: WAVEY red ENR.		RP, TMD		

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ZNY-3-2-	59	2138	ZDC stops WAVEY due to weather.	*(EP, I/IC, RRP)	TMD		
ZNY-3-2-	60	2145	2 AFPs in place. EWR, LGA, ORD GDPs (ORD for volume). 8 ground stops (including LGA for runway change).				
ZNY-3-2-	61	2152	The DD TMC requests that the STMC call the Area B Supervisor to reopen J75. He points out that the small weak cell is moving out of the BIGGY area. RAPT shows J75 clear.	*(RO, I/IC, EP)	TMD		
ZNY-3-2-	62	2209	The north gates have been restricted 15 MIT from 1830 to 2330. Weather is building in eastern ZOB. The cluster of weather in western ZDC is decaying. The northern portion of the line is weakening in ZDC but the southern end is holding together. There is a strong cluster in southern ZBW. RAPT shows J95 and J6 red ENR, J48 yellow ENR, WHITE J79 dark green, WHITE J209 red to yellow to green.		RP		
ZNY-3-2-	63	2216	N90 asks ZNY to reopen PARKE. The blockage is in ZID. J6 remains closed. RAPT shows J6 red ENR.	*(EP, I/IC)	TMD-LOU, RP		
ZNY-3-2-	64	2219	J48/J75 is closed by ZDC. RAPT shows J48 open and J75 green to yellow.		RP, TMD		
ZNY-3-2-	65	2220	LANNA/BIGGY J48/J75 is closed by ZDC. RAPT shows J48 clear, J75 green-yellow-red ENR.				
ZNY-3-2-	66	2223	N90 stops ELIOT due to volume. RAPT shows ELIOT green, GAYEL yellow.		TMD		
ZNY-3-2-	67	2224	Level 6 weather with little lightning is on J95. The route remains open with 15 MIT. RAPT shows J95 red ENR then red-yellow-red-yellow ENR with the next update.		EO, RP		
ZNY-3-2-	68	2235	N90 opens ELIOT.				
ZNY-3-2-	69	2250	ZDC asks about route status on the hotline. ZDC comments that WHITE will open first once the cell moves off. RAPT shows WHITE yellow then green.	*(RO, I/IC, EP)	TMD-S, RP		

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ZNY-3-2-	70	2254	Area B is using CIWS to determine whether a holding area over CAMRN is good. N90 will not accept the traffic due to weather. Traffic is being moved to the Mantas sector. The Area Supervisor is using CIWS to coordinate the holding area with the STMC.		TMD		CIWS Echo Tops Forecast, Precipitation
ZNY-3-2-	71	2300	A cluster of cells is located in northeast ZOB and moving into northwest ZNY. RAPT shows J95 yellow and J36 yellow/red ENR.		RP		
ZNY-3-2-	72	2315	ZDC is reopening J48 for NY with 15 MIT regardless of altitude, which ATCSCC changed to 15 MIT per strat. WHITE is reopening 10 MIT by ZDC. RAPT shows J48 clear and WHITE green to clear.	*(RO, I/IC, EP)	TMD, RP		
ZNY-3-2-	73	2335	LGA has an aircraft whose crew is due to time out. They are trying to release the aircraft via WHITE. ZNY says WHITE is unusable because of a level 5, 45 kft cell at the fix. RAPT shows WHITE J79/J209 clear.	*(I/IC, EP)	RP, EO		
ZNY-3-2-	74	2348	WHITE is reopened by ZNY. PHL departures are moved from DITCH to PTW to allow WHITE deviations. RAPT shows WHITE clear (has been for some time).		RP, PB, TMD		
ZNY-3-2-	75	0000	J6 remains closed. The STMC feels it should be open. The observer notes that there is severe weather in ZID. The STMC states that no Center should have to look beyond its first tier for route decisions, given that it takes some time for flights to reach the second tier and, given that weather will change by that time. It is unclear whether weather will or will not persist as an issue. The STMC says he should be able to call the first tier and, if weather is clear, should be able to work the traffic.		TMD, EO, TMD-LOU		
ZNY-3-2-	76	0004	LANNA is stopped by N90 due to volume. The STMC states that N90 releases by minutes in trail and if all towers release at the same time, sectors can overload. This suggests that RAPT need not probe into ZID and ZTL.		TMD		
ZNY-3-2-	77	0008	There is a large cluster of level 5 weather in extreme northwest ZNY, just north of J95. North gates are still running. RAPT shows J95 yellow and J36 clear.		RP, EO		



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ZNY-3-2-	78	0030	An east-west line is still holding together and elongating in ZDC. RAPT shows J48 yellow ENR and the route is open; J75 is yellow to red ENR and closed.		RP		
ZNY-3-2-	79	0033	WAVEY is closed. Weather has cleared but the fix cannot be opened until the aircraft holding for JFK are moving to the airport. RAPT shows WAVEY clear.		TMD, EO, RP		
ZNY-3-2-	80	0040	WHITE and WAVEY are reopened with 20 MIT each. WHITE was running 10 MIT.		TMD		
ZNY-3-2-	81	0100	The broken east-west line of level 5 weather is near J48/J75. RAPT shows J48 yellow ENR and R75 red ENR. J48 has been running 15 MIT per strat. J75 remains closed. There is a cluster of level 5-6 weather just north of J95. RAPT shows J95 and J36 clear. There is level 5 weather on J60 in ZOB. RAPT shows J60 green.		RP		
ZDC-3-2-	1	1735	The STMC closes J75 and moves J48 traffic to J6. RAPT shows J48 green.		RP		
ZDC-3-2-	2	1741	Level 4-5 cells now over J48				
ZDC-3-2-	3	1742	ZDC tells ZNY that all Nye traffic will be routed down the coast. J48 is lost and they will lose J75 in 45 to 60 minutes. FL traffic on J75 will transition to J79.		RP, TMD		
ZDC-3-2-	4	1745	NY traffic on J48 is moving to J6. RAPT shows J6 and J48 yellow. The STMC expects J75 to close soon. RAPT shows J75 green prior to this now J75 yellow.		RP		
ZDC-3-2-	5	1759	ZDC tells ZNY to expect J75 to close in 10 to 15 minutes. RAPT shows J75 yellow.		RP		
ZDC-3-2-	6	1803	The STMC tells the observer that J48 is unusable. RAPT shows the route red.		RP, EO		
ZDC-3-2-	7	1811	The STMC announces that J75 is closed for a while.		TMD		
ZDC-3-2-	8	1840	RAPT shows J75 all red with tops 49-50 kft.				
ZDC-3-2-	9	1841	The STMC states that J48 will open soon but RAPT shows it open now.	*(RO)	RP		

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ZDC-3-2-	10	1943	ZDC tells ZNY that they are going to open J48 and J75 but Nye traffic would have to deviate west first.		RP, TMD		
ZDC-3-2-	11	1923	Weather approaching from west with heavy growth. RAPT shows J6 all red. J75 is all green.				
ZDC-3-2-	12	1947	N90 asks JFK if J75 is open. JFK responds that J75 via RBV is open. RAPT shows all routes green.		RP, TMD		
ZDC-3-2-	13	1952	Large mass of embedded strong level 6 cells with 48 - 58 kft tops west of ZDC western border moving rapidly east. Line of level 5 - 6 cells with 41 - 50 kft tops over arrival routes J51 and J191				
ZDC-3-2-	14	1955	RAPT showing WHITE Yellow @ 2015 & 2020 with Tops 33 kft J6 all Yellow and Reds with ENR Tops				
ZDC-3-2-	15	2025	WHITE 15 MIT NO EXCL. 1800 - 2200 ZDC:ZNY WAVEY 25 MIT EXCL: RIC/DCA/BWI AOB160 1800 - 2200 ZDC:ZNY RAPT shows WHITE Routes all red. WAVEY yellow at 2100 and red at 2110				
ZDC-3-2-	16	2117	ZDC tells ZNY: WHITE closed for NY Departures. WHITE all red on RAPT at 2127.				
ZDC-3-2-	17	2137	ZDC tells ZNY: WAVEY closed for NY Departures				
ZDC-3-2-	18	2155	RAPT shows WHITE J79 all green. WHITE J209 and WAVEY J174 all red.				
ZDC-3-2-	19	2216	ZDC tells ZNY: J75 & J48 closed.				
ZDC-3-2-	20	2222	ZNY tells JFK: J48 & J75 via RBV stopped				
ZDC-3-2-	21	2223	N90 asks JFK if WAVEY still stopped. JFK responds 'still waiting word'. RAPT is showing WAVEY red.				
ZDC-3-2-	22	2229	JFK asks N90 if J48 and J75 closed for Wx. N90 responds, yes.				
ZDC-3-2-	23	2244	STMC examines RAPT and shows J48 are open despite CIWS weather. Also points out WHITEs are open despite the neighboring high cell.	SA-1	RP, EO		
ZDC-3-2-	24	2248	Large Level 5 cell with 44 kft tops SSW of WHITE moving ENE over J79/J209				

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ZDC-3-2-	25	2249	ZDC tells N90 that they are waiting for a huge cell to clear WHITE in 20 to 30 minutes before opening WHITE. Then the weather will move to WAVEY with a probable SWAP to WHITE.	*(EP, RO)	RP, EO		
ZDC-3-2-	26	2254	RAPT shows WHITE J209 yellow to green but there is a level 5 cell with 43 kft tops over J209.	*(RO)	RP, TMD		
	27	2258	Large strong level 6 cell with 55 kft tops ENR moving east of J48 moving east to J75				
ZDC-3-2-	28	2303	ZDC tells ZNY that WHITE will be released in 10 to 12 minutes as the weather moves off but WAVEY will be longer. The STMC notes that RAPT shows EWR: WHITE J79 J209 green.	*(RO) SA-1	RP, TMD		
ZDC-3-2-	29	2312	ZDC opens J48 to ZNY. WHITE is 10 MIT with no exclusions as soon as ZNY can get into it.		TMD		
ZDC-3-2-	30	2350	The STMC reports to ATCSCC that there are still no aircraft on WHITE even though it has been open for 40 minutes. The observer overhears on the hotline that NY is still coordinating the release of the first WHITE departure.		TMD-LOU		
ZDC-3-2-	31	2352	The first WHITE departure is released. The Flight Data Position TMC commented that he would like to use RAPT when customers call for suggested flight plans to file, but he has to turn the customers over to the TMC.	*(I/IC, RRP)	TMD, RP		
ZOB-3-2-	1	1400	Widespread precipitation is located in ZOB. There are already lots of reroutes for weather. J36 was closed earlier but is now open. ZOB is back to normal routes. All weather in ZOB is below 30 kft. The more significant weather is in ZBW and on the ZNY/ZBW boundary. Even here, there is very little above 30 kft.		TMD		

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ZOB-3-2-	2	1408	<p>The CP TMC says that he expects a challenging day because the forecast is difficult. He demonstrated CIWS to a new controller, explaining the functions and products and how valuable it is to them. The 6-hour CCFP shows all of ZID and southern ZOB covered and more on the ZNY/ZBW boundary.</p> <p>The DTW TMC reports that earlier high-topped storms impacted the DTW to NY flow. They expanded the MIT restriction to allow for deviations. Two NY and two DC arrivals were routed through a gap near Erie/SPICA due to concerns about DRYER. This route is working.</p>		TMD		CIWS
ZOB-3-2-	3	1515 SPT	JFK reports 75+ minute departure delays. A JFK GDP is scheduled for 1830-0259, EWR/LGA GDP in place. There is no improvement in the weather so the airport cannot land more. Chokepoints are in effect for JFK. ATCSCC is coordinating east and west Canadian playbook routes. Thunderstorms are expected in NY after 00Z.		TMD		
ZOB-3-2-	4	1630	ZOB is holding for DTW due to wind shear. ITWS indicates that this is a gust front. The observer took the opportunity to talk a little about ITWS to DTW TMC and other personnel, pointing out some features and explaining wind shear/microburst warnings. Overlays were added at the request of the DTW TMC and windows were enlarged. It was reported that DTW is not happy with the lack of ITWS training. Note: The observer thought the ITWS was operational but found a sign saying not to touch it.		TMD	Yes	ITWS
ZOB-3-2-	5	1650	Wind shear and microburst alerts are in effect at DTW. The maximum alert is a 35 kn loss. Traffic is holding at all corners. A first tier ground stop until 1715 has been implemented. The observer provided more ITWS briefing to an off-duty TMC. The on-duty TMC used CIWS to coordinate with DTW.		TMD	Yes	CIWS, ITWS

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ZOB-3-2-	6	1715	There is no real activity in ZOB at this time, other than DTW. During the STMC hand-off briefing, the outgoing STMC indicated that SPICA was open and possibly POLAR. (The observer thinks this could have happened sooner. Runways have been clear for a while.)		TMD		
ZOB-3-2-	7	1715	The STMC was interviewed. He said that at this time he has no use for RAPT. He felt RAPT could be a good tool for NY, if they would use it. ZOB uses CIWS. They use RAPT to "critique NY."	SA-3	EO, TMD		
ZOB-3-2-	8	1747	CIWS is used during the hand-off briefing at the CLE/PHL TMC position.		TMD		CIWS
ZOB-3-2-	9	1848	The Area 7 Supervisor visited the TMU for an unknown reason. While there, he used CIWS Growth and Decay for situational awareness.		TMD		CIWS Growth and Decay Trends
ZOB-3-2-	10	1850 Interview	The observer visited the Areas. The Area 7 Supervisor indicated that he was from the TMU and uses CIWS all the time. He particularly likes Growth and Decay and Forecast. The Area 6 Supervisor uses CIWS Forecast as a decision/situational awareness tool. He uses RAPT to look at J80 and anticipate changing conditions.	SA-2, EP			CIWS Growth and Decay Trends, Forecast
ZOB-3-2-	11	1900	The STMC told the CP TMC to open J64 based on the CIWS forecast. Echo tops are 35 kft but moving off the route. NY departures will not get to the weather for at least 30 minutes and by then the route will be clear. The STMC admits that he does not think J64 should have been closed in the first place because there was room to deviate. RAPT shows all routes through ZOB green.	*(RO)	TMD, RP		CIWS
ZOB-3-2-	12	1950	The CP TMC checks RAPT to verify that ZOB to ZNY routes are clear. RAPT is all green.	SA-1	RP		

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ZOB-3-2-	13	2000	ITWS shows weather moving to DTW. ZOB is holding at the north and southwest gates. They do not want to hold at the southeast gate because weather is moving that direction. Weather contains microburst and wind shear activity. The gust front will shift the wind to 315 at 45 – 50 kn. Outlying airports report winds 300/20. The observer demonstrated some of the ITWS functions to the DTW TMC. The TMC coordinated with DTW and referred to ITWS weather. They stopped all DTW arrivals.		TMD	Yes	ITWS
ZOB-3-2-	14	2010	Wind shear alerts at DTW; +/- 25 kn.				
ZOB-3-2-	15	2015	The DTW TMC is trying to figure out what to do with ZBW/ZNY traffic to DTW. He is considering using a gap south of J16. CIWS shows growth in this area. The TMC decides this is too risky.		TMD		CIWS
ZOB-3-2-	16	2030	LGA reports gridlock. Why? Only the DC routes are impacted. Routes through ZOB are fairly clear.		TMD-LOU		
ZBW-3-2-	1	1630	The biggest weather concern is storms impacting routes through ZDC and ZID. (J6 and J48 are closed to ZBW traffic.) RAPT shows GREKI open, J6 and J48 red. RAPT is not displayed at the STMC desk or in the Areas. CIWS and WARP are being used for weather information.		RP		CIWS, WARP
ZBW-3-2-	2	1745	Storms are developing in eastern ZNY airspace. RAPT shows all N90 routes green; routes through ZDC are impacted. The observer notes that RAPT verifies that there is no need for a GREKI offload at this time.		RP		
ZBW-3-2-	3	1745	ZDC calls ZBW to warn that ZBW would lose J75 at 19Z.		TMD		CIWS
ZBW-3-2-	4	1800	ZDC will not close J75, but the STMC is skeptical that it will remain open for ZBW traffic much longer. The STMC and TMC use CIWS and decide to move all ZBW traffic to J174.		TMD		CIWS VIL, Forecast, Storm Motion

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ZBW-3-2-	5	1825	The STMC notes that the CIWS forecast shows that J75 will be open in 90 minutes. He suggests to the TMC working severe weather to move traffic back to J75 by 1930.		TMD		CIWS Forecast
ZBW-3-2-	6	1832	ZBW traffic to ZDC/IAD is being vectored to SYR due to storms en route. This route is for traffic that was already in the air before the IAD ground stop was implemented. CIWS is used to verify that showers south of SYR are low enough for traffic to top.		TMD		CIWS Forecast, Echo Tops
ZBW-3-2-	7	1905	Strong storms close GREKI as a N90 offload and are impacting traffic bound for BOS. GREKI traffic is moved to BETTE. THE STMC used CIWS to determine the extent of the GREKI impact. The observer discussed RAPT with the STMC, who subsequently opened the RAPT window and confirmed that GREKI is closed.		RP, TMD	Yes	CIWS Forecast
ZBW-3-2-	8	2000	The observer notes that level 4/5 cells are over GREKI, but RAPT shows the route green.		RP, EO		
ZBW-3-2-	9	2010	The STMC uses the CIWS forecast to make a plan to take traffic on a reverse EWR bypass. That is, because storms are blocking the normal routes to BOS, the STMC would like to take BOS inbound traffic from the south up the Hudson and then turn them east after they clear the weather.		TMD		CIWS Forecast
ZBW-3-2-	10	2027	Storms are blocking normal routes to BDL from the south (GREKI). The TMC working the weather desk notices three aircraft on normal routes in ZDC airspace and brings it to the attention of the STMC. Based on the CIWS forecast, a plan is made to bring the traffic east over ACK and then north and behind the weather, to circumnavigate the storms and approach BDL from the north.		TMD		CIWS VIL, Forecast, ETMS
ZBW-3-2-	11	2112	CIWS is used to plan a reroute for ZBW traffic arriving from the south. ZDC wanted to send the traffic to ZBW on J121 but CIWS shows that traffic would be on the wrong side of the storms. The TMC uses CIWS to plan to bring traffic west (behind) the storms.		TMD		CIWS VIL, Forecast, Storm Motion

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ZBW-3-2-	12	2137	The TMC at the severe weather position uses CIWS for a hand-off briefing.		TMD		CIWS Echo Tops Forecast, Forecast, Precipitation, Storm Motion, WARP, ETMS
ZBW-3-2-	13	2218	Thunderstorms are impacting PVD, an arrival fix for BOS.		TMD		CIWS VIL, Forecast, Storm Motion
ZBW-3-2-	14	2330	Thunderstorms are impacting J75. RAPT shows J75 yellow to red. The observer demonstrated how RAPT can be used to assess impacts on other routes.		RP,TMD	Yes	CIWS Forecast
COA-3-2-	1	1430	GDPs in place for EWR, JFK and LGA. COA has proactively cancelled flights due to the early morning fog and expected afternoon thunderstorms.		TMD		CIWS, Flight Explorer, ITWS
COA-3-2-	2	1624	Most weather is N, NNW and W of NY Metro area, no weather to South. Ops Manager noted that there is a push for Florida/southbound right now so it is good there is no weather to the south.				
COA-3-2-	3	1626	SIA page shows no stops but RAPT shows both Greki and PARKE as yellow.				
COA-3-2-	4	1840	SIA stops for DTW/1830; ATL/1900; IAD/1930; LANNA; GREKI V419 and DIXIE/1840				
COA-3-2-	5	1851	CIWS domain starting to fill with weather. GDPs in place for ATL, EWR, IAH, LGA, ORD with GSs for HPN, IAD, ORD and there is the AFP5 and AFP8 in place. RAPT shows GREKI red, PARKE yellow, WHITE red. Low impact at EWR, no departures waiting on runway at EWR possibly due to cancellations.				
COA-3-2-	7	2026	Stop on LANNA, GREKI, PARKE BIGGY				
COA-3-2-	8	2051	Stop on MERIT (Thunderstorms)				



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COA-3-2-	9	2123	Level 3-5 cell crossed north of EWR with 20/35kt WS/MB on ITWS. Did not cause arrival or departure problems.				
COA-3-2-	10	2136	Internationals are stopped as there is no route east. This is causing a major taxiway problem at EWR as all international departures take off around the same time.				
COA-3-2-	11	2214	SIA shows stops for WHITE, PARKE and East except GREKI. Delays at EWR are +75min. International departures heading east are causing backup. A solid E-W line across Ohio Valley extending through most of the southern part of SDC is also causing problems for N-S (Florida) traffic.				
COA-3-2-	13	0145	The E/W high Etop line from Ohio Valley eastward across is causing major flow problems across ZDC. GS for: All Airports (N of VA/NC border because of enroute thunderstorms) for ZMZ, ZJX, ZTL.				
COA-3-2-	14	2146	A GREKI pathfinder is requested.				
COA-3-2-	15	2209	The GREKI pathfinder is successful and the route is open.				

**RAPT Benefits Assessment  
BLITZ #4 Observations Summary  
Day 1 - August 8, 2007**

**Participating Facilities: LGA, JFK, EWR, N90, ZNY, ZDC, ZOB, ZBW, Continental Airlines**

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LGA-4-1-	1	1120	The Supervisor viewed the RAPT timeline and graphics to determine if the northern gates would be impacted by weather. He saw that all routes were green and passed the information along to his ground and local controllers and also the Quality Assurance Manager who happened to be in the cab. The Supervisor requested that MERIT be added to RAPT.	SA-1, I/IC, EP	UR, TMD		
LGA-4-1-	2	1138	All west gates are stopped at this time primarily because of staffing at N90 and/or ZNY. Controllers could not get into work because of flooding on the roads and traffic jams.		TMD		
LGA-4-1-	3	1202	All north gates stopped at this time, ZNY presently not accepting handoffs				
LGA-4-1-	4	1232	The Tower Supervisor called ATCSCC, ZNY and N90 to ask for some relief. Arrivals are still inbound to LGA but departures are stopped. This causes a large backlog of planes on the airport. In addition, departing on R31 and arriving on R22 is not an optimal configuration for LGA. Taxiways to the departure end of R31 are packed with planes. When these taxiways are blocked, aircraft cannot push back from their gates and leave the ramp area. As a result, arrivals cannot get to the gates and deplane passengers. The situation caused the departure queues to increase to the point of gridlock. A R31 departure also greatly impacts the traffic pattern at EWR, TEB, and JFK, and prior coordination is essential. North gates are released at approximately 1235Z and ZNY agrees to a lower arrival rate. ZNY was unaware that the repeated stopping of departures was causing such a big problem at LGA.		TMD, TMD-LOU		

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LGA-4-1-	5	1400	North departures are stopped due to volume. RAPT shows all routes green. The observer and Supervisor consulted RAPT.	SA-1	TMD	Yes	TSD
LGA-4-1-	6	1415	Residual weather from earlier thunderstorms causes the DIXIE gate to close. Departures are shifted over to WAVEY. All LGA routes were green. However, routes via DIXIE are not part of the current overlay set and need to be added.		UR, TMD		
LGA-4-1-	7	1855	J80 traffic stopped due to small discreet cells in a west to east orientation moving southeastward. RAPT is showing J80 completely red. J36 traffic is still moving although RAPT also shows J36 completely red.				
LGA-4-1-	8	1959	J80 is still closed but RAPT currently shows the route red, changing to all green for departures at 2000Z. Forecast guidance is poor; it is bouncing back and forth while the route itself remains closed for weather.		RP, EO		
LGA-4-1-	9	2014	PARKE J6 is released with 6 MINIT (excluding IAD). RAPT shows red ENR for the next 30 minutes, with echo tops dropping from 51kft to 40kft. The LGA Tower Supervisor notes the discrepancy between the forecast and actual operations. Aircraft are flying along J6 via PARKE without too much trouble.		RP, EO		
LGA-4-1-	10	2022	The TMC questions why J80 is closed so he calls Columbus and Dayton. The TMC feels that J80 should be open so he also spoke with someone at ATCSCC. According to the TMC, the one cell just west of IND is not sufficient justification to close the entire route. The TMC notes that RAPT shows the route green.	SA-3, I/IC, *(RO)	RP, TMD		TSD
LGA-4-1-	11	2103	ZNY is trying to reopen J80 even though the LGA TMC has been asking for it to open for almost the past hour. The TMC states that by the time J80 is open, weather will be on it again and RAPT will show it blocked. RAPT shows J80 green for the following 30 minutes.	SA-2. SA-3 *(RO)	RP, TMD		

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	12						
JFK-4-1-	###	Note	The observer states that RAPT is not used at JFK because it is currently on the Supervisor's computer, making access to the tool difficult. Also, traffic management in the tower is not very proactive during a weather event. The staff is busy taking, logging, and distributing restrictions and reroutes from other facilities.				
JFK-4-1	1	1300	Observer arrived at facility to find RAPT not up. Showed the TMC that the RAPT client was still installed at the supervisor's desk. After starting RAPT client, RAPT showed all JFK departure routes green.				ETMS/TSD
JFK-4-1-	2	1403	North departures are stopped, but not sure of the reason. Most probably volume in N90 airspace. DIXIE departures are stopped due to weather. RAPT is showing all JFK departures green.				ETMS/TSD
JFK-4-1	3	1438	SHIPP is 20 miles in trail and WAVEY is 15 miles in trail, both due to weather and Warning Areas going hot. RAPT is not showing any evidence of weather on the routes. All departure routes are still green.				ETMS/TSD
JFK-4-1	4	1512	All north and east gates are stopped. No reason given. Five minutes later, at 1517, all north and east gates are released. Again, no reason given.				
JFK-4-1	5	1731	J80 is now 30 miles in trail due to weather (thunderstorms). RAPT is showing the J80 departures out of JFK green with some red.				
JFK-4-1	6	1903	North gate departures are now 15 miles in trail with no back-to-back on J80 due to volume. RAPT is now showing J80 departure most yellow with some intermittent red.				
JFK-4-1	7	2018	J6 which has been showing red for the past 5-6 minutes was just released. TMC was not aware that traffic had been stopped on J6. RAPT is still showing the J6 departure red.				

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EWR-4-1-	1	1206		TMD		ITWS
EWR-4-1-	2	1615		TMD		TSD/ITWS
EWR-4-1-	3	1707				
EWR-4-1-	3	1820	*(EP)	RP		
EWR-4-1-	4	1829				
EWR-4-1-	5	1832	SA-3			
EWR-4-1-	6	1903	SA-1			
EWR-4-1-	7	1930	SA-1	RP, EO		
EWR-4-1-	8	Note		TMD		
N90-4-1-	1	1110				

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N90-4-1-	2	1130	There is a large storm cell in the eastern half of N90 airspace (offshore). RAPT shows all routes green.		TMD		
N90-4-1-	3	1146	EWR holding due to volume and weather. Weather in southwestern Pennsylvania over J80. RAPT shows J80 red 1200-1210 then dark green		TMD		TSD
N90-4-1-	3	1148	N90 is holding for EWR due to volume and weather. RAPT shows J80 green to red.		TMD		
N90-4-1-	4	1157	The TMU is trying to reduce the RBV restriction so they can depart from 22L. RAPT shows all routes green.		TMD-LOU		
N90-4-1-	5	1203	There is one little cell in southern ZOB, Convective Weather Forecast anticipates the cell will cross J80 within 60 minutes. RAPT shows J80 yellow, echotops to 49 ENR then to red. The north gates are stopped by ZNY and N90 is trying to find out why. ZNY said it was due to volume and stops would be short.		TMD-S, RP		
N90-4-1-	6	1224	There are frequency problems with north gates due to previous weather but there is no MIT restriction in place.				
N90-4-1-	7	1230	N90 is still trying to ease the RBV 15 MIT restriction so JFK can depart both runways. (22L is still closed.)		TMD-LOU		
N90-4-1-	8	1232	West gates stopped due to volume.		TMD		
N90-4-1-	9	1236	North gates released by N90		TMD		
N90-4-1-	10	1245	A small cell with 50 kft tops in ZOB is impacting J80. When the observer asked if there were problems on J80, the TMC used TSD with the route overlay. The TMC states that the impact is not bad and they expect J80 to be clear in about 30 minutes.	*(EP)	TMD		TSD
N90-4-1-	11	1255	LGA in GDP until 0200. LGA flights from BOS are being held.				
N90-4-1-	12	1303	ZNY extends the RBV 15 MIT restriction.		TMD		
N90-4-1-	13	1315	ZDC is holding for LGA in order to balance fixes to release ZBW traffic. ZNY holding traffic at CAM because pilots are refusing to fly through level 1-2 weather.				
N90-4-1-	14	1328	ZBW is out of hold for LGA. RAPT shows all routes green.				
N90-4-1-	15	1329	ZDC is out of hold for LGA.				

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N90-4-1-	16	1336	ZDC back in hold for LGA and PHL.				
N90-4-1-	17	1401	ZNY stops DIXIE for weather.				
N90-4-1-	18	1404	N90 sectors stop north gates.		TMD		
N90-4-1-	19	1419	Departures on DIXIE are 20 MIT, WAVEY 15 MIT, and SHIPP 20 MIT thru 1630.				
N90-4-1-	20	1420	SHIPP 20 MIT due to weather and volume. There is a small cell impacting SHIPP				
N90-4-1-	21	1530	EWR in ground stop				
N90-4-1-	20	1805	There are cell still over J80 with 50+ kft tops. RAPT shows J80 red then yellow with the subsequent update; some time segments for WHITE are red but there is not obvious weather nearby. J80 is restricted 30 MIT for JFK and 20 MIT elsewhere.		TMD, RP		
N90-4-1-	21	1812	TMU asked what "number and ENR" means. RAPT showing red on J80 routes with echotops at 51ENR.				
N90-4-1-	22	1820	N90 conferred with JFK to determine departures for JFK. TMC looked at RAPT forecast and determined that the weather should be okay for JFK J6 departures as the weather should be north of J6. Decided to stay with RBV departures.				CIWS/RAPT/ CWF
N90-4-1-	23	1830	ZNY stopped J80. RAPT is showing J80 routes red with echotops at 57 ENR	*(SA-1)	TMD		CIWS/RAPT/ CWF
N90-4-1-	24	1930	ZNY stopped ELIOT for 10 min. due to volume, 2 sectors down. RAPT shows J80 red.				
N90-4-1-	25	2005	ZNY stopped traffic on J6 with the exclusion of IAD				
ZNY_4-1	1	1130	JFK in a ground stop until 1159 due to weather. ZNY in 3-hour P-times.		RP		CIWS
ZNY_4-1	2	1159	The weather just south-southeast of N90 is building. RAPT shows JFK: RBV J80 yellow to red ENR.				CIWS

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ZNY_4-1	3	1156	The JFK ground stop is cancelled. Weather is clearing but there are still issues with RBV. RBV is open but planes are deviating. RAPT shows JFK: RBV green.		PB, TMD, RP		DSR
ZNY_4-1	4	1204	ZNY stopped taking traffic from N90 through north gates due to volume.				
ZNY_4-1	5	1207	J36 closed due to volume. EWR DSP is down.				
ZNY_4-1	6	1217	Weather is clearing. A cell is impacting RBV to the north of RBV. Traffic seems to be moving better. There are no restrictions and the sectors are handling deviations. RAPT shows RBV yellow and green.				CIWS
ZNY_4-1	7	1235	N90 and JFK repeatedly requesting a reduction in RBV restrictions. ZNY says restrictions are in place due to staffing issues, not weather.				
ZNY_4-1	8	1246	JFK RBV J80 showing red on RAPT, echotops to 51 ENR until 1310. There is some very small cells right on J80 in ZOB with echotops around 50, but nothing is impacting traffic in ZNY or ZOB.				
ZNY_4-1	9	1300	ZNY looking for information regarding overhangs which seem to be causing a lot of issues for pilots. Also looking for PHL information.				
ZNY_4-1	10	1654	Weather is starting to build in the southwest corner of Pennsylvania, closing in on J80. Can't get to the RAPT display, but no one seems concerned about it.				
ZNY_4-1	11	1701	Scattered thunderstorms are building on J80. Tops are 31 to 45 kft. CIWS forecast shows some growth. RBV, ELIOT, and J80 are yellow ENR.		TMD, RP		
ZNY_4-1	12	1705	There are no issues on J80 at this time. ZOB is not passing back any restrictions and there are no impacts in ZNY. RAPT shows J80 red ENR.		RP, EO		
ZNY_4-1	13	1722	The weather is intensifying in the southwest corner of PA and moving along J80. RAPT shows J80 green. The STMC looks at CIWS for situational awareness and notes that the weather is building.		RP		CIWS VIL, Echo Tops, Forecast Contours



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ZNY_4-1	14	1725	J80 is restricted 15 MIT per strat by ZOB. RAPT shows J80 yellow/red ENR. The STMC looks at RAPT because the observer is monitoring it.		RP	Yes	
ZNY_4-1	15	1733	ZNY passes back a 30 MIT restriction to ZBW for J80 to accommodate ZOB restriction. The STMC looks at RAPT and sees that weather is about 90 to 120 minutes out. Weather will impact Area A. The Area Supervisor gave the STMC a heads up. The Area Supervisor looked at CIWS for situational awareness.	SA-2, I/IC, EP	TMD, RP		CIWS VIL Forecast
ZNY_4-1	16	1744	Weather is moving along J80 and approaching J6. J6 is not restricted yet. J80 is restricted 15 MIT per strat from ZNY to ZOB and 30 MIT from ZOB to ZNY. RAPT shows J80 yellow/green ENR; J6 yellow/green ENR. The STMC is watching CIWS to monitor the J80 situation and wonders when ZOB will close J80.		TMD, RP, EO		CIWS VIL, Echo Tops, Forecast Contours
ZNY_4-1	17	1811	Weather is moving along J80 east-southeast toward J6 in ZDC. There is no weather in ZNY. Weather is building along J6 in ZID. RAPT shows J80 red to yellow ENR; J6 green to yellow to green ENR. The STMC is expecting a SWAP but all weather is in adjacent Centers.		RP, EO,		CIWS VIL, Echo Tops, Forecast Contours
ZNY_4-1	18	1814	RAPT shows J80 completely red with echotops ranging from 47 to 52 ENR		RP		
ZNY_4-1	19	1823	ZOB closes J80 due to weather. RAPT shows the route yellow/red/yellow ENR.				
ZNY_4-1	20	1835	Holding traffic at CAMRN due to volume and ceiling and visibility.				
ZNY_4-1	21	1902	ZNY holding for EWR at PENNS due to visibility issues.				
ZNY_4-1	22	1905	J80 is now yellow/red/dark green and J6 is now showing green on RAPT.		RP		

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ZNY_4-1	23	1929	Areas A and C have CIWS displayed. Areas B and D are using WARP. Area B was using CIWS before the shift change. RAPT is showing J80 red with echotops in the high 40's ENR; J6 is yellow then red with echotops in the high 40's ENR.		TMD		
ZNY_4-1	24	1933	ELIOT shut down due to volume in next sector. ZNY is responding to restrictions from ZOB on J80. The Area A Supervisor is flexible and is working traffic without difficulties.		TMD		
ZNY_4-1	25	1941	RAPT shows J6 yellow to red ENR. J6 is open. ELIOT and MEDINA are resumed.		RP		
ZNY_4-1	26	1948	Weather is slowly moving west-southwestward in the southeast portion of ZOB airspace, heading toward the ZNY/ZDC border. Weather is impacting ZDC only. RAPT is showing J80 green and J6 red/yellow/red with echotops 49-51 ENR.				
ZNY_4-1	27	2010	Area A asks Area B for 15 MIT over PARKE due to weather on J6. The restriction is being passed to N90. RAPT shows J6 red ENR. CIWS is used for situational awareness.		TMD, RP		CIWS
ZNY_4-1	28	2029	Weather is moving from northern ZID into southeastern ZOB and appears to be growing. RAPT shows J80 yellow echotops 47 ENR. The STMC looks at RAPT and CIWS for situational awareness and comments that it seems really quiet given the weather in ZOB.	SA-1	RP		CIWS VIL, Forecast Contours
ZNY_4-1	29	2035	The observer gave a RAPT briefing to the STMC and discussed the echo tops information in the timelines. Observer also spoke to the numbers and timeline in the animated window. The STMC notes that RAPT is becoming more useful for situational awareness and to anticipate issues.			Yes	
ZNY_4-1	30	2100	ZOB requests pathfinders for J80. RAPT shows J80 green.		TMD, RP		

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ZDC-4-1-	1	1105	RAPT is displayed as a window on CIWS at TMU STMC position in the EWR configuration. CIWS products being displayed are: Precipitation, Satellite, Growth and Decay Trends, Echo Tops, Storm Motion, and Forecast.		TMD		
ZDC-4-1-	2	1120	ZDC opens J121 and J174. These routes were closed at 1039 due to weather.		TMD		
ZDC-4-1-	3	1123	An area of convection is over Long Island, CT, RI, and MA. The south edge is at WAVEY with echo tops to 31 kft. Level 3-5 is centered over northeast Long Island with echo tops to 52 kft. RAPT shows all routes green. RAPT was opened by the observer upon arrival.		RP		
ZDC-4-1-	4	1129	<p>A large Level 5 – 6 storm mass with echo tops up to 50 kft is mostly over southern Long Island and moving rapidly east. The storm had an associated EF-2 tornado touchdown about 1032Z in the Bay Ridge area of Brooklyn. Flight cancellations and delays are reported by LGA, JFK, and EWR due to the storm conditions and heavy rainfall. Level 2 – 3 weather with echo tops ~32 kft is in southern and central NJ in vicinity of PHL, ARD, OOD, VCN, SEI, WHITE and CAMRN. A mass of isolated cells is forming in southern ZOB in the west/central areas of southern PA and in area of route J80.</p> <p>Restrictions:  JFK CAMRN 20 MIT 1015 – 1200 ZNY:ZDC  LGA RBV 15 MIT 1100 – 1500 N90:ZDC  PHL GDP 1200 – 1859 weather/Low Ceilings</p> <p>The STMC asks the TM Coordinator Position if J121 and J174 are open yet, so he can officially log it. The STMC announces the ZBW ground stop at 1124.</p> <p>RAPT shows all routes green.</p>		TMD, RP		

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ZDC-4-1-	5	1140	ZNY cannot allow deviations west of RBV. RAPT shows the routes green.		RP, TMD		
ZDC-4-1-	6	1144	LGA and EWR can use WHITE but not WAVEY. A pathfinder from ZBW is attempting J174 (COM158).		TMD		
ZDC-4-1-	7	1145	ZNY is not accepting any traffic from ZDC except those destined for ZBW. RAPT shows J79 green.				
ZDC-4-1-	8	1147	The STMC and ATCSCC agree to no offloading on J220. The STMC uses CIWS for situational awareness.				CIWS
ZDC-4-1-	9	1150	The STMC and Area 8 Supervisor discuss the need for two or three pathfinders from DC metros to ZBW on J121/J174, but ZBW does not want them to deviate east. N90 shuts off ZDC for EWR via the hotline.		TMD		
ZDC-4-1-	10	1155	The JFK ground stop is cancelled 12Z. ZDC requested ZNY send a pathfinder over J174/J121.		TMD		
ZDC-4-1-	11	1156	The STMC and ATCSCC are trying to determine if a pathfinder for J174 has been identified yet. The STMC consults CIWS and states "looks like all J42."		TMD		CIWS
ZDC-4-1-	12	1159	The STMC and Area 8 Supervisor determine a path for the J174 pathfinder via Manchester. RAPT shows J174 green.	*(RO)	RP, TMD		
ZDC-4-1-	13	1200	They are still looking for a pathfinder for J121/J174 from ZNY. ZNY says they are working on a route to ZBW.				
ZDC-4-1-	14	1203	ATCSCC requests a route from ZDC for the J174 pathfinder. The STMC says they are still working on it.		TMD		
ZDC-4-1-	15	1210	The STMC identifies Speedbird as the J220 pathfinder.				
ZDC-4-1-	16	1215	ZNY says there is no route to ZBW, the pathfinder didn't make it. RAPT shows all routes green		TMD		
ZDC-4-1-	17	1220	ZDC is hoping to open RBV departures except for ZBW. A small cell is north of WAVEY. RAPT shows ELIOT yellow, echotops 47 ENR, all others green.		RP		

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ZDC-4-1-	18	1225	Back to normal routes except for ZBW.				
ZDC-4-1-	19	1245	BOS Ground Stop cancelled, APREQ BOJets until 1415 on EDCTS. A cell just south of J80 in the mid PA/MD border has RAPT showing J80 red.		RP		
ZDC-4-1-	20	1247	A large storm mass of Level 5 – 6 weather off southern Long Island is moving east and out of ZNY, while still in eastern N90 airspace. There are small isolated cells in southern PA at the intersection of ZOB/ZNY/ZDC in the vicinity of route J80 traffic. There is mostly Level 1 – 2 weather still in central NJ and moving off the NJ coast. A single small cell off J80 is causing RAPT to show J80 mostly red, due to high echo tops (51 kft).		RP, EO		
ZDC-4-1-	21	1315	ZDC is holding for LGA. Pilots at JFK don't want to go through level 1-2 convection so ZDC is expecting a hold for JFK also.		PB, TMD		
ZDC-4-1-	22	1337	JFK took low altitude out of hold, but are still spinning high altitude arrivals.				
ZDC-4-1-	23	1620	A small level 3-4 cell is in the southwest corner of PA over J80 and moving southeast at 15 to 20 kn. A second cell is on the PA/MD border. RAPT shows ELIOT green.		RP		
ZDC-4-1-	24	1802	RAPT shows J80 red ENR for departures at and after 1755.				
ZDC-4-1-	25	1805	A long east-west line of level 4 – 6 storms in southern ZOB contains embedded strong level 6 cells with tops 47 – 56 kft. This weather is affecting J80 and moving towards J6, tracking southeast into ZDC. RAPT now shows J80 yellow.		RP		
ZDC-4-1-	26	1805	An east-west line of level 4 - 6 cells is lying along J80. CIWS shows leading edge echo tops of 31 kft. Echo tops reach 55 kft in the line. RAPT shows ELIOT red/yellow.				
ZDC-4-1-	27	1808	A line of weather stretches across the southwest corner of PA into WV and OH. CIWS shows echo tops reaching 60 kft. RAPT shows ELIOT red and yellow ENR, PARKE green and yellow ENR.		RP		

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ZDC-4-1-	28	1824	Beginning at 1945, ORD will be as one. RAPT shows ELIOT J80 yellow then red for 1835 departures. RBV J80 is yellow then red for 1850 departures.				
ZDC-4-1-	29	1827	The line of weather is breaking into three distinct groups: along southwest PA/MD panhandle (level 5-6); second stretches north the westward from the first area, level 4-6 cells; the third area is just north of J80 on an east-west line - level 4-6 cells embedded in level 2-3 activity.		RP		
ZDC-4-1-	30	1834	The first cluster of cells in the east-west line through southwest PA is decaying. RAPT shows J6 green, J80 red.				
ZDC-4-1-	31	1841	The leading clusters in the line are moving into MD panhandle/WV. The rest of the east-west line still lies along J80. ZDC is blending a single stream along the east coast due to volume and weather. RAPT shows J80red ENR, J6 green.				
ZDC-4-1-	32	1846	A line of convection from the MD panhandle stretches west-northwest through the southwest corner of PA into OH. RAPT shows J6 PARKE and RBV yellow beginning with 1850 departures and J80 red.		RP, EO		
ZDC-4-1-	33	1855	The CWSU briefs the STMC using the CIWS display. The CWSU believes that the line of storms is not as aggressive as the CCFP thinks it is.				CIWS
ZDC-4-1-	34	1926	The CWSU briefs the STMC that there is a severe thunderstorm warning in Ohio. The STMC consults CIWS for situational awareness and to verify the CWSU forecast.				
ZDC-4-1-	35	1937	CIWS shows no cells with echo tops higher than 30 kft in the NY/ZDC area. RAPT shows J64 green, J80 yellow/red/yellow with tops to 55 kft, J6 yellow to red for 1950 departures over JFK: RBV and LGA: PARKE (echo tops 53 kft), and J48 red through 1940 departures with tops to 55 kft.		RP, EO		

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ZDC-4-1-	36	2009	The same convective line is moving over extreme north WV and along south PA border. CIWS is still showing all storms decaying over extreme northeast WV/north VA border. RAPT shows J80 green, J6 red.				
ZDC-4-1-	37	2012	The STMC tells the Departure Position TMC that J6 is open to ZNY, because the weather is breaking up. J6 is open with 15 MIT for ZNY:ZDC due to deviations. RAPT shows J6 red ENR.		RP, EO		
ZDC-4-1-	38	Note	The ZDC STMC states that he only cares about the airspace west to the border of WV in ZID. Anything further is not useful.		EO, TMD		
ZOB-4-1-	1	1107	Scattered level 4+ cells are located in the southeast section of ZOB. Tops are 64+ kft near the J152/J211 intersections. Weather is drifting east. According to the Area 6 Supervisor, traffic is deviating right on J211 and left on J518. The STMC relayed this information to the CP TMC and suggested treating the traffic on these routes "as one." The CP TMC looked at CIWS and demand (ETMS). The demand is dropping off so no change was made. The observer displayed RAPT upon arrival. EWR air routes are displayed. All are green except J80, which is red/yellow/red ENR.		PB, TMD	Yes	CIWS, ETMS
ZOB-4-1-	2	Note	A tornado warning has been issued for the NY metro area. All NY airports except JFK are ground stopped void 1120 and extended to 1200. There have been no departures from N90 since before 5:30 AM local.				
ZOB-4-1-	3	1114	ZOB is holding for NY metros. RAPT shows all routes green.		EO		
ZOB-4-1-	4	1128	The NY position TMC indicates that the weather had cleared JFK about 10 minutes ago. He calls NY (ZNY? N90?) to see if they could start coming out of the hold. NY denies the request even though the traffic is about one hour away. Lightning was sighted near the airport.	*(AHD) I/IC	TMD		CIWS

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ZOB-4-1-	5	1144	The NY position TMC had problems getting clarification from ZBW on what traffic they were taking. ZBW is now taking all but JFK (ground stopped) with 30 MIT per airport. ZOB is now out of the hold for JFK (1146). RAPT shows J80 green/yellow ENR/red ENR/green		TMD-S, RP		
ZOB-4-1-	6	1200	The observer notices that J80 on RAPT flickers from impacted to clear. There is a small cell near J80 and as the forecast for this cell changes, RAPT flickers.		RP, EO		
ZOB-4-1-	7	1252	The ZOB TMU is very quiet at this time. J8 is red ENR. It appears that weather clears the route before aircraft enter ZOB airspace. The observer questions red status.		RP, EO		
ZOB-4-1-	8	1430	Very light showers are in southwest ZOB. There is not impact on traffic.				
ZOB-4-1-	9	1700	The CP TMC uses CIWS to note development of cells on J80. RAPT shows all routes green.		RP		CIWS VIL, Satellite, Echo Tops
ZOB-4-1-	10	1708	The Area 6 Supervisor reports deviations on J80. The CP TMC does nothing. Deviations are only one mile north of J80. RAPT shows J80 red/yellow/red ENR.		PB, RP, TMD		CIWS Echo Tops, Precipitation, ETMS
ZOB-4-1-	11	1712	The CP TMC coordinates with Area 6 concerning the cells on J80. He reports that he is "keeping an eye on it." Area 6 is anxious to do something about J80 traffic. The CP TMC does not want to make changes just yet. RAPT is not displayed.		TMD		CIWS Echo Tops, Precipitation, Storm Motion
ZOB-4-1-	12	1718	The CP TMC notes that the echo top of the cell on J80 was 49kft. RAPT shows the route green.		PB, TMD, EO		CIWS Echo Tops
ZOB-4-1-	13	1723	J80 has been restricted 15 MIT per strat due to weather and deviations. The cells near J80 are scattered, level 6 with 50+ kft tops. RAPT shows the route yellow/red/yellow/green/yellow.		RP, TMD, EO		CIWS Satellite, Precipitation, Echo Tops



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ZOB-4-1-	14	1744	ZID calls concerning J80. They are asking if ZOB wants MIT on J80 for NY traffic. The CP TMC states that the current 15 MIT is working, so no change is implemented. After the call, the CP considers closing J80 and moving the traffic to J6/J64. He looks at RAPT for situational awareness. RAPT shows J80 yellow ENR, green/yellow/green; J48 red ENR.	SA-2, SA-3	EO, RP		CIWS Echo Tops, Growth and Decay Trends, Forecast Contours, Precipitation
ZOB-4-1-	15	1750	The CP and STMC are worried about the 56kft cell north of J80 at ZID/ZOB boundary. The STMC suggests increasing the MIT restriction. No change at this time.		TMD		CIWS Echo Tops, Growth and Decay Trends, Forecast Contours, Precipitation
ZOB-4-1-	16	1756	RAPT is back to green on all routes. The weather in southeast ZOB is becoming more linear and oriented east-west along J80/J152. Tops are consistently above 40 kft.		EO, RP		
ZOB-4-1-	17	1804	The STMC uses the CP position SD to look at weather on J80 and RAPT. He wants to confirm that, according to RAPT, J80 is closed. However, traffic is still using J80 because there is room to deviate. In addition, traffic on J80 has been thinned by moving some to J6 to allow more room to deviate. RAPT shows the STMC what he expects. The CP says he is surprised that J80 is still open; it is usually closed when there is any type of weather near it.	SA-2, SA-3	PB, RP, TMD		CIWS Echo Tops, Growth and Decay, Forecast Contours, Precipitation, Storm Motion
ZOB-4-1-	18	1808	The CP TMC comments on RAPT "flicker" to the STMC.		EO		

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ZOB-4-1-	19	1813	The CP TMC wants to close J80. He coordinates with Area 6. The STMC asks about volume and deviation room. He notes that a playbook route is being used and it will thin the volume. Area 6 says to keep J80 open a while longer. Aircraft are deviation north, but are OK for now. The observer asked why there was so much discussion about closing J80. The CP said that if the route is closed, there is constant pressure to open it again. They will sometimes implement a MIT restriction that makes the route unusable for NY and NY will close the route themselves and not "bug" ZOB. The CP decides to close J80 from ~1825 – 2030.		PB, TMD		
ZOB-4-1-	20	1840	The CP TMC is discussing J80 with Area 6. He quotes what CIWS shows. The point of discussion is not clear. A line of storms on J80/J152 persists with tops 50+ kft. Cells on west end of line within ZOB airspace are decreasing in strength and merging into a more solid line (gaps filling).		TMD		CIWS Echo Tops, Growth and Decay, Forecast Contours, Precipitation
ZOB-4-1-	21	1844	The CP TMC calls ATCSCC concerning DC metros. Aircraft want to go south of the weather from north of the line. The CP TMC wants to take traffic from ZAU through ZID, bypassing ZOB. ATCSCC contacted ZID, who refused (1850) based on concerns about volume and tactical reroutes.		TMD		All CIWS products except Forecast Contours
ZOB-4-1-	22	1905	The CP TMC warns the ORD position TMC that he can expect to lose ORD in about 10 minutes. Meanwhile in ZOB, the weather at the western end of the line continues to dissipate. The east end of line continues to be quite strong.		TMD		WARP
ZOB-4-1-	23	1915	The STMC announces that they are moving DC metro traffic from ZAU through ZID and south of the weather. He offered ZID the option of moving traffic back into the southeast corner of ZOB south of the weather. ZID accepted the route as a possible offload. The STMC uses CIWS to prepare for the SPT.		TMD		All CIWS products except Forecast Contours
ZOB-4-1-	24	1934	RAPT shows J64 red for the period but this does not appear to be correct. The forecast loop suggests the route would be clear by 1936.		RP, EO		

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ZOB-4-1-	25	1945	The CP TMC uses CIWS during a hand-off briefing. The line of weather on J152/J80 continues to sink slowly south without changing much in character.		TMD		All CIWS products except Forecast Contours
ZOB-4-1-	26	1952	The STMC looked at CIWS, RAPT, and WARP for situational awareness.	SA-2			CIWS, WARP
ZOB-4-1-	27	2031	Opening J80 for ZID internals from NY metros landing ZID AOB 22kft. Weather is finally beginning to dissipate. CIWS was used for coordination and situational awareness.		TMD		All CIWS products except Forecast Contours
ZOB-4-1-	28	2138	RAPT shows J80 green. ZID internals from NY are already using J80. The observer asked if J80 could not be officially opened. The CP TMC said that it probably could be opened, but there was a big cell on the route in ZID airspace.	*(RO)	TMD, RP	Yes	All CIWS products except Forecast Contours
ZOB-4-1-	29	2142	Area 5 calls to request that J64 be closed due to deviations. The CP TMC uses CIWS to determine that the cell is moving off the route. No action is taken. RAPT shows J64 yellow, green, yellow ENR.		RP, TMD		All CIWS products except Forecast Contours
ZOB-4-1-	30	2147	The CP TMC calls Area 6 to check the status of J80. He tells the Supervisor that the route "looks fine on CIWS." This is in response to the observer's question about opening J80 at 2138Z.		TMD	Yes	All CIWS products except Forecast Contours
ZOB-4-1-	31	2148	The CP TMC coordinates with ATCSCC and ZID and requests that J80 be opened. ZID denies the request. This is in response to the observer's question about opening J80 at 2138Z.		TMD	Yes	

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ZOB-4-1-	32	2237	ZOB closes J64 at the urging of Area 5 due to deviations. Traffic is moved to J60. The weather throughout ZOB is dissipating. The strongest cell is now in ZDC airspace. The cells that comprised the western end of the line have moved northeast and dissipated into isolate cells and showers. RAPT shows J64 red ENR. J64 has been red for some time, but no action was taken until the Area 5 request.		RP, TMD, EO		All CIWS products except Forecast Contours
ZOB-4-1-	33	2310	ZOB is trying to open J80. The weather that was causing the problem in ZID airspace is dissipating. On the hotline they announced that J80 was closed to all traffic for locations west of ZID. ZID internals and those further east with destinations in ZID could use the route.		TMD		
ZBW-4-1-	1	1150	Strong thunderstorms are on and just west of J174 and J121 and on BOS. ZBW is ground stopped for all NY, although LGA just opened. J80 is rerouted. RAPT is not open.		TMD		CIWS Forecast, Precipitation, Echo Tops, TSD, WARP
ZBW-4-1-	2	1210	BOS delays are +120 minutes. NCC (National Command Center?) wants to know if the weather has cleared BOS so it can open.				CIWS Forecast, Precipitation, TSD
ZBW-4-1-	3	1220	Weather is on J80 and J80 is closed until 1400. It should not be. RAPT shows J174 green The observer started RAPT at the STMC position. ZBW cannot use RAPT for J174 closed for then.			Yes	
ZBW-4-1-	4	1250	An isolated, 50 kft storm cell is on J80. Also, level 1-2 showers developed over BOS in the past 20 minutes. Visibility is decreasing. RAPT shows J80 red.		RP		
ZBW-4-1-	5	1400	Most of the weather is off the coast. J174 pathfinders had no problems and J174 is open for all but PVD. RAPT shows all routes green.	*(RO)	RP		

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ZBW-4-1-	6	1900	J80 has been closed due to thunderstorms with 50 kft tops along the route. Thunderstorms are developing in central VT/NH/western MA. RAPT shows J80 impacted but the STMC is not using RAPT.		RP		
ZBW-4-1-	7	2040	The only concern in ZBW is the storm northwest of PVD. There is no lightning in this level 6 cell. RAPT is not displayed. The STMC glances at CIWS for situational awareness.				CIWS
COA-4-1-	1	1130	CIWS and ITWS are on the displays. RAPT shows EWR all green.		TMD		
COA-4-1-	2	1224	Showers are moving toward J80. RAPT shows J80 yellow for 1235 departures. The Supervisor uses RAPT to coordinate internally. The leading COA aircraft is going to FL and uses a different fix.	SA-1, I/IC, EP			Flight Explorer, CIWS Echo Tops
COA-4-1-	3	1246	Small cell is moving over J80, RAPT is showing J80 red with echotops 51ENR.				
COA-4-1-	4	1301	The departure queue is beginning to get length again. The normal departure push is shifted later due to early morning weather. RAPT shows J80 green.		TMD		CIWS, SIA
COA-4-1-	5	1416	There are currently no weather-related problems.				
COA-4-1-	6	1453	Runway 29 departures are terminated. It is too hot and taking too much runway for take offs.		TMD		Flight Explorer, CIWS
COA-4-1-	7	1643	Small cells are forming in western PA and moving est. RAPT shows J80 yellow ENR for 1700 departures.		RP		CIWS Forecast, ITWS Winds, Flight Explorer
COA-4-1-	8	1715	RAPT shows ELIOT J80 yellow ENR.		RP		
COA-4-1-	9	1749	Storms are in western PA and eastern OH. The Supervisor wonders why there are no stops. The observer explains that there is room to deviate in ZOB.				

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COA-4-1-	10	1804	RAPT has been flipping back and forth between red and yellow for EWR: ELIOT J80 ENR. All fixes and routes remain open according to SIA. The observer fields questions concerning RAPT behavior. Now SIA shows J80 ELIOT 8 MINIT through 2030.		EO, RP, TMD	Yes	CIWS Forecast, Flight Explorer
COA-4-1-	11	1822	RAPT shows ELIOT J80 and J64 red ENR and WHITE J79 red ENR. The only restriction is ELIOT J80 8 MINIT until 2030. The COA Supervisor uses RAPT to see that the impact is en route, but the estimated impacts do not match actual restrictions.	SA-2,	EO, RP		
COA-4-1-	12	1838	J80 is stopped. RAPT continues to show J80 red ENR.		RP		
COA-4-1-	13	1841	ITWS web winds appear to be OTS. COA relies heavily on ITWS winds.		TMD		ITWS
COA-4-1-	14	1856	RAPT shows ELIOT red and PARKE J6 red. The Supervisor asks about the RAPT overwarning.		RP, EO		CIWS Forecast
COA-4-1-	15	1925	Currently WHITE is restricted 5 MINIT, ELIOT is 8 MINIT, and J80 is stopped. RAPT shows ELIOT J64 and J80 red ENR.		RP		
COA-4-1-	16	2005	PARKE J6 is stopped excluding IAD. RAPT shows ELIOT J80 and PARKE J6 red.		RP		CIWS Forecast

**RAPT Benefits Assessment  
BLITZ #4 Observations Summary  
Day 2 - August 9, 2007**

**Participating Facilities: LGA, EWR, N90, ZNY, ZDC, ZOB, Continental Airlines**

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LGA-4-2-	1	1550	Local NYC weather is sunny with unrestricted visibility. ATC is very busy launching planes on R13 and landing planes on R04. A large area of level 4-6 thunderstorms and rain is present in south central PA along J6. Additional convection is located in northeast OH into northwest PA. J80/6/48/60/75 are all stopped for weather which is consistent with RAPT blockage guidance. A SWAP is already activated and there are many existing route restrictions.		RP, TMD		
LGA-4-2-	2	1605	The Tower Supervisor uses RAPT to plan ahead and conclude that gates and routes to the southwest will start getting more restrictions and possible closures. BIGGY J75 was green, then yellow for 1615Z departures, then red for 1630Z departures. The Supervisor saw in the RAPT graphics section that a large area of thunderstorms is forecasted to drop south and east and impact BIGGY J75 over the next 30 minutes with echo tops of 35kft – 37kft. The Supervisor requested that the observer show him the status of J75. The observer explained that RAPT forecast green for now, then yellow (for possible route impacts) starting at 1615Z. Anyone scheduled to depart LGA at 1630Z would likely need a reroute. The Supervisor swung around and advised his ground and local controllers of the forecast route impacts. The observer did not influence his decision but did provide the “assist”.	SA-2, EP, *(I/IC, PRSA)		Yes	

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LGA-4-2-	3	1622	Approximately 30 aircraft are waiting to depart and many have shut down engines completely to save fuel because west gates are closed. Aircraft are PARKE on the taxiways out of the way of those who could still depart to the north, south, and east. A CPC states that LGA is not nearing gridlock yet. Note: The observer did not want to suggest using the CDR tab on the RAPT route selector because it might bias the blitz. It appeared possible, based on the location of the weather at the time and RAPT forecast, that westbound departures could get out by just deviating north around a large area of storms.	*(RRP)	TMD, RP		
LGA-4-2-	4	1648	WHITE J79/J209 is stopped just as one plane filed for the same gate/route is cleared for takeoff. RAPT shows J79 and J209 green for the next 30 minutes. It was a curious forecast because there was no weather near WHITE. The Supervisor later said that the gate was closed due to volume. Planes headed west were being routed over WHITE, which is currently too congested to keep running.		TMD, RP, TMD-S		
LGA-4-2-	5	1600	LGA departures are beginning to queue with approximately 38 planes waiting for a useable route. Local ATC is currently developing a plan to put those who cannot depart (no route available) away from those who can. The Supervisor asks for some relief from N90/ZNY with a possible 10 mile gap between departures. There is much discussion about where everyone should go; either to a ramp, back to a gate, or a different taxiway. Some planes are crossing the active runway to get back to a gate or different taxiway. This is how LGA gridlock begins.	*(PRSA)	TMD		
LGA-4-2-	6	1707	BWI is ground stopped. There is no reaction in the tower since all west gates are still stopped (which was consistent with RAPT).		RP		
LGA-4-2-	7	1711	WAVEY departures only are open with APREQ. The Supervisor calls N90 to get approval to launch two planes through WAVEY but is put on hold. There is no significant weather over WAVEY and the Supervisor expresses displeasure with the support he is getting. Shortly thereafter, N90 grants approval for both to depart, with 8 minutes separation.		TMD, TMD-LOU		



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LGA-4-2-	8	1725	LGA is able to flush the departure queues a bit and tensions are easing. N90/ZNY helped LGA by not stopping or closing any more gates. Local ATC is instructing crews to start engines. There does not appear to be any chance to shuffle the departure sequence to take advantage of routes that opened first.		TMD		
LGA-4-2-	9	1752	Approximately 44 aircraft are waiting to depart at this time and LGA is approaching gridlock again. The Supervisor indicates that he does not have time to rearrange the departure queue.		TMD		
LGA-4-2-	10	1759	The Supervisor pushes to reduce departure restrictions and N90 is now 5 MINIT over WHITE. ATC is scrambling to launch all backlogged aircraft filed for WHITE. RAPT shows J79 WHITE all red with echo tops to 49kft. RAPT shows J209 green through 1815Z then yellow. There is a small but strong thunderstorm in eastern VA and NC; otherwise J79 appears fine. Pilots must be able to deviate around the small cells. There is an urgent need to get planes out of LGA to free up parking.	*(RO, I/IC)	TMD, RP, EO		
LGA-4-2-	11	1926	The TMC stops on all arrivals to LGA. There are 20 aircraft holding the air that should start landing soon. There has not been an arrival in the past 20 minutes or so. The TMC wants to clean up the airport and change the landing runway. The 20 planes spinning northwest and southwest of LGA are being sequenced in. TMC wants an “easy” rate at first to see how his plan works. Note: The first arrival landed at 1928Z on R22. They were landing R04 earlier. RAPT was visible for the TMC and Supervisor but they were playing catch-up and did not use the tool.		TMD		

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LGA-4-2-	12	1932	The TMC is trying hard to get someone out via J75. The TMC shows the observer that J75 was a viable route on RAPT since it is green, then yellow at 1955Z with tops only to 25kft. He uses RAPT for guidance to request proactive routing but unfortunately, either N90 or ZNY will not open the route. The TSD is used for supplementary weather information.	SA-3, EP	TMD, TMD-LOU		TSD
LGA-4-2-	13	2007	LGA cannot take any more traffic and the airport is gridlocked. The TMC (or possibly the Supervisor) says 60 aircraft are sitting on the ground. It is imperative that departures resume before arrival traffic is started. LGA airport congestion is overriding RAPT guidance. A 25-rate is possible pending some aircraft getting out. On several occasions, LGA has proposed a usable route based on RAPT, the TSD, and common sense; and N90 and ZNY agree. The flow of information is reversed because LGA does not have the “big picture” and seems to be driving decisions. Maybe LGA was given priority over other Northeast airports.	SA-3, EP, RO	TMD		
LGA-4-2-	14	2034	Departure delays are one hour. There are 21 planes stuck in a line on one taxiway.		TMD		
LGA-4-2-	15	2052	A giant bow echo is present across Ohio and a second smaller bow echo is present across southwest PA. Weather-wise, north gates are still good so GREKI CAM, GAYEL J95, and COATE J36 are still green.		RP		
LGA-4-2-	16	2102	According to the TMC, RAPT is showing what is operationally flyable. North routes are green, but the Command Center has been taking so long to react that problems continue appearing with ZNY TFM.	SA-2, EP	TMD-LOU, RP		
LGA-4-2-	17	2118	The TMC is trying to reach ATCSCC to ask a question. He is using the TSD to manage traffic and is moving the cursor over routes of interest to highlight various options. It would be nice if RAPT had a similar route highlight feature.		UR		

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LGA-4-2-	18	2135	WHITE traffic is stopped, PARKE is open, and DC traffic is low level only. As soon as the TMC questioned N90 about why WHITES were stopped, N90 opened the fix. According to the Supervisor, ATC is letting aircraft deviate around all the convection with echo tops of 48kft in VA and along J79 and J209. They were not getting any complaints and RAPT actually made a good forecast of WHITE routes as red.		TMD, RP, PB		
LGA-4-2-	19	2150	All west gates are still stopped and some low level routes are open but the ground controller is frustrated because of odd routing coming down. He cannot establish the departure sequence because once it changes too frequently.		TMD-LOU		
LGA-4-2-	20	2315	ZNY requests AA785 fly as a route checker via PARKE since all west gates are stopped. RAPT shows all routes to the west as blocked with echo tops up to 33kft.		TMD, RP		
LGA-4-2-	21	2323	AA785 departed LGA filed for PARKE. The intention is if AA785 makes it to PARKE, west gates will reopen, even though RAPT shows all west gates red.		RP, TMD		
LGA-4-2-	22	2353	AA785 traverses J6 and the route is open, even though the aircraft appears to be surrounded by weather on the TSD.		RP, TMD		
LGA-4-2-	23	0008	PARKE is being used but RAPT still shows J6 red with 32-33kft echo tops. The forecast is good but the route is open even though it intersects level 3 and level 4 convection. The TMC viewed RAPT and said PARKE should close soon because crews can deviate only so much.	SA-2	TMD, RP, PB		
LGA-4-2-	24	0140	WHITES are stopped but BIGGY and PARKE are open and being used. RAPT shows WHITE J79 red, then yellow for 0145Z departures and WHITE J209 green, then yellow at 0145Z. BIGGY J75 is red then yellow for 0155departures. ATC did not make any decisions based on RAPT but the routes are being used when RAPT shows them blocked.		RP, EO		

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LGA-4-2-	25	0144	ZDC is rerouting J48 traffic over J6 which has worse weather. The TMC pointed this out to the observer and asked why. RAPT shows J48 all green. J6 is red then yellow at 0205Z. The TMC does not understand why ZDC would make this decision. Even the TSD shows weather is more intense over J6 with echo tops up to 50kft.	SA-3	TMD-LOU, RP		TSD
LGA-4-2-	26	0223	J48 and J75 are still closed. RAPT shows J48 yellow then red at 0220Z and J75 is all red. The TMC questions both routes since there are planes waiting to depart LGA for Tampa, MCO, and CLT. He sees that both routes are blocked on RAPT and the CDR tab did not provide any alternate routing to Florida or Charlotte. The TSD was used but there was no assist with using RAPT. If CDRs had been available on RAPT, the TMC might have used them to make the case to N90 and ZNY since he really wanted to get the planes off the airport.	SA-1, *(RRP, I/IC)	UR, RP, TMD		TSD
EWR-4-2-	1	1530	ELIOT, PARKE and LANNA are stopped. A call is out for a J60 pathfinder. EWR does not have one. RAPT is not displayed.				TSD, ITWS
EWR-4-2-	2	1600	BIGGY is stopped. There is a small cell on J75. A SWAP is in place. There are no delays at EWR. Demand is low at this hour. A large level 5/6 cell 100-150nmi west of EWR is impacting ELIOT routes. PARKE and LANNA and moving towards BIGGY. RAPT shows BIGGY yellow for 1610 departures; ELIOT, PARKE, and LANNA red, echotops 30-37.		TMD, RP		
EWR-4-2-	3	1630	A controller offers to re-route a plane over WHITE. The plane would need to refuel. The pilot calls his dispatch, gets permission for the re-route and heads back to gate for fuel. The west gates are closed. RAPT is not displayed.		TMD		
EWR-4-2-	4	1645	WHITE is stopped due to volume. RAPT shows COATE yellow. Only WHITE and GREKI CAM are green. The TMC checks RAPT and asks again about adding the MERIT route.	SA-1	TMD, UR	Yes	
EWR-4-2-	5	1654	WHITE is released 7 MINIT				

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EWR-4-2-	6	1700	LANNA, ELIOT (J64, J80), PARKE, and BIGGY are closed. ELIOT J60 is 7 MINIT. RAPT shows weather on all EWR routes. GREKI, GAYEL, and WHITE are green. J60 is yellow for 1730 departures. The observer discussed RAPT with the TMC.		RP	Yes	
EWR-4-2-	7	1720	WHITE is stopped for 30 minutes. RAPT shows WHITE red/yellow. The observer does not see any weather on WHITE routes.		RP		
EWR-4-2-	8	1735	Two aircraft are allowed to depart over WHITE in an attempt to open the route. RAPT shows WHITE is red. ELIOT is stopped for 20 minutes.		RP, TMD		
EWR-4-2-	9	1743	WHITE is stopped due to volume. The TMC noticed that RAPT had crashed. The observer restarted RAPT and it shows WHITE routes green.		RP, EO		
EWR-4-2-	10	1748	WHITE is stopped until 1830. ELIOT J60 is released. RAPT shows J60 red ENR		RP, EO		
EWR-4-2-	11	1755	A controller is trying to get one plane released over WHITE. RAPT shows J60 red ENR.		TMD		
EWR-4-2-	12	1800	WHITE is released with 8 MINIT. EWR receives departure times for two ELIOT flights.		TMD-LOU		
EWR-4-2-	13	1806	Cells are growing near the WHITE routes. RAPT shows WHITE yellow. EWR is still moving aircraft and no backups are observed on the runways.		TMD, EO		
EWR-4-2-	14	1841	J60 is stopped. RAPT is not displayed.		EO		TSD, ITWS
EWR-4-2-	15	1846	WHITE and all west departures are closed except J60. Convective cells continue to grow on the WHITE routes. RAPT shows PARKE J6 and BIGGY J75 yellow, WHITE red 49 ENR.		RP		
EWR-4-2-	16	1911	ELIOT is stopped. RAPT shows J79 yellow.		RP		
EWR-4-2-	17	1927	J60 is released. RAPT shows J60 red for 1940 departures, BITTY J75 green. The observer was asked to demonstrate some RAPT features.		RP,EO	Yes	
EWR-4-2-	18	1930	West except J60, WHITE, DIXIE, PHL, BWI, IAD, and DCA are stopped. RAPT is not displayed.		EO		

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EWR-4-2-	19	1952	PARKE is released 7 MINIT. EWR delays are +60 minutes. RAPT shows PARKE and BIGGY yellow. The Supervisor asked the observer to show him the north routes on RAPT.		RP	Yes	
EWR-4-2-	20	2000	The Supervisor calls N90 to ask about north releases.	*(RO, SA-3)			
EWR-4-2-	21	2011	PARKE J6 is released. RAPT shows J6 green then yellow for 2020 departures, echotops 48ENR.	*(SA-3)	RP		
EWR-4-2-	22	2015	LANNA J48 is currently stopped. RAPT shows weather moving off LANNA. The route is currently yellow.	*(RO)	RP		
EWR-4-2-	23	2051	LANNA is stopped. PARKE is 7 MINIT. RAPT shows GREKI/CAM, COATE, and GAYEL green; ELIOT and WHITE red; PARKE and LANNA yellow .		RP		
EWR-4-2-	24	2123	PARKE is released. RAPT shows PARK red for 2140 departures. The Supervisor looked at RAPT and said that the opening of PARKE would not last long.	SA-2, SA-1	RP		
EWR-4-2-	25	2125	A controller receives a call to release WHITE. The controller asks what RAPT is showing. RAPT shows WHITE red. Another call immediately follows saying that WHITE is not open.	SA-3	TMD-S, RP		
EWR-4-2-	26	2135	WHITE is open with 8 MINIT. RAPT shows WHITE red.		RP, EO		
EWR-4-2-	27	2139	LANNA is open with 7 MINIT. RAPT shows LANNA yellow. PARKE is stopped. RAPT shows PARKE red, but the observer does not see any weather on the route.		RP		
EWR-4-2-	28	2152	North is released. PARKE is released 8 MINIT. LANNA is released 10 MINIT. RAPT shows PARKE and LANNA yellow then red.		RP		
EWR-4-2-	29	2207	EWR is sending a pathfinder over BIGGY J75 to DCA.		TMD		
EWR-4-2-	30	2214	WHITE and PARKE are APREQ N90. RAPT shows all but the north gates red.		RP, TMD		ITWS, TSD
EWR-4-2-	31	2224	West is stopped. DIXIE and north are 6 MINIT. RAPT is not displayed.				
EWR-4-2-	32	2255	N90 calls to release two WHITE departures. RAPT shows WHITE red ENR.		RP, TMD		
EWR-4-2-	33	2314	EWR departures are stopped. RAPT is not displayed.		EO		

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EWR-4-2-	34	2319	EWR is ready to send a pathfinder over PARKE. RAPT shows PARKE J6 red. ATC is not using any weather displays at this time.		TMD		
EWR-4-2-	35	2328	The pathfinder (BTA2941) has departed. N90 allows one departure for WHITE from EWR. RAPT shows all routes red except north.		TMD		
EWR-4-2-	36	2334	There are restrictions on DIXIE, ELIOT, LANNA, and north. West and SERMN are stopped. WHITE is APREQ.				
EWR-4-2-	37	2338	East is stopped.				
EWR-4-2-	38	2344	East is 7 MINIT as one.		TMD-LOU		
EWR-4-2-	39	2346	ELIOT J60 is released 10 MINIT. EWR is looking for a pathfinder over J80. RAPT is not displayed.		EO		
EWR-4-2-	40	0029	LANNA, BIGGY, PARKE, MERIT, SRMN routes stopped. RAPT showing ELIOT J64 yellow.				
EWR-4-2-	41	0035	PARKE is released 8 MINIT, ELIOT is 8 MINIT as one. RAPT shows PARKE J6 red and ELIOT J60 green, J64 yellow.		RP		
N90-4-2-	1	1520	A large cluster of storm is in PA. RAPT shows J60, J64, J80, and J6 red.				
N90-4-2-	2	1533	ZNY stops RBV due to weather.				
N90-4-2-	3	1533	J6, J80, J64, and J60 area all closed due to weather. The SWAP began 1345. A large level 6 cell is crossing from ZOB into the southern half of ZNY. Also a large level 2 system is covering the western half of ZOB with some scattered level 6 and 50+ echo tops around J60 and J64. RAPT shows J6, J80, J64, and J60 red.		RP		
N90-4-2-	4	1540	RAPT shows J48 red, in addition to J60, J64, J80, and J6.		RP		
N90-4-2-	5	1540	The STMC uses CIWS to anticipate the loss of BIGGY and LANNA. ELIOT and PARKE are already closed. RAPT shows J48 yellow to red.	*(SA-2, EP, RRP)	RP,TMD		
N90-4-2-	6	1555	All west gates except BIGGY are closed due to weather.				

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N90-4-2-	7	1600	ZNY stops J75 over BIGGY. RAPT shows J75 green to yellow for 1610+ departures.		RP		
N90-4-2-	8	1602	ZNY is looking for a pathfinder from LGA. RAPT shows J60 yellow. WHITE is restricted 10 MIT.				
N90-4-2-	9	1606	ZNY requests a pathfinder for J60 off LGA (N6465). RAPT shows J60 going yellow ENR for routes out of JFK and LGA and red ENR for route off EWR.		RP, TMD		
N90-4-2-	10	1632	Another J60 pathfinder is attempted. RAPT shows J60 turning green while most other routes are red.	*(RO)	RP, TMD		
N90-4-2-	11	1646	The J60 pathfinder is successful and J60 is open.		TMD		
N90-4-2-	12	1646	ZOB opens J60 with 20 MIT.				
N90-4-2-	13	1654	ZNY opens J60.				
N90-4-2-	14	1708	Storms are in north MD and east PA approaching PHL. GAL is ground stopped. The forecast pushes the complex just south of N90. IAD is shut down. ZBW is saturated with weather and is experiencing deviations. RAPT shows J64 red ENR, J60 yellow ENR, J6, J48, and J75 red.		RP, PB		
N90-4-2-	15	1712	Weather is moving along J60, J64, and J80. RAPT shows J60 flip-flopping from green to red.				
N90-4-2-	16	1738	The weather in PA/MD/DE appears to skirt to the south gates. WHITE and WAVEY are stopped by ZDC due to volume and weather. RAPT shows J209 red.		TMD, RP		
N90-4-2-	17	1754	WHITE is open to LGA to help alleviate gridlock. WHITE is 15 MIT, WAVEY is 20 MIT. ZDC releases RBV J60 with 30 MIT.		TMD		TSD
N90-4-2-	18	1757	WHITE is open with 15 MIT. WAVEY is open.				
N90-4-2-	19	1803	ELIOT J60 is stopped due to a line of storms over the route in PA in ZNY airspace. RAPT shows ELIOT J60 red ENR. ELIOT good at 1811.		RP		
N90-4-2-	20	1803	ELIOT J60 is stopped. RAPT shows J60 red.				
N90-4-2-	21	1808	ELIOT is open with 20 MIT. RAPT shows ELIOT red.		TMD, RP		
N90-4-2-	22	1814	RBV J60 is good. RAPT shows red 47 ENR.				



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N90-4-2-	23	1831	A pathfinder from LGA (American 731) is on J60 via PARKE. RAPT shows J6 yellow.		RP, TMD		
N90-4-2-	24	1835	LGA is gridlocked so all arrivals are stopped. LGA is also undergoing a runway change. ZNY stops J60. RAPT shows J60 red.		RP, TMD		
N90-4-2-	25	1849	Storms are weakening as they enter NJ. There are storms in southwest PA. J80 and J64 are impacted. RAPT shows J80, J64, J48, J75, J79, and J209 red; J6 is going yellow.		RP		
N90-4-2-	26	1857	TMC consults ITWS Precipitation to determine if WAVEY will be impacted.	*(SA-2, EP)	TMD		ITWS
N90-4-2-	27	1902	ZBW Is stopped until 1000 due to weather.				
N90-4-2-	28	1905	ELIOT J60 is opened by ZNY. RAPT shows J60 red.		RP		
N90-4-2-	29	1906	WAVEY is stopped by ZDC.				
N90-4-2-	30	1920	The STMC consults CIWS for situational awareness during the SPT.		TMD		CIWS
N90-4-2-	31	1926	LGA is sending a pathfinder over J6. RAPT shows J6 red. WHITE and WAVEY are stopped due to weather.		RP		
N90-4-2-	32	1939	Weather is impacting the west and south gates. RAPT shows these gates red.				
N90-4-2-	33	1950	All west and south departures are stopped due to weather. North gates are stopped due to volume (by ZNY).				
N90-4-2-	34	2015	North gates are open.				
N90-4-2-	35	2025	RBV J60 is good. RAPT shows RBV J6 green/yellow.		RP		
N90-4-2-	36	2029	Weather over NJ is level 2/3 with tops to 32 kft. TMC indicates that ELIOT is good.				ETMS
N90-4-2-	37	2035	SERMN south to DC metro is good until 0400. RAPT shows all west routes red except PARKE and RBV (green/yellow). RAPT shows J6 open.		RP		
N90-4-2-	38	2050	J6 is open. The TMC thinks J48 will open soon. RAPT shows J48 yellow.		RP, TMD		
N90-4-2-	39	2108	J6 is stopped for RBV and PARKE due to volume by ZNY. It is open again at 2116.				

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N90-4-2-	40	2117	WHITE is release by ZDC. RAPT shows J6 yellow and most routes red.				
N90-4-2-	41	2118	All west gates are still stopped.				
N90-4-2-	42	2124	The STMC consults CIWS during the SPT for situational awareness. WHITE is opening.		TMD		CIWS
N90-4-2-	43	2140	Only J6 and J48 are not impacted by weather but ZNY has stopped J6 for volume.		TMD		
N90-4-2-	44	2155	LANNA is restricted 12 MINIT, PARKE is 31 MINIT.				
N90-4-2-	45	2217	All west gates are closed again, including J6 and J48. ZDC cannot accept the traffic. RBV and WAVEY are stopped too.				
N90-4-2-	46	2230	WHITE is still running with 30 MIT and deviations. RAPT shows all routes red.		PB, RP		
N90-4-2-	47	2300	Numerous lines of weather are impacting almost all routes. WAVEY is stopped. RAPT shows all routes red except WAVEY J174, GREKI/CAM, COATE, and GAYEL.		RP		
N90-4-2-	48	2311	WHITE departures off TEB are stopped due to volume. The weather that is impacting WHITE is well south. RAPT shows WHITE red ENR.		RP, TMD		
N90-4-2-	49	2316	J60 is running through the thunderstorm anvil in northeast PA. J60 is only good for ZOB landings. RAPT shows J60 red ENR. ATC is considering opening J60. WHITE is open. RAPT shows WHITE J209 opening.		PB, TMD, RP		
N90-4-2-	50	2333	WAVEY is released. RAPT shows J174 green.		RP		
N90-4-2-	51	2342	WHITE is stopped. Weather over NJ and NC is impacting the route. RAPT shows J209/J79 red ENR.		RP		
N90-4-2-	52	2342	WHITE is stopped by ZNY.				
N90-4-2-	53	2349	J60 is open. RAPT shows J60 red ENR. A J6 pathfinder is requested from N90.		RP		
N90-4-2-	54	2349	ELIOT J60 is open. RAPT shows J60 red ENR. WAVEY is open with 20 MIT.		RP		

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N90-4-2-	55	2355	Three pathfinders from TEB are trying PARKE on J6. One pathfinder from PHL is on J80. GREKI reroutes are restricted 20 MIT. RAPT shows J60, J80, and J36 red.		RP, TMD		
N90-4-2-	56	0018	The LGA GDP is cancelled. Weather is decaying near the south gates. RAPT shows WHITE going yellow; LANNA is green.		RP		
N90-4-2-	57	0020	A wall of storms stretches from eastern PA to north VA, followed by another wall from western PA to northwest WV. RAPT shows J80, J6, J48, J75, and J209 red; J60 yellow ENR, J64 yellow.		RP		
N90-4-2-	58	0033	ZNY opens ELIOT J80. RAPT shows J80 red. North gates are open but there is no demand.		RP		
N90-4-2-	59	0049	Storms are decaying slowly. J80 is open. RAPT shows J64 green; J80 red.				
N90-4-2-	60	0112	LANNA J48 is open by ZDC. Weather is moving off J48. Another line is approaching but is not close yet. The sector is holding for LANNA. RAPT shows J48 going yellow in 20 minutes.		RP, TMD		
N90-4-2-	61	0130	Weather is decreasing in intensity. RAPT shows most routes green and yellow, except on J75, J6, and J80.				
N90-4-2-	62	0135	ZNY opens LANNA.				
N90-4-2-	63	0138	N90 requests 8 MINIT as one for EWR ELIOT departures due to sector volume.		TMD		ACD sector
N90-4-2-	64	0221	The west routes are about to be impacted by another line of storms in north VA. RAPT shows the west gates red for 0225 departures but the routes are still open.		RP, EO		
N90-4-2-	65	0234	The heavy weather is now mostly in north VA and MD. RAPT shows J6, J45, J75, J6, and J80 yellow.		RP		
N90-4-2-	66	0300	BIGGY, WHITE, RBV, and WAVEY are all impacted by weather.				
ZNY-4-2-	1	1556	ZOB and Area D are trying to find a pathfinder for J60. The TMC used CIWS and the TSD to coordinate. .		TMD		CIWS Forecast, Precipitation

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ZNY-4-2-	2	1607	Two pathfinders for J60 are coordinated. TCF6465 and N341AP are identified				
ZNY-4-2-	3	1640	The pathfinders must have been successful. J60 is open.		TMD		
ZNY-4-2-	4	1722	A very large region of level 2/3 weather is approaching central NJ. ZOB contains some level 3/4 scattered weather. RAPT shows J64, J80, J6, J48, and J75 all red. J60 is yellow to green ENR.		RP		
ZNY-4-2-	5	1724	N90 stops WHITE.				
ZNY-4-2-	6	1737	ZDC stops WHITE and WAVEY due to volume. RAPT shows WHITE green.		TMD		
ZNY-4-2-	7	1751	ATC is trying to reroute international flight from ZBW, ZNY and ZDC arriving IAD. They are trying to take them over Hancock and then down the back side of the weather impacting ZDC/Potomac. CIWS is used to find and coordinate reroutes.		TMD		CIWS Forecast
ZNY-4-2-	8	1755	ZDC opens WHITE with 15 MIT and WAVEY with 20 MIT.		TMD		
ZNY-4-2-	9	1800	Areas C and D will not take international traffic via Hancock/Hagerstown. Area A will put the traffic over Hagerstown and will work a route with Area D. Area A used CIWS and the TSD to determine the options and coordinate. This saved 10 international flights. The weather on the TSD was the primary tool because traffic and weather are on the same display. CIWS was used for situational awareness. J80, J6, J48, J75, J152, J220, and J64 are closed. Areas A, B, and C are all using CIWS.		TMD		CIWS, TSD
ZNY-4-2-	10	1400	The Area A Supervisor used CIWS to make the call to close J80. The Supervisor said the forecast was really useful for making that decision.		TMD		CIWS
ZNY-4-2-	11	1800	J220, which has been restricted 20 MIT, is opened by Area A. CIWS and the TSD are used to make the decision.		TMD		CIWS VIL, Forecast, TSD
ZNY-4-2-	12	1815	Weather in ZOB is moving toward J80 at the ZNY border. The Area Supervisor uses CIWS for situational awareness and to consider what he might want to do in the near future.		TMD		CIWS VIL, Forecast, Echo Tops, Growth and Decay Trends

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ZNY-4-2-	13	1839	WHITE is stopped by N90/ZDC. RAPT shows WHITE red ENR. WAVEY is open, RAPT shows WAVEY green.		RP		
ZNY-4-2-	14	1848	Area A is taking two international pathfinders down J6 to ATL. RAPT shows J6 green to yellow. The Area Supervisor uses CIWS to identify a large hole in the weather, so he is willing to try. (DAL97 and DAL63 identified)		RP, TMD		CIWS
ZNY-4-2-	15	1856	They are attempting a departure on J6, given the large hole. RAPT shows J6 yellow.	SA-2, SA-3	RP		
ZNY-4-2-	16	1905	ZDC stops WAVEY due to weather.				
ZNY-4-2-	17	1908	Two pathfinders for J80 are coordinated between the Area A Supervisor and ZOB. RAPT shows J80 red 42 ENR.		RP, TMD		CIWS Forecast
ZNY-4-2-	18	1914	J60 is closed by Area D. The Area Supervisor says everyone is deviating near the J60/J36 intersection. The observer does not see this.		PB, EO, TMD		
ZNY-4-2-	19	1917	A pathfinder for PARKE from LGA and a J6 pathfinder launched. The pathfinders are both overflights and the LGA departure was coordinated using CIWS. (COA551 identified)		TMD		CIWS Forecast, Forecast Contours.
ZNY-4-2-	20	1918	A pathfinder for J80 from JFK is coordinated.				
ZNY-4-2-	21	1922	J6 from ZBW to ATL is open with 40 MIT. CIWS shows the route viable and there is very little traffic, so deviations are acceptable.		TMD		CIWS Forecast
ZNY-4-2-	22	1926	ATCSCC wants to use J75 for international flights to DC metros. The Supervisor looks at CIWS and agrees to the plan. This may help open routes to DC. RAPT shows J75 yellow to red.		TMD, RP		CIWS Forecast
ZNY-4-2-	23	1932	RBV J60 and ELIOT J60 are closed by ZOB. RAPT shows these routes red ENR.		RP		
ZNY-4-2-	24	1941	J80 and J6 are 15 MIT as one. Area A will accept this because a pathfinder used the route and the CIWS forecast shows the hole is workable.		TMD		CIWS Forecast
ZNY-4-2-	25	1945	COA551 pathfinder made it out through PARKE. PARKE departures opened.				

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ZNY-4-2-	26	1946	The TMC is hesitant to open J80 because of all of the weather on the route in ZOB. He is concerned that when the traffic reaches ZOB airspace, ZNY will have to hold. RAPT shows J80 red ENR. ZNY is going to use J6 instead of J80 to avoid holding traffic.	*(SA-1)	TMD, RP		CIWS VIL
ZNY-4-2-	27	2008	LGA is closed to arrivals until some departures can be released. The STMC wants to take LGA west departures on J60 to J78.		TMD		
ZNY-4-2-	28	2010	N90 calls to coordinate a CVG pathfinder on PARKE J6. (Eagle895 identified)				
ZNY-4-2-	29	2019	ATCSCC wants to open J75 for ZNY internals to DC. The TMC asks that they wait until the two pathfinders. RAPT shows J75 red.		RP, TMD		
ZNY-4-2-	30	2015	J80 is closed by ZOB. RAPT shows J80 red ENR.				
ZNY-4-2-	31	2026	Area A is willing to open J6 from PHL for one pathfinder. RBV is open. CIWS was used to make this decision.		TMD		CIWS Forecast
ZNY-4-2-	32	2028	ZDC allows four WHITE departures with 30 MIT. They are willing to try them to see what happens in their airspace. RAPT shows red ENR.		TMD, RP		
ZNY-4-2-	33	2044	The Area Supervisor opens J6 from PHL with 25 MIT. He decided not to wait for the pathfinder. He thinks that once he gets them past the weather they can go west again.		TMD		
ZNY-4-2-	34	2221	WHITE has stayed closed. It appears the pathfinders from 2028 did not work. ZDC says they can't handle the traffic.		TMD		
ZNY-4-2-	35	2041	The STMC want to try a pathfinder of J60. A CLE flight was chosen (Comair659)				
ZNY-4-2-	36	2047	CLE is ground stopped, so the pathfinder may not be released.				
ZNY-4-2-	37	2049	ZDC will take two pathfinders on J48 and two on J75. ATCSCC wants to favor LGA. RAPT shows J75 red ENR and J48 yellow. Based on the CIWS forecast, Area A will only take one on J75. They think the weather will build along the southern part of ZNY and turn into a solid line. (DL1485 identified)	*(SA-2, DP)	TMD, RP		CIWS Forecast
ZNY-4-2-	38	2050	ZDC opens J48 in their airspace.				

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ZNY-4-2-	39	2107	The Area B Supervisor is using CIWS to keep PARKE J6 open. It is currently the only route out. J48 is open in ZDC but the STMC does not know if he can get to it.  N90 closes PARKE for 10 minutes due to volume.		TMD		CIWS Forecast
ZNY-4-2-	40	2109	Area A stops RBV J6 due to weather. RAPT shows RBV J6 yellow to red ENR for 2115 departures.		TMD,RP		CIWS Forecast
ZNY-4-2-	41	2117	WHITE is released 30 MIT.				
ZNY-4-2-	42	2118	All west gates are stopped.				
ZNY-4-2-	43	2123	J220 is stopped due to deviations. Area A wants to open J48, J75, and J6 with large restrictions. CIWS shows some clearing. RBV to J48, J75, and J6 is open with restrictions.		TMD		CIWS Forecast
ZNY-4-2-	44	2127	The STMC calls ATCSCC to try to get LGA departures west via J60 to J78. A line of weather east of PIT will clear, leaving a hole until the next line approaching the PA/OH border fills in - then they will get LGA departures up, get the surface moving and then they can bring in LGA arrivals.		TMD		CIWS Forecast
ZNY-4-2-	45	2138	ZOB denies the request to use J78. The ZNY STMC thought he could get a few through before the second line closed J78.		TMD		
ZNY-4-2-	46	2140	North gates are moving well.				
ZNY-4-2-	47	2148	ZDC is 15 MIT per strat on J48, normals only. All J75 traffic is stopped. RAPT shows J48 yellow to green.		RP		
ZNY-4-2-	48	2144	All north gates are stopped. ZNY will not take N90 handoff due to volume.		TMD		
ZNY-4-2-	49	2151	RAPT is being used for situational awareness. CIWS seems to be the main tool for decisions.	SA-1			CIWS
ZNY-4-2-	50	2215	J6 is closed. J48 will be useable for about 30 more minutes. No J6, J48, J75 but PHL will continue to run. RAPT shows the routes red. CIWS is used for situational awareness, but the routes are closed due to deviations.		PB, RP, TMD		CIWS Forecast

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ZNY-4-2-	51	2235	J60 and J78 are open with 20 MIT to help with offloads from ZNY. The STMC started this at 2008, trying to take advantage of the gap between the two lines in southeast ZOB/ZNY/central ZOB. ZOB refused at that time. Reference 2126z, the STMC called ATCSCC to ask for intervention. It took another hour, but the route was opened. This request started with CIWS. The STMC saw that there was an open space along J60 to J78 to get southwest and west.		TMD		CIWS Forecast
ZNY-4-2-	52	2324	WAVEY is open with 20 MIT by ZDC if the traffic uses oceanic routes. RAPT shows WAVEY green		RP, TMD		
ZNY-4-2-	53	2330	ZOB is opening J60 with restrictions. RAPT shows J60 and J64 red ENR. J64 remains closed to allow for deviations.		TMD, RP		
ZNY-4-2-	54	2336	ATCSCC announces that J80 is opening for ZOB internal landers and three pathfinders for landers west of ZOB. RAPT shows J80 red. CIWS shows weather on J80 in ZOB with tops to 50 kft and lots of lightning. The Echo Tops Forecast show tops remaining above 35 kft.		RP, TMD		CIWS VIL, Forecast, Echo Tops, Echo Tops Forecast
ZNY-4-2-	55	2343	Pathfinders are on J6/J80 (BTA2941, AAL785). RAPT shows the route red. The ZNY OMC requested the pathfinders to get traffic moving in Area A. He used CIWS while discussing this option with the STMC.		RP, TMD		CIWS, DSR
ZNY-4-2-	56	2354	The pathfinders for J6/J80 were successful. J6 is open with 20 MIT.		RP		
ZNY-4-2-	57	2349	A pathfinder is on J80 (COA621). If ZNY can get him out easily, the route will open. This was initiated by a request from ATCSCC. RAPT shows J80 red. ZNY would not have opened the route, but ZOB did even though echo tops reach 56 kft. If the pathfinder can top the weather in ZNY, then it will be up to ZOB to handle the traffic. The pathfinder is successful.		TMD, RP		
ZNY-4-2-	58	0020	Weather seems to be weakening along J64. J64 was opened but J64 needs to move. RAPT shows the route yellow. The observer pointed this out to the STMC because they are looking for routes west. The STMC called ZOB to ask them to consider it.	*(RO, SA-2, EP) I/IC		Yes	CIWS Forecast
ZNY-4-2-	59	0025	RAPT shows J60 green, J84 yellow.				



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ZNY-4-2-	60	0047	RAPT shows the northwest routes from J64 north all going green. . All routes are open except J48 and J75.	*(RO, SA-2, EP)			
ZNY-4-2-	61	0107	Weather will move off J48 soon. The STMC called ZDC to see if they would open J48. Weather from J6 is forecast to move onto J48 in the next 2+ hours. ZDC agreed to open J48 20 MIT per strat. RAPT shows J48 red ENR. The STMC would have tried sooner without CIWS but would have been declined.		TMD, RP		CIWS VIL, Forecast
ZNY-4-2-	62	0137	J75 is open for DC metros. LGA want to open J75. RAPT shows the route red.		RP		
ZNY-4-2-	63	0143	ZDC closed J48. ZNY says they are getting a lot of deviations. RAPT shows J48 green.				
ZNY-4-2-	63	0240	J75 is still closed but there are few problems.				
ZDC-4-2--	1	1525	<p>A large level 4 – 5 storm mass is at intersection of ZDC, ZNY, and ZOB. There are strong embedded level 6 cells are in the southeast portion of the storm mass, with tops to 47 kft. These cells are moving rapidly southeast towards J6 and affecting J64, J80, and J6. Another large mass of level 4 – 6 weather is in northern Ohio/ZOB near J64, J70, J36. Embedded cells with tops to 50 kft are moving rapidly east towards the PA border. Current restrictions are:</p> <p>EWR ARD 15 MIT 1630 – 0000 N90:ZDC  LGA RBV 15 MIT 1145 – 2000 N90:ZDC  J6 15 MIT Per STRAT 1345 – 1630 ZDC:ZNY  B24 25 MIT 1200 – 1600 ZNY:ZDC  PHL VCN 25 MIT JETS 1600 – 1715  J64 and J80 have been shut down all morning due to weather.</p> <p>RAPT shows J60, J64, J80, and J6 all red.</p>		TMD, RP		
ZDC-4-2--	2	1537	ZNY shuts off J6 and J48 for everyone and J75 for ZBW. J64 and J80 have been closed all morning. The observer assisted the STMC in interpreting the RAPT timelines.		TMD	Yes	

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ZDC-4-2--	3	1551	A level 6 cell with tops to 42 kft is on J6. RAPT shows J6 red.		RP		
ZDC-4-2--	4	1620	Level 6 cells are moving onto J48. RAPT shows J48 red.		RP		
ZDC-4-2--	5	1623	A strong level 6 cell is on/near J60. RAPT shows J60 red but JFK: RBV and LGA: ELIOT is green/yellow ENR/red ENR.		RP		
ZDC-4-2--	6	1630	ATCSCC asks ZDC if there are any JFK concerns. ZDC does not expect problems because storms are moving east. The STMC used CIWS during the discussion.		TMD		CIWS
ZDC-4-2--	7	1644	The ZDC Severe Weather Position is opening. There are no reroutes yet. The ESP Position TMC states that EWR and LGA arrivals will be single stream as one in 15 minutes. Weather is moving onto J42/J51. The STMC briefs the Severe Weather Position TMC using CIWS.		TMD		CIWS VIL, Satellite, Growth and Decay Trends, Echo Tops, Storm Motion, Forecast, DSR
ZDC-4-2--	8	1649	The EWR GDP starts now. WHITE is stopped by ZNY.				
ZDC-4-2--	9	1657	A level 6 cell is over J75 north-northeast of DC. RAPT shows J75 red.		RP		
ZDC-4-2--	10	1712	A level 6 cell over LDN and west of DC is showing growth and moving southeast to J48. RAPT shows J48 red. Another level 6 cell in eastern OH is moving east over J64. RAPT shows J64 red ENR.		RP		
ZDC-4-2--	11	1830	The STMC and Operations Manager discuss ZJX traffic using CIWS. WHITE and WAVEY stopped for volume.		TMD		CIWS
ZDC-4-2--	12	1833	The STMC and ZBW discuss traffic. The STMC consulted CIWS for situational awareness during the discussion.		TMD		CIWS
ZDC-4-2--	13	1846	A huge level 6 cell with tops to 63 kft is moving off J75. RAPT shows J75 yellow.	*(SA-2)	RP		
ZDC-4-2--	14	1907	The ZDC STMC advises ZNY to stop WAVEY due to weather. RAPT shows J174 WAVEY green. The ZDC STMC uses CIWS and volume concerns to decide to stop WAVEY.		RP, EO, TMD		CIWS
ZDC-4-2--	15	1918	Level 4/5 storms are on J6 on the PA border and northwest of LDN. RAPT shows J6 red ENR for 1910+ departures.		RP		

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ZDC-4-2--	16	1933	ZDC is ground stopped for JFK. A J6 pathfinder has been launched. RAPT shows J6 red ENR.		RP,TMD		
ZDC-4-2--	17	1940	The STMC reviews the traffic situation with the Area 8 Supervisor using CIWS.		TMD		CIWS
ZDC-4-2--	18	1950	The SPT is still in progress. The ZDC STMC provides input to the telecon using the TSD, but primarily CIWS.		TMD		CIWS, TSD
ZDC-4-2--	19	1957	Level 6 cells are southwest of ORF. RAPT shows J174 red ENR, J6 green.		RP		
ZDC-4-2--	20	2017	Strong cells south-southwest of LDN and north-northeast of ROA are moving southeast to J48. RAPT shows J48 red ENR for 2010 departures, yellow for 2015+ departures.		RP,EO		
ZDC-4-2--	21	2022	A large storm in north ZDC airspace and south central NJ is dissipating. Large level 4 – 6 cells with tops to 61 kft are southwest of ORF over an area of J174/J209. Heavy cells are in northern VA south of DC and southwest of NHK with tops now 53 to 61 kft. Cells are moving onto J75 and affecting J42, J51, and J191 NY arrival routes. A line of level 4/6 weather is in south central ZOB and south PA with very large level 6 embedded cells and tops at 50 – 56 kft located over J80 and in vicinity of J64.				
ZDC-4-2--	22	2024	Level 4/5 weather is in northern DE. A level 6 cell is located southwest of DC. Both are moving east-southeast to J75. RAPT shows J75 red for 2015 departures.		RP		
ZDC-4-2--	23	2029	ZDC expecting to launch UA287 as a pathfinder over AML at about 2039z.				
ZDC-4-2--	24	2039	The CWSU briefs the STMC using the CIWS display.		TMD		CIWS VIL, Growth and Decay Trends, Storm Motion, Forecast
ZDC-4-2--	25	2043	ATCSCC asks ZDC if J48 and J75 can be released. The TMC allows two aircraft per route from New York. RAPT shows J48 green to yellow for 2045 departures; J75 red ENR.	*(RO, EP)	RP, TMD		

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ZDC-4-2--	26	2047	ZDC opens J48.				
ZDC-4-2--	27	2050	On the hotline, ATCSCC tells NY to release two J75 pathfinders. NY indicates that they will favor EWR. ATCSCC agrees saying that JFK is doing fine with the AFP.		TMD		
ZDC-4-2--	28	2057	WHITE pathfinders were released at 2028; three from LGA (DAL1597, AWI4063, EGF895) and one from EWR (COA330). RAPT shows J79.J209 red ENR for 2050+ departures.		RP, EO		
ZDC-4-2--	29	2117	ZNY announces via the hotline that J48, J75, and J6 are opening.	*(RO)	TMD		
ZDC-4-2--	30	2115	The ZDC STMC uses CIWS throughout the SPT for situational awareness.		TMD		CIWS
ZDC-4-2--	31	2130	Three of the pathfinders (DAL1597, AWI4063, EGF895) for WHITE deviated around the weather, the fourth (COA330) was rerouted and skirted northwest of the storm.		PB, RP		
ZDC-4-2--	32	2139	The observer discussed RAPT with two Area 8 Supervisors. These Supervisors stated that they do not use RAPT because they are not familiar with it.		TMD		
ZDC-4-2--	33	2145	The ZDC STMC reiterates on the hotline that J75 is closed due to weather. J48 is open. (J48 was opened at 2047.) RAPT shows J75 red with 46-54 echotops. Observer reviewed RAPT with STMC.		TMD-S		
ZDC-4-2--	34	2155	A huge line weather with embedded level 6 cells is parallel to J6. RAPT shows J6 red.		RP		
ZDC-4-2--	35	2158	Large level 4/6 cells with tops to 61 kft are southwest of ORF over an area of J174/J209. Heavy cells in are northern VA, southwest of DC and affecting J75. Cells are moving onto J75 and also affecting J42, J51, and J191 NY arrival routes. The line of cells in northern WV is moving east-southeast directly towards J6. ZID is overloading on J6 and ZDC is demanding restrictions due to volume. ZDC/ATCSCC stops J6 ZNY and ZBW departures due to volume. Reviewed against RAPT J6.		TMD, RP	Yes	

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ZDC-4-2--	36	2213	A small level 4 cell is located southwest of FKN and moving southeast. RAPT shows J174 green, then yellow ENR for 2230+ departures.		RP		
ZDC-4-2--	37	2217	WAVEY is still closed by ZDC. J48 is 15 MIT per strat.		TMD		
ZDC-4-2--	38	2233	Large cells are located northwest of LDN. RAPT shows J6 red.		RP		
ZDC-4-2--	39	2237	ZDC approves one WAVEY release. RAPT shows JFK: J174 WAVEY green.	*(DP, RO)	RP, TMD		
ZDC-4-2--	40	2328	ZDC opens WAVEY with 20 MIT for Atlantic Routes only. RAPT shows J6, J48, J75, J79, and J209 red; J174 green. J6 is restricted 20 MIT regardless of altitude ZDC:ZNY and ZID:ZDC. J48 is restricted 15 MIT per strat ZDC:ZNY.		RP		
ZDC-4-2--	41	0021	Level 3/5 weather is moving east to PHL; level 3/6 weather is southwest of PHL. RAPT shows J75 red. The observer asked the TMC about ATCSCC thinking on PHL clearing. After consulting CIWS, The TMC tells ATCSCC is not clearing. Weather is growing and persists for at least another 35 minutes.		TMD		
ZDC-4-2--	42	0034	There is a 60 kft cell near EKN. ZDC requests an LDN pathfinder for DC metro via J134 or J6. The STMC references CIWS and requests pathfinders despite the 60 kft cell.		TMD		CIWS
ZDC-4-2--	43	0050	Two level 6 cells are over and northeast of EKN. RAPT shows J6 red. ZDC is still trying J134/J6 pathfinders from IAD.		RP, EO		
ZDC-4-2--	44	0107	ZNY requests route openings. ZDC opens J6 and J48 with 20 MIT but keeps J75 closed. RAPT shows J6 red ENR for 0105+ departures; J48 red for 0105+ departures, yellow after; J75 red.		TMD-S, RP		
ZDC-4-2--	45	0141	ZDC proposes to ATCSCC that ZID arrivals go through Greensboro and up the Potomac. The STMC used CIWS to determine this route.		TMD	Yes	CIWS
ZDC-4-2--	46	0153	There is a little weather located on the ZNY/ZDC border. The Departure Position TMC recommends using Pulaski routes to clear the area.			Yes	

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ZDC-4-2--	47	0237	A level 3/5 cell northeast of LDN shows growth and is moving east. The Severe Weather TMC discusses this with the Area 4 Supervisor using CIWS.		TMD	Yes	CIWS
ZOB-4-2-	1	1155	Widespread weather is north of Lake Erie on the ZOB/NavCanada boundary. Heavier storms are on the ZAU/ZOB boundary and north-to-south across western PA. The DTW position TMC is talking to NWA about a flight without sufficient fuel for the proposed reroute. "CIWS shows weather at the airport (DTW) in 2 hours." The TMC offers to let the pilot go to Dayton and possibly hold. The STMC says that the CWSU thinks the weather will move south of the airport. The cell south of DTW has an associated tornado warning. RAPT shows J64 red ENR but the traffic is on J60 (typical). RAPT shows J80 yellow ENR but it cleared at 1200.		TMD, RP, EO		CIWS Lightning, Storm Motion, Echo Tops
ZOB-4-2-	2	1225	The DTW position TMC tells the STMC he has put 25 MIT of ZBW to DTW to make space for merging ZDC to DTW traffic to approach DTW north of the weather. He used CIWS to coordinate this. RAPT shows J64 red ENR, J60 yellow ENR.		TMD, RP, EO		CIWS all but forecast contours
ZOB-4-2-	3	1232	The J64 closure is extended, coordinating with ZNY and ATCSCC.				CIWS all but forecast contours
ZOB-4-2-	4	1243	ZAU called to ask what ZOB wants to do with ZAU to DTW traffic now that the weather is clearing ZAU airspace. 15 MIT over KEELR, 15 MIT over GIPRR		TMD		CIWS all but forecast contours
ZOB-4-2-	5	1251	Strong cells are approaching DTW. Level 6 weather in southwest PA is moving toward J80. The CP TMC coordinated J80 10 MIT per strat 1300 – 1500 at Area 6 request. RAPT shows J80 green then yellow ENR.		TMD, RP		CIWS all but forecast contours
ZOB-4-2-	6	1255	Area 6 reports deviations on J518/J211 due to a level 6, 55 kft cell in southwest PA. However, demand is low so the TMU will watch the situation and change things if needed.		TMD, PB		CIWS all but forecast contours

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ZOB-4-2-	7	1304	CP hand-off briefing				CIWS all but forecast contours
ZOB-4-2-	8	Interview	One of the TMCs commented that he thought the CIWS ASR product was more accurate than the CIWS VIL product. He felt the Precipitation product consistently overestimated intensity relative to the ASR. He based this on observed pilot behavior (Pilots won't penetrate a storm with lightning; will not penetrate level 4; will penetrate level 3 50% of the time, etc.)		TMD, PB		
ZOB-4-2-	9	1311	The observer helped CP position TMC open a forecast window. He was using a Precipitation window and asked how to get the loop.		TMD	Yes	CIWS Forecast
ZOB-4-2-	10	1315	J80 is 10 MIT per strat and deviating. RAPT shows J80 red ENR.		TMD, PB, RP, EO		
ZOB-4-2-	11	1315 SPT	ZNY is shutting down J80 due to weather development at ZNY/ZOB border. ZOB is holding in weather for LGA. RAPT shows J80 and J64 red, J60 yellow then red. DTW is going to south flow because of storms off south end of runways. They are hoping the weather stays south of the runways (as predicted by the CWSU), though CIWS and ITWS predict that it will not.		TMD, RP		CIWS all but forecast contours, ITWS
ZOB-4-2-	12	1345	The STMC and DTW TMC asked questions about ITWS. Specifically they wanted to know about the red shapes. They are hoping that the weather will stay south of the airport, otherwise they will hold. The observer demonstrated the ITWS forecast product, which predicts a direct hit.		TMD	Yes	ITWS
ZOB-4-2-	13	1349	Level 6 weather on DTW; lost the airport. Ground stop DTW internals and first tier. The STMC told the TMC that he could expect DTW to be shut down for 30 minutes based on the ITWS forecast. Ground stop all CLE/PHL//DET/PTK 1352-1445, ground stop DTW 1400 – 1459.		TMD		ITWS TRACON Precipitation, Storm Motion, Forecast

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ZOB-4-2-	14	1351	The CP coordinated the closure (or extension of closure?) of J64 with a SWAP to J60 with 20 per strat. J60 is OK with tactical reroutes past the weather. ZNY is avoiding using J60. RAPT is used for situational awareness and shows J64 red ENR changing to red at 1353.	SA-1, SA-2	RP, TMD, EO		
ZOB-4-2-	15	1418	Weather that impacted DTW is moving across Lake Erie, accelerating and dissipating. The portion of the bow that is over land south of Lake Erie is maintaining level 6. Ahead of the bow, a region of level 4 weather is moving east along the Lake Erie shore into PA. The region of level 6 weather in western PA has moved east to the ZOB/ZNY boundary.  ZBW will not take PHL traffic from ZOB even though this was coordinated. The PHL TMC is working to correct the problem. The STMC and TMC study CIWS to consider alternatives.		TMD		CIWS all but forecast contours
ZOB-4-2-	16	1419	The CP TMC announced on the hotline that he was extending the J80 closure to 1600. DTW traffic from NY is going on J6 to get past the weather and then to DTW.		TMD		
ZOB-4-2-	17	1444	J80 is open in ZOB but the TMC does nothing because the route is closed in ZNY.		TMD		CIWS all but forecast contours
ZOB-4-2-	18	1451	The CP TMC is negotiating a route for LGA departures to Columbus (J6/J149). ZOB suggested a J80 pathfinder but NY says they can't get there. They tried a pathfinder on J60/J64, but it didn't work.		TMD		
ZOB-4-2-	19	1507	The CP TMC coordinated with ? concerning CLE. Storms are on the airport. As soon as they are past, they will go back to normal routes.				CIWS all but forecast contours, WARP
ZOB-4-2-	20	1540	Someone on the hotline requested two pathfinders on J36 to Columbus. The NY TMC said OK, but just two. He thinks the route is bad due to weather on J29. RAPT shows J36 green,	*(SA-2, DP, RRP, EP)	TMD, RP		CIWS all but forecast contours



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ZOB-4-2-	21	1555	Weather impacting J80 has moved into ZNY airspace. Level 6 weather is impacting J60/J64 south and west of Cleveland. ZNY requested a pathfinder for J60. ZOB agreed to a pathfinder and used RAPT to help make this decision. RAPT shows J60 yellow then red ENR.	*(I/IC, SA-2, DP)		Yes	CIWS all but forecast contours
ZOB-4-2-	22	1605	ZNY offered another pathfinder for J60. They didn't know where the first one was. ZOB agreed. There are now two pathfinders headed for J60. RAPT shows J60 yellow ENR then red ENR.		RP,TMD		
ZOB-4-2-	23	1638	ZNY says the pathfinders did OK and wants to open J60. ZOB agreed to open J60 with 20 per strat. RAPT shows J60 red ENR.		RP, EO, TMD, PB		CIWS all but Growth and Decay and Forecast Contours
ZOB-4-2-	24	1830	Ground stops are in effect for DC metros, PHL, LGA, and PIT. J60 is still open even though RAPT shows it red. J64 is closed and traffic on that route is moved to J60 with 20 MIT per strat. RAPT shows J60 and J80 red.		RP, EO, TMD		
ZOB-4-2-	25	1854	The ORD position TMC tried to get ATCSCC to take traffic on J6 because it is nearly clear. ATCSCC would not ask NY to take it. TMC asked why. "They can't." (No other reason given.)		TMD-S		
ZOB-4-2-	26	1930	J60 is closed 2000-2200. RAPT shows this route closed for a long time.		RP		
ZOB-4-2-	27	2000	There is holding throughout the facility due to widespread weather. A line of strong storms runs from the middle of Lake Erie, southwest into ZID across ROD. A second area of strong storms is located in southwest PA near J152. J518/J211 20 MIT as one AOA FL 240 2000 – 2200.		TMD		
ZOB-4-2-	28	2015	J80 is closed. RAPT shows J60, J64, and J80 red.		RP		
ZOB-4-2-	29	2042	Very busy, very reactive. There are pathfinders on J6.		TMD		

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ZOB-4-2-	30	2044	The CVG position TMC asked why the forecast loop stopped at 30 min. He is trying to determine what to do with the CVG push 90 to 120 minutes from now. The observer showed the TMC how to work the forecast loop. The forecast shows an impact on CINCE6 at the ZID/ZOB boundary. There is little traffic at this time. Most of the traffic is from the NY area, which is under the weather. It is unlikely those flights will depart on time so demand will be low. The TMC coordinated with ZID and internally.		TMD	Yes	CIWS Precip window – all products  CIWS Forecast window
ZOB-4-2-	31	2052	ZID opened APE even though it is covered with level 6, 51 kft storms containing lightning. ZOB is sending one pathfinder to test the fix.		TMD		CIWS
ZOB-4-2-	32	2107	STMC is trying to open J60 with MIT.		TMD		CIWS
ZOB-4-2-	33	2127	Pathfinder off DTW over APE deviated to west of weather.				
ZOB-4-2-	34	2140	The STMC and CP are trying to find a westbound route. They are looking at J60. The observer took the opportunity to demonstrate RAPT. J60 does not look good for at least 2 hours. J60 was not opened. J36 is open. They are trying to get the westbound transcons out of PHL. RAPT shows J60 red.	*(SA-1, EP, RRP)	RP, TMD	Yes	CIWS all but Forecast Contours, Echo Tops, Echo Tops Forecast, Precip Forecast
ZOB-4-2-	35	2200	ZOB agreed to take "a few" on J78 from N90 to try to open the route.				CIWS all but forecast contours
ZOB-4-2-	36	2238	COATE departures are stopped. RAPT shows the route open.		RP, TMD-LOU		
COA-4-2-	1	1515	A large complex of level 6 weather is in center and western PA. AFP5 and AFP 8 are in effect/ RAPT shows ELIOT J60, J64, and J80; PARKE j6; and LANNA J48 red. ELIOT and PARKE are stopped.		TMD		ITWS Winds

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COA-4-2-	2	1637	SIA shows DIXIE 6 MINIT, WHITE 5 MINT, ELIOT, PARKE, LANNA, and BIGGY stopped. RAPT shows ELIOT J60, ELIOT J64, ELIOT J80, Parke J6, LANNA J48, and BIGGY J75 red ENR. COA agrees with the stops and is not pushing.	*(SA-3, EP)		Yes	ITWS Winds, CIWS Forecast, Echo Tops
COA-4-2-	3	1852	The first wave of weather is in eastern PA but more weather is developing in OH and western PA. There are few problems so far.				Flight Explorer, CIWS Forecast and Echo Tops, ITWS Precipitation and Winds, FSM
COA-4-2-	4	1906	WAVEY stopped (heard over hotline)				

**RAPT Benefits Assessment  
BLITZ #5 Observations Summary  
Day 1 - August 16, 2007  
Participating Facilities: LGA, JFK, N90, ZNY, ZDC, ZOB, ATCSCC**

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LGA-5-1-	1	1540	The TMC does not agree that WHITE should be closed. He views RAPT and the TSD and calls N90 and ZNY to inquire why WHITE routes are not open. RAPT shows J79 and J209 yellow until 1555Z departures. The TRACON and ARTCC apparently had not considered opening WHITE until the TMC called at 1555Z, when RAPT then showed both LGA routes through WHITE green.	SA-3, I/IC, RO *(RO)			TSD
LGA-5-1-	2	Note	In addition to the Supervisor and TMC, the Cab Coordinator uses RAPT and TSD to advise the Local and Ground Controllers.	SA-1, SA-2			TSD
LGA-5-1-	3	1735	Small cells are present around BUF, ROC, SYR, and the western edge of CAM. RAPT shows all routes green.		RP		
LGA-5-1-	4	1742	APREQ WHITE continues with 20 MIT. The TMC questions this restriction based partially on RAPT and calls ZNY because he does not see any significant weather enroute or near DCA. Possibly because of the TMC's call, in-trail spacing dropped to 15 MIT at 1748Z. All routes green on RAPT.	RO, I/IC, SA-2, SA-3 *(RO)	TMD-LOU		
LGA-5-1-	5	1748	WHITE restriction is reduced to 15 MIT.				
LGA-5-1-	6	1758	WHITE is restricted 7 MINIT (via hotline). RAPT shows all routes green.				
LGA-5-1-	7	1814	Thunderstorms are building from BUF to ROC and into Canadian airspace. RAPT shows J36 and J95 green. The weather is north and east of these routes.				
LGA-5-1-	8	2005	Convection is developing in northwest VA. RAPT shows J48 yellow for 2020 departures.		RP		
LGA-5-1-	9	2209	Due to AMASS maintenance, a ladder has blocked my access to the RAPT display since 2045. Access has been returned at this time.				

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LGA-5-1-	10	2212	Heavy convection is in southern OH and northeast KY. This weather is not visible on ITWS even at the 200 nmi range, but RAPT provides sufficient range to see this weather. RAPT shows PARKE J6, LANNA J48, BIGGY J75, WHITE J79, and WHITE J209 red; GREKI CAM yellow. All routes are stopped by 2216.	SA-1, SA-2, I/IC	RP		
LGA-5-1-	11	2222	GREKI stopped. RAPT shows GREKI CAM red for 30 minutes.				
LGA-5-1-	12	Note	The LGA Tower Supervisor trusted the ZNY CWSU weather briefing so much at 1935Z that he scheduled supper breaks for his crew earlier than normal. The forecaster called for significant weather development around 2200Z so he sent as many controllers on break about one hour earlier than normal to insure they were available to work position when the weather developed. Moreover, the Supervisor used RAPT to staff the ground control sequence (GC-Seq) position efficiently. Prior to 2200Z, the GC-Seq person was assigned easier duties since weather and traffic weren't so bad and his training opportunity was limited. When the Supervisor saw routes turning red on RAPT, he moved the trainee to the more difficult sequence position because it was very busy and afforded maximum training opportunities.	EP, SA-1, SA-2, I/IC	TMD		
LGA-5-1-	13	2246	GAYEL is stopped. RAPT shows GAYEL J95 green. LANNA is still stopped and RAPT shows the route red then green for 2300 departures.	*(DOL) SA-2	RP		
LGA-5-1-	14	2304	GAYEL is released. RAPT shows J95 green.		RP		
LGA-5-1-	15	Note	The Supervisor commented that there appeared to be many more route closures and restrictions this year than in past years due to weather outside of N90 or ZNY airspace.		TMD		
LGA-5-1-	16	2344	There are 20 planes waiting to take off. RAPT shows PARKE J6 red, BIGGY J75 red then yellow for 0000 departures, LANNA J48 red then yellow for 2345 departures.		TMD, RP		

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LGA-5-1-	17	0002	The TMC checked with N90 and ZNY to determine if there was a pathfinder currently on J48 (via LANNA). At 0011Z, RAPT indicated J48 as red, yellow at 0010Z, and red again from 0015Z – 0035Z. The pathfinder eventually reported at 0019Z that he made it through; but shortly thereafter, the gate and route were closed again. RAPT clearly showed a succession of cells moving west to east across J48 so the pathfinder must have deviated around the weather along the route but then gaps must have closed after the PIREP.	SA-2	RP, EO, TMD		
LGA-5-1-	18	0025	WHITE is closed due to weather in ZDC. RAPT shows WHITE J79 yellow to red for 0050 departures and WHITE J209 green.		RP		
LGA-5-1-	19	0037	The Supervisor uses RAPT to determine if the current stop on WHITE is reasonable. ZDC is not accepting any traffic from ZNY. LGA ATC does not understand why this is because RAPT shows departures before 0055Z could possibly make it. The Supervisor thinks the weather is too far away to be an impact and, at the time, J79 was green, yellow for 0045 departures, and then red for 0050 departures. En route echo tops vary from 41 to 49kft. The observer assisted in viewing the display.	SA-3 *(RO)	EO, RP, TMD, TMD-LOU	Yes	TSD
LGA-5-1-	20	0044	All departures are stopped.				
LGA-5-1-	21	0052	The Supervisor references RAPT graphics to see where weather is relative to J79. He says that weather is still well west of the routes via WHITE and that RAPT is doing well. RAPT shows J79 was green to yellow for 0055 departures to red for 0105 departures.	SA-1 *(RO)	RP, EO		

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LGA-5-1-	22	Note	<p>The TMC made several specific requests for RAPT overlays. He does not want to open various tabs via the Route Selector and individually click fixes, jetways, etc. He wants everything (including this list) to be a default for LGA.</p> <ul style="list-style-type: none"> <li>• Jetway 174 via WAVEY</li> <li>• MERIT routes</li> <li>• HAAYS fix and associated routes for LGA</li> <li>• NEION fix and associated routes for LGA</li> <li>• Jetway 121 via SHIPP</li> <li>• BAYYS fix and associated routes for LGA</li> </ul>		UR		
JFK-5-1-	1	1615	The observer opened RAPT on the Supervisor's computer. RAPT shows All routes green except WAVEY. RAPT shows WAVEY red. Weather is a stationary front southern Illinois to northern W.Va, then becoming a cold front extending along the Mason-Dixon line, eastward along the southern edge of Long Island out to the Atlantic.		RP, EO		
JFK-5-1-	2	1620	WAVEY is restricted 30 MIT and RBV is 15 MIT per transition.		TMD		
JFK-5-1-	3	1628	North gates are restricted 10 MIT. RAPT showed WAVEY green to yellow to red but then updated to mostly yellow with two red segments at the end of the timeline.		TMD		
JFK-5-1-	4	1711	JFK has 15 minute departure delays. Aircraft are landing on both runways.		TMD		
JFK-5-1-	5	1735	JFK has 30 minute departure delays. Controllers are having problems getting DSP approvals from the pit, delaying aircraft from taxiing to the departure runway.		TMD		
JFK-5-1-	6	1748	No departure delays at this time. A ground stop is in effect for JFK. Weather is still south of JFK, affecting arrivals instead of departures, resulting in the ground stop.		TMD		
JFK-5-1-	7	1814	WAVEY/SHIPP is stopped. RAPT shows the route green.	*(DOL, SA-2)	RP, EO		

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JFK-5-1-	8	1838	A pathfinder for WAVEY is requested.		TMD		
JFK-5-1-	9	1843	The WAVEY pathfinder departs. RAPT shows all routes clear.		TMD		
JFK-5-1-	10	1853	Pathfinder was successful. WAVEY/SHIPP is opened with 20 MIT. RAPT shows WAVEY/SHIPP clear.				
JFK-5-1-	11	1906	The TMC requests that RAPT be made available on the TMC computer.		UR		
JFK-5-1-	12	2024	The TMC reiterates his request that RAPT be made available on the TMC computer. It is not very accessible to him now.				ETMS, ITWS
JFK-5-1-	13	2117	J75 is stopped. RAPT shows J75 red.		RP		
JFK-5-1-	14	2204	GAYEL is stopped due to weather. The observer notes some weather nearby, but not on the route. RAPT shows GAYEL green. The TMC is investigating why the route is closed after reviewing RAPT.	SA-3, SA-2, I/IC, EP *(DOL)	RP		ETMS
JFK-5-1-	15	2205	ZNY confirms that GAYEL is stopped due to weather en route.		TMD		
JFK-5-1-	16	2234	J75 is still stopped due to weather, with two aircraft waiting for J75 routing and release. RAPT shows the route red. The TMC checked RAPT and concurred.	SA-2, SA-3	RP		ETMS
JFK-5-1-	17	2250	GAYEL is released, but that traffic is being rerouted anyway. RAPT shows GAYEL clear.		RP, TMD		
JFK-5-1-	18	0032	WAVEY 20 MIT. RAPT not accessible.				
JFK-5-1-	19	0107	J48 and J75 are stopped due to weather. RAPT shows the routes red.		RP		
JFK-5-1-	20	0114	GAYEL is stopped. RAPT shows GAYEL green.		RP, EO		
JFK-5-1-	21	0135	Weather is impacting GAYEL J95. RAPT shows the route fluctuating between yellow and green.		RP, EO		



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N90-5-1-	1	1549	<p>A large area of level 2-6 precipitation over central PA stretches southwestward to the PA/WV border across southwestern PA into northwestern WV and southeastern OH. Level 6 cells are in a north-south line across southwestern PA into northern WV and in another line from the southwest corner of PA southwestward to northwest/northwest-central WV. Small scattered areas of level 2-3 precipitation are over Cape Cod, extreme eastern Long Island, and eastern PA eastward into NJ.</p> <p>The TMU position CIWS display contains a RAPT window showing routes for JFK and EWR, VIL, Precipitation Forecast, and Echo Tops windows. The LGA ITWS display is open at the TMU position. The CIWS display at the STMC position contains a RAPT window showing EWR routes, Echo Tops, and Precipitation Forecast. The TSD displays all four NY airports.</p>				
N90-5-1-	2	1549	<p>Currently, WHITE is stopped, J48 and J75 are rerouting as appropriate for aircraft. ORD is 30 MIT 1500-1630z, DTW is 20 MIT 1630-1730z, BIGGY and LANNA are 20 MIT to 2000z, ELIOT is 15 MIT to 1400z, PARKE is 15 MIT to 2000z, and WHITE and RBV are 15 MIT to 2000z.</p> <p>RAPT shows EWR: PARKE J6 yellow; ELIOT J60, J64, J80 green; EWR: WHITE J79 yellow through 1550 departures.</p>		RP		
N90-5-1-	3	1600	<p>ZNY closes WAVEY. RAPT shows EWR: ELIOT J60 yellow. J64 yellow for 1605-1620 departures then green, J80 yellow to 1625 departures then green, EWR: PARKE J6 yellow for 1605-1610 departures and green otherwise.</p>		RP, TMD		
N90-5-1-	4	1606	<p>Level 5-6 area moving eastward through southern NJ. RAPT shows LANNA J48 green and other routes as described at 1600.</p>				CIWS, TSD

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N90-5-1-	5	1613	Level 2-3 weather is surrounding ELIOT, PARKE, LANNA, BIGGY. A north-south line of level 4-6 cells is located from south-central to southeastern NJ (Burlington to Cape May counties); J209 to J121. ZNY has stopped WAVEY. RAPT shows all routes green.		RP, EO, TMD-LOU		CIWS, ITWS, TSD
N90-5-1-	6	1643	TEB is reopened. RAPT shows all routes green.				
N90-5-1-	7	1654	ZNY is asking N90 to hold CAMRN as much as possible. RAPT shows routes green.		EO, TMD		
N90-5-1-	8	1704	A level 6 cell is northeast of WAVEY. A second level 6 cell is south-southeast of WAVEY. A north-south line of level 4-6 cells runs from WHITE between J79 and J121 crossing J121 and barely reaching J174 in the south NJ area. RAPT shows JFK: WAVEY J174 yellow ENR.  EWR GDP until 0135z.		RP		
N90-5-1-	9	1723	An area of convective activity stretches from PARKE to western Long Island to west of WAVEY to north NJ coast to Atlantic ocean to over J174 to WHITE to BIGGY. An area of level 5-6 cells east of WHITE stretches south-southwestward to central NJ coastline. There is a level 6 cell on edge of ZNY to south of WHITE with tops to 45 kft. RAPT shows all routes green.		RP, EO		
N90-5-1-	10	1730	Restrictions: North gates 10/15 MIT to 2000z BIGGY/LANNA 20 MIT to 2000 excluding DC metros ELIOT/PARKE 15 MIT to 2000z/1900z respectively excluding IAD (for PARKE) WHITE 20 MIT to 2000z no exclusions RBV 15 MIT to 2000z P/T  The level 2-4 area is moving eastward and clearing over the west gates. RAPT shows all route green.		RP, TMD		

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N90-5-1-	11	1806	The TMC notes that the weather is moving out of EWR and calls to EWR to see about clearing out some aircraft. EWR says that the visibility is still too low to increase the departure/arrival rate, but it is changing rapidly. RAPT shows all routes green. The TMC watched the EWR routes turn green and remarked that the weather appeared to be clearing up and that he was going to call EWR.	SA-2, EP, I/C	TMD		ITWS, ACD
N90-5-1-	12	1833	Traffic through MUGSY stopped, sector unsure if it's volume or something else		TMD, TMD-LOU		
N90-5-1-	13	1836	WAVEY is 20 MIT with no exceptions per ZDC. RAPT shows all routes green.		RP, EO		
N90-5-1-	14	1840	A Jetblue flight volunteers to be a WAVEY pathfinder. RAPT shows all routes green.		TMD		
N90-5-1-	15	1848	The Jetblue pathfinder reports that WAVEY is good. N90 requests that ZNY and ZDC approve opening the WAVEY routes. RAPT shows all route green.	*(DOL, SA-2, SA-3)	TMD, RP		
N90-5-1-	16	1857	Convective weather is now off the NJ coast and over mid to extreme eastern Long Island. A second area of scattered level 2-5 cells is moving eastward along the Canadian border from Lake Erie to southwest ME. A third large area of convection is in eastern IL along the southern IN border. An east-west line of level 5-6 storms is in southwestern IN to southeastern IL. RAPT shows all routes green.		RP		
N90-5-1-	17	1900	The LGA ground stop is cancelled with restrictions. RAPT shows all routes green.		RP		
N90-5-1-	18	2003	ZDC is holding for LGA due to volume caused by earlier weather. RAPT shows all routes green.		TMD		
N90-5-1-	19	2019	WHITE is 15 MIT until 2200z with normal exclusions. RBV is 10 MIT until 0000z. A small area of level 4-6 cells are moving eastward across northern VA. More scattered cells are along the western border of VA and WV. Traffic continues to move through the area. RAPT shows EWR and LGA: LANNA J48 red; JFK: RBV J48 red ENR.		RP, TMD		

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N90-5-1-	20	2050	Cells have moved and are now in the southernmost area between J48 and J75. A level 6 cell is directly over J48. The northernmost cells have a leading edge touching J48 in northern VA with level 5-6 cells just west of J48. There is little impact on NY metro traffic. RAPT shows J48 LANNA and all RBV routes red, ENR and J75 BIGGY yellow to red ENR for 2100 departures.		RP, EO		TSD, CIWS Precipitation Forecast
N90-5-1-	21	2115	J75 is closed, excluding DC metro traffic. CVG is ground stopped due to level 6 cells. GREKI/CAM is impacted by cells in western NY. A north-south line is east of CAM's western end. Another cell is just west of the ZBW/ZOB border. RAPT shows J48 and J75 LANNA/BIGGY/RBV red ENR, J79 WHITE yellow ENR, J6 PARKE/RBV yellow ENR, and GREKI/CAM red ENR to yellow ENR to red.		RP, TMD		
N90-5-1-	22	2133	J48 and J75 are stopped (excluding DC metro traffic) due to weather.				
N90-5-1-	23	2139	LANNA and BIGGY are stopped.				
N90-5-1-	24	2150	The restrictions on WHITE and WAVEY are extended to 0100. J48 and J75 are expected to remain closed over the next hour due to large thunderstorm overhangs. RAPT shows all J48 and J75 routes red ENR.		RP		CIWS
N90-5-1-	25	2243	PARKE is stopped; GREKI is 30 MIT. A large level 6 cell is east of J75/J42 intersection and two smaller level 5-6 cells are west of the larger cell, located between J48 and J75. A north-south line of level 4-5 cells, with three level 6 cells, are located in central to eastern NY over the CAM route. Another level 6 cell is in western NY near Lake Erie. A large area of level 1-3, with an embedded southeast-northwest line of level 4-6 extends from west central WV into southern OH and northern IN. RAPT shows GREKI/CAM yellow ENR; J6, J48, J75 all red ENR.		RP		
N90-5-1-	26	2256	The MERIT restriction is extended to 0100. The 30 MIT restriction on GREKI is extended to 0130. RAPT shows J6, J48, and J75 red ENR for all fixes and GREKI/CAM yellow ENR.		RP, EO		
N90-5-1-	27	2305	North gates are restricted 15 MIT due to a frequency outage.		TMD		CIWS

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N90-5-1-	28	2315	LGA north gates are released with MIT restrictions. A large area of convection stretches across ME, NH, CT, and eastern NY. There is a north-south line of level 5-6 weather, with a hook to the northeast through the New England states. An area from central VA extends westward with break in western VA then an east-west line through central WV. Level 5-6 cells are embedded in level 2-3 precipitation. RAPT shows north routes all green, J6 red ENR through 2345 departures, J48 red ENR through 2335 departures, and J75 red through 2345 departures.		RP, TMD		
N90-5-1-	29	2329	A northeast-southwest line of convection extends from the northeast corner of PA across eastern NY through south central VT, central NH, and northern ME. An area of level 5-6 convection lies in an east-west line through central VA, crossing J48 and J75. A large area of convection in a general east-west line stretches through central WV, southern OH, and northern KY. RAPT shows all J6 and J75 routes red and all J48 routes green.		RP		
N90-5-1-	30	2338	North gate departures for JFK, LGA, and EWR are stopped by the Center due to volume. RAPT shows all J6 routes red ENR, all J48 routes yellow ENR, and all J75 routes red to yellow ENR.		RP, TMD		
N90-5-1-	31	2351	A pathfinder for J48 is launched off EWR. RAPT shows J48 green		TMD		
N90-5-1-	32	0020	J48 is open. RAPT shows J48 red then yellow ENR.	*(RO, SA-2)	TMD, RP, EO		
N90-5-1-	33	0030	ZDC states that J6, J48, J75, J79, J209 are of "uncertain disposition" and there is no route southbound. No reason is given. WHITE is closed indefinitely. The first four NRA's out of EWR are given DIXIE reroutes with 10 MINIT (per N90). RAPT shows all J48 routes yellow ENR, all J75 routes red ENR, and all J79 routes yellow ENR through 0035 departures then red ENR for 0040-0055 departures.		TMD-LOU, TMD, RP		
N90-5-1-	34	0036	RBV 20 MIT as one (per N90). RAPT shows J75 red, J6 red ENR, J48 yellow ENR, LGA: WHITE J79 yellow ENR to red through 0105 ENR, and all remaining routes green.		TMD, RP		

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N90-5-1-	35	0044	JFK has a lot of departures in the next hour and needs RBV, but the fix remains closed. ZNY does not plan to open RBV. JFK inquires about J6 and J60. ZNY says that J6 is closed, but J60 is clear. RAPT shows RBV green except for J48 and J75.	*(RO, SA-1)	RP, TMD, TMD-LOU, EO		
N90-5-1-	36	0048	LGA is approaching gridlock. N90 is requesting departure routes. J6, J48, J75, and WHITE are all closed. ZNY is working on DIXIE departures. RAPT shows J6, J48, and J75 red through 0115 departures.		TMD, RP		
N90-5-1-	37	0058	A pathfinder for WHITE, coordinated with ZDC, is released. ZDC is tentatively expecting to restrict WHITE 25 MIT with no exclusions. RAPT shows WHITE J79 red ENR and WHITE J209 green. The TMC consulted RAPT when talking to the pilot.	SA-2, I/IC	RP, EO, TMD		CIWS
N90-5-1-	38	0103	WHITE is open with APREQ, no exceptions.		TMD		
N90-5-1-	39	0107	A large area of convection stretches east-west across central VA, followed by a slight break then an area covering central/south central WV that stretches westward into southern OH/northern KY. A line of level 5-6 cells is embedded in the center of the first area. RAPT shows J6, J48, and J75 red ENR.		RP		
N90-5-1-	40	0112	GAYEL J95 is closed. Three GAYEL departures are vectored over COATE. RAPT shows all J95 routes green.		RP, EO, TMD		
N90-5-1-	41	0130	North departures from the four NY metro airports are stopped due to volume. RAPT shows north gates green.		TMD		
N90-5-1-	42	0134	COATE only is open to north departures. RAPT shows EWR: GAYEL J95 green, JFK: GAYEL J95 alternately yellow and green, LGA: GAYEL J95 green to yellow to green.		RP, EO		
N90-5-1-	43	0212	WHITE and WAVEY are stopped. J6, J48, and J75 are red.		TMD, RP		
N90-5-1-	44	0305	The ELIOT restriction is cancelled. EWR has a large number of departures for this fix. RAPT shows all routes green except for J75 (yellow ENR), J79 (red ENR), and J209 (red ENR).	*(RO)	RP, TMD		
N90-5-1-	45	0310	ZOB requires 10 MIT on J80 due to volume out of DC metro. RAPT shows all southbound (J6, J48, J75, J79, and J209) red.		TMD, RP		

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N90-5-1-	46	0329	ELIOT is stopped. ZNY requires 15 MIT on all ELIOT departures, not just J80. RAPT shows all southbound (J6, J48, J75, J79, and J209) red.		TMD-LOU, RP		
ZNY-5-1-	1	1555	Weather is moving into N90. Lines along the ZDC/ZNY border are moving from MD to DC to south NJ and Delaware Bay. RAPT was displayed at the STMC and Departure Position when the observer arrived. RAPT shows WAVEY J174 yellow to red, WHITE yellow to green. CIWS echo tops forecast shows tops to 55+ kft moving over south NJ.		RP		CIWS
ZNY-5-1-	2	1605	The STMC states that within the past hour, 50 kft-topped storms moved over J209 but RAPT showed the route green the entire time.		RP, EO		
ZNY-5-1-	3	1610	Areas A, B, and C are all displaying CIWS. Area D is displaying WARP. The weather in ZNY is not currently causing problems but the weather in ZDC has forced the closing of WHITE and WAVEY.				
ZNY-5-1-	4	1615	The SWAP is started. A strong cluster of storms are impacting WHITE in ZDC. Another strong cluster is south of PCT. WHITE is closed. WAVEY was closed previously for volume due to flights using gaps in the weather. WAVEY is open now. RAPT shows WAVEY red and WHITE open. RAPT is open at the STMC position and maximized at the Departure position. Areas A, B, and C are using CIWS; Area D is using WARP.		TMD, RP, EO		
ZNY-5-1-	5	1617	Weather is moving into southern NJ along J174. RAPT shows J174 yellow to red.		RP		
ZNY-5-1-	6	1625	The STMC uses CIWS during a briefing to describe the weather scenario.				CIWS VIL, Satellite
ZNY-5-1-	7	1627	WAVEY is open. RAPT shows WAVEY yellow to red. The STMC has been reviewing CIWS to understand the weather.		RP, EO		CIWS
ZNY-5-1-	8	1629	ZDC asks for three WHITE pathfinders with 30 MIT. RAPT shows WHITE green.	I/IC *(RO, SA-2)	EO, TMD		

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ZNY-5-1-	9	1630	The W-IDS warning area is active, which makes it difficult to use A-761.		TMD		
ZNY-5-1-	10	1636	A WHITE pathfinder is released from LGA. RAPT shows WHITE green.		TMD, RP		
ZNY-5-1-	11	1638	A WHITE pathfinder is released from EWR.		TMD		
ZNY-5-1-	12	1641	Weather is along the southern NJ coast. J174 is still open but traffic may be deviating in ZDC. RAPT shows WAVEY J174 green to yellow to red.		TMD, RP, EO		
ZNY-5-1-	13	1648	A third WHITE pathfinder is released from LGA. RAPT shows WHITE green.		TMD, RP		
ZNY-5-1-	14	1650	Northbound JFK arrivals on the east side of ZDC are shut off by Area E because they are 30 miles off route. The flow must be stopped until the PHL holding stack is cleared by ZDC. Otherwise, Area E will have to close WAVEY and ZNY does not want that. Thus, clearing PHL holding is now a ZDC priority. This also impacts the WHITE pathfinders. The Departure TMC asks for another WHITE departure but the STMC says to wait because of the JFK flow impacts. RAPT shows WAVEY J174 green to yellow to red.		TMD, RP		
ZNY-5-1-	15	1704	WHITE is 20 MIT, no exclusions. The first of two pathfinders made it through ZDC with no problems. However, the northern part of the line of weather is starting to impact WAVEY in ZNY. Aircraft are deviating toward DITCH. DITCH traffic is light now, so deviations are allowed for now. RAPT shows WHITE green, WAVEY yellow to red. The STMC is using CIWS to assess the weather on and near departure and arrival fixes.		TMD, EP, RP, PB		CIWS
ZNY-5-1-	16	1705	WHITE traffic is deviating in ZNY toward DITCH. ZDC reduces the restriction to 20 MIT because the first two pathfinders were successful; the third deviated around some weather in southern N90. The STMC confirms the reopening of WHITE with 20 MIT. RAPT shows WHITE green to clear, WAVEY yellow.		RP		



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ZNY-5-1-	17	1708	The STMC is investigating weather impacts by WHITE and WAVEY He is having a hard time seeing the fix overlays on CIWS so he changes the fix colors. The STMC also viewed RAPT for a cleaner depiction of the weather near WHITE. RAPT shows WHITE green and clear.	SA-1, EP	RP		CIWS VIL, Lightning, Echo Tops
ZNY-5-1-	18	1713	There is a strong cluster of level 6 weather impinging on WAVEY J174. The observer notes some flip-flopping in the CIWS Forecast and RAPT impacts. RAPT shows WAVEY yellow to red. The STMC notes the red status of RAPT and states that WAVEY issues may be causing problems soon.	SA-2, EP	EO, RP		
ZNY-5-1-	19	1720	The Area E Supervisor is concerned about oceanic arrivals from the southeast arriving near the N90 border when the weather cluster arrives there. The Supervisor presents a plan to proactively bring these arrivals in further west, near SIE, then north on the back side of the weather. The Area Supervisor and STMC question how fast the cluster is moving. They consult the DSR and recall previous of the weather to infer that the weather is slowing down. The observer tells the STMC that ITWS shows the cluster moving northeast at 25 kts.		TMD	Yes	ITWS
ZNY-5-1-	20	1748	WHITE is 15 MIT with no exclusions. RAPT shows WHITE green, WAVEY red.		RP, TMD, EO		
ZNY-5-1-	21	1820	WAVEY/SHIPP is closed due to weather.		EO		
ZNY-5-1-	22	1835	Level 2 weather is off the NJ coast and over Long Island. Storms are developing in upstate NY ahead of a cold front. RAPT shows all routes clear.		RP		
ZNY-5-1-	23	1838	The weather is dissipating and moving off along Long Island. RAPT shows all routes green.				
ZNY-5-1-	24	1848	The WAVEY route is good through N90. RAPT shows all routes clear.		RP		
ZNY-5-1-	25	1849	WAVEY departures at N90 worked fine.		TMD		
ZNY-5-1-	26	1850	ZDC opens WAVEY with 20 MIT. The ZNY STMC is waiting for the results of a pathfinder through the ZDC airspace before officially opening the route. RAPT shows WAVEY clear.	*(RO, SA-2, I/IC)	TMD, RP		

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ZNY-5-1-	27	1853	The STMC asks the observer about the prospects for convection. The STMC references the CIWS satellite product for preliminary evidence of current and expected conditions.				CIWS Satellite
ZNY-5-1-	28	1900	LGA is first-tier ground stopped for volume. JFK is ground stopped for low visibility. EWR is under a GDP for low ceilings and visibility.		TMD		
ZNY-5-1-	29	1925	A discussion of weather impact on Chicago was underway when the STMC panned the CIWS west to assess the weather impacts in the Chicago area.				CIWS VIL, Satellite
ZNY-5-1-	30	1936	Weather is building north and northwest in ZNY. Weather along the front is expected to begin developing in western PA in the next hour or two.				
ZNY-5-1-	31	1945	The Area B Supervisor asks if CIWS/RAPT can predict convective weather before it develops. They are expecting storms after 6PM today and would like for CIWS to provide a heads-up before the storms pop.		TMD		
ZNY-5-1-	32	2005	Isolated cells are developing in ZDC between J6 and J48. There are more isolated cells further south along J48 in southwest ZDC. RAPT shows EWR J48 clear to yellow ENR for 2020 departures.		RP		
ZNY-5-1-	33	2015	Storms are building east of J48 in ZDC. RAPT shows J48 red ENR, in spite of the fact that the weather is significantly off the route. The CIWS forecast shows weather on J48 at 21Z.		RP, EO		
ZNY-5-1-	34	2015	Weather is building in southwest ZDC, west of J48. RAPT shows LANNA J48 yellow to red ENR.				
ZNY-5-1-	35	2018	Weather is starting to develop on the PA/NY border south of ROC. It is a small cell near J70 and growing rapidly. RAPT shows LANNA J48 red ENR.		RP, EO		
ZNY-5-1-	36	2026	Weather is building along J48 in ZDC. RAPT shows J75 BIGGY yellow ENR for 2050 departures. The observer helped STMC review RAPT.			Yes	
ZNY-5-1-	37	2040	There are two large clusters of weather in ZBW with a gap near UCA. No routes are currently closed and RAPT shows GREKI 34 ENR.		RP, EO		

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ZNY-5-1-	38	2050	J48 is closed by ZDC. Traffic on J48 is combined with J75 as one. The observer notes that the previous RAPT forecast did an excellent job of predicting the impact on J48. RAPT currently shows J48 red and J75 clear to yellow to red.		RP, EO		
ZNY-5-1-	39	2050	At the Area C Supervisor's request, the observer adds a new fix to the CIWS display and saved the configuration. The observer also opens RAPT on the Area C display.				
ZNY-5-1-	40	2050	ZDC closes J48 due to weather and restricts J75 10 MIT. RAPT shows J48 red ENR for 2045 departures, J75 yellow for 2055 departures and red ENR for 2100 departures. The RAPT forecast was correct. RAPT was not used operationally, but the observer did show the STMC that RAPT was correct.				
ZNY-5-1-	41	2113	ZDC tells Area B to stop J75 departures. This matches well with the RAPT guidance, which shows J75 red for 2110 departures and J48 red.	*(EP, SA-2)	TMD, EO		
ZNY-5-1-	42	2114	ZDC closes J75, taking what is already in the air. J48 is still closed. RAPT shows J75 yellow to red ENR for 2110 departures. The STMC is looking at RAPT for situational awareness and notices the color changes.	SA-2, SA-1, SA-3	RP		CIWS
ZNY-5-1-	43	2115	During SPT, the STMC notes issues with thunderstorm overhang affecting J48 and J75 traffic.		PB, RP		
ZNY-5-1-	44	2116	Storms are forming along J6 in ZID. RAPT shows J6 yellow ENR for 2115 departures. The STMC notes the J6 timeline status and informs another STMC of pending J6 impacts.	SA-2, I/IC, EP	RP, TMD		CIWS VIL
ZNY-5-1-	45	2117	ZDC reports that large overhangs on J75 and J48 are causing deviations to the east. RAPT shows J48 and J75 red ENR.		RP, TMD,EO		
ZNY-5-1-	46	2125	The CWSU provides a briefing for the STMC. The STMC cites the RAPT timeline to point out the scope of the J6/J48/J75 impacts. The CWSU uses the CIWS display to describe the current and expected weather scenario.	EP, SA-1, I/IC	TMD		All CIWS products.

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ZNY-5-1-	47	2130	Scattered large, level 6 strong cells are in upstate NY. A cluster of level 6 cells is still impacting J48/J75. A new level 4 cell developed in eastern ZOB along J70. Only J48 and J75 are closed. There is significant weather in ZID near J6. RAPT shows J48/J75 red (J75 missing ENR notation), J6 red ENR, and GREKI yellow. The STMC is watching CIWS echo tops and notes that the cell in eastern ZOB is building because the tops have increased from 28 kft to 33 kft.		EO,RP		CIWS Echo Tops
ZNY-5-1-	48	2159	Area C reports that J82 traffic is deviating to the south of the weather onto J95. If this continues, ATC will have to close J95. RAPT shows J95 green.		TMD, RP		
ZNY-5-1-	49	2200	Area A reports that J6 is 20 MIT per strat, imposed by ZDC or ZID. There is a large convective cluster along J6 in ZID. RAPT shows J6 red.		RP, TMD,EO		
ZNY-5-1-	50	2202	J95 GAYEL is stopped by ZBW due to weather and deviations.		TMD		
ZNY-5-1-	51	2204	GAYEL departures are stopped because J82 arrivals are deviating around weather.		TMD, PB		
ZNY-5-1-	52	2207	Area A stops J6 due to volume. There is weather on J6 in ZID but the stop is due to volume in Area A.		TMD		
ZNY-5-1-	53	2225	There is a significant storm cluster in ZID and a small, but severe, cluster along J48/J75 in ZDC. Several large cells are producing overhangs in ZBW (upstate NY). GREKI is restricted 20 MIT. N90 stops GREKI for all Towers and accepts APREQs only. RAPT shows GREKI red ENR; J6, J48, and J75 red.		TMD, RP		
ZNY-5-1-	54	2230	Isolated level 5 cells along the ZDC coast are decaying to level 3 and echo tops are dropping. RAPT previously shows WHITE J79 yellow to red; now clear.	*(RO, SA-2)	RP		
ZNY-5-1-	55	2235	There is a cluster of strong storms (level 6, 41 to 50 kft with gaps) embedded in the coagulated blow-off and impacting GREKI. RAPT shows GREKI red then yellow.		RP		
ZNY-5-1-	56	2238	ZDC closes J6. The Area A Supervisor informs the STMC who then informs the Departure Desk TMC who informs N90 who then informs the Towers via the hotline. RAPT shows J6 red ENR.		TMD,RP		

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ZNY-5-1-	57	2255	Storms along J48 are very strong. Development along the line continues to impact J48. It appears that the convection will stretch into ZID and form a solid line. RAPT shows J6, J48, and J75 red. RAPT indicated possible clearing on J48 and the STMC stated that there might be an opportunity for a J48 pathfinder in 30 minutes. However, when RAPT updated, it shows J48 red. The observer explained that the CIWS forecast was having difficulty picking up the new, continuous growth on the back of the cluster of J48.	SA-2, I/IC	EO, RP, TMD	Yes	
ZNY-5-1-	58	2259	GAYEL, which was closed to accommodate the deviations on arrival route J82, is reopened. Normally, ZNY does not see J82 traffic because it passes from ZOB to ZBW. Deviations south of the route bring the traffic into ZNY airspace. The STMC indicated that they could have just closed the door on ZOB (instead of allowing the deviations into ZNY airspace), but this late in the day ZNY can tolerate temporary gate closures and they work to accommodate weather impacts on other facilities. ZOB called the ZNY to thank them for their help. RAPT shows no weather impacts on GAYEL.		TMD		
ZNY-5-1-	59	2300	The cluster of weather on J48 shows growth. The CIWS forecast shows the weather moving off the route. RAPT shows J48 red to yellow to clear, indicating J48 clearing for 2320 departures.		EO, RP		
ZNY-5-1-	60	2305	RAPT shows J48 is red again. The CIWS forecast is having difficulty with the discrete growth on the back of the weather.		EO, RP		
ZNY-5-1-	61	2305	The Unit is fairly quiet. J6, J48, and J75 are still closed but all west and north gates are open.				
ZNY-5-1-	62	2315	ZID, ZDC, and ZBW impacts are discussed on the SPT. The STMC pans the CIWS display to ZID to view the weather impacts there.				CIWS VIL, Echo Tops, Lightning, Forecast

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ZNY-5-1-	63	2325	A cluster of level 6 weather continues to impact J48 but may be moving off. RAPT shows J48 going green. The STMC notes this and calls the ZDC STMC to inquire about potential route usage. ZDC reports that even if the weather does clear J48, PCT issues and internal holding problems could still prevent use of the route at this time. (There are significant PCT departure fix closures and route swaps now.)	I/IC, SA-2, EP	TMD, RP		CIWS VIL, Echo Tops, Lightning, Forecast
ZNY-5-1-	64	2335	On the SPT, USAir asks ZDC for a J75 pathfinder. ZDC reports a lot of weather on J75, but they are investigating the possibility of reopening J48 for NY with the Areas. RAPT shows J48 yellow then clear; J75 red ENR. The ZNY STMC consults CIWS when he hears about the J75 pathfinder and tells the observer that J48 is a better candidate than J75.	DP, SA-1, EP	RP, TMD		CIWS VIL, Echo Tops, Lightning
ZNY-5-1-	65	2335	Small scattered cells are developing along J48 between the ZID and ZDC weather clusters. RAPT shows J48 yellow ENR.		RP		
ZNY-5-1-	66	2345	The ZDC observer notes that the STMC will try a J48 pathfinder for NY. The STMC coordinates with the ZNY Departure Desk TMC. RAPT shows J48 yellow ENR.		TMD, RP		
ZNY-5-1-	67	0005	J48 pathfinders are released from PHL and EWR. RAPT shows J48 yellow ENR but changes to red to yellow ENR for the 0005 update.		TMD, RP		
ZNY-5-1-	68	0006	Three J48 pathfinders are en route. The first departed at 2350.				
ZNY-5-1-	69	0015	Storms are building in a short line in ZBW and northern ZNY. Further south, clusters are filling into an east-west line in ZDC. There are three J48 pathfinders en route. RAPT shows the north gates clear, J48 flipping between all yellow and yellow/red, J6 red, J75 yellow to red, and WHITE clear to green to yellow to red.		EP, RP		
ZNY-5-1-	70	0020	The STMC highlights the J48 pathfinders on the TSD to monitor their progress.				
ZNY-5-1-	71	0025	Sector-to-sector, ZDC closes WHITE departures. Now, J6, J48, J75, J209, and WHITE are closed. RAPT shows WHITE clear to green to yellow to red.		TMD, RP, EO		

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ZNY-5-1-	72	0028	ZDC reports that the pathfinder for J48 deviated off the route and that weather is filling the hole. RAPT shows J48 yellow to green for 0050 departures. The STMC views RAPT, sees the green at 0050, and contemplates the opportunity in 30 minutes. However, he understands that this weather situation is difficult to forecast.		RP, EO, TMD		CIWS VIL, Echo Tops
ZNY-5-1-	73	0028	The first J48 pathfinder deviated too far west, so J48 is not opened. The STMC used RAPT to see if any routes to the south were potentially open.	SA-1, EP			
ZNY-5-1-	74	0030	Weather continues to build along and near J95. Area C reports that GAYEL traffic is now deviating, but no action is taken. RAPT shows J95 clear to green.		PB, RP, TMD		
ZNY-5-1-	75	0031	The observer visited Area C. Weather is starting to build on J95 and the north gates. The Area C Supervisor says that aircraft are beginning to deviate south of the weather. RAPT shows J95 turning green.		RP, PB, EO		
ZNY-5-1-	76	0034	There are 4 ALT flights at EWR for which there is no route available. The STMC consults CIWS for situational awareness, then offers a DIXIE to J174 reroute for these aircraft. Apparently the pit is also working on this problem, so the STMC says to disregard the DIXIE offer.		TMD		CIWS
ZNY-5-1-	77	0043	An isolated cell is not on top of J36 and a small cell is on J95. RAPT shows J36 and J95 clear; J6, J48, and J75 red.		RP		
ZNY-5-1-	78	0045	ZNY is working with JFK to determine where to send the JFK RBV push. Typically this traffic uses J48/J75. JFK asks about the possibility of using J6/J60. RAPT shows J6/J48/J75 red and J60 clear. The STMC consults the RAPT loop and timelines and tells JFK/N90 that J6 will be impacted for some time, but that J60 is fine. He cites CIWS growth to explain that weather near J48 keeps "back-growing" over the route and will continue to impact the route for some time.	I/IC, SA-1, SA-2, EP, RRP	TMD, RP		CIWS Growth and Decay Trends

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ZNY-5-1-	79	0045	N90 called to discuss JFK departures over the next hour. JFK departures typically use RBV J48/J75. However, these routes are closed. RAPT shows J48, J75, and J6 red; J60 green. The STMC used RAPT to make a proactive determination to reroute JFK departures over RBV to J60.				CIWS Forecast
ZNY-5-1-	80	0045	There are strong cells near J36 and J95. WHITE has been closed for some time, but the core of the weather still remains well west of J209. However, the considerable overhang well east of the cores is impacting the route and pilots are avoiding it. RAPT shows J36/J95 clear to green for 0100 departures; WHITE J79 green to yellow to red; WHITE J209 clear. RAPT is not capturing the impact from the thunderstorm overhang.		EO, RP		
ZNY-5-1-	81	0055	Storm cells are nearly on top of J95, RAPT shows J95 green to yellow to green.		RP, EO		
ZNY-5-1-	82	0059	ZDC opens WHITE with 25 MIT. The observer questions the timing of the opening: Dark so pilots cannot see overhang? Military airspace usage has changed?		TMD, RP, TMD-LOU		
ZNY-5-1-	83	0101	Weather is building in a short line near J95, but is still mostly northeast of the route. RAPT shows J95 green. The STMC consults CIWS for situational awareness along J95		RP		CIWS VIL, Echo Tops, Storm Motion, Lightning
ZNY-5-1-	84	0102	Weather on J95 is building a little. However, demand is falling off, so the STMC is not worried. The STMC used CIWS to assess the weather on J95.		TMD, RP, TMD-LOU		CIWS
ZNY-5-1-	85	0106	A line of weather is just off J95. An aircraft filed GAYEL/J95 is deviating. RAPT shows J95 green.	*(RRP, I/IC, EP, SA-2)	RP, PB, TMD		DSR
ZNY-5-1-	86	0113	J95 traffic is rerouted to J36 (two as one) due to deviations around level 6, 41 kft weather. RAPT shows J95 green.		RP, EO		
ZNY-5-1-	87	0113	J95 traffic is being swapped to J36 because there are only three left. RAPT shows J95 and J36 green.		TMD		



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ZNY-5-1-	88	0130	A short solid line of weather is on J95. N90/ZNY has stopped the north gates due to volume. RAPT shows J95 green.		RP, TMD		
ZNY-5-1-	89	0150	An impenetrable east-west line of weather is bisecting ZDC. J6, J48, J75, and WHITE are closed, WAVEY is open. RAPT shows WAVEY clear to green.		RP		
ZNY-5-1-	90	0202	ZDC reports that WHITE/WAVEY will be closing imminently. Traffic is getting squeezed by weather and warning area activity. New, strong cells are developing rapidly in ZDC, in southern DE northeast of the main line. RAPT shows WHITE red ENR and WAVEY red.		EPO, RP, TMD		
ZNY-5-1-	91	0212	ZDC closes WHITE/WAVEY. RAPT shows WHITE and WAVEY red.		RP		
ZNY-5-1-	92	0217	The convection impacting GAYEL and COATE is weakening. GAYEL traffic is still swapped to COATE. RAPT shows GAYEL green to clear and COATE clear.		EO, RP		
ZNY-5-1-	93	0220	The STMC uses CIWS to consider using J6. He notes the spurious echo tops value of 67 kft, but says that J6 may be an option for a pathfinder soon. RAPT shows J6 red.		TMD		CIWS VIL, Echo Tops, Lightning
ZNY-5-1-	94	0230	N90 consults ZNY about ELIOT restrictions, requesting that they not be extended. The ZNY STMC consults MAP and says that an extension is unlikely. However, the TMC states that ZOB may continue the ELIOT J80 restriction.		TMD		
ZNY-5-1-	95	0245	The line of weather in ZDC is beginning to demonstrate appreciable stratiform gaps near J6 and J75. RAPT shows J6 yellow ENR changing to red with the next update and J75 yellow to red.	*(DOL, SA-2, I/IC)	RP, EO, TMD		
ZNY-5-1-	96	0310	ZOB has imposed a 10 MIT per strat restriction on J80 because all metro DC flights (even FL traffic) are coming out J518. ZNY agrees with the restriction.		TMD		
ZNY-5-1-	97	0324	Earlier, ZNY requested a J6 pathfinder from ZDC. ZDC denied the request due to workload. Currently, the weather on J6 is level 3-5 stratiform rain with tops to 31 kft and no lightning. RAPT shows J6 yellow to red ENR.	*(RO)	EO, RP, TMD		

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ZNY-5-1-	98	0324	ZDC refuses to try a pathfinder on J6. RAPT shows J6 yellow ENR.				
ZNY-5-1-	99	Interview	<p>The STMC says that CIWS is now an invaluable tool to the TMU. It is the only weather tool they use, but it took some time for them to come to rely on it.</p> <p>The STMC comments that they are starting to use RAPT too. During the SWAP, ZNY is very reactive and does not have time for in-depth TFM research. RAPT helps by quickly showing route status and pinpoints improving conditions, which they can pass to the Towers. This little bit of tactical heads-up goes a long way during SWAP.</p> <p>Any modifications or improvements to RAPT should ideally be in place by March, ahead of SWAP season. This allows the TMU to begin learning the tool so they can use it effectively during SWAP.</p> <p>Gathering cases before SWAP season and showing the Areas examples of how RAPT is useful to TFM helps convince them that RAPT is something they should use.</p>	EP, SA-2, I/IC	TMD		
ZNY-5-1-	100	Interview	The Area B Supervisor stated that during a couple of SWAP events, ATCSCC and the Centers should let RAPT make the route usage decisions to test proactive deviation avoidance TFM in ZNY, which is a benefit the Areas crave.		TMD		
ZNY-5-1-	101	Interview	The STMC says that ZNY has been unable to try J70 as a westbound departure escape route because of limitations with printing hard copy flight strips for Area controllers.		TMD		
ZDC-5-1-	1	1615	The morning's weather is decaying but WHITE is stopped by ZDC due to weather in ZDC near the NY border. The STMC uses ITWS to brief the observer. RAPT is open at the STMC desk with EWR selected. RAPT shows J60 and J64 green and yellow due to a cell in N90 airspace. CIWS is also open.		RP		CIWS Forecast, Echo Tops, Storm Motion, Lightning

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ZDC-5-1-	2	Note	The TMC said that RAPT was not accurate earlier this morning. WHITE was blocked, but RAPT showed the route green.		EO, RP		
ZDC-5-1-	3	1629	ZDC is requesting three WHITE pathfinders. RAPT shows J79 and J209 green.	*(DP, SA-1)	RP, TMD		
ZDC-5-1-	4	1655	Two WHITE pathfinders are released.		TMD		
ZDC-5-1-	5	1703	WHITE is opened with 20 MIT by the Area Supervisor. RAPT shows WHITE green.		TMD, RP		
ZDC-5-1-	6	1734	The W107 warning area is in use and blocking some routes. In addition, there is a level 6 cell blocking the rest of the east coast routes, including J174 and J121. BOS and NY are stopped. ZDC is trying to find new routes for JFK. RAPT shows J174 green to red for 1745 departures.		TMD-LOU, RP		
ZDC-5-1-	7	1745	The restriction on WHITE is dropped from 20 MIT to 15 MIT with normal exclusions. RAPT shows all routes except WAVEY J174 green.		TMD, RP		
ZDC-5-1-	8	1800	ZDC is requesting a pathfinder from JFK over CAMRN. RAPT shows some yellow on JFK: WAVEY J174. (CAMRN is not displayed.)		TMD		ITWS
ZDC-5-1-	9	1820	ZDC is holding on the east coast due to weather between CAMRN and NYC. ZDC initiated a ground stop for JFK until 1930. LGA is ground stopped by ATCSCC until 1900. RAPT shows all routes green.		TMD		
ZDC-5-1-	10	1823	The traffic being held for JFK is being moved to CAMRN.		TMD		
ZDC-5-1-	11	2015	A small level 6 cell in northern VA is near J48. ZDC places a restriction of 15 MIT per strat on J48 and J75 in anticipation of deviations. RAPT shows J48 red J75 green.		TMD		CIWS Forecast
ZDC-5-1-	12	2050	ZNY requires that ZDC close a route (J48 or J75) to preclude side-by-side deviations. ZDC closes J48, swaps this traffic to J75, and lowers the restriction on J75 to 10 MIT per strat. RAPT shows J48 red and J75 red for 2055 departures.		TMD, RP, EO		

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ZDC-5-1-	13	2112	The Areas want to close J75 and shift traffic to J6. Traffic is deviating due to a thunderstorm overhang. The cell in north VA is centered on J48, moving east at 20 nmi. Another cluster of level 6 cells is moving east through ZID. The J6 reroute will turn the traffic before they reach the second storm. RAPT shows J48 and J75 red, J6 yellow.		PB, EO, TMD, RP		
ZDC-5-1-	14	2135	ZID restricts J6 20 MIT per strat. RAPT shows J6 red. The observer notes that the Rapt route status changes dramatically with each update.		TMD, RP, EO		
ZDC-5-1-	15	2240	ZID closes J6 and J134 for weather. RAPT shows J6, J48, and J75 red.		RP, TMD		
ZDC-5-1-	16	2336	ZDC EWR and LGA traffic is deviating too far east. ZDC may need to hold. ZDC is requesting three pathfinders on J48 with 30 MIT.		TMD		
ZDC-5-1-	17	2351	A pathfinder for J48 is released. RAPT shows J48 green, J6 red, and J75 red to yellow to green.		RP, TMD		
ZDC-5-1-	18	0000	ATCSCC want to run FL traffic northeast with 40 MIT. This route takes the traffic into the weather over Flat Rock. RAPT shows J6, J48, and J75 red. The STMC used CIWS to convince ATCSCC that the proposed route would not work. ATCSCC did not know what the STMC was talking about.		TMD-LOU, RP	Yes	CIWS Growth and Decay Trends, Echo Tops, Lightning
ZDC-5-1-	19	0022	The three pathfinders on J48 were successful. The Areas still want to close J48, but the TMC requests three more pathfinders before they close it. RAPT shows J6 red, J48 yellow until 0035 departures then green, J75 red, and J79 red for 0035 departures.	*DP, SA-1, I/IC	RP, TMD		
ZDC-5-1-	20	0024	WHITE is stopped due to weather and volume. Traffic is deviating east. RAPT shows WHITE J79 red for 0035 departures, WHITE J209 green.		RP, PB, EO		
ZDC-5-1-	21	0029	The Area closes J149 due to deviations.		TMD, PB		
ZDC-5-1-	22	0100	WHITE is open with 25 MIT. RAPT shows J6, J48, J75, and J79 over WHITE red, WHITE J209 green.		EO, RP, TMD		
ZDC-5-1-	23	0141	One pathfinder from DC, requested by ATCSCC, is attempting J6. RAPT shows J6 red ENR; J48, J75, J79 red; J209 and J174 green.		TMD, RP		

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ZDC-5-1-	24	0200	A line of weather stretches from KY to the east coast. DC metros and Woodstown are stopped due to weather. WHITE and WAVEY are still open with 25 MIT. RAPT shows J6, J48, J75, J70, J209, and J174 red.		RP		
ZDC-5-1-	25	0209	WHITE and WAVEY are stopped. The pathfinder for J6 (0141Z) never launched.		TMD		
ZDC-5-1-	26	0235	ATCSCC requests a pathfinder to Norfolk over DAILY. RAPT shows J6, J48, J75, J70, J209, and J174 red.		TMD, RP		
ZDC-5-1-	27	0249	A pathfinder out of Dulles over Montebello reported continuous moderate turbulence with lightning. No other pilots agreed to be pathfinders. RAPT shows J6 red.		PB, TMD, RP		
ZDC-5-1-	28	0316	ZNY wants to open J6 with 10 MIT. The STMC agrees to attempt a pathfinder on J6 to MOL to J48 and south. He contacts the Areas for permission. RAPT shows some yellow now for J6.		RP, TMD		
ZDC-5-1-	29	0355	ZDC agrees to allow 5 aircraft on J6 over MOL to J48 with 30 MIT. RAPT shows J6 yellow, J48 yellow to green for 0400 departures, and J75 red.	DP, I/IC, SA-1, EP	RP, TMD		
ZOB-5-1-	1	1500	A line of weather is located on the ZOB/ZDC border with tops reaching 45 kft. This is the only relevant weather in ZOB. RAPT was covered when the observer arrived. The observer displayed RAPT; EWR and JFK airports are selected. J80 is yellow, all other routes are green.		EO, RP		
ZOB-5-1-	2	1515	SPT: The 6-hr CCFP shows weather in southern ZOB, ZID, ZTL, and ZDC with low confidence and 25-40% coverage. DC is normal routes on all fixes with MIT. "According to CIWS," there is growth in the weather near WHITE, where departures are deviating.		TMD		CIWS
ZOB-5-1-	3	1520	Weather in northern VA appears to be more intense on CIWS than on WARP.		TMD		CIWS, WARP
ZOB-5-1-	4	2030	Scattered cells are moving into western ZOB. The cell in northeast ZOB is persistent and slowly moving into ZBW. No issues.				

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ZOB-5-1-	5	2115	All of the significant weather appears to be in ZID airspace. CVG is impacted. A first tier ground stop for CVG has been implemented. The only significant weather in ZOB is the small cell in the northeast.				
ZOB-5-1-	6	2224	A cell in northeast ZOB is beginning to cause problems. J82 is expected to be impacted soon. ZNY cannot let the traffic deviate south and ZBW cannot let it deviate north. ZOB suggests taking ZBW departures north into Canada. ZBW departures are currently over SYR. Deviations north off J82 are interfering with these ZBW departures. ZOB expects ZBW to shut them off. If that happens, ZOB will hold in the airspace where the deviations are occurring and will have to shut off ZBW departures. RAPT shows all routes through ZOB green.		TMD		All CIWS products except forecast contours
ZOB-5-1-	7	2235	J6 is closed in ZID airspace. A No_J6_2 playbook route is being implemented. CIWS is used for external coordination, route planning, and route selection		TMD		All CIWS products except forecast contours
ZOB-5-1-	8	2242	ZBW is using a CAN1-west playbook so ZOB can move ZBW arrivals north of the weather.		TMD		CIWS
ZOB-5-1-	9	2254	The flurry of activity centered around the ZBW reroute is now calming down. The STMC is briefing the OM using the WARP. RAPT shows all routes through ZOB green.		TMD		WARP
ZOB-5-1-	10	2309	The level 2 weather that has been over western ZOB for a long time, is finally showing signs of level 3-4. It is not impacting DTW at this time.				
ZOB-5-1-	11	2330	Weather in ZOB is dissipating and there are no real weather-related problems in the Center.				
SCC-5-1-	1	1530	When the observer arrived, RAPT was not displayed on any of the computers. There was some difficulty bringing up the display, so RAPT was unavailable until 1652.				
SCC-5-1-	2	1652	RAPT is now displayed with EWR routes selected. RAPT shows all EWR routes green.				

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SCC-5-1-	3	1749	JFK arrivals over CAM are stopped due to level 3-4 weather moving east at 30 kn. RAPT shows all departure routes green.		TMD		TSD
SCC-5-1-	4	1820	JFK continues to be ground stopped for ZTL and ZDC; all those arrivals use the CAN route. LGA is ground stopped for volume. RAPT shows all EWR departure routes green.		TMD		
SCC-5-1-	5	1915	SPT: JFK reports problems with ceiling and visibility. There is a GDP for EWR and JFK. Aircraft are being held for the NY airports as far away as ZMP. There are no departure problems. RAPT shows all routes green.		TMD		
SCC-5-1-	6	2045	A few isolated storms are developing in central ZDC. RAPT shows BIGGY J75 yellow ENR then red.		RP		WARP, CIWS VIL
SCC-5-1-	7	2053	ATCSCC is attempting to coordinate a route for NY departures to go down the east coast to ATL and CLT. ATCSCC coordinates with ZDC, ZNY, ZTL ZJX, and ZBW. J48 traffic (primarily ATL) is moved to J75 (primarily CLT). ATCSCC stated that this coordination was particularly easy. RAPT shows LANNA J48 red ENR, BIGGY J75 tops 45 ENR. The NSST coordinator commented that CIWS/RAPT is not well placed. He has so many phone calls that it is normally very difficult to coordinate. The observer demonstrated RAPT, indicating that J75 would be impacted soon.	*(RRP, I/IC, SA-2)	TMD, EO	Yes	TSD, CIWS Forecast
SCC-5-1-	8	2111	ZDC calls ATCSCC to notify that the J48/J75 reroute is no longer working. Aircraft are deviating and thunderstorm overhang from storms on J48 is impacting J75. The observer assisted NSST with RAPT. RAPT shows J48 and J75 red.		PB, EO	Yes	TSD, CIWS Forecast, VIL, Storm Motion
SCC-5-1-	9	2114	ATL traffic will use J6 and go west of the weather. RAPT shows J48 and J75 red.	*(EP, SA-1, SA-2)	TMD, RP		
SCC-5-1-	10	2117	The plan to use J6 for ATL traffic will probably not be implemented because of weather in OH. They are trying to use J6 as a temporary measure then use it for NY traffic only. BOS traffic must remain east. RAPT shows J6 yellow ENR for 2115 departures, CAM red	*(RRP, SA-2)	RP, TMD		TSD, CIWS, FSM

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SCC-5-1-	11	2127	The observer demonstrates RAPT. NSST indicates that J48 will likely remain closed for at least another hour because a pathfinder is needed to open the route. Pathfinders are lower priority until airborne traffic is rerouted. RAPT shows CAM yellow ENR, J48 red ENR to green for 2145 departures, J75 red through 2150 departures. The observer notes that this is an opportunity for NY airports to push traffic down J48 when the weather clears.	*(DP, RP, I/IC, SA-2)	TMD, RP, EO	Yes	TSD, CIWS Echo Tops, Forecast
SCC-5-1-	12	2130	RAPT now shows LANNA J48 red ENR.		EO		
SCC-5-1-	13	2131	The observer asks what ATCSCC needs to help them determine what to do about J6/J48/J75. ATCSCC responds that he needs to be able to display flights so he can determine which can be rerouted.		EO, TMD		
SCC-5-1-	14	2143	J6 ATL traffic is extended to 20 MIT. There is more room to deviate in ZID. To coordinate this, NSST had to call 5 centers. RAPT shows J6 red ENR in ZID.		TMD, EO, RP	Yes	TSD
SCC-5-1-	15	2150	The NSST Supervisor says that he prefers to move entire flows (e.g., DC metros to ATL) on J6 rather than individual flights due to the amount of coordination required. RAPT shows J6, J48, J75, and J79 all red ENR.		TMD, RP		TSD
SCC-5-1-	16	2158	NSST NE Assist calls ZNY and tells them to move J6 long-haul flights to J80 or J60 because ZID closed J6. RAPT shows J6 red ENR, J48 red ENR, and J75 etops 40.		RP, TMD	Yes	TSD
SCC-5-1-	17	2201	The observer was asked about J48. Using RAPT, the observer demonstrated that J48 would probably not clear for about 55 minutes. The NSST plans to ask ZNY for a pathfinder in about 20 minutes because the flight takes 30 minutes.	*(DOL, RO, I/IC, EP, SA-2)	RP, TMD	Yes	CIWS Forecast
SCC-5-1-	18	2218	NSST uses RAPT for situational awareness. RAPT shows CAM yellow ENR, J6, J48, J75, and J79 red ENR.	SA-2	RP	Yes	TSD, CIWS Forecast
SCC-5-1-	19	2221	NSST calls ZDC to check the status of J48. ZDC says J48 is still not good. NSST asks if they can send a flight on J6 and split him off. RAPT shows J6 red ENR (in ZID).		EO, RP, TMD		



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SCC-5-1-	20	2230	NSST is attempting to coordinate J6 traffic to J134 without success. J80 is moved to J29 for NY and NSST is coordinating with ZBW, ZDC, and ZID. RAPT shows CAM, J6, J48, and J75 red ENR.		TMD, RP		
SCC-5-1-	21	2340	NSST authorizes a J48 pathfinder. It will take about 30 minutes to fly the route once the pathfinder is launched. NSST used RAPT to see an opportunity in advance. A gap was identified and the flight time was planned. RAPT shows J48 red ENR then yellow ENR for 2345 departures then green after 2355.	DP, I/IC, EP, SA-2	TMD, RP		CIWS VIL, Echo Tops, TSD
SCC-5-1-	22	2349	ZDC calls to express concern about small cells near J48. There is a broken line across north ZDC and a large complex in eastern KY/southern OH. ZDC wants a full ground stop for all northbound traffic because the warning areas are active. NSST is trying to develop a plan.		TMD, TMD-LOU		CIWS VIL, Echo Tops, TSD
SCC-5-1-	23	0000	Two pathfinders on J48 were successful, but the gap in the weather is closing. RAPT shows J48 yellow ENR.		RP, TMD		
SCC-5-1-	24	0002	ZDC says they are looking at CIWS and seeing growth in the weather on J48. They are concerned that the hole will close. NSST is trying to get any route. ATCSCC declares that J48 is 40 MIT as one, with ZJX understanding that they may have to hold. It is late in the evening and demand should be dropping. RAPT shows J48 yellow. Deviations are expected.		TMD, RP		CIWS
SCC-5-1-	25	0008	A761 remains open and NY is told to use that route to help avoid ZDC problems.		TMD		
SCC-5-1-	26	0014	The No_J6_2 playbook route is extended to 0004. NSST used RAPT and CIWS to extend the reroute. RAPT shows J6 red ENR, J48 yellow ENR, and J79 green to yellow ENR.	RRP, SA-1, I/IC, EP	RP, TMD	Yes	CIWS Forecast
SCC-5-1-	27	0030	The gap in the weather, centered on J48, is filling.				
SCC-5-1-	28	0035	A pathfinder is sought for J78. RAPT shows J6 and J75 red ENR; J79 green to yellow to red ENR and J48 red to yellow ENR.		TMD, RP		CIWS VIL, Forecast, Echo Tops
SCC-5-1-	29	0050	Traffic is headed southbound on J48. RAPT shows J6, J48, J75, and J79 red ENR.		TMD, RP		CIWS Forecast, TSD

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SCC-5-1-	30	0235	A southbound DC metro departure reported extreme turbulence. The observer does not know the route positively, but believes it was J48.		TMD, RP		

**RAPT Benefits Assessment  
BLITZ #6 Observations Summary  
Day 1 - August 30, 2007**

**Participating Facilities: LGA, EWR, JFK, N90, ZNY, ZDC, ATCSCC**

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LGA-6-1-	1	1650	ITWS shows no weather echoes within the TRACON at this time, but there were strong thunderstorms on the PA/OH border between J60 and J80 with new convection beginning to develop in central PA and southwest New York. Large areas of rain with embedded thunderstorms are also present near the TN/NC border. Airspace Flow Program 5 is in effect through Michigan and Ohio. All RAPT routes for LGA are green. The TMC and Supervisor are discussing a plan for changing the airport configuration in anticipation of heavy traffic at JFK later in the day. LGA is currently departing on R13 and landing on R22. There is concern about keeping jet noise down over the USTA National Tennis Center during the on-going US Open if JFK wanted to land on both 22R and 22L.		TMD		
LGA-6-1-	2	1805	The TMC notices that ELIOT J80 has turned yellow on RAPT and advises the Local and Ground controllers that a restriction might be forthcoming. He also says that based on his experience and with what the TSD shows, J36 will likely close soon because traffic is already being rerouted off that jetway.	SA-2, I/IC, EP	RP, TMD		
LGA-6-1-	3	1848	GAYEL is stopped because arrivals are deviating into the departure route.		EO, TMD		
LGA-6-1-	4	1851	RAPT shows GAYEL J95 all green.		RP, EO		
LGA-6-1-	5	1909	Northbound traffic is released (via GAYEL).		TMD		
LGA-6-1-	6	1913	The TMC uses RAPT for reference to see that all LGA routes are green, with the one exception of ELIOT J60 being red, then yellow at 1910Z, and red again for 1935 departures.	SA-1			

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LGA-6-1-	7	1959	All departures are stopped suddenly. One plane is already rolling and 13 are waiting to go. RAPT shows LANNA J48 red ENR, PARKE J6 yellow to red ENR, and ELIOT J60 yellow ENR. All other LGA routes are green.		TMD, TMD-LOU, RP		
LGA-6-1-	8	2004	Departures are released.		TMD		
LGA-6-1-	9	2122	The TMC is surprised that the ELIOT gate is still open, given all the convection in the area as seen on his TSD. RAPT correctly shows J60 and J80 are both red. At the request of the observer, the TMC puts aircraft on the TSD and sees planes deviating off the jetways in central PA. The TMC and observer question why pilots are flying so close to strong thunderstorms. A bit more investigation shows that 6 aircraft are flying near heavy convection. There is about a 10 nm wide gap in central PA but the aircraft are currently headed directly towards a strong thunderstorm. At the same time, another flight is deviating slightly to the south around some cells.		TMD, PB, RP		
LGA-6-1-	10	2219	COATE is stopped. RAPT shows COATE J36 green. Without assistance from the observer, the Supervisor viewed RAPT and questioned the closure, unsure of the problem. There was one small level 6 cell near AVP (Scranton) that was embedded in rain with nothing west of it. The RAPT forecast showed the single cell moving southeast towards the COATE fix, but at time = 0, there should not have been a problem provided that aircraft could deviate slightly to the south and west. Blow off might have been the issue.	SA-3	TMD, RP		
	11	2226	The Tower Supervisor notices that PARKE J6 is green but there was a 10 MINIT restriction until 2315Z.	SA-3	RP, TMD, TMD-LOU		
LGA-6-1-	12	2227	The observer comments that it is surprising that J60 is not closed. Level 6 weather in ZNY touches the route and RAPT shows the route yellow.		RP		
LGA-6-1-	13	2230	ELIOT J80 is stopped. RAPT shows the route yellow.		RP		
LGA-6-1-	14	2237	J60 is stopped. RAPT shows the route yellow to green.		RP		
LGA-6-1-	15	2238	All ELIOT departures are stopped. RAPT shows ELIOT J60 yellow to green and ELIOT J80 yellow to red for 2240 departures.	*(RO)	RP		

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LGA-6-1-	16	2308	A pathfinder for COATE is released from LGA. RAPT shows COATE J36 green; it has been green for about 30 minutes.	*(RO, DP)	TMD, RP		
LGA-6-1-	17	2318	The TMC comments that based on TSD, thunderstorms appear to be dissipating.		TMD		TSD
LGA-6-1-	18	2329	The TMC calls ZNY to inquire about the status of the COATE pathfinder. It appears that the pathfinder made it.		TMD		
LGA-6-1-	19	2337	COATE is opened with 7 MINIT. RAPT shows COATE J36 green.		TMD, RP		
LGA-6-1-	20	0050	The Supervisor uses RAPT to brief an incoming TMC.	SA-1, I/IC			
LGA-6-1-	21	NOTE	A request was made from ATC to include ELIOT J64 as part of the LGA Airport set.		UR		
EWR-6-1-	1	1800	The observer arrived and the SWAP was already in place. RAPT was displayed and showing all routes green. Convective weather was developing near ELIOT J80 and COATE J36.				TSD
EWR-6-1-	2	1810	COATE is stopped. RAPT shows COATE J36 yellow and ELIOT J80 and J60 yellow ENR.		RP		
EWR-6-1-	3	1815	RAPT shows COATE J36 turning red at 1825 w/tops to 40 and ELIOT J60 turning red at 1830 ENR/tops 45				
EWR-6-1-	4	1830	An incoming TMC looks at RAPT, notes that ELIOT J80 is red and asks the Supervisor about the status of the route. J80 is open.	SA-3, I/IC, EP	RP, TMD		
EWR-6-1-	5	1840	West is stopped and then released two minutes later. RAPT shows J36 yellow and J80 red.				
EWR-6-1-	6	1847	GAYEL is stopped. ELIOT is as one with 5 MINIT. All north departures are stopped. RAPT is obscured.		EO, TMD		
EWR-6-1-	7	1855	COATE is stopped. RAPT shows COATE J36 green and J60 red ENR.	*(RO)	RP		
EWR-6-1-	8	1909	GAYEL is released.				
EWR-6-1-	9	1940	There are restrictions on ELIOT, GAYEL, and DIXIE. COATE and ELIOT J60 are closed. When the TMC sees the observer checking RAPT, he asks if RAPT reflects what is happening operationally. The observer discusses RAPT with the TMC.		TMD	Yes	

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EWR-6-1-	10	1955	EWR calls to ask for a COATE pathfinder. RAPT shows COATE J36 green. The Supervisor discussed RAPT with the observer.	*(DP)	RP, TMD	Yes	
EWR-6-1-	11	2016	Weather is impacting J60/J64 and J6/J48. COATE is still closed.		TMD		
EWR-6-1-	12	2134	The Supervisor calls N90 to discuss COATE, commenting that RAPT shows COATE green. N90 opens COATE with 7 MINIT.	SA-3, I/IC, EP, RO	TMD, RP		
EWR-6-1-	13	2216	There is weather on the ELIOT routes. PARKE is stopped. At 2220, RAPT shows J60/J64/J80 yellow to red; PARKE J6 green.	*(DOL)	TMD, RP		
EWR-6-1-	14	2220	COATE is stopped. A small level 5/6 cell is near/on the route. RAPT shows COATE green.		TMD, RP, EO		
EWR-6-1-	15	2300	EWR has 30 minute departure delays. The TMC looks at RAPT and the TSD for situational awareness.	SA-1			
EWR-6-1-	16	2306	A COATE pathfinder is identified. COATE, ELIOT, and PARKE are stopped. RAPT is obscured.		EO, TMD		
EWR-6-1-	17	2315	COATE pathfinder is released		TMD		
EWR-6-1-	18	2337	COATE is released following feedback from the pathfinder. RAPT shows LANNA J48 red ENR and ELIOT J80 yellow ENR.		RP, TMD		
EWR-6-1-	19	0010	GREKI and J80 are stopped. RAPT shows GREKI yellow ENR.		RP		
EWR-6-1-	20	0018	The TMC consults RAPT for situational awareness then calls to ask for relief on ELIOT. Currently GREKI and J80 are stopped. RAPT shows J80 red and J60/J64 green.	SA-3, I/IC, *(RO)	TMD, RP		
JFK-6-1-	1	1730	Runways 13 are in use. RAPT is not displayed and, again, still found on the Supervisor computer. No Supervisor is on duty until evening shift. The internet is still not available on the TMC computer. Aircraft are landing on runway 31L via the VOR approach and also on 22L ILS. Aircraft are departing runway 31R.		EO, TMD		ETMS
JFK-6-1-	2	1735	The observer opened RAPT on the Supervisor computer. RAPT shows all routes clear. There is a cold front extending from the northeast corner of VT southwest to the southern boundary of IN passing through NY state and western PA. RAPT shows all routes green.				

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JFK-6-1-	3	1800	SWAP is in effect. The observer demonstrated RAPT to the TMC, who is newly assigned and untrained in its use. The user was not aware RAPT was available on the Supervisor's computer. RAPT shows J60 dark green but radar returns show no weather.		EO, RP	Yes	
JFK-6-1-	4	1814	North gates are restricted 15MIT, RBV is 15 MIT, WAVEY is 20 MIT. RAPT shows J60 yellow; all others green.		TMD		
JFK-6-1-	5	1830	The Supervisor is on duty in the Tower. He is conferring with the TMC about evening shift forecast using ETMS.		TMD		ETMS
JFK-6-1-	6	1844	WAVEY is released with 30 MNIT. RAPT shows J60 red and all other routes green.		TMD, RP		
JFK-6-1-	7	1848	North departures are stopped by N90.		TMD		
JFK-6-1-	8	1901	The weather is filling in along the surface front. RAPT shows J60 red, J64 2 green then yellow, and J80 green.		RP		
JFK-6-1-	9	1902	N90 releases upstate NY destinations via the north gates.		TMD		
JFK-6-1-	10	1911	GAYEL is released. RAPT shows J60 red and all other routes green.		RP		
JFK-6-1-	11	1921	GAYE is 30 MIT. The RAPT timelines change often, but J60 is fairly consistent. RAPT shows J6 green to yellow and J60 mostly red.		EO, TMD, RP		
JFK-6-1-	12	1923	The observer discussed RAPT with the evening shift TMC. The TMC reiterated that he cannot get to the RAPT while it is installed only on the Supervisor computer The TMC states he does not use RAPT when the observer is not present.		EO		
JFK-6-1-	13	2030	COATE is stopped. There is no COATE timeline on the JFK airport option. The TMC requests COATE, MERIT, and GREKI routes on the JFK option. The MC and N90 are discussing a possible runway change to 22s. RAPT shows J60/J64 red, J6 and J48 red and yellow, and J75 green.		UR, TMD, RP		ETMS
JFK-6-1-	14	2101	The airport configuration change is complete. Aircraft are departing 22R and 31L.		TMD		
JFK-6-1-	15	2105	Most RBV departures are NRA on DSP. RAPT shows RBV mostly yellow.	*(RO)	TMD, RP		

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JFK-6-1-	16	2128	The runway configuration is changed back to 13s due to a disabled aircraft across the hold line for 22R, thus preventing departures. Delays have reached 15 minutes and this will undoubtedly worsen the situation.		TMD		
JFK-6-1-	17	2131	COATE is released with 15 MIT.		TMD		
JFK-6-1-	18	2225	Departure delays have reached 45 minutes. RAPT shows J60 yellow, J64 and J80 red, all other route green.		RP		
JFK-6-1-	19	2247	J60 and J64 are stopped. GAYEL is still stopped. RAPT shows J60 yellow to green, J64 and J80 red.		RP		
JFK-6-1-	20	2311	Weather is direction over J64 but is projected to drop south off the airway. RAPT shows J80 yellow to red; J60 and J64 green.		RP		
JFK-6-1-	21	2317	J60/J64 is open, as predicted by RAPT.		RP		
JFK-6-1-	22	0010	GREKI is stopped due to weather. There is no GREKI timeline on the JFK airport option.		EO		
JFK-6-1-	23	0012	Using the RAPT play feature, the observer estimates that J80 will be red by 0045 departures. Currently, RAPT shows J64 green; J80 green to yellow to green to yellow; and J48 yellow.		RP		
JFK-6-1-	24	0035	J80 is stopped. RAPT shows J80 red to yellow.		RP		
JFK-6-1-	25	0048	GREKI is released. There is no GREKI timeline on the JFK airport option.				
N90-6-1-	1	1800	There are scattered level 5-6 cells in north-central PA, western PA, and WV moving eastward. A ground stop is in effect for EWR due to volume. J36 is rerouted to J95 for a three mile stretch in north-central PA to avoid a level 5-6 cell. AFP05 is in place. ORD is 30 MIT 1715-1900Z. RAPT is not displayed so the observer opens a RAPT window at the Supervisor's desk. RAPT shows all routes green. CIWS and TSD are displayed at the TMC desk.		TMD		CIWS VIL, Precipitation Forecast, Echo Tops Forecast,
N90-6-1-	2	1804	ELIOT is 10 MIT to 2000z, RBV is 15 MIT to 2000Z, and GAYEL is 10/15 MIT to 2000Z. RAPT shows J80 routes yellow ENR to green, J60 routes are yellow ENR.		TMD, RP		



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N90-6-1-	3	1810	COATE departures are moved to GAYEL. GAYEL is restricted 10/15 MIT. RAPT shows J36 yellow to green, J60 yellow, EWR: ELIOT J80 yellow ENR, JFK: RBV J80 and LGA: ELIOT yellow ENR.		EO, RP		
N90-6-1-	4	1816	A line of convection is forming from ALB south-southwestward through central PA, the southwest corner of PA/MD panhandle, to WV. RAPT shows LGA: J36 COATE yellow to red, J60 yellow ENR.		RP		CIWS VIL, Precipitation Forecast, Echo Tops Forecast
N90-6-1-	5	1826	Loose line of convection with north-northeast/south-southwest orientation from north central PA/NY border-northwest corner PA-southwest corner PA. Level 5 cells in northern portion, Cells in the ALB area are level 4. RAPT shows ELIOT J60 routes are yellow with the exception of LGA/EWR J60 which is red.				
N90-6-1-	6	1835	Level 5 cells are over J60 and level 6 cells are in north-central PA at the ZNY border. All west gates are stopped due to volume. RAPT shows J36 yellow ENR and J60 red ENR. The TMC comments that RAPT is a good tool, but unless ZNY uses it, it does not help N90 much.		RP, TMD, TMD-LOU, RP		
N90-6-1-	7	1842	West gates are open.		TMD		
N90-6-1-	8	1846	North gates are stopped due to volume and weather. RAPT shows J36 yellow and J60 yellow ENR.		TMD, RP		
N90-6-1-	9	1909	ATCSCC stops EWR due to volume. ZNY wants all NY metro traffic through GAYEL 15 MIT as one. N90 requests 30 MIT for JFK. RAPT shows EWR: ELIOT J60 red ENR, JFK: RBV red ENR to yellow ENR to red ENR.		TMD, RP		
N90-6-1-	10	1913	GAYEL is 7 MINIT for EWR. RAPT shows the J60 routes red ENR.		TMD, RP		
N90-6-1-	11	1920	A northeast to southwest line of convection, containing level 5-6 cells, is between J95 and J60. This area is moving southeast. There are scattered cells along the NY/VT border. Another northeast to southwest line of level 5-6 cells stretches from the northeast corner of WV to the WV/OH border along WV's western border. RAPT shows J60 red to yellow ENR for 1920 departures and J6 yellow ENR.		RP		

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N90-6-1-	12	1922	DIXIE is 20 MIT to 2230. ZNY agrees to 30 MIT over GAYEL. SHIPP is 20 MIT. RAPT shows J60 red ENR, J6 yellow ENR, and J48 red ENR for 1935 departures.		RP		
N90-6-1-	13	2022	The STMC is discussing RBV route (J6, J75, J48) status over the next few hours. ZNY is looking to move traffic down to J48 (coordinating with ATCSCC). RAPT shows J6 RBV red ENR, J6 PARKE yellow ENR, and J48 is red ENR to yellow ENR. The STMC checks routes on RAPT for the trend before taking to ZNY about reroutes.	SA-2, I/IC, EP	TMD, RP		
N90-6-1-	14	2042	N90 is looking for a pathfinder for COATE J36. ZNY is allowing traffic AOB FL160 only on COATE. RAPT shows COATE routes green. The TMC asks why COATE is closed when RAPT shows the route green. The observer discussed RAPT with the TMC and he decided to ask for a pathfinder.	*(DP) SA-3	TMD, RP	Yes	
N90-6-1-	15	2055	ZNY closes J6. A northeast-southwest line of convection extends from J95 into WV. Individual cells reach level 5-6 and are moving east-southeast across the southbound routes. Cells appear to be decreasing in intensity. RAPT shows J6 yellow ENR.		TMD- LOU, RP		
N90-6-1-	16	2100	There is a pathfinder on J36 COATE. J64 is closed for JFK and LGA. The line of convection is breaking up. One large level 6 cell is in north-central PA. RAPT shows J64 and J80 red ENR, J6 and J60 yellow ENR.		TMD, RP		
N90-6-1-	17	2134	The COATE pathfinder was successful and COATE is open with 7 MINIT for LGA, 15 MIT for JFK, and 10 MINIT for TEB. RAPT shows J60 and J64 red ENR.		TMD, RP		
N90-6-1-	18	2158	Convection on J6 is clearing. RAPT shows J6 green, J60, J64, and J80 red ENR.	*(RO, I/IC, EP)	RP		
N90-6-1-	19	2210	COATE/GAYEL is 15/15 MIT to 0000z, ELIOT is 15 MIT to 0000z, RBV is 15 MIT to 0000z, and DIXIE is 20 MIT to 2230z. RAPT shows J60 red ENR, J64 red ENR, GREKI CAM yellow then red, J80 red ENR to yellow ENR to red ENR to yellow ENR.		RP		
N90-6-1-	20	2230	J80 is closed by ZNY. PARKE is 30 MIT AOA FL360. RAPT shows J80 yellow ENR and J64 red.		TMD- LOU, RP		

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N90-6-1-	21	2236	ELIOT J60 is stopped by ZNY. RAPT shows J60 yellow to green.		TMD, RP, TMD-LOU		
N90-6-1-	22	2238	All ELIOTs are stopped.				
N90-6-1-	23	2242	GREKI is 20 MIT for US to Canada flights only to 0100Z. RAPT shows GREKI red.		TMD, RP		CIWS Precipitation Forecast, TSD
N90-6-1-	24	2247	GAYEL J95 is stopped. RAPT shows J95 green		TMD, RP		
N90-6-1-	25	2306	J95 is open. ZNY is looking for a pathfinder for J36. RAPT shows J95 green, J64 red, and J80 red ENR.		TMD, RP		
N90-6-1-	26	2308	GAYEL is 15 MIT. LGA is looking for a COATE pathfinder and EWR has one. RAPT shows J36 COATE green, LGA: ELIOT J60 green, LGA: ELIOT J80 yellow ENR to red ENR for 2235 departures, and PARKE green.		RP		
N90-6-1-	27	2309	PARK and ELIOT are closed by ZNY.		TMD-LOU		
N90-6-1-	28	2311	PARKE is opened. ELIOT is still stopped. J64 and J80 are closed. A pathfinder is out for J60.		TMD		
N90-6-1-	29	2313	ZNY opens ELIOT J60 7 MINIT because the pathfinders were successful. J64 is opened with 7 MINIT. RAPT shows J60 green, J64 yellow to green.		TMD		
N90-6-1-	30	2336	COATE is 15 MIT until 0130Z. RAPT shows the COATE routes green.		RP		
ZNY-6-1-	1	1800	SWAP begins. When the observer arrives, RAPT is not displayed anywhere. The observer opens RAPT at the STMC position. The STMC reports that J36 was closed about 30 minutes earlier to accommodate arrivals. He coordinated with Area C and ZOB for JFK traffic to deviate north in an attempt to make an orderly proactive closure. RAPT shows J36 red and J60 red ENR.  Areas A and B are viewing CIWS and Areas C and D are using WARP.		TMD		CIWS, WARP

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ZNY-6-1-	2	1840	There is a broken line of storm cells in ZOB. The Area Supervisor reports that they are going to have to come off J60 soon because traffic has started to deviate to the south. RAPT shows J36 yellow and J60 red ENR.		TMD, RP		
ZNY-6-1-	3	1843	The Area C Supervisor asks the STMC to look at sector 39. J95 traffic is being affected by arrivals deviating north off J70. ZBW will not accept point-outs, so ZOB claims that arrivals deviating north in ZNY is the only option. The ZNY STMC is investigating. This will have to be coordinated through ATCSCC because ZBW will not accept J70 arrival traffic. RAPT shows J36 yellow and J95 green, but arrivals are dictating usage.		TMD, EO, RP		
ZNY-6-1-	4	1850	J60 is closed by Area C. RAPT shows J60 red ENR (weather is in ZOB). It is likely that aircraft are deviating in ZNY before they reach the weather in ZOB. Scattered cells are developing in southern ZDC near J48. RAPT shows J48 yellow ENR.		TMD, EO, RP		
ZNY-6-1-	5	1855	The RAPT update matches well with operations. J60 is closed due to weather and RAPT shows J60 red ENR. J36 is closed due to deviating arrivals and RAPT shows J36 green.		EO, RP, TMD		
ZNY-6-1-	6	1900	The strongest level 6 cluster on J60 is dropping toward J64. Scattered weak precipitation is currently on J64. A small level 5 core on the route is contributing to RAPT showing the route yellow. The Area D Supervisor comes to the STMC to inform the TMU of the small cell on J64. The STMC uses CIWS to assess the cell.	*(SA-2, I/IC)	RP, TMD		CIWS VIL, Echo Tops
ZNY-6-1-	7	1908	It appears from the TSD that the J70 arrivals have been moved into ZBW. This allows GAYEL J95 to run unimpeded. It is unclear if the route was closed and by whom, but it is open now. RAPT shows J95 clear, J60 red ENR to yellow.  The Area Supervisor tells the STMC that J95/BGM/Dunkirk is not working and they need something like J95/BGM/BUF. RAPT shows J60 red ENR.		TMD, RP		

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ZNY-6-1-	8	1925	A broken line of weather is parallel to and approaching J6 is intensifying. RAPT shows J60 red ENR, J64 green to yellow, J6 green to yellow ENR, and J48 green to red ENR. The STMC asks the observer for a review of the echo tops information in the RAPT timelines and the differences between the shades of green.		RP, TMD	Yes	
ZNY-6-1-	9	1930	Scattered cells are along J48 in extreme southwest ZDC. J48 is open without restrictions. RAPT shows J48 red ENR. This is a forecast starting with 1925 departures who will not encounter weather until 2015. If the route is impacted at 2015, then this is a good forecast.		EO, RP		
ZNY-6-1-	10	1938	Area B requests 20 MIT on Modina J80 because of "significant" weather deviations. 20 MIT is added to ELIOT as well. RAPT shows J80 clear. There are embedded level 3/5 cells in the vicinity of J80, but they are broken and spotty.		PB, RP, EO, TMD		
ZNY-6-1-	11	1945	The line of weather is dropping slowly towards J6. Scattered cells are near J48 in southwest ZDC. Another cluster is over the arrival routes between J36 and J60. RAPT shows J60 red ENR, J6 yellow to red ENR, and J48 red ENR.		RP, TMD		
ZNY-6-1-	12	1952	Area A is holding PHL arrivals. RAPT shows J6 red.		TMD		
ZNY-6-1-	13	1955	Isolated cells with overhang are west of J75 in extreme southwest ZDC. RAPT shows J75 red ENR for 2015 departures.		EO, RP		
ZNY-6-1-	14	1957	N90 asks ZNY for a pathfinder on J36. There is thunderstorm overhang on J36 from the large level 6 cell just south of the route. RAPT shows J36 clear. The STMC views J36 on RAPT. He also views CIWS to determine that the cell is moving away from the route and agrees to a pathfinder. The STMC then coordinates with Area C. The Area C Supervisor reports that J95 departures are deviating north around the apparent overhang. The STMC believes a pathfinder could go because this situation mirrors a similar event last week when a pathfinder was successful.		PB, RP, EO, TMD, TMD-LOU		CIWS VIL, Storm Motion
ZNY-6-1-	15	2006	A broken line of cells is settling towards J6 in ZDC. RAPT shows J6 red for 2005 departures. The STMC asked the observer to explain the J6 impact.		RP, EO	Yes	

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ZNY-6-1-	16	2015	A storm cluster is along the central ZOB/ZNY boundary. There is a broken line further southwest along the ZOB/ZID/ZDC border. J36 and J60 are closed; J80 is 20 MIT. RAPT shows J60/J64 yellow ENR, J80 clear, J6 red ENR, and J48 red to yellow. The STMC consults CIWS and cross-checks the current weather with the RAPT timeline status.	SA-3	RP, EO		CIWS VIL, Echo Tops, Storm Motion
ZNY-6-1-	17	2020	A small, strong bow south of J36 is moving southeast, with thunderstorm blow-off to the northeast over J36. RAPT shows J36 clear. The STMC consults RAPT and CIWS and comments that he thinks J36 should reopen. However, he took no action.		EO, RP, TMD		CIWS VIL, Storm Motion
ZNY-6-1-	18	2023	On the hotline, N90 asks ZDC the status of J6, J48, and J75. ZDC states that J6 will be the first to close and will be problematic for about 90 minutes. ZDC is already thinning J6 traffic and J75 traffic is being thinned because FL traffic is being routed down the east side. RAPT shows J6 red for 2100 departures, J48 red to yellow, and J75 green.		RP, TMD		
ZNY-6-1-	19	2030	Embedded strong cells (level 6) in loose cluster in J60/J64 region. RAPT shows J60/J64 all red				
ZNY-6-1-	20	2040	J6 is closed by ZDC. RAPT shows J6 red.				
ZNY-6-1-	21	2045	PHL arrivals are deviating well south around weather into ZOB and affecting J80 departures. The Area A Supervisor warns the STMC not to overload J80 because of this issue. The STMC says that is exactly what happened. When J6 closed, DAL/MEM flights are moved to J80. The Area A Supervisor warns that J152 (PHL arrivals) are likely to close soon. RAPT shows J80 clear, J36 clear (now closed), J60 green to clear (now closed), J64 yellow to red, J6 yellow to red to yellow ENR, and J48 and J75 green.		TMD, PB, EO, RP		
ZNY-6-1-	22	2059	The Area expresses concern about one large deviation around a cell on J60/J64. He wants to consider closing the route. The STMC points out that only one aircraft has deviated significantly; the rest are going through with only minor deviations. The route remains open. RAPT shows J64 red ENR.		PB, TMD, RP		DSR

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ZNY-6-1-	23	2100	ZOB is unhappy with the J95 routing, saying it is splitting two sectors and doubling workload. ZNY is working to get J95 running nominally. ATCSCC is unhappy that J36 is still closed and pushes for a pathfinder to get it open. RAPT shows J36 clear. (The pathfinder is successful at 2130.)	*(RO, SA-3, I/IC)	TMD, TMD-LOU		
ZNY-6-1-	24	2103	The Area D Supervisor tells the STMC that ZOB wants to close J64 and transition to J60. RAPT shows J64 red ENR and J60 green. The STMC consults RAPT and understands why ZOB wants to do this. He agrees with the plan.	SA-1, SA-3, I/IC, RRP	TMD, RP		CIWS VIL, Echo Tops, Storm Motion
ZNY-6-1-	25	2110	Area A reports that J152 will close to PHL arrivals after three flights currently in south-central ZOB have landed. Aircraft are deviating due to weather. Also, ZOB is experiencing frequency problems for J80, which may force J80 to close. RAPT shows J80 yellow to red updating to red ENR.  The Observer notes that now that the weather is more mature the RAPT timelines are more stable and match well which routes are actually closed.		PB, TMD, RP		
ZNY-6-1-	26	2115	The broken line along J6 is decaying. The cluster is maintaining itself along the ZOB/ZNY border. J60 is open, J64 is closed, and J80 is restricted 20 MIT with PHL arrivals stopped. RAPT shows J6 yellow ENR to green; J60 and J64 red; and J80 red ENR.	*(RO, I/IC, SA-2, SA-3, EP)	TMD, EO, RP		
ZNY-6-1-	27	2120	During the SPT, the STMC consults RAPT and CIWS to assess the weather along J70. The STMC requested that arrival routes be added to RAPT so that, in addition to the weather depiction provided by CIWS, he could see the estimated route blockages.	SA-1	UR, EO		CIWS VIL, Echo Tops, Storm Motion
ZNY-6-1-	28	2130	Weather along J6 continues to decay (embedded isolated level 6 cells). RAPT shows J6 green to yellow ENR.		RP		
ZNY-6-1-	29	2130	The COATE pathfinder is successful and COATE is reopened with 7 MINIT. RAPT shows J36 clear (for hours).		RP, TMD		

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ZNY-6-1-	30	2138	A pathfinder for the J70 arrival route is being attempted. The flight was just handed off to ZNY from ZOB. There is a level 6 cell just south of J70 and moving east. This is an aggressive arrival pathfinder request compared to requests for departure pathfinders and was initiated by ZOB. It is in the best interest of ZOB to get this route open. (The route is opened at 2145 with 20 MIT.)		TMD, PB		DSR, CIWS VIL, Echo Tops, Storm Motion
ZNY-6-1-	31	2141	Embedded cells are just south of J6 in ZDC. RAPT shows J6 green to yellow ENR.		RP		
ZNY-6-1-	32	2153	The observer shows the STMC that echo tops on J6 are collapsing and gaps are opening. RAPT shows blockage along the route dissipating. (J6 is green.) The STMC commented that they should request a pathfinder from ZDC, but no action was taken.	*(DP, I/IC, SA-2)	TMD, RP	Yes	CIWS VIL, Echo Tops
ZNY-6-1-	33	2200	ZDC reopens J6 for traffic at and above FL360. RAPT shows J6 clear. The STMC viewed CIWS echo tops to assess the altitude restriction.	*(RO)	TMD, RP, TMD-LOU		CIWS Echo Tops
ZNY-6-1-	34	2220	J36 is closed by Area C due to deviations caused by a new cell developing on the route. RAPT shows J36 green.		RP, PB, EO		CIWS VIL, Echo Tops
ZNY-6-1-	35	2224	The Area A Supervisor asks the STMC the status of J6. The STMC reports that J6 is open AOA FL360. The Area A Supervisor asks if the STMC has looked at J80 recently. There is a lot of traffic on J80 flying through weather that is stronger than the weather on J6 and J80 is open with 20 MIT. RAPT shows J80 and J6 are clear. The STMC uses CIWS to assess the weather on J6 and J80.		TMD		CIWS VIL, Echo Tops
ZNY-6-1-	36	2228	Area A is closing J80 due to deviations. RAPT shows J80 red ENR, updating to yellow ENR.  J60 and J64 are closed. There is embedded level 6 in the cluster in ZNY on both routes. RAPT shows J60 yellow to green and J64 red.	*(RO)	PB, RP, TMD		
ZNY-6-1-	37	2236	N90 calls an all stop for ELIOT J60. (Is J60 already closed?) RAPT shows J60 yellow to green.		TMD-S, RP		



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ZNY-6-1-	38	2240	There are more questions in the unit concerning opening J6 to more than AOA FL360. Currently J36, J60, J64, and J80 are closed. RAPT shows J6 clear, J50 yellow to green, J64 red, and J80 red ENR. The STMC consults CIWS for the status of the weather on J6.	*(EP, I/IC, SA-1)	TMD, RP		CIWS VIL, Echo Tops
ZNY-6-1-	39	2246	Area C reports that aircraft are deviating on J95, but the Area Supervisor does not know why. There is nothing on the DSR to indicate why they are deviating. RAPT shows J95 clear. The STMC and Area Supervisor consult RAPT and CIWS to assess the weather on J95. CIWS shows that the problem may be due to thunderstorm overhang. N90 announces via the hotline that J95 is closed sector-to-sector. J95 traffic is deviating into ZBW.	SA-2, I/IC, SA-3	PB, RP, TMD, EO		DSR, CIWS VIL, Echo Tops
ZNY-6-1-	40	2255	The TMC points out to the STMC that the last two aircraft on J95 stayed on the route without deviations. The STMC is going to talk to Area C to reopen J95. RAPT shows J95 clear.		TMD, RP		DSR
ZNY-6-1-	41	2300	Pathfinders are currently attempting to navigate GAYEL and COATE (J36 and J95). The weather on these fixes is dissipating. RAPT shows J36 and J95 clear. The STMC consults RAPT to confirm that routes are clear.	*(RO)	TMD, RP		CIWS VIL, Echo Tops
ZNY-6-1-	42	2305	J60 is reopened. J6 is open at all altitudes. J80 and J64 remain closed. RAPT shows J60 clear to green and J6 clear.	*(RO)	RP, TMD		
ZNY-6-1-	43	2320	The STMC wants to open J64, but the Area D Supervisor thinks this is premature. The STMC wants to send a pathfinder on the route. There is a level 6 cell on the route, but it is moving south off the route. RAPT shows J64 yellow to green to clear. A pathfinder is sent at 2325.	DP, I/IC, SA-2	TMD, RP		CIWS VIL, Echo Tops, Storm Motion, Forecast
ZNY-6-1-	44	2325	A small area of level 2 with tops below 25 kft is on J36. The Area C Supervisor is unhappy that two flights were sent down J36. The STMC states that there is no weather on the route and to expect more traffic. RAPT shows J36 clear.		TMD, RP		DSR

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ZNY-6-1-	45	2340	A lone level 5 cell with 48 kft tops is northwest of J48 and moving toward the route. The cell appears to be decaying. RAPT shows J48 red ENR. This is an example of how an improved decay forecast can lead to improved blockage guidance and that RAPT is overly sensitive to blockage from a single cell in en route airspace where there is sufficient room to deviate.		EO, RP		
ZNY-6-1-	46	2348	Area D stops J64 and moves traffic to J60. Aircraft are deviating around an overhang. RAPT shows J60 clear and J64 yellow to green. This is an Area call and they are not using CIWS.		PB, RP, EO, TMD		DSR
ZNY-6-1-	47	0005	A small cluster of strong cells is along J80, straddling the ZOB/ZNY border. A large overhang to the northeast is impacting J64. J64 and J80 are currently closed. RAPT shows J64 green and J80 green to yellow.		EO, RP		
ZNY-6-1-	48	0011	GREKI traffic is moved to MERIT. A large level 6 cluster of weather is located in south ZBW. RAPT shows GREKI yellow ENR. The Operations Manager consults RAPT and CIWS to assess the significance of the weather on GREKI.	SA-1, SA-3	EO, RP, TMD		CIWS VIL
ZNY-6-1-	49	0015	Storm cells are sinking toward J80. These storms are slow moving and disorganized. J64 is still closed due to thunderstorm overhang on the route. RAPT shows J80 red and J64 clear.		RP, EO		

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ZDC-6-1-	1	1715	<p>Isolated level 6 cells with tops ~45 kft are in central PA, all growing and moving southeast. Level 4 – 5 cells with tops ~35 kft are in southern ZOB airspace.</p> <p>Restrictions:            CLT J75 15 MIT 1600 – 1900 ZDC:ZNY            CLT MAJIC 15 MIT RALT L/T 1915 – 2000 ZDC:ZNY            EWR ARD 15 MIT 1630 – 2030 N90:ZDC            JFK 15 MIT 1830 – 2100 ZNY:ZDC            LGA RBV 15 MIT 1130 – 2100 N90:ZDC</p> <p>GDPs:            FCAA05 1830 – 0159 Wx/T'Storms</p> <p>Overflow restrictions:            PHL TERRI 20 MIT JETS 1800 – 1930 PHL:ZDC            PHL VCN 10 MIT JETS 1800 – 1930 PHL:ZDC            PHL VCN 20 MIT JETS 1745 – 1930 ZDC:ZNY</p> <p>RAPT shows all routes green. RAPT is displayed at the STMC position with EWR selected.</p>		TMD, RP		CIWS, ITWS, WARP, TSD, DSR
	2	1805	Observer noted that adverse weather is starting to affect J60 and J80				
ZDC-6-1-	3	1807	<p>NY Hotline Activated. RAPT shows 60 and J80 Dark Green and some Yellows            J60 ENR Tops 42 kft            J80 ENR Tops 30 kft</p>				
ZDC-6-1-	4	1815	<p>Large Level 6 cell with Tops 53 kft south of central PA/NY border. RAPT shows J36 Yellows with 40 – 43 kft Tops @ 1815 – 1825 and turning Red with Tops 44 kft at 1830 – 1845            J60 mostly Red with ENR Tops 46 kft. J80 now all Dark Green</p>				

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ZDC-6-1-	5	1825	The EWR ground stop is cancelled.				
ZDC-6-1-	6	1828	Observer heard ZDC STMC: 'Going into SWAP soon, and will open Departure Director (DD) position'				
ZDC-6-1-	7	1857	Line of embedded Level 6 cells with Tops 47 – 50 kft, growing and moving SE towards J6. RAPT shows J60 all Red with ENR Tops 43 kft				
ZDC-6-1-	8	1907	EWR is ground stopped. RAPT shows J60 red ENR, all other routes green.		RP		
ZDC-6-1-	9	1914	RAPT shows J60 yellow to red. The STMC discusses the growth of the weather with the Area 3 Supervisor using CIWS.		TMD, RP		CIWS
ZDC-6-1-	10	1940	The STMC coordinates with ATCSCC and suggests that ZNY and ZBW traffic use J79 to free up J75 since J48 is now effectively closed due to deviations. RAPT shows J48 green to yellow ENR for 1950 departures; J6 is yellow to red ENR.		PB, RP, EO, TMD		
ZDC-6-1-	11	1945	ZDC is swapping traffic off J75 to reduce volume, allowing traffic on J48 to deviate.		TMD, RP		
ZDC-6-1-	12	1948	RAPT shows J48 red ENR. The STMC notices this and the observer takes the opportunity to discuss RAPT.		RP, EO	Yes	
ZDC-6-1-	13	2009	ATCSCC calls to approve the execution of the STMC to offload J75 and move traffic down the east coast on J79 (suggested at 1940). RAPT shows J48 red ENR until 2015 departures then yellow ENR.		TMD, RP		
ZDC-6-1-	14	2025	ZDC reports to N90 the status of its routes. J75 is offloaded to J79, J48 is open with deviations, J6 is problematic and will probably be the first to close, J6 is swapped to J518 and J34 for the next hour to hour and a half.		TMD		
ZDC-6-1-	15	2030	The STMC tells the TMC that they can expect to lose J6 in 30 to 45 minutes. J6 is currently open with deviations. RAPT shows J6, J60, and J64 red ENR.		TMD, RP,EO		
ZDC-6-1-	16	2039	The Area 3 and 4 Supervisors are concerned about weather on J80, but the STMC is not concerned and notes that RAPT shows J80 green.	SA-1, EP, I/IC	TMD, RP		

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ZDC-6-1-	17	2040	The STMC opens the Severe Weather Position. J6, LDN, and AML are closing. RAPT shows EWR: PARKE J6 and TEB: PARKE J6 red ENR, JFK: RBV J6 and LGA: PARKE J6 yellow ENR. The CWSU briefs the STMC using the CIWS display.		RP, TMD		CIWS
ZDC-6-1-	18	2043	The STMC tells N90 and ZNY that J6 is stopping and ZDC is swapping to J22.		TMD		
ZDC-6-1-	19	2050	The ESP TMC notes that aircraft continue to deviate off J48. RAPT shows J48 green.		RP, PB, TMD, EO		
ZDC-6-1-	20	2121	J64 pathfinders are approved. RAPT shows J6 yellow ENR.		TMD, RP		
ZDC-6-1-	21	2158	The STMC is going to open J6 for higher altitudes because flights are not really deviating. RAPT shows all routes green.	*(RO)	EP, TMD		DSR
ZDC-6-1-	22	2200	J6 is open AOA FL360 with 15 MIT. RAPT shows J6 green.		TMD		
ZDC-6-1-	23	2234	Traffic continues to deviate on J6. J220 is still closed. There are 4 Supervisor requests that J6 traffic be kept AOA FL360 because J80 traffic is deviating into ZDC airspace and compromising DC metro flights. RAPT shows J6 green.		TMD, RP		DSR
ZDC-6-1-	24	2241	ZNY is closing J80. J48 traffic is still deviating south of J48. J220 is still closed. RAPT shows J80 red ENR and J48 green. The TMC comments that he does not believe that the TSD is showing the weather correctly on J48.		RP, TMD, PB		DSR
ZDC-6-1-	25	2301	ZDC tells ZNY that J6 is open at all altitudes.		TMD		
ZDC-6-1-	26	2311	ZNY closes PARKE J6. RAPT shows J80 yellow ENR.				
SCC-6-1-	1	1806	Discussions about J36 weather start. RAPT shows J80 yellow ENR.				CIWS VIL, TSD
SCC-6-1-	2	1810	Weather is beginning to develop quickly along the front in northern WV and western PA. No problems with NY and DC metro airports are reported. RAPT shows J36 yellow and J80 yellow ENR.		RP		
SCC-6-1-	3	1820	RAPT shows J36 red, but traffic has already been moved.		TMD		
SCC-6-1-	4	1850	ZOB calls to close J60. RAPT shows J60 red. The NSST glances at RAPT for situational awareness.	SA-1	RP	Yes	

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SCC-6-1-	5	1900	Weather is starting to fill in across west VA and far west PA. RAPT shows J80 red ENR, J48 yellow ENR.		RP		
SCC-6-1-	6	1923	The NSST-NE coordinates with ZOB and ZID who are having problems getting through a small line of storms with very high tops that is forming. This is a push and they are trying to determine where to move the flows. RAPT shows J60 red ENR, J64 yellow ENR for 1940 departures, J6 yellow ENR for 1930 departures, and J48 yellow then red ENR for 1930 departures.		TMD, RP		CIWS Echo Tops, TSD
SCC-6-1-	7	1957	The NSST-NE is coordinating DC metro traffic from ORD. All are going south of the weather. RAPT shows J60, J6, and J48 red ENR.		TMD, RP		
SCC-6-1-	8	2050	Storms in west VA are decaying. There is still a gap in NY state and PA. DC metro traffic has been moved south of the weather in VA. RAPT shows J64 red ENR, J80 yellow ENR then red, J6 red ENR, and J48 yellow ENR.		TMD, RP		CIWS Echo Tops, Growth and Decay Trends, TSD
SCC-6-1-	9	2108	J60/J64 has been running as one for some time. RAPT shows J60 yellow, J64 red, J80 yellow ENR, J6 red ENR, and J48 yellow ENR.		EO		
SCC-6-1-	10	2116	J80 is being impacted. ZNY calls NSST to request 20 MIT on J80. J6 is still stopped. RAPT shows J60 yellow, J64 red, J80 red ENR, J6 yellow ENR, and J48 yellow ENR. The NSST-NE glanced at RAPT for situational awareness, though the display is placed inconveniently for this position.	SA-1	EO, RP		TSD
SCC-6-1-	11	2222	NSST-NE is working on LGA arrivals from CVG on J6. RAPT shows CAM yellow to red, J60 yellow, J64 red, J80 red ENR, and all others green.		TMD	Yes	CIWS VIL, Echo Tops, Growth and Decay Trends, TSD
SCC-6-1-	12	2244	Deviations off of J80 onto J6 are causing problems. RAPT shows J80 red ENR and J6 green.		TMD, RP		
SCC-6-1-	13	2255	ZDC calls to say that the weather on J6 is not properly displayed on the TSD. According to CIWS, the weather on J6 has echo tops of 25 kft and is decaying. This may be overhang. CIWS is referenced by both ZDC and ATCSCC. RAPT shows CAM red, J64 red, and J80 red ENR.		TMD		CIWS, TSD

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SCC-6-1-	14	2301	ATCSCC forces J6 and J60 open.		TMD		
SCC-6-1-	15	0000	There are some problems with JFK to ALB traffic. They are going to swing around a cell north of NYC at the MA-CT-NY border. RAPT shows CAM yellow ENR, J80 green and yellow ENR, and J48 yellow ENR.		TMD		CIWS Growth and Decay Trends, TSD
SCC-6-1-	16	0028	ZDC is not using J211 and J518 due to weather. DC departures are having problems. J134 and J149 are good routes. RAPT shows CAM yellow ENR and J80 red.		TMD		
SCC-6-1-	17	0101	J80 is opened. RAPT shows J80 yellow then green for 0100 departures. J80 was opened about 45 minutes before NY originally said it would open.	*(RO, SA-3, I/IC)	TMD, RP	Yes	CIWS VIL, Forecast, Echo Tops, Growth and Decay Trends, TSD
SCC-6-1-	18	Interview	The NSST states that CIWS is hands down the best tool for en route weather and ITWS is best for the terminals. The TSD is used because of the traffic display, but CIWS and ITWS are their primary weather display tools.		TMD		

**RAPT Benefits Assessment**  
**BLITZ #7 Observations Summary**  
**Day 1 - September 9, 2007**  
**Participating Facilities: LGA, EWR, N90, ZNY, ZDC, ZOB, ZBW, ATCSCC**

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LGA-7-1-	1	1643	SWAP is not in effect, but J36 is closed and traffic is being rerouted to J95. AT is already using RAPT, which shows GAYEL J95 yellow, COATE J36 green to yellow for 1705 departures to green for 1715 departures. A large area of weather extends from eastern OH to western PA into most of western NY to near the MA border.	SA-1	RP		
LGA-7-1-	2	1652	Departures are stopped.		TMD		
LGA-7-1-	3	1658	Departures are released.		TMD		
LGA-7-1-	4	1659	The departure runway is switched from R31 to R13 because surface winds have shifted to the south. Arrivals continued on R22. Although R13 is preferred, the men's tennis final at the US Open requires controllers to issue the "Flushing Climb out" to ensure aircraft stayed north of Arthur Ashe Stadium (which is about 1 mile from the end of the runway). Tournament officials and sponsors were very sensitive about jet noise. During most of the daylight hours, controllers have to deal with higher than normal traffic because three blimps are in the area, along with extra helicopters, seaplanes, and private jets. The mostly VFR flights are due to the tennis match, baseball game at Shea Stadium, and a local pro football game.		TMD		
LGA-7-1-	5	1749	The TMC does not understand the logic behind the COATE stop because RAPT does not show any yellow or red blockage.	SA-3	TMD, RP, TMD-LOU		
LGA-7-1-	6	1805	The TMC asks the ZNY TMU why J36 is closed because the TSD and RAPT do not show any weather along the route. The answer is problems in ZOB airspace.	SA-3, I/IC, EP	TMD		TSD



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LGA-7-1-	7	1808	The LGA Tower Supervisor requests a pathfinder for J36 because no one wants to fly the route, even though all level 3 and higher weather is east of the jetway. An MDX plane on J36 had to deviate. The TMC calls the ATCSCC Severe Weather Unit and asks what the problem is. JFK arrivals on J70 are being given priority over J36 departures, and they do not want to continue dealing with J36 traffic deviating into the J70 arrival stream. Neither the Supervisor nor TMC understand this because RAPT and the TSD show that J36 traffic does not need to deviate.	SA-3	TMD, EO, TMD-LOU	
LGA-7-1-	8	1820	The Supervisor calls ZOB to try to open J36. This was an aggressive action on his part but it was met with resistance from N90, ZNY, and ZOB. RAPT shows COATE J36 green for 30 minutes and J95 green and yellow. The observer suggests that it is possible that ZNY and/or ZOB decided to put all planes on J95 and have everyone deviate on that route rather than put normal traffic on J36 and have no one deviate.	SA-3	TMD, RP, TMD-S, TMD-LOU	
LGA-7-1-	9	1851	Crew change complete. No TMC on duty for evening shift.			
LGA-7-1-	10	1855	COATE traffic is finally released, possibly sooner than otherwise because of the forceful inquiries by LGA.		TMD	
LGA-7-1-	11	1918	The Supervisor uses RAPT and the TSD to try to understand why PARKE and ELIOT are stopped. RAPT shows PARKE and ELIOT green. The restriction was due to excess volume to/from Chicago.	SA-3, EP	TMD-LOU	
LGA-7-1-	12	1939	Departures are stopped due to volume.		TMD	
LGA-7-1-	13	1946	Departures are released.		TMD	

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LGA-7-1-	14	2202	GREKI traffic is stopped for weather. GREKI CAM is yellow for 30 minutes with echo tops of only 28-29kft. An aircraft was on the runway ready for takeoff and filed for GREKI. The LGA Supervisor believed it was a questionable restriction and immediately asked ZNY for alternate routing over MERIT. MERIT was approved and the aircraft was set to roll when GREKI was reopened. The back-and-forth resulted in a 24-minute delay and a flight plan for MERIT, even though the original fix (GREKI) was perfectly fine all along. If the Sup had amended the flight plan again, the aircraft would have had to be pulled off the runway. As a result, the second and third planes behind the first flight were also delayed.	*(DOL, EP, I/IC, SA-1)	TMD,RP		
EWR-7-1-	1	1750	The observer arrives. RAPT is not displayed, so the observer displays RAPT. COATE is closed due to frequency problems. GAYEL is 7 MINIT. There is no SWAP and no current delays at EWR. RAPT shows all routes green.				TSD
EWR-7-1-	2	1802	Precipitation is present north and west. Level 3 is on GAYEL/J95. RAPT shows GAYEL yellow.		RP		
EWR-7-1-	3	1839	North gates are 8 MINIT. COATE is closed.		TMD		
EWR-7-1-	4	1849	East gates are 5 MINIT as one. RAPT is not currently displayed.		TMD, EO		
EWR-7-1-	5	1855	WHITE is restricted 5 MINIT as one beginning 1915. There are level 2 cells near the WHITE routes. RAPT shows all routes green		RP, EO, TMD		
EWR-7-1-	6	1917	East gates and WHITE are restricted 5 MINIT as one. COATE is closed. PARKE and ELIOT are stopped due to volume. RAPT is not currently displayed.		TMD, EO		TSD
EWR-7-1-	7	2000	The line of storms has intensified to level 5 and is moving towards ELIOT J80. RAPT shows all routes green, with J80 being dark green. The observer discussed RAPT with the TMC.		RP	Yes	

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EWR-7-1-	8	2140	Convective cells are near GREKI CAM. There are no delays at EWR. RAPT shows GREKI CAM yellow, going red with the next update. RAPT was opened by the observer after a long period when it was not displayed.		TMD, RP		TSD
EWR-7-1-	9	2240	EWR is reporting 15 minute departure delays. RAPT shows all routes green, except GREKI which is yellow.		TMD		
EWR-7-1-	10	2326	The EWR TMC calls for relief on MERIT, but is denied. RAPT shows GREKI CAM yellow.		RP, TMD		
N90-7-1-	1	1716	No RAPT displayed at STMC upon arrival at facility. SWAP not in effect. North gates are restricted (15/15) and J36 is closed due to deviations. COATE is stopped. An area of weak showers extends from north ME through VT, NH, south-central NY, and western PA. A small area of level 3/4 is on the NY /PA border. RAPT shows EWR: GREKI yellow and EWR: GAYEL J95 yellow. J36 is green.		TMD-S, RP		TSD, CIWS
N90-7-1-	2	1733	All north gates are closed to departures to ORD.		TMD-S, RP		
N90-7-1-	3	1746	RAPT shows all routes green.				
N90-7-1-	4	1800	J36 is closed due to deviations into arrival routes. No SWAP is in effect. There are weak showers in the north and east. RAPT is displayed full-screen at the STMC desk and as a window at the TMC desk. RAPT shows J95 yellow to green, J36 green.		TMD, RP		
N90-7-1-	5	1834	The 15 MIT restriction of each of the north gates is extended until 0000Z. RAPT shows all routes green.		TMD, RP		
N90-7-1-	6	1849	ELIOT is 15 MIT as one. RBV is 15 MIT. GAYEL is 20/20 MIT. J36 is normal. RAPT shows all routes green.		TMD, RP		
N90-7-1-	7	1900	WAVEY is restricted 15 MIT with normal exclusions. WHITE 10 MIT starting at 1915Z. RAPT shows all routes green.		TMD, RP		
N90-7-1-	8	1918	ZNY stops PARKE and ELIOT departures. RAPT shows all routes green.		TMD		
N90-7-1-	9	1929	PARKE and ELIOT are released with 7 MINIT per transition.		TMD		

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N90-7-1-	10	2043	A small level 5 cell in southeast NY between J95 and GREKI CAM is moving northeast at 20 kn. RAPT shows ELIOT J80 for all airports yellow.		RP		
N90-7-1-	11	2130	A cell north of NJ is beginning to encroach on CAM over GREKI. RAPT shows CAM green to yellow to red. All other routes are green.		RP		
N90-7-1-	12	2130	Weak precipitation is in NY, VT, NY, PA, and WV. An area of level 5/6 cells is in southeast NY. RAPT shows GREKI CAM yellow to red for 2140 departures. The STMC puts RAPT in "Play" mode to assess the weather. However, RAPT jumps in 30 minute intervals instead of flowing smoothly.	SA-1	TMD, RP		
N90-7-1-	13	2257	DSP BOS. The PHL ground stop is cancelled. RAPT shows GREKI CAM yellow and all others green.		RP, TMD		
N90-7-1-	14	2329	N90 requests GREKI departures with 20 MIT and, if backed up, to reroute to MERIT. ZNY agrees. RAPT shows all routes green.	*(RO, I/IC, SA-2, EP)	TMD, RP		
N90-7-1-	15	2355	Weather is moving toward JFK (fog). IAD is stopped.				CIWS VIL, Forecast, Echo Tops Forecast
ZNY-7-1-	1	1800	Stratiform, low-topped weather is in north-northwest ZNY and into upstate NY. There is a small area to the north-northeast, in northwestern MA, with tops to 35 kft. J36 is closed; J95 is open. While the weather is not particularly bad, departures are deviating south into NY metro arrivals. Therefore, departures are routed on J95. The Departure TMC called the NY metro airports looking for a pathfinder. CIWS is displayed at the STMC, Arrival, and Departure desks.		EO, TMD		CIWS
ZNY-7-1-	2	1817	Areas A and B are using CIWS but not RAPT. Areas C & D are using WARP.				
ZNY-7-1-	3	1825	The weather is slowly moving east-northeast. The STMC opens RAPT, which shows all routes green.	SA-1	RP		

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ZNY-7-1-	4	1830	The STMC uses RAPT and CIWS to assess the weather situation on J36 and J95. RAPT shows all routes green. The STMC opens J36, but the decision to do so was probably not based solely on RAPT/CIWS.	SA-1, SA-3, RO, EP	TMD, RP		CIWS
ZNY-7-1-	5	1835	J36 is open.				
ZNY-7-1-	6	1839	The weather appears to be building a little in the southeast part of ZOB. RAPT shows all routes green.		RP		
ZNY-7-1-	7	1845	The STMC is concerned that J95 is going to close, so he was eager to open J36. Aircraft are not yet deviating, but the volume on the route is high. RAPT shows J95 green. The STMC looks at RAPT and CIWS for situational awareness, but takes no action.	SA-1, SA-2	TMD, RP		CIWS
ZNY-7-1-	8	1859	WAVEY is restricted 15 MIT with normal exclusions. WHITE is restricted 10 MIT with no exclusions. These restrictions are due to weather in ZDC.		TMD, RP		
ZNY-7-1-	9	1905	The weather in northwest ZNY is growing. Tops are reaching 30k ft. RAPT shows J95 green.		RP		
ZNY-7-1-	10	1918	ZNY stops PARKE and ELIOT due to volume.		TMD		
ZNY-7-1-	11	1924	N90 is holding CAMRN for 5 to 10 minutes due to volume. RAPT shows all route green.		TMD		
ZNY-7-1-	12	1935	Moderate stratiform rain with embedded heavier showers is located in southwest ZBW. RAPT shows all routes green.		RP		
ZNY-7-1-	13	1955	TS Gabrielle came ashore in NC. WHITE is restricted 10 MIT and WAVEY is 15 MIT. RAPT shows all routes clear.		RP, TMD		
ZNY-7-1-	14	2005	Broken convection is located in ZID near J80. RAPT shows J80 clear to dark green. A level 6 cell is near J36 in western ZNY and if forecast to stay off the route. RAPT shows J36 clear. Level 6 cells in ZBW extend from the Catskills to ALB. RAPT shows all ZBW routes clear.		RP		
ZNY-7-1-	15	2025	The cluster of level 6 embedded cells is intensifying in southern NY. RAPT shows GREKI green.		RP		

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ZNY-7-1-	16	2045	Weather in ZID is moving onto J80. RAPT shows J80 yellow ENR to green to yellow ENR. With the next update, RAPT shows J80 clear. The level 6 cells in northwest ZNY are becoming electrically active. RAPT shows J36 and J95 clear to green.		EO, RP		
ZNY-7-1-	17	2107	Level 3 weather is near the ZOB/ZNY border. RAPT shows J60 dark green.		RP		
ZNY-7-1-	18	2204	Weather reaching level 6 is over ALB. GREKI is closed and swapped to MERIT with 5 MINIT. RAPT shows GREKI yellow, then yellow to red with the next update.		RP, TMD		
ZNY-7-1-	19	2204	Weather is building to the north and west. GREKI CAM is closed. RAPT shows GREKI CAM yellow to red.				CIWS
ZNY-7-1-	20	2205	The weather to the west of J60 is building slightly. Echo tops reach 31 kft. It appears that aircraft can still deviate around the weather. RAPT shows J80 green and J60 yellow to green.		RP, PB		CIWS Echo Tops
ZNY-7-1-	21	2225	JFK departures are allowed over GREKI, all others are swapped to MERIT with 15 MIT. MERIT is stopped by N90 due to volume. Some MERIT departures are allowed to reroute vial BETTY/Nantucket. RAPT shows GREKI yellow. The STMC is monitoring route status using RAPT.	SA-1, SA-2	TMD, RP		
ZNY-7-1-	22	2234	The ZBW STMC tells N90 on the hotline that GREKI is open with 30 MIT. The ZNY TMC asks the ZNY STMC for clarification on GREKI. N90 says that the route is officially open with 30 MIT to all departures, but if everyone sends their traffic there, the fix will be swamped. N90 advises continuing the swap to MERIT. RAPT shows GREKI yellow to green.		TMD, RP, TMD-LOU, TMD-S		
ZNY-7-1-	23	2240	The largest cell in the cluster near ALB has intensified to level 6 and will move over GREKI soon. GREKI is still open with 30 MIT, though some traffic is still rerouted over MERIT to limit volume. RAPT shows GREKI yellow.		TMD, RP		

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ZNY-7-1-	24	2312	There is weather between J36 and J95 south of BUF and moving toward the ZNY airspace. The echo tops reach 31 kft. RAPT shows all routes green, but CIWS Growth and Decay Trends suggest the weather will impact J95.		RP		CIWS Echo Tops, Growth and Decay Trends
ZNY-7-1-	25	2345	The cluster of weather near GREKI is moving east of CAM. The GREKI restriction was reduced to 20 MIT at 2320. ZBW want to fully open GREKI. RAPT shows GREKI clear.		TMD, RP		
ZNY-7-1-	26	2346	The STMC is using CIWS to locate the Deer Park (DPK) fix (located at the ZNY/ZBW border) for ATC-related issues. He displayed it on CIWS and zoomed in to clearly see the fix location.		TMD		CIWS Overlays
ZNY-7-1-	27	Interview	<p>The OMIC stated that on Saturday (September 8, 2007), RAPT showed many routes yellow to red but the routes were fine. There were no requests from the Areas to compensate for deviations and no route closures were required. When asked if the reduced Saturday traffic may have been responsible for this, the OMIC agreed that some RAPT-estimated blockages might have better matched operations during a weekday SWAP.</p> <p>A TMC volunteered his opinion on RAPT. He said that RAPT does not work. It too often shows a route blocked (red) when the route is open without issues. He loves CIWS.</p>		TMD, RP, EO		
ZNY-7-1-	28	Interview	According to the STMC, the CWSU forecasts that storm tops will remain in the 20 kft range during the evening shift. The STMC notes that CIWS is forecasting echo tops in the 30's and reminds the observer that the CWSU's rule of thumb is to subtract 5 kft from CIWS echo tops.		TMD		
ZDC-7-1-	1	1845	ZDC restricts WHITE and WAVEY for growth of thunderstorms in NC. At 1850, RAPT shows J209 WHITE red for 1920 departures.		RP, TMD		
ZDC-7-1-	2	2003	A small level 5 cells is on J80 in central OH. RAPT shows J80 green.		RP		

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ZDC-7-1-	3	2148	The Area 8 Supervisor holds a discussion with the STMC. He identifies the large level 6 cell near the MD/DE border west of J191 arrival route and reports PALEO routes east to SIE are deviating. Internationals flights are swapped off RBV/SWANN. RAPT shows CAM yellow. The observer briefed the STMC and TMC on RAPT.		TMD, PB, RP	Yes	
ZDC-7-1-	4	2209	PCT needs relief, but LGA arrivals are deviating to the west of a storm cell on descent. The TMC says the restriction must remain.  DCA/IAD/BWI PALEO 15 MIT per airport excluding APREQS IAD/DCA SWANN 15 MIT per airport excluding APREQS BWI SWANN 20 MIT excluding APREQS  The observer reviewed the weather with the TMC using the TMC CIWS display.		TMD	Yes	CIWS
ZDC-7-1-	5	2218	The TMC asked the observer to help show the cell movement.			Yes	
ZOB-7-1-	1	1700	Widespread stratiform rain with tops below 30 kft is located throughout eastern ZOB. The heaviest weather is level 3 – 4 in northwest ZOB. Currently there is no real impact on air traffic. Earlier, J36 was swapped to J95. The CP TMC reported that when the aircraft got to the weather they deviated south onto J36. The TMC indicates that swapping J36 to J95 was the wrong call and that "they" did not account for weather moving northeast at 20 kn. J95 should have been swapped to J36. RAPT was not displayed when the observer arrived, so the observer displayed it on the CP position CIWS.		TMD		
ZOB-7-1-	2	1751	ZAU asks ZOB to confirm the 20 MIT restriction on JFK traffic. ZAU asks is the restriction is due to volume. ZOB does not know and says ZNY does not know either. ZNY refers the question to N90. (Communication problem.) RAPT is closed.		TMD-S, EO		
ZOB-7-1-	3	1819	LGA calls ZOB to ask about the ride on J6. ZOB reports on problems in ZOB airspace.		TMD, TMD-LOU		



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ZOB-7-1-	4	Interview	The TMC reports a disagreement between CIWS Precipitation and CIWS ASR Precipitation. The observer explains the discrepancy. The TMC requests 10-, 20-, and 30-minute forecasts be displayed in the CIWS ASR window.		UR, TMD		
ZOB-7-1-	5	1830	The observer briefs the TMC on ITWS gust front vs. microburst vs. wind shear alerts.			Yes	
ZOB-7-1-	6	1834	The weather in ZOB is still mostly level 1-2 with embedded level 3 with tops at or below 35 kft. RAPT is not displayed in the unit. The observer opens RAPT for route status. RAPT shows all routes (EWR) green.		RP		
ZOB-7-1-	7	1848	The observer overhears on the hotline that ZNY has opened J36. Errors on ESIS are causing problems. N90 and ZNY are trying to figure out J36 traffic. N90 asks if J36 is running normally and receives an affirmative reply.		TMD-S, TMD		
ZOB-7-1-	8	1885	J36 and J95 are restricted due to loss of frequency. ORD J60/J64 is 30 MIT as one due to volume and spacing.		TMD		
ZOB-7-1-	9	2012	BUF, ROC, TEB, MMU, LGA, HPN are ground stopped for traffic through ZBW due to weather. A 43 kft thunderstorm is impacting traffic. ZOB is warned that ZBW may have to shut them off. RAPT shows all routes green		TMD, RP		
ZOB-7-1-	10	2030	The J36/J95 restriction is cancelled.		TMD		
ZOB-7-1-	11	2115	There are widespread level 1-2 showers in the eastern half of ZOB. There is no impact on ZOB traffic.				
ZOB-7-1-	12	2150	EWR, TEB, MMU, CDW, LGA, and HPN are restricted 20 MIT as on altitude at or above FL290 from 2030 to 0000. The weather is not particularly convective. ZOB wants to decrease the restriction and coordinates with ATCSCC and ZBW. The ZOB TMC reports that they "have a CIWS expert right here." He uses CIWS to argue for the reduction. The restriction is decreased to 10 MIT. This allows Toronto to get some departures off.		TMD		
ZOB-7-1-	13	2155	ZBW cancels the "as one" restriction and puts 30 MIT on LGA and HPN. EWR and EWR satellites are as one at 20 MIT.		TMD		

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ZBW-7-1-1	1	1830		EO, TMD		CIWS Forecast, Echo Tops, VIL, Growth and Decay Trends
ZBW-7-1-2	2	Interview		TMD		CIWS Forecast, Echo Tops, VIL, Growth and Decay Trends
ZBW-7-1-3	3	2000		TMD		CIWS, CWSU, WARP
ZBW-7-1-4	4	2006		PB, TMD		DSR, ETMS
ZBW-7-1-5	5	2020		TMD		CIWS Forecast, Growth and Decay Trends
ZBW-7-1-6	6	2025		TMD		CIWS Growth and Decay, Storm Motion
ZBW-7-1-7	7	2055				CIWS

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ZBW-7-1-	8	2150	CIWS is used to plan the GREKI transcons. The TMC is moving transcons over MERIT.		TMD		CIWS Forecast, Growth and Decay Trends, Storm Motion
ZBW-7-1-	9	2210	The STMC opens RAPT to assess GREKI even though he is concerned about the transcons. RAPT shows GREKI yellow. The STMC allowed at least one more GREKI departure based on RAPT.	DOL, SA-1, EP	RP, TMD		CIWS Forecast
ZBW-7-1-	10	2236	N90 asks ZBW to end GREKI (with 30 MIT) and move traffic to MERIT. ZBW was using MERIT for BOS arrivals. They tried to keep GREKI open for N90 transcons traffic to prevent delays at BOS. Around this time, the sector controlling GREKI expressed concern about handling traffic around the weather. The STMC reduced the restriction on GREKI to 20 MIT to keep N90 traffic on GREKI and off of MERIT.	*(I/IC, EP)	TMD		
ZBW-7-1-	11	2246	GREKI turning red due to higher tops. Pilots deviating north of route inbound to BOS.		PB, RP		
ZBW-7-1-	12	2256	RAPT shows GREKI green by 2310 but the CIWS Forecast shows level 6 well west of the route. The STMC reports that one GREKI aircraft refused while another aircraft flew through.		RP		DSRD, WARP
ZBW-7-1-	13	2300	The observer discussed the RAPT impact strategy. RAPT currently shows GREKI green but a level 6 cell is on GREKI now.			Yes	CIWS Echo Tops, Storm Motion
ZBW-7-1-	14	2310	There is new growth north and east of HNK along the front. RAPT shows GREKI green.		RP	Yes	CIWS Growth and Decay Trends
ZBW-7-1-	15	2327	The GREKI restriction is reduced to 20 MIT at the request of N90. A level 5 cell is on the route. RAPT shows GREKI ;yellow. The STMC used RAPT and CIWS to assess GREKI.	SA-3, I/IC, EP	TMD, RP		CIWS Forecast

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ZBW-7-1-	16	2337	GREKI is open with no restrictions.	*(RO)	TMD		
SCC-7-1-	1	1800	There is some discussion of AFP using the 2-hour CIWS forecast. It was determined that an AFP was not yet needed so none was issued. RAPT shows J95 yellow to green.		RP, TMD		TSD, CIWS Forecast
SCC-7-1-	2	1810	CIWS was used to coordinate between NSST, ZFW, and ZME concerning routes from TX to the East Coast. During the discussion, the TSD precipitation and echo tops and CIWS forecast was used to coordinate Dallas arrivals through ZME. There was concern that the main flows were getting shut off. CIWS showed that over the next two hours, flows would not need adjustments as thunderstorms were expected to be scattered and tactical adjustments should suffice.		TMD		TSD, CIWS Forecast
SCC-7-1-	3	1904	J36 is reopened. RAPT shows all routes green. The NSST looked at RAPT and noted that J36 was green at the same time ZNY announced they were opening the route.	SA-1	RP		
SCC-7-1-	4	2030	The NSST looks at CIWS forecast and notes that there is not much weather yet. The telecon planner reviewed CIWS to prepare for the tactical update portion of the telecon.		TMD		CIWS Forecast

**RAPT Benefits Assessment  
BLITZ #7 Observations Summary  
Day 2 - September 10, 2007  
Participating Facilities: LGA, EWR, N90, ZNY, ZDC, ZOB, ATCSCC**

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LGA-7-2-	1	1454	A line of weak convection is present in N90 from west-central CT southwest to near PHL. All RAPT routes were GREEN.		RP		
LGA-7-2-	2	1508	North departures are stopped. The line of convection has intensified quickly and COATE J36 and GAYEL J95 are closed. The restriction makes sense but the echo tops must not have been high enough or wide enough to produce a RED blockage on RAPT. ITWS shows the storms moving E to ESE at 5-10 knots and according to ZNY or a pilot report, echo tops were only 22kft.		TMD, PB, EO		
LGA-7-2-	3	1530	The observer demonstrated Coded Departure Routes for at least one plane in the line-up headed to ORD. RAPT clearly shows that alternate routes and gates were available, but LGA AT does not want to request a CDR because of the complexity involved in coordinating the new flight plan with multiple facilities, including ZOB and ZDC. There is no urgency and AT believes that by the time coordination is completed, north routes might be open again.		TMD	Yes	
LGA-7-2-	4	2213	LANNA J48 is stopped. The TMC noted that RAPT has already shown the route RED at 2204Z so the restriction is not a surprise. The TMC also looked at the TSD.	SA-1, SA-2, EP	RP, TMD		TSD
LGA-7-2-	5	0010	The TMC studies the RAPT timeline and graphics on his own initiative to see why LANNA J48 and BIGGY J75 might have problems. No action is taken.	SA-1, SA-2	TMD		
EWR-7-2-	1	1520	Aircraft are departing runway 11 and arriving runway 29. There is a wind shear alert on runway 22. Departure delays are 15 minutes. RAPT was not displayed when the observer arrived; the observer opened RAPT. ITWS shows a level 3 cell within 30 nmi.		TMD		ITWS

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EWR-7-2-	2	1558	Departure delays are 30 minutes due to localized weather. Runways 22 are in use. RAPT shows GAYEL and ELIOT J64 darkgreen on and off.		TMD		
EWR-7-2-	3	1612	Convective weather is building on PARKE J6. The RAPT window is not displayed.		EO		
EWR-7-2-	4	1645	Operations are normal and there are no delays. RAPT shows all routes green.		RP, TMD		
EWR-7-2-	5	1715	A level 5 convective cell is 10 nmi northeast on the arrival end of runway 22. Aircraft are arriving with no problems. RAPT shows all green.		TMD		ITWS
EWR-7-2-	6	1906	Weather reaching level 3 is building on the PARKE and LANNA routes. There are three level 3 cells near the airport.				ITWS
EWR-7-2-	7	1943	Weather reaching level 4 is impacting J48 and J6 and is moving east and north. There are no delays and RAPT shows all routes green.		TMD, RP		
EWR-7-2-	8	1955	WHITE is restricted 5 MINIT with no exclusions.		TMD		
EWR-7-2-	9	2004	Restrictions are placed on ELIOT, WHITE, and east departures.		TMD		
EWR-7-2-	10	2006	Departures are stopped. RAPT shows LANNA J48 yellow ENR to red. All other routes are green.		TMD		
EWR-7-2-	11	2012	The observer discussed the weather with the Supervisor using RAPT.				
EWR-7-2-	12	2106	Operations are normal and there are no delays. Level 4 cells are on/around PARKE and LANNA. RAPT shows PARKE/LANNA yellow ENR. A level 4 cell is south of EWR on WHITE. RAPT shows the WHITE routes green.		TMD, RP		
EWR-7-2-	13	2131	An isolated level 4 cell is on the WHITE routes. RAPT shows WHITE routes green. PARKE/LANNA are impacted by weather reaching level 4. RAPT shows PARKE/LANNA green to yellow.		RP		
EWR-7-2-	14	2200	RAPT shows J48 LANNA red. J6 PARKE green. However there appears to be level 4 cells on both routes.				
EWR-7-2-	15	2216	LANNA J48 is stopped. The observer had just commented that J48 was red and the Supervisor noted this. The Supervisor opened RAPT. RAPT now shows J48 green to yellow ENR.	*(SA-2, I/IC, EP, PRSA)	EO, RP, TMD		

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EWR-7-2-	16	2239	Level 3 weather is on PARKE/LANNA. There are no delays at EWR. RAPT shows all routes green.		TMD		
EWR-7-2-	17	2343	IAD is ground stopped. RAPT is not displayed. The observer opens RAPT which shows LANNA turning red for 2350 departures, PARKE green, and BIGGY yellow.		EO, RP, TMD		
EWR-7-2-	18	0024	IAD is released.		TMD		
EWR-7-2-	19	0120	EWR has 12 departures in line. LANNA is closed. There are level 4 cells around BIGGY and J42. RAPT shows all routes green.		TMD, RP, EO		
N90-7-2	1	1510	A small line of level 2 weather stretches from the CT/MA/NY border south-southwest to GAYEL-HAAYS-NEION-COATE to northern NJ. Level 3/4 weather between NEION and BREZY is moving east. The north gates are restricted 10/15 MIT, ELIOT is 15 MIT, RBV is 15 MIT, ORD is 20 MIT, and BOS is 15 MIT. RAPT shows J95 dark green. All else bright green.		TMD, RP		ITWS, CIWS, ACD, TSD
N90-7-2	2	1515	EWR north and west gates are stopped due to weather. RAPT shows JFK: J95 yellow, LGA and EWR J95 routes green.				
N90-7-2	3	1517	A small level 3/4 cells are near PARKE/LANNA. RAPT shows JFK: GAYEL J95 yellow.		RP		
N90-7-2	4	1526	Due to cells around GAYEL and LANNA, EWR is south departures only. North and west departures are stopped until the cells pass. LGA is stopped on the north gates. RAPT shows JFK: GAYEL J95 and LGA: GAYEL J95 yellow, all other routes green.		TMD, RP		
N90-7-2	5	1534	EWR north gates are open. The weather is southwest of the airport impacting JFK. Only LGA north gates are restricted.		TMD, RP		
N90-7-2	6	1624	LGA west and north gates are stopped. RAPT shows all routes green.		RP, TMD, EO		
N90-7-2	7	1629	N90 is holding for EWR. A level 4 storm is off the airport. RAPT shows all EWR routes green. Level 3/4 cells are west of EWR, south of BREZY. RAPT shows TEB: GREKI CAM yellow, LGA: ELIOT J60 and LGA: ELIOT J80 yellow.		TMD, RP		

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N90-7-2	8	1654	LGA/EWR west gates are as one with 7 MINIT. RAPT shows LGA routes GAYEL J95, COATE J36, and ELIOT J60 yellow, all other routes green.		TMD, RP		
N90-7-2	9	1704	N90 is holding for TEB due to a level 5 cell near the airport. EWR is shut down due to a level 5 cell on LENDY arrival. LGA is 7 MINIT as one on the west gates. RAPT shows LGA routes GAYEL J95, COATE J36, ELIOT J60, and ELIOT J60 yellow, all other routes green.		TMD, RP		
N90-7-2	10	Interview	The TMC stated that RAPT was priceless during a SWAP but they don't use it much on days like this.		TMD, RP		
N90-7-2	11	1818	A level 4 cell is over J6 in WV. RAPT shows all J6 routes yellow.		RP		
N90-7-2	12	1845	A level 5 cell is over RBV. RAPT shows all JFK: RBV routes yellow.		RP, EO		
N90-7-2	13	1846	A cell over RBV has caused ZNY to implement a restriction of 15 MIT for RBV traffic, even though the weather is in N90 airspace and the Center airspace is clear. RAPT shows all RBV routes red.				
N90-7-2	14	2005	Level 5 cells are moving into western VA from WV. The cell on the northern VA/northeastern WV border is lying along J6 and RAPT forecasts the cell to move east along J6. RAPT shows all J48 routes yellow ENR to red ENR for 2015 departures. All J6 routes are green.		RP, EO		
N90-7-2	15	2050	A large cluster of cells is moving northeast from WV and is beginning to impact J6 and J48 in VA/WV. RAPT shows J6 green and J48 yellow.		RP		
N90-7-2	16	2212	ZNY stops J48 traffic due to weather. Traffic is expected to be rerouted to J75. RAPT shows J48 yellow to red for 2220 departures and J6 green		RP, TMD		
N90-7-2	17	2213	RAPT shows J48 green to yellow now.		EO		
N90-7-2	18	2316	Front extending NE toward NJ from VA/MD border. J48 still closed and being rerouted. RAPT shows J48 yellow and red. J6 dark green.				
N90-7-2	19	2348	Leading edge of weather in northern VA and pushing into MD. Embedded level 3/4 cells. EWR PARKE, JFK RBV yellow. J48 yellow and red. J75 yellow.				
N90-7-2	20	0110	Weather crossing VA/MD border with some level 3 activity. Decaying quickly. RAPT shows J48 changing from yellow to green.				



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ZNY-7-2-	1	1430	Isolated small cells are east of COATE in N90. There are currently no route closures and RAPT shows all routes clear. RAPT is displayed at the STMC desk. LGA has a GDP in place due to low C&V. VACapes, B, C, and E warning areas are active. AREAS A and B are using CIWS, Areas C and D are using WARP. Areas E and F are using CIWS.		TMD, RP	
ZNY-7-2-	2	1450	The Arrival TMC tells the STMC that he may want to add additional staff to the "pit." This is likely due to N90 maneuvering for weather.		TMD, RP	
ZNY-7-2-	3	1451	A short line of weak convection is in N90. RAPT shows all routes clear.		EO, RP	
ZNY-7-2-	4	1507	A small storm is intensifying just west of EWR. ATCSCC calls N90 to ask if they are having any problems with departures. N90 reports no problems because traffic is light at this time. RAPT shows all route clear. Generally this is not a good portrayal of near-terminal/TRACON impacts, but with low demand, it matches the current operational situation well.		RP, TMD, EO	
ZNY-7-2-	5	1515	Scattered level 5 storms are in N90 airspace. The ZNY STMC is writing a SWAP statement. RAPT shows all routes clear. The STMC consults CIWS for weather guidance when writing the SWAP statement.		TMD, RP	CIWS VIL, Echo Tops, Forecast Contours
ZNY-7-2-	6	1518	Over the hotline, it is announced that EWR is hold for a level 5 cell near the field. The TMC tells the STMC that EWR is requesting 3-hour p-times because of backups caused by weather. RAPT shows routes clear.		TMD, RP	

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ZNY-7-2-	7	1525	A broken line of level 5 cells is located in N90 airspace. EWR and LGA north gate sectors are stopped for departures, ATCSCC asks ZNY to offload J36/J95 EWR and LGA departures to the west gates. The ZNY STMC agrees and tells the TMCs to begin the offload. EWR clarifies issue explaining that their weather is not affecting the north gates as it is lying SW of the field. Only LGA north gates will be rerouted. RAPT shows EWR clear and LGA J95 yellow and J36 dark green.		TMD, RP		CIWS
ZNY-7-2-	8	1537	Weather is moving into the NY metro area. Some weather is building just south of the N90 border. RAPT shows J36 green and J95 yellow.		RP		
ZNY-7-2-	9	1540	The TMC asks the STMC if LGA-ORD departures (typically on J36) should also be moved to the west gates (J60/J64). The STMC says that all LGA north gate departures are being rerouted. However, the STMC calls ATCSCC for the protocol. ATCSCC tells ZNY to hold off moving LGA-ORD until they can coordinate. ATCSCC then calls back and indicates that the reroute has been coordinated.		TMD, TMD-W		
ZNY-7-2-	10	1550	A line of level 5 weather stretches from the north N90 boundary to east of BIGGY. This line contains embedded level 6 cells, no lightning and echo tops reach 32 kft. North gate departures from LGA are rerouted to the west gates. RAPT shows LGA: J95 green to yellow; LGA: J36 green.		TMD, RP, EO		
ZNY-7-2-	11	1551	RAPT shows J60, J80, and J75 going dark green for 1605 departures. The STMC glanced at CIWS and RAPT for situational awareness. All weather is currently in N90 airspace.	SA-1, SA-2	RP		CIWS
ZNY-7-2-	12	1552	EWR departure delays are +30 minutes due to thunderstorms.		TMD		
ZNY-7-2-	13	1555	EWR is in a GDP until 0359 due to low ceilings.		TMD		
ZNY-7-2-	14	1600	JFK is holding at LENDY due to weather. Traffic is backing up in Area C. ZOB will have to hold JFK arrivals as they approach the ZNY boundary.		TMD		

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ZNY-7-2-	15	1600	A broken line of weak cells is developing southwest from EWR to PHL to BWI. LGA north gates are closed and JFK LENDY arrivals are being held. RAPT shows LGA: J60 dark green and J80 dark green to yellow.		TMD, RP		
ZNY-7-2-	16	1615	ZBW is shut off at the Kingston fix for JFK arrivals. The STMC checks with the Area to confirm that this traffic will be handled sector-to-sector.		TMD		
ZNY-7-2-	17	1620	A slow-moving level 6 cells are developing east of BWI but are not affecting NY departure routes. RAPT shows EWR J95 green and LGA J95 clear.		RP		
ZNY-7-2-	18	1640	Area C is stopping LENDY arrivals due to weather. The STMC confirms that this is not a big problem due to low demand at this time.		TMD		
ZNY-7-2-	19	1640	A level 6 cell is expanding in size over TEB. RAPT shows LGA: J95 green to yellow and J36 yellow to green.		RP		
ZNY-7-2-	20	1640	Area C stops arrivals at LENDY due to deviations cause by weather.				
ZNY-7-2-	21	1650	A level 5/6 cluster of weather is on the north departure gates over TEB. LGA is using the north gates with 7 MINIT. RAPT shows LGA clear; EWR: J95 green to yellow, J36 yellow to green and J60 green to yellow to green.		RP, TMD		
ZNY-7-2-	22	1652	The observer visited the Areas, which are quiet now. Area A is dealing with PHL holds due to volume. Area B, where the weather has just moved through, is not experiencing issues. Areas C and D are using WARP. No Areas are using RAPT. The STMC seems to use CIWS often and RAPT occasionally.		TMD		CIWS

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ZNY-7-2-	23	1657	Weather is impacting LENDY arrivals. The ZNY STMC adds the LENDY overlay and forecast contours to the CIWS display in an attempted to determine how long LENDY will be affected. The STMC coordinates with ZOB for two aircraft routed over LENDY that are currently in ZOB airspace. The STMC informs and ZOB that LENDY may be clear in 30 minutes. Based on the CIWS forecast, it was agreed that an aircraft in ZOB airspace, about 30 minutes from JFK, would attempt the LENDY fix.		TMD		CIWS Forecast, Storm Motion
ZNY-7-2-	24	1705	EWR is shut off because of level 5 on final. EWR traffic will have to be held. A second tier ground stop for EWR and TEB is implemented. This is an arrival problem, so RAPT is not applicable. RAPT shows EWR clear; LGA: J95/J36/J60/J64 yellow J80 green to yellow, and J6/J48 green.		TMD, RP, EO		
ZNY-7-2-	25	1710	EWR is ground stopped. A level 4/5 cell is at the airport. RAPT shows J36, J60, J80, and J95 yellow to green.				
ZNY-7-2-	26	1715	It is announced on the SPT that a preemptive second tier ground stop for LGA will be implemented as soon as the weather cluster moved from EWR to LGA. The ZNY STMC monitored CIWS during the SPT for situational awareness. The ground stop was implemented at 1729Z.		TMD		CIWS
ZNY-7-2-	27	1718	A preemptive second tier ground stop is implemented for LGA in anticipation that the weather impacting EWR will soon impact LGA. RAPT shows J60 yellow for 1730 departures.		RP		
ZNY-7-2-	28	1727	The Area Supervisor reports that sector 54 arrivals are still getting through but they are all turning. The STMC offers 15 MIT to help arrivals.		TMD, PB		
ZNY-7-2-	29	1730	A broken north-south line of showers is developing behind the TED to RBV cluster. One cell west of LENDY developed quickly to level 4. A level 6 cell is over WHITE, but WHITE is still open. RAPT shows. LGA: J60/J80/J6/J48 green and J36/J95 clear to green.		RP		

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ZNY-7-2-	30	1735	The weather west of TEB at RBV appears to be growing. RAPT shows J60, J80, and J6 green. The weather is sparse enough for traffic to get through.		RP		
ZNY-7-2-	31	1740	The observer visited the Areas. Areas C and D are using WARP, Area B is using CIWS.		TMD		
ZNY-7-2-	32	1745	The cell near TEB is collapsing. RAPT shows all LGA route clear.		RP		
ZNY-7-2-	33	1748	There is a level 5 cell just southeast of WHITE/DIXIE. NY metro departures are having no problems going around the weather. RAPT shows all routes green.		RP		
ZNY-7-2-	34	1800	Convection is developing between COATE and LENDY. A level 4/5 cell is over GAYEL and into southern ZBW. There is now level 5 in the broken line from north of GAYEL to east of ELIOT. RAPT shows EWR clear.		RP		
ZNY-7-2-	35	1815	All NY metro ground stops are cancelled. TEB and LGA report 45 minute departure delays.		TMD		
ZNY-7-2-	36	1822	Weather to the west of NY metro airports seems to be semi-stationary but also growing in intensity. Weather is building west-northwest of EWR. RAPT shows J75 green for 1830+ departures. The bulk of the weather is in N90 and ZDC, so ZNY is quiet. The STMC glancing at CIWS but there is little need at this time.		RP		CIWS
ZNY-7-2-	37	1830	Level 6 cores are in the scattered low-topped weather in south-central N90 and northeast ZDC. All tops are below 30 kft. No departure routes are closed. RAPT shows EWR J6 clear to green.		RP		
ZNY-7-2-	38	1835	Weather is growing in ZDC just west of J75 and east of J209. This may impact south departures. RAPT shows J6 green for 1855 departures.		RP		
ZNY-7-2-	39	1840	The Area Supervisor reports deviations at RBV.		PB		

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ZNY-7-2-	40	1847	ZNY and N90 are discussion restrictions on RBV. ZNY placed a 15 MIT restriction on RBV departures but N90 states that the weather is in the N90 airspace and that they can work with a 10 MIT restriction. Even though the weather is in N90, aircraft are deviating in ZNY airspace. RAPT shows RBV J64/J80 yellow, RBV J60 green, RBV J6 green to yellow. CIWS was consulted to confirm the location and movement of the weather.		TMD, PB, RP		CIWS VIL, Echo Tops, Storm Motion
ZNY-7-2-	41	1848	There are issues with RBV. N90 wants to reduce the 15 MIT restriction placed by ZNY, stating that the weather is in their airspace and they can handle a reduced MIT. ZNY ways that the planes are not coming out consistently. Once they are consistent, ZNY will reduce restriction.				CIWS
ZNY-7-2-	42	1855	The Area Supervisor reports that pilots are deviating around the weather near PENNS. The weather is not visible on the scope but pilots report that the weather is growing. The deviations have forced the Area to hold EWR arrivals. The STMC consults CIWS and adds overlay to display, turns on trends and sees growth signature just north of PENNS. Tells Area Sup that he thinks he sees what the pilots are talking about. STMC logs this.		PB, TMD		CIWS VIL, Growth and Decay Trends
ZNY-7-2-	43	1857	Pilots are deviating near PENNS due to developing weather. ZNY is holding in that area. This weather is not visible on the DSR scope, so the STMC uses CIWS to assess the weather and notes growth. He calls N90 with a heads-up that if ZNY continues to hold		TMD		CIWS
ZNY-7-2-	44	1904	Weather is building near RBV. RAPT shows RBV green.		RP		
ZNY-7-2-	45	1910	Weather appears to be sitting over RBV. RAPT shows RBV J64 and J80 green and RBV J60 and J64 green to yellow.		RP		
ZNY-7-2-	46	1912	The Area B Supervisor reports that RBV departures are deviating 15 miles off the route. PHL DITCH traffic is moved to J132 because of RBV weather. The STMC looks for victor airways on CIWS. RAPT shows RBV routes green.		PB, RP, TMD		

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ZNY-7-2-	47	1914	Weather is moving east to RBV. CIWS shows growth west of RBV. RAPT shows the RBV routes going green as the weather moves east.		RP		
ZNY-7-2-	48	1920	A strong level 6 cell is located in southeast NJ. Another cell is between WHITE and WAVEY. RAPT shows WHITE and WAVEY clear. The STMC checks CIWS for impacts to support his SPT discussion.	*(EP, SA-2)	RP, TMD		CIWS VIL, Echo Tops, Storm Motion
ZNY-7-2-	49	1920	The problems at RBV have stopped, so the RAPT guidance seems correct. RAPT shows RBV green.		RP		
ZNY-7-2-	50	1930	Area B requests that arrivals on DITCH be moved farther east to get around the weather moving off RBV. The observer notes that this seems to be a good proactive decision. Without moving the traffic, aircraft may deviate, causing problems with other departures and resulting in delays. DITCH J225 is moved to DITCH V312 DRIFT.		TMD		TSD
ZNY-7-2-	51	1932	ZNY requests victor airways.		UR		
ZNY-7-2-	52	1945	A PIREP is received of 22 kft for the weather at RBV/J225. CIWS shows echo tops values of 23 kft to 27 kft. The observer points this out to the STMC to illustrate the accuracy of the CIWS echo tops product.		PB, TMD	Yes	CIWS Echo Tops
ZNY-7-2-	53	1947	One aircraft did not receive the DITCH reroute in time but flew the original route without problems.		TMD, PB		
ZNY-7-2-	54	1955	Isolated level 5 cells are developing on J6 in ZDC, ahead of the main push of weather further southwest. Weather approaching J48 is intensifying to level 6. There are no route impacts yet. RAPT shows J6/J48 clear. At 1955, RAPT updated J48 to yellow ENR and to yellow to red with the 2000 update. Based on this forecast, J48 should be blocked starting 2055.		RP, TMD, EO		
ZNY-7-2-	55	1958	Weather in northwest ZDC is growing and moving toward J48. RAPT shows J48 yellow ENR.		RP		
ZNY-7-2-	56	2004	Weather is growing on J48 in ZDC. RAPT shows J48 red ENR for 2015 departures.		RP, EO		

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ZNY-7-2-	57	2020	J6/J48 embedded wx cluster, level 3-5, tops 30 to 40K, no lightning. Spurious high top on J48, seen in time 0 of ETF, may be contributing to higher RAPT blockage of this route.				
ZNY-7-2-	58	2034	<p>The Area B Supervisor reports that WHITE departures are deviating. He suggests either stopping DITCH arrivals or stopping/slowng WHITE departures. The TMU decides to stop PHL DITCH departures. CAMRN arrivals are holding just east of WHITE. If this holding stack cannot be resolved, WHITE will have to close. N90 is clearing up the holding stack and WHITE will continue to run. ZDC has imposed a 10 MIT restriction on WHITE and 20 MIT on WAVEY. RAPT shows WHITE clear to green to yellow for 2055 departures.</p> <p>The Arrival TMC asks why WHITE is not red at this time and wants a detailed description of the blockage algorithm. The observer asked if the STMC considers RAPT WHITE a bad call, given that operations are matching guidance. The STMC said the plan will not work because of holding at CAMRN. (He did not know that the holding issue was worked out.)</p>		PB, TMD, EO, RP, TMD-S		
ZNY-7-2-	59	2050	The cluster of weather on J6/J48 appears to be weakening. There is no lightning and the maximum echo tops are 37 kft. RAPT shows J6 green, J48 yellow ENR, and WHITE green. The STMC notes that J48 is yellow but takes no action.	SA-2	EO, RP, TMD		CIWS VIL, Echo Tops
ZNY-7-2-	60	2055	The STMC establishes a FEA to monitor J6 traffic in anticipation of weather impacts along J6 in ZDC. RAPT shows J6 and J48 green to yellow. The STMC is also monitoring CIWS for J6 impacts.	SA-2, EP, I/IC	TMD		CIWS VIL, Echo Tops
ZNY-7-2-	61	2104	The line of weather in ZDC appears to be filling. RAPT shows J6 yellow ENR for 2125 departures and J48 yellow ENR for 2120 departures.		RP		
ZNY-7-2-	62	2115	An isolated level 6 cell is approaching J174 in eastern ZDC. RAPT and the CIWS forecast shows the cell clearing J174 at 2150. RAPT shows WAVEY green to clear.		RP		



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ZNY-7-2-	63	2200	There are embedded level 5/6 cells with tops to 43 kft over J5/J48. RAPT shows J6 green, J48 red ENR. If this is correct, the route will be blocked at 2235. With the next update, RAPT shows J174 green to yellow to red for 2255 departures. The STMC asks why J48 is red and the observer explains.		EO, RP	Yes	CIWS VIL, Echo Tops, Forecast
ZNY-7-2-	64	2205	A pathfinder is used for J225, but ATC decided to open the route anyway based on the TSD.		TMD		TSD
ZNY-7-2-	65	2212	ZDC closes J48 and moves traffic to J75. There is current level 5 weather on the route. RAPT shows J48 green to yellow.		EO, RP, TMD		
ZNY-7-2-	66	2215	The STMC calls ZDC to as the status of J6 and J75. He inquires if J6 will be impacted, noting that CIWS shows J6 more severely impacted than J48. ZDC confirmed that J6 weather was a concern for PCT departures as they climbed out, but that ZNY overflights were topping the weather.		TMD		CIWS VIL, Echo Tops, Storm Motion
ZNY-7-2-	67	2220	Weather with embedded level 5 cells extends from J6 to J48 in a northwest to southeast broken line. Echo tops appear to be decreasing along J48. RAPT shows J48 green to yellow ENR to green to yellow ENR.	*(RO, I/IC, SA-2)	RP, TMD		
ZNY-7-2-	68	2223	Weather is slowly moving toward ZNY from the northwest corner of ZDC. Weather is impacting J48, but J6 looks worse. The STMC indicated that the tops on J6 were not high and therefore not a problem. RAPT shows J6 green and J48 green to yellow.	SA-1, SA-2	RP, TMD		
ZNY-7-2-	69	2230	The TMC questions why RAPT shows J6 green instead of blocked. The observer explained that the impact is occurring in airspace with ample room to deviate. As a result, the RAPT representation of the route is wider and the computed impact is below the threshold. This RAPT blockage estimate appears to be good because J6 is open and traffic is using the route.	SA-1, SA-2	RP, TMD	Yes	
ZNY-7-2-	70	2231	The STMC looks at RAPT for situational awareness and wonders when ZDC will reopen J48. RAPT shows J48 and J6 green.	SA-1	RP, TMD, TMD-LOU		

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ZNY-7-2-	71	2234	ZDC continues to keep J48 closed, most likely due to pressure from the ZDC Areas. ZDC has not really closed many routes today and there has been a fair amount of weather in that airspace. The continue closing of J48 may be in response to volume issues. RAPT shows RBV J48 and LANNA J48 yellow ENR for 2250 departures.		EO, RP		
ZNY-7-2-	72	2235	Weather is dissipating on J48. RAPT shows J48 clear and J6 green.		EO, RP		
ZNY-7-2-	73	2250	There is a level 6 cell between J6 and J48. RAPT shows J6 green and J48 clear.				
ZNY-7-2-	74	2253	Traffic is running well with the exception of J48. ZDC has not yet reopened J48. RAPT shows J6 yellow ENR to green.				
ZNY-7-2-	75	2312	ZDC tells N90 that they are having problems with EWR traffic over ARD. A level 6 cell is over ARD.		TMD		
ZNY-7-2-	76	2315	Weather is building and moving from ARD to RBV causing problems for ZDC traffic going to EWR. RAPT shows EWR LANNA yellow for 2320 departures to green to yellow for 2333 departures.		TMD, RP		
ZNY-7-2-	77	2323	ZNY is taking 5 or 6 aircraft from ZDC to offload holding for ARD. RAPT shows EWR: LANNA J48 yellow.		TMD, EO, RP		
ZNY-7-2-	78	2325	Thunderstorm overhang is just south of IAD, east of the main convection in north VA. PCT is having difficulties departing west into and over the weather.  The 15 MIT per strat restriction on J80 has been in place for a while. The weather on the route is level 1. The observer thinks the problem may be due to overhang.	*(RO, I/IC, SA-2, EP)	PB, RP, TMD		
ZNY-7-2-	79	2340	Weather is moving onto J75. RAPT shows J75 yellow and LANNA J48 going back to red.		EO, RP		
ZNY-7-2-	80	2353	A broken line of convection reaching level 5 extends from J6 to J75 in ZDC. RAPT shows J6 green and it is open. J48 is yellow to red and closed. J75 is green to yellow and open.		RP		
ZNY-7-2-	81	2355	A level 4 cell is developing just west of LENDY. The STMC notes the cell and its echo top (25 kft) and checks the DSR to determine if JFK arrivals are using the route and, if so, are deviating.		TMD, EO, RP		CIWS Echo Tops

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ZNY-7-2-	82	NOTE	The observer notes that there are no CIWS overlays to support the Ocean-Areas and suggests adding them. Also, the ZNY super-high sectors should be removed since they are not used.		TMD		
ZNY-7-2-	83	0008	A level 5 cell embedded is in the cluster over J75. RAPT shows J75 yellow /green/yellow and J48 yellow. The STMC notices that J75 is yellow and consults CIWS for closer inspection. He is considering the possibility of closing the route, but would like to see it hold out for another hour since departure traffic will be down by then.	SA-2, EP	RP, TMD		CIWS VIL, Echo Tops
ZNY-7-2-	84	0030	The cluster near J75 is intensifying again. J75 is open, J48 is closed. RAPT shows J75 yellow.		RP		
ZNY-7-2-	85	0100	A level 5 cell is developing in N90, northwest of TEB in a broken line back to LANNA/BIGGY. The STMC notes that even if severe storms impact a key fix, air traffic impacts on this day are minimal. Demand is down so there is no steady stream of departures out a fix. When there is a steady stream of departures, it concerns controllers because there is no room for deviations.		TMD, EO		
ZNY-7-2-	86	0113	J48 is reopened by ZDC. RAPT shows J48 green.		RP, TMD		
ZNY-7-2-	87	0114	ZDC opens J48. RAPT guidance seemed to match.				
ZNY-7-2-	88	0118	A broken line of level 3/5 cells is in N90. The STMC sees the line developing on CIWS and calls the CWSU for more information. RAPT shows all routes clear.	SA-1	TMD, RP		CIWS VIL, Echo Tops

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ZDC-7-2-	1	1608		TMD, RP		
		<p>ZDC: LGA and EWR are going single stream for a while as weather moves across.  Restrictions:  BOS 30 MIT 30 P/R 20 N/C 1500 – 1700 ZNY:ZDC  EWR ARD 15 MIT 1600 – 2000 N90:ZDC  LGA RBV 15 MIT 1600 – 0100 N90:ZDC  PHL VCN 10 MIT JETS 1600 – 1700 PHL:ZDC  PHL TERRI 15 MIT JETS 1600 – 1700 PHL:ZDC  PHL BRIGS 20 MIT JETS 1530 – 1700 ZDC:ZNY  GDPs:  EWR 1600 – 0359 Weather/Low Ceilings  LGA 1458 – 0359 Weather/Low Ceilings  JFK 1800 – 0359 Weather/Low Ceilings</p> <p>RAPT shows GAYEL J95 yellow for 1630 and 1635 departures and green otherwise, all other routes are green.</p>				
ZDC-7-2-	2	1659		TMD		
		ZDC is ground stopped for EWR and LGA until 1730Z, still single stream. RAPT shows LGA: GAYEL J95 and COATE J36 yellow.				
ZDC-7-2-	3	1708		TMD		
		ZDC is holding for TEB due to weather over TEB. Dual streams now for EWR/LGA.				
ZDC-7-2-	4	1709		TMD		
		The LGA ground stop is cancelled. The EWR ground stop is activated by ATCSCC.				
ZDC-7-2-	5	1715				
		SPT Telecon - no ZDC input.				
ZDC-7-2-	6	1737				
		J42 and J79 are restricted 15 MIT per route. RAPT shows all routes green.				

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ZDC-7-2-	7	1747	Level 5 – 6 weather with tops to 29 kft is east of EWR and about TEB and LGA. A level 6 cell with tops to 34 kft is over WHITE. A level 3 – 4 cell is in south-central NY over J209/J174, moving east-southeast. A level 3 – 4 cell is over the MD/DE border over arrival route J191. Level 2 – 4 weather is in southeast WV along the ZDC/ZID border with tops of 27 – 29 kft near J6 and J42. RAPT shows all routes green. The observer briefed the TMC on the LGA-sector weather status using the CIWS display.		TMD		CIWS VIL, Echo Tops, Growth and Decay Trends
ZDC-7-2-	8	1753	ZDC asks N90 and ATCSCC if there is movement on NY metro traffic. N90 reports that EWR is still holding, but TEB is moving and one LGA can be released. RAPT shows all routes green. The STMC reviewed CIWS and recognized that, based on the weather, there should be movement and release of held traffic.		TMD, RP		CIWS
ZDC-7-2-	9	1803	ATCSCC tells ZDC that EWR, LGA, and TEB are coming out of ground stops.		TMD		
ZDC-7-2-	10	1824	Two level 4 – 5 cells with tops to 26 – 28 kft are located in north-central NJ. The observer assisted the TMC using the CIWS display. The TMC discussed the probability of NY extending the J42 and J79 restrictions, which are to expire in ~6 minutes. The observer suggested that the weather and tops look OK, so it should be OK for the restrictions to expire.		TMD	Yes	
ZDC-7-2-	11	1830	J42 and J79 restrictions expire.		TMD		
ZDC-7-2-	12	1833	THE STMC used the CIWS display to brief the TMC regarding NY and SWANN weather and related expiring restrictions.		TMD		
ZDC-7-2-	13	1835	ZDC is holding LGA RBV traffic due to weather.				
ZDC-7-2-	14	1848	N90 asks ZNY why the RBV restriction is increased from 10 to 15 MIT when traffic can just deviate.		TMD, TMD-LOU		
ZDC-7-2-	15	1911	BWI, DCA, and IAD restrictions are increasing for about 30 minutes due to thunderstorms at SWANN and RBV. RAPT shows some yellow on the RBV routes.		TMD, RP		

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ZDC-7-2-	16	1948	Level 4-5 cell over RBV moving closer to WHITE. The STMC and TMC discuss restrictions on OOD and WHITE due to deviations. RAPT shows all routes green. The decision on the restrictions is made based on CIWS.		TMD, RP, EO		CIWS
ZDC-7-2-	17	1952	WHITE is restricted 10 MIT for jets with no exclusions. OOD is restricted 15 MIT on jets.		TMD		
ZDC-7-2-	18	2006	Level 6 cell, tops 32K ft, north of J48, moving towards route and intensifying. The STMC states that there is no ZDC sector or Area complaints of weather. RAPT shows J48 yellow to red ENR.		EO, TMD, RP		
ZDC-7-2-	19	2034	ZDC is restricting J121/J79 because a level 5 cell with tops to 33 kft is over J209 and south of DE/MD border. RAPT shows J79/J209 WHITE with some yellow and J48 red ENR.		RP		
ZDC-7-2-	20	2040	ZNY is holding some CAMRN traffic to allow a couple of WHITE departures out. RAPT shows J48 red to yellow ENR.		EO, TMD, RP		
ZDC-7-2-	21	2047	A level 6 cell is over WHITE. WHITE is restricted 10 MIT, WAVEY 20 MIT, OOD 30 MIT, and J121/J174 30 MIT per strat. RAPT shows WHITE green. The observer briefed the TMC using CIWS and RAPT. The TMC states that RAPT looks consistent.		RP, TMD	Yes	CIWS
ZDC-7-2-	22	2201	RAPT shows J48 red ENR. The observer reviewed weather over MOL with the TMC using RAPT and CIWS.		EO, RP	Yes	CIWS Growth and Decay Trends
ZDC-7-2-	23	2202	The Areas 1 and 4 Supervisors state that J48 is unusable. The STMC and Supervisors discuss rerouting J48 traffic using CIWS and determine an appropriate route.		RP, TMD		CIWS Forecast
ZDC-7-2-	24	2212	J48 is stopped and moved to J75 GVE.		TMD		
ZDC-7-2-	25	2220	ZNY calls ZDC and state that "according to CIWS," there is more weather on J6 than on J75. The observer reviews the weather with the STMC using CIWS and the STMC concurs with the ZNY observations.		TMD	Yes	CIWS
ZDC-7-2-	26	2245	The observer asks the status of J6, which RAPT has shown green since at least 2200. The STMC says that J6 is open in ZDC.		TMD, RP		

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ZDC-7-2-	27	2301	LDN/AML is stopped for weather (except BWI because of higher altitudes on departures). DCA and IAD arrivals are swapped south via GVE/MOL. (MOL saturated with weather but ATC is trying to keep it open.) Departures are routed up J518/J211 with 30 MIT to J80 (off-loads). RAPT shows all routes green.		TMD		
ZDC-7-2-	28	2309	A level 6 cell is over ARD. The Area 8 Supervisor request that ARD arrivals be stopped because EWR traffic is deviating into LGA traffic, forcing LGA into a hold. RAPT shows all routes green.		PB, EO, TMD		
ZDC-7-2-	29	2334	The TMC asks Area 4 for one IAD to LDN or AML pathfinder. A flight off DCA is routed via J149/AML. RAPT shows J48 and J75 starting to turn yellow.		EO, RP, TMD		
ZDC-7-2-	30	2344	The J149 pathfinder is doing well. A second pathfinder is released. ATCSCC says that PCT arrivals are deviating on hand-off PCT, but the pathfinders (departures) seem to be doing well.		TMD		
ZDC-7-2-	31	0019	J48 is still closed. RAPT shows J48 yellow, J6 and J75 green.	*(RO, SA-2)	RP, TMD		
ZDC-7-2-	32	0021	The observer reviewed the weather with the TMC using CIWS.		TMD	Yes	CIWS Forecast, Growth and Decay Trends
ZDC-7-2-	33	0044	The second pathfinder for AML was successful.		TMD		
ZDC-7-2-	34	0104	The ATCSCC asks when J48 will open. The STMC reports that J48 is still closed so that traffic on J75 can deviate. It will probably remain closed for another hour. RAPT shows J48 yellow and J75 green. The observer consulted CIWS and RAPT with the STMC.	*(I/IC, SA-2, SA-3, EP)	TMD, RP, TMD-LOU	Yes	CIWS
ZDC-7-2-	35	0110	The STMC consults Areas 1 and 4 then calls ATCSCC to open J48. RAPT shows J48 green to yellow to green.		TMD, RP		
ZOB-7-2-	1	1515	Small cells near NY metro airports are impacting the north departure gates. There is widespread level 3 weather, with tops at or below 30 kft, in southern ZID near J8, J6, and J526.				

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ZOB-7-2-	2	1642	The NY position TMC calls ZNY to clarify the route. He was unaware of weather in ZNY. He consults CIWS for situational awareness.		TMD		CIWS VIL, Echo Tops
ZOB-7-2-	3	1650	ZOB calls ZBW to ask if ZNY is taking traffic from ZBW. ZNY shut off ZOB. ZOB wants to take traffic through ZBW only if ZNY will accept them. ZOB is holding for JFK and LGA. ZNY is not holding for LGA. ZOB will keep JFK traffic.		TMD, TMD-S		
ZOB-7-2-	4	1659	ZOB called ZAU and ZID to warn them to expect to hold for LGA and JFK and possibly EWR.		TMD, EO		
ZOB-7-2-	5	1730	ZOB is out of the hold for LGA. There is no weather in ZOB airspace. All impacts due to weather are in NY. RAPT shows all routes green.		TMD		
SCC-7-2-	1	1610	A very small amount of thunderstorm activity is around NY City. RAPT shows J95 green, but the weather is too close to the NY metro airports to show on RAPT. CIWS and the TSD are used for situational awareness.		EO, TMD		TSD, CIWS VIL, Forecast, Echo Tops
SCC-7-2-	2	1708	EWR is ground stopped. RAPT shows all routes green		TMD		
SCC-7-2-	3	1715	On the SPT, there is talk of a preemptive second tier ground stop for LGA. ZDC is holding for LGA.		TMD		
SCC-7-2-	4	1827	GDPs are in place for BOS, LGA, and JFK for low ceiling and for LGA and TEB for thunderstorms. The TSD and ITWS are used for situational awareness at the NY airport. ITWS was used to see that weather was moving off the airports and this helped avoid a lengthy ground stop for EWR.		TMD		TSD, ITWS
SCC-7-2-	5	2250	There is some concern for DC metro arrivals from ZOB through WV. They are considering using J518/J80 as offloads. RAPT shows J6 yellow to green and all other routes green. The TSD is used to monitor traffic for deviations.		TMD		TSD



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SCC-7-2-	6	2305	ZDC/NSST/ZOB has coordinated J518 to J80 for DC departures. RAPT shows all routes green. CIWS and TSD were used to determine the best side of the weather to be on. Departures from DC metro will use J518 to J80. This is an unusual departure routing and required coordination. The TSD was used to traffic situational awareness and CIWS was used to determine the best route around the weather.		RP, TMD		TSD, CIWS VIL, Forecast
SCC-7-2-	7	2315	N90 agrees to the cancellation of the GDP. J220 will be used for NY metro arrivals. RAPT shows all routes green.		TMD		
SCC-7-2-	8	0015	Some light rain is approaching IAD. RAPT shows J48 and J75 yellow. CIWS is used for situational awareness.		TP		TSD, CIWS VIL, Growth and Decay Trends, Storm Motion
SCC-7-2-	9	0030	Cells splitting around IAD. CIWS is used for situational awareness. Cells on the south side are growing but ZDC and PCT continue to land traffic.		TMD		CIWS VIL, Growth and Decay Trends, Storm Motion
SCC-7-2-	10	0050	The NSST has been looking very closely at CIWS and IAD ITWS to see if it will rain. Slightly stronger cells are south of IAD. NSST decided not to issue a ground stop for DC because ZDC is working traffic well.		TMD		CIWS, ITWS, TSD
SCC-7-2-	11	0015	ITWS is being used for situational awareness for DC metro traffic.		TMD		ITWS

**RAPT Benefits Assessment  
BLITZ #7 Observations Summary  
Day 3 - September 11, 2007  
Participating Facilities: LGA, EWR, N90, ZNY, ZDC, ATCSCC**

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LGA-7-3-	1	1038	Conditions at LGA are 600 feet overcast ceiling and 3-5 miles visibility in light rain. A large area of rain and embedded thunderstorms stretches from OH-WV-PA into western NY. There are level 3 and 4 cells in central PA. The Hotline is not active and there is no SWAP. RAPT shows all routes GREEN except for ELIOT J60 which was YELLOW.		TMD, RP		
LGA-7-3-	2	1119	West gates are stopped ( ELIOT, PARKE, BIGGY, and LANNA). All gates and associated LGA routes are GREEN, except for COATE which is YELLOW. The forecast is good but pilots must be reluctant to fly IMC into known areas of thunderstorms. J80 passes directly through level 4/5 weather in south-central PA but the convection must not cover enough of the route.		TMD, RP, PB		
LGA-7-3-	3	1124	Departures are stopped with 11 planes waiting for departure. There is no significant change to the blockage scores.		TMD, TMD-LOU		
LGA-7-3-	4	1129	Departures are released except for west gates.				
LGA-7-3-	5	1136	West gates released, 8 MIT as one.				
LGA-7-3-	6	Interview	The Supervisor says that RAPT can have a direct correlation to miles-in-trail and it might be better for RAPT to depict YELLOW routes as "RESTRICTED".		EO, TMD		

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LGA-7-3-	7	1222	GAYEL J95 is 6 MINIT and is not closed, even though the route passes directly into thunderstorms and a line of convection in northeast PA. RAPT shows the route RED then YELLOW for 1240 departures. The forecast is technically good but operationally wrong. The Supervisor sees the discrepancy and puts aircraft on the TSD to see what is going on. The assumption is that planes are over-flying the tops as the TSD shows heights up to FL350. RAPT shows echo tops at 31 kft. Later, two aircraft flew through or over the line of storms, and by 1235Z, the forecast had GAYEL J95 YELLOW.	SA-3	TMD, RP, EO, PB	
LGA-7-3-	8	1255	GAYEL is stopped. RAPT shows J95 yellow. This correlates better with RAPT but LGA did not know J95 was ever closed and did not explain why several jets were using the jetway.		TMD-S, TMD, RP	
LGA-7-3-	9	1312	GREKI/MERIT stopped. RAPT shows GREKI yellow to green.			
LGA-7-3-	10	1339	GREKI/MERIT released. SWAP at 1340Z.			
LGA-7-3-	11	1536	LGA now on Hotline.			
LGA-7-3-	12	1655	A line of level 3/4 weather is near the final approach path for R22. Cells are moving east-northeast at 40 knots with tops to 20kft. Most weather is inside N90 and there are only short-duration restrictions.		TMD	
LGA-7-3-	13	1704	The TMC and Supervisor used RAPT to select a CDR to DFW. It is unclear if any decision was made based on the forecast because local weather conditions were deteriorating rapidly.	SA-1, EP	TMD	
LGA-7-3-	14	1708	Level 3 and 4 thunderstorms hit the airport and bring moderate rain and west winds up to 16 knots. It is very dark from west through north.		TMD	
LGA-7-3-	15	1710	Visibility drops to less than half a mile with heavy rain and lightning.			
LGA-7-3-	16	1712	ITWS displays gust front arrival and wind shear alerts of +15 and +20 kn.		TMD	
LGA-7-3-	17	1719	The departure runway is changed to R31.		TMD	
LGA-7-3-	18	1721	The heavier precipitation passes over LGA to the southeast.		TMD	
LGA-7-3-	19	1805	A pathfinder launches for WHITE.		TMD	

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LGA-7-3-	20	1810	The pathfinder reports that WHITE is good. WHITE is reopened with 5 MINIT.		TMD, EO		
EWR-7-3-	1	1110	Runway 22 is in use. COATE, GAYEL, PARKE, and ELIOT are restricted 8 MINIT. PHL is stopped. The observer initiated and displayed RAPT on arrival. RAPT shows J95 and J36 green and yellow.		TMD, RP		TSD, ITWS
EWR-7-3-	2	1210	COATE, GAYEL, PARKE, and ELIOT are restricted 8 MINIT. RAPT shows GAYEL J95 and COATE J36 yellow; GREKI CAM green to yellow; and ELIOT, PARKE, AND LANNA green.		TMD, RP		
EWR-7-3-	3	1220	EDCTs for LGA. Traffic is flying through weather with deviations. RAPT is covered by other applications. The observer displays RAPT, which shows GAYEL J95 red.		TMD, RP, PB, EO		
EWR-7-3-	4	1240	GAYEL is stopped. RAPT shows J95, J36, J60, J64, J80, and J6 yellow.	*(PRSA, SA-2)	RP, TMD		
EWR-7-3-	5	1310	MERIT and GREKI are stopped due to weather. RAPT shows ELIOT J80 and J60 red.		EO, RP		
EWR-7-3-	6	Note	Both TMC and Sup indicated to me that they would like to get to a point where they could look @ RAPT and see that a route is either going to close or open up. I asked them if they were gaining more confidence in the system and they both agreed that they didn't see/or understand why Center/Tracon made some decisions when RAPT showed otherwise.				
EWR-7-3-	7	1330	SWAP in 10 minutes There are no route available on the east gates. RAPT shows ELIOT red.		TMD, RP		
EWR-7-3-	8	1334	The Supervisor requested that the observer display the MERIT route on RAPT. The observer explained that MERIT is not available on RAPT.		UR, EO	Yes	
EWR-7-3-	9	1335	GREKI and MERIT as one. RAPT shows GREKI green.		RP, TMD		
EWR-7-3-	10	1356	ELIOT J80 and GAYEL are stopped.		TMD, EO		

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EWR-7-3-	11	1403	PARKE and ELIOT are stopped. RAPT shows GREKI CAM yellow, all ELIOT routes red, and PARKE J6 yellow.		RP, TMD		
EWR-7-3-	12	1414	The Supervisor called to ask about releasing ELIOT and was told to release them with 8 MINIT. RAPT is obscured.		EO, TMD		ITWS
EWR-7-3-	13	1416	ELIOT/PARKE is as one with 9 MINIT. This appears to contradict the earlier call. RAPT is obscured.		TMD-S, TMD		
EWR-7-3-	14	1425	COATE is released with 5 MINIT. RAPT is obscured by the screen saver. The observer displayed RAPT. RAPT shows ELIOT yellow for 1430 departures.		EO, RP		
EWR-7-3-	15	1445	COATE is stopped due to volume. The observer provided RAPT training to a controller trainee.		TMD	Yes	
EWR-7-3-	16	1450	A large line of storms with some level 4 is moving north-northeast. RAPT shows all north and west routes yellow.		RP		
EWR-7-3-	17	1525	The TMC asked the observer to go through the RAPT screens and explain the various uses. Hotline active. RAPT shows GREKI routes red, GAYEL, COATE, ELIOT yellow.			Yes	
EWR-7-3-	18	1610	There are no stops and demand is low.		TMD		
EWR-7-3-	19	1620	A line of level 3 weather is moving north-northeast toward EWR. EWR departures are stopped. RAPT shows BIGGY turning red.		TMD, RP		
EWR-7-3-	20	1625	A line of level 4 weather is in western NJ. EWR is trying to get departures out over WHITE and then turn right around the weather.		TMD		ITWS Gust Front, Lightning
EWR-7-3-	21	1643	WHITE is released off runway 22. They are trying to get three departures out. RAPT is obscured.		EO, TMD		
EWR-7-3-	22	1655	LLWAS issues a wind shear alert. Visibility is 1/4 mile. RAPT shows all WHITE routes red and all others green.	*(PRSA, SA-2, EP)	TMD, RP		ITWS
EWR-7-3-	23	1704	All departures are released on a 260 heading. RAPT is obscured. North gates are stopped due to frequency problems.		TMD, EO		
EWR-7-3-	24	1710	South departures are stopped. RAPT shows WHITE routes red.	*(PRSA, I/IC, SA-2)	EO, RP, TMD		

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EWR-7-3-	25	1720	North gates are released. RAPT is obscured.		TMD		ITWS
EWR-7-3-	26	1740	South departures are opened. Demand is low. RAPT is obscured.				
EWR-7-3-	27	1850	ELIOT is 5 MINIT; no stops, no delays. RAPT shows all routes green.		TMD, RP		
EWR-7-3-	28	1920	WHITE departures are stopped. RAPT is under other applications. The observer opens RAPT to find WHITE red. BIGGY is 6 MINIT.	*(SA-2, I/IC/EP)	TMD, RP		
EWR-7-3-	29	2014	There are restrictions on ELIOT, BIGGY, SERMN, and east departures. PHL WHITE is stopped. RAPT shows WHITE red to yellow, all other routes green. ATC continues to request MERIT routes on RAPT.	*(RO, SA-2, I/IC)	UR, TMD, RP		
EWR-7-3-	30	2026	A large level 5 cell is on the WHITE routes in southern DE. The TMC calls to get a reroute over LANNA. RAPT shows all routes green.		TMD, RP		TSD
EWR-7-3-	31	2027	WHITE is released.		TMD		
N90-7-3-	1	1058	An area of level 2 precipitation is over NY, PA, and WV stretching south through KY, TN, northern LA, and central TX. A north-south line of level 3-5 is in central PA. ELIOT is restricted 15 MIT, PARKE 20 MIT, RBV 10 MIT, north gates 15/15, DTM, ATL, CLE, ORD, BOS 20 MIT. Traffic is flowing with deviations. RAPT shows J36, J60, J64, and J6 yellow, all others green.		PB, TMD, RP		ACD, ITWS
N90-7-3-	2	1110	ELIOT, PARKE, AND RBV are restricted. RAPT shows J36 yellow; J95, J60, J64, and J80 green and yellow.		TMD, RP		
N90-7-3-	3	1119	West gates are stopped due to deviations. RAPT shows J36, J64 and LGA J95 yellow.		PB, RP, TMD		ACD, ITWS
N90-7-3-	4	1120	LGA departures are stopped due to weather.		EO, TMD		
N90-7-3-	5	1131	EWR: PARKE/ELIOT is 8 MINIT as one. RAPT shows J36 yellow, all other routes green.		TMD		ACD, ITWS
N90-7-3-	6	1204	PHL is ground stopped. RAPT shows GAYEL J95 red for EWR, JFK, and LGA and yellow for TEB.		TMD, RP		ACD, ITWS
N90-7-3-	7	1209	ELIOT and PARKE are split 8 MINIT per fix for EWR and 9 MINIT for LGA. RAPT shows J64 yellow.		TMD		ACD, ITWS

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N90-7-3-	8	1246	GAYEL is rerouted over COATE. RAPT shows LGA: ELIOT J64 yellow, JFK: RBV J64 red; TEB: ELIOT J64 red; GREKI CAM yellow; J95, J36, J60, and J80 yellow.		EO, RP		ACD, ITWS
N90-7-3-	9	1312	GREKI and MERIT are stopped due to weather. No reroutes are available. Weather surrounding Long Island reaches level 4. RAPT shows GREKI CAM yellow to green, J95 yellow, J60 red, J64 red to yellow, ELIOT J80 red and yellow, and RBV green.		RP, TMD		
N90-7-3-	10	1343	J80 is closed. RAPT shows ELIOT J80 yellow, J60 and J64 red, RBV green.	*(RO, EP, SA-1, I/IC)	TMD, RP		ACD, ITWS
N90-7-3-	11	1350	Weather is still in a line from MA to TN reaching level 4 to the north and east. RAPT shows GREKI CAM and J95 yellow, J36 green, J60 is red and yellow, ELIOT J80 red, PARKE J6 yellow and RBV is green. PARKE and ELIOT are as one with 8 MINIT. RBV is 15 MIT.		RP		
N90-7-3-	12	1403	GDPs are in place for LGA and EWR. PARKE and ELIOT are stopped by the areas due to weather. RAPT shows ELIOT red and PARKE yellow		TMD, RP		
N90-7-3-	13	1407	Stop all north gates due to volume in the areas. RAPT shows GREKI CAM and J95 yellow.		RP		ACD, ITWS
N90-7-3-	14	1413	ELIOT is released. PARKE is stopped due to weather. PARKE shows ELIOT red, PARKE yellow.		TMD, RP		
N90-7-3-	15	1417	PARKE and ELIOT are as one with 9 MINIT. GREKI and MERIT are as one. RAPT shows GREKI yellow.	*(RO, SA-2)	RMD, RP		
N90-7-3-	16	1417	PARKE is open with 9 MINIT as one with ELIOT.				ACD, ITWS
N90-7-3-	17	1423	COATE is open. RAPT shows COATE yellow.		TMD, RP		
N90-7-3-	18	1423	COATE is open with 10 MIT as one.		TMD		ACD, ITWS
N90-7-3-	19	1506	BOS is stopped due to weather. All north gates are open now. ELIOT and PARKE are separate again. RAPT shows CAM red; J95 and J36 are yellow with scattered red; J60, J64, J80, J48, and J6 are yellow and green.		TMD, RP		

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N90-7-3-	20	1510	ELIOT and PARKE via Broadway are split. RAPT shows J80, J6, J48, J75, J79, J209 intermittent red-yellow-green.		RP		ACD, ITWS
N90-7-3-	21	1543	LGA is stopped.		TMD		ACD, ITWS
N90-7-3-	22	1614	The TMC initiated a EWR hold for ZDC due to weather just west of EWR. RAPT shows EWR: LANNA and BIGGY yellow to red for 1630 departures.		TMD, RP		
N90-7-3-	23	1656	EWR, TEB, and LGA departures are stopped due to weather. JFK is expected to stop in 20 to 25 minutes.		TMD		ACD, ITWS
N90-7-3-	24	1702	All RBV departures are stopped.				ACD, ITWS
N90-7-3-	25	1708	LGA is still stopped; EWR is opening to the west. RAPT shows J95, J60, and J64 yellow; J6, J48, and J75 yellow to red for 1735 departures.		RP		ACD, ITWS
N90-7-3-	26	1730	There is a line of level 5 weather extends along the east coast of NJ. EWR is departing west only. LGA is shut down due to weather and JFK is still running.		TMD		
N90-7-3-	27	1749	Pilots departing EWR over WHITE are deviating. LGA reports a storm over the airport. RAPT shows RBV red through 1805 departures then green, WAVEY red, all other routes green.		PB, RP, EO, TMD		
N90-7-3-	28	1756	Weather in the NY metro area is affecting arrivals and departures for JFK. N90 is holding indefinitely. RAPT shows JFK: RBV and WAVEY red to yellow for 1815 departures; J75, J48, J80, and J60 yellow.		RP		ACD, ITWS
N90-7-3-	29	1802	The TMC calls ZDC concerning LGA departures over RBV in anticipation of weather clearing. The STMC consults the TSD and guesses about 20 minutes until the weather clears. RAPT shows RBV yellow to green by 1805 departures.	*(EP, SA-2, I/IC)	TMD, RP		
N90-7-3-	30	1807	N90 is providing 15 MIT from LGA. WHITE is open now.		TMD		ACD, ITWS
N90-7-3-	31	1810	WHITE is opened. Ground stop for LGA is cancelled.				
N90-7-3-	32	1812	LGA ground stop is cancelled. 36 rate for arrivals.		TMD		ACD, ITWS
N90-7-3-	33	1843	The JFK ground stop is extended to 1945. RAPT shows PARKE and RBV yellow, all other routes green.		TMD, RP		ACD, ITWS



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N90-7-3-	34	1855	ZNY cannot hold over CAMRN due to weather. N90 is clearing an area to move traffic through. RAPT shows all routes green.		TMD		ACD, ITWS
N90-7-3-	35	1900	RAPT shows all routes green.		RP		
N90-7-3-	36	1923	WHITE and WAVEY are stopped. A level 4 cell is south of NY City. RAPT shows WHITE red for 1940 departures, WAVEY yellow to green.		EO, TMD, RP		
N90-7-3-	37	1933	ZNY restricts BIGGY 15 MIT.		TMD		
N90-7-3-	38	1933	RAPT shows J174 yellow to red, J79 yellow to red and J209 yellow to red.				
N90-7-3-	39	1936	WHITE and WAVEY are stopped. Holding at CAMRN. The EWR ground stop is cancelled.				ACD, ITWS
N90-7-3-	40	1945	PHL is ground stopped due to weather. RAPT shows WHITE yellow to red for 1950 departures, WAVEY yellow to green to yellow. All else green.		EO, RP		
N90-7-3-	41	2039	WHITE is opened. RAPT shows WAVEY yellow to green for 2045 departures.		EO, TMD, RP		
N90-7-3-	42	2039	APREQ all WHITE departures void 2330. RAPT shows all routes green.	*(RO, I/IC)	TMD, RP		ACD, ITWS
N90-7-3-	43	2057	WAVEY is 30 MIT.		TMD		ACD, ITWS
N90-7-3-	44	2100	WAVEY is open with 30 MIT. RAPT shows all routes green.	*(RO, I/IC)	TMD, RP		
N90-7-3-	45	2125	All level 3 weather has moved east and all routes are clear.		RP		
N90-7-3-	46	2125	WAVEY is 20 MIT. All routes green.		TMD		ACD, ITWS
N90-7-3-	47	2245	The EWR Tower called to ask about a line of weather to the northwest from the south border of NY to Canada. The Tower states that the weather looks fairly intense on the TSD but mild on ITWS. EWR wants to know what RAPT and CIWS are showing.	SA-1, I/IC	TMD		

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ZNY-7-3-	1	1055	A north-south line of heavy rain and convection extends from south NY to central PA. More convection is on J80 in ZOB/ZID. There are no significant restrictions except 30 MIT on J6 not due to weather. There are no deviations in ZNY at this time. RAPT shows J36 green to yellow, J60 and J64 yellow, and J6 yellow ENR.		TMD, RP		
	2	1108	There is weather in southwest ZNY and northwest ZDC. Tops are below 32 kft. There are currently no closures. RAPT shows J60, J64, J80 yellow and EWR: J6 yellow ENR.		RP		
ZNY-7-3-	3	1115	During the SPT, ATCSCC cites the lack of lightning as the reason pilots are not deviating. The observer suggests adding lightning to the RAPT weather blockage calculations. The STMC asks for a RAPT refresher.		PB	Yes	
ZNY-7-3-	4	1120	Embedded heavy rain is located in southeast ZNY. The Area Supervisor calls The STMC to discuss the weather. The STMC consults CIWS, after looking at the DSR, for clearer information on potential impacts.		TMD		CIWS VIL, Echo Tops
ZNY-7-3-	5	1121	The STMC is using CIWS to review the weather in northern ZNY and along the ZBW border as he participates on the SPT. While there is considerable weather, the tops are low. RAPT shows J36 yellow and green sporadically along J60, J64, and J80.		RP		CIWS VIL, Satellite, Lightning
ZNY-7-3-	6	1124	Heavy rain is moving northeast towards J36. RAPT shows J36 yellow and J95 clear to green to yellow.		RP		
ZNY-7-3-	7	1135	On the TSD, the weather in central PA appears to be a solid line of level 4/5 convection. It looks much more threatening on the TSD. RAPT shows J36 yellow; J60, J64, and J80 green.		TMD, RP		
ZNY-7-3-	8	1143	The Departure TMC is using CIWS to describe potential weather impacts during a hand-off briefing.		TMD		CIWS VIL, Echo Tops, Forecast
	9	1143	The Departure Desk TMC uses CIWS for situational awareness with Area D.				CIWS

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ZNY-7-3-	10	1145	Level 3 - 5 weather is moving onto J36 towards J95. RAPT shows J36 yellow and J95 green to yellow.		RP		
ZNY-7-3-	11	1155	Level 3 - 5 weather is moving onto J36 towards J95. RAPT shows J36 yellow and J95 yellow. The OMIC notes the route status on RAPT.	SA-2	RP		
ZNY-7-3-	12	1200	Weather is approaching J95. RAPT shows J95 yellow to red to yellow. The red on the RAPT timeline attracts the attention of the STMC, who consults the DSR to look for deviations.	SA-2, EP	TMD, RP		DSR
ZNY-7-3-	13	1202	The Area Supervisor tells the STMC that COATE traffic must stay on the route to get through the weather or they will have to go two-as-one out the north gates. The Area Supervisor is concerned with the current COATE impact. RAPT projects the COATE cell will move onto J95, hence J95 is red and not J36.	*(SA-2, I/IC, EP)	TMD, EO, RP		
ZNY-7-3-	14	1204	A level 5/6 cell is located just inside COATE on J36. All routes remain open. The STMC sees deviations around this cell on the DSR. He uses CIWS for a more detailed inspection of the weather characteristics.		PB, EO, TMD		CIWS VIL, Echo Tops
ZNY-7-3-	15	1208	Pilots report "top level" moderate turbulence near BGM and do not want to encounter any more.		TMD, PB		
ZNY-7-3-	16	1210	SPUDS and BUNTZ arrivals for PHL are being held. PHL is experiencing low ceiling problems.		TMD		
ZNY-7-3-	17	1213	Weather with higher tops is moving to the northeast near the northwest corner of N90. RAPT shows GREKI CAM, J95, and J36 yellow.		RP		
ZNY-7-3-	18	1215	Weather is over the north gates. RAPT shows J95 red to yellow, J36 yellow, and GREKI yellow. The red J95 status coincides with the PIREP of turbulence.		RP, PB		
ZNY-7-3-	19	1220	Heavy rain in moving northeast onto the west gates (J64). RAPT shows J64 green to yellow.		RP		

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ZNY-7-3-	20	1221	The weather is mostly in Areas C and D with tops below 32 kft. Some aircraft are deviating but the Areas are handling it. RAPT shows J95 red until 1230 departures then yellow. GREKI CAM yellow. The STMC noticed the red but took no action.		RP, TMD		
ZNY-7-3-	21	1224	LGA is in a GDP for low ceilings		TMD		
ZNY-7-3-	22	1229	Weather on J95 is starting to become electrically active. Tops reach 35 kft. RAPT shows J95, J36, and CAM yellow. The STMC occasionally looks at RAPT and CIWS for situational awareness.	SA-1, SA-2	EO, RP		CIWS
ZNY-7-3-	23	1230	The Area Supervisor reports that they can no longer tolerate the GAYEL deviations. GAYEL/J95 is closed and J36/J95 is combined as one. J36 already has a restriction from earlier. The STMC could not point out the deviations to the observer, but based on the CIWS/RAPT depiction and earlier issues (moderate turbulence and slight deviations), the route was closed. With J36/J95 two-as-one, another staff member is added to the "pit." RAPT shows J36/J95 yellow. The STMC uses CIWS/RAPT as corroborating evidence in support of the route closure.	SA-3, I/IC	PB, TMD, EO, RP		CIWS VIL, Echo Tops, Lightning
ZNY-7-3-	24	1230	PHL exits the ground stop and goes into a GDP for low ceilings.		TMD		
ZNY-7-3-	25	1232	GAYEL departures on J95 are deviating. This traffic is moved to J36. There is weather with tops to 35 kft and lightning on J95. Deviations appear small, the Area Supervisor is concerned. The STMC moves the traffic but questions whether it is really necessary. There were reports of moderate turbulence in the area about 30 minutes ago. RAPT shows J95, J36, and CAM yellow.		TMD, RP		
ZNY-7-3-	26	1236	Weather is moving near J80 and J152 in western ZNY. Tops are reaching 38 kft and there is sparse lightning. RAPT shows J80 yellow, J60 yellow to green and J64 green.		RP		
ZNY-7-3-	27	1241	Weather from the southwest corner of ZNY is moving to J80/J152/J64. Tops reach 36 kft. The weather in northern ZDC is growing. RAPT shows GREKI CAM, J95, J36, J60, and J80 yellow. J64 is yellow to green.		RP		

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ZNY-7-3-	28	1256	LGA arrivals are holding at LIZZI. The STMC calls to ask why and for how long. N90 shut off ZNY due to volume, but this should clear up soon.		TMD		
ZNY-7-3-	29	1308	Weather approaching J80 has tops to 36 kft. Traffic can deviate to the east, but it is in an area where J80 and J6 are close together. Also, weather is moving near the north/south portion of J60. RAPT shows J80 and J64 yellow, J60 yellow to red for 1330 departures.		RP		
ZNY-7-3-	30	1311	Sector 56 is shutting off ZDC arrivals. The STMC follows up with the Area Supervisor to find out the status of the situation. BOS traffic will be stopped as a compromise.		TMD		
ZNY-7-3-	31	1312	The observer visited Area A to assess the weather impact. There are very small deviations due to weather. The biggest problems are associated with light to moderate turbulence and chop. The Area Supervisor notes that tops are still low. CIWS is being used to monitor weather tops and movement.		TMD		CIWS VIL, Echo Tops, Forecast
ZNY-7-3-	32	1313	Weather moving towards J60/J80 region is affecting PHL arrivals. They are still running because tops are low. The Area A Supervisor determined this from CIWS. Turbulence in Area A is a concern. RAPT shows same as 1308 entry.		TMD		CIWS
ZNY-7-3-	33	1320	On the SPT, ZBW reports that GREKI/MERIT is unavailable due to weather near GREKI and weather near HNK, which may affect NY arrivals.		TMD, EO		
ZNY-7-3-	34	1320	Weather is moving northeast, closer to the N90 border. J60, J64, and J80 are open, RBV and ELIOT are restricted due to volume and this may be helping with the weather. RAPT shows J60, J64, and J80 yellow to red.		TMD, RP		
ZNY-7-3-	35	1323	SWAP begins at 1340 because weather on the north gates is causing problems for ZBW and ZNY. In addition, there are concerns about the weather moving along J60/J64/J80.		TMD		
ZNY-7-3-	36	1330	The SWAP will start at 1340. The closure of the east gates (MERIT) precipitated the SWAP.		TMD		

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ZNY-7-3-	37	1330	The cluster of weather in central ZNY continues to move northeast towards N90. RAPT shows J60 and J64 red, J80 yellow to red, J6 green to yellow, and J80 red.		RP		
ZNY-7-3-	38	1336	J80 is closed by Area B due to deviations. RAPT is displayed in Area B at the request of the Supervisor. The observer provides on-the-spot RAPT training.		TMD. PB		CIWS Forecast
ZNY-7-3-	39	1336	J80 is closed due to deviations at the request of Area B. Flights are swapped over to J60/J64. CIWS was used to determine that conditions would not improve. The Area Supervisor is not convinced that the closure is needed. He is seeing very little deviation. The Area Supervisor asked about RAPT so the observer opened the RAPT window and gave a quick briefing. The Area Supervisor agreed to leave the window open.		TMD	Yes	CIWS
ZNY-7-3-	40	1350	Referencing the closure of J80 by Area B, the STMC noted that the route was shut off "close in" and traffic was swapped to J60/J64. This reroute still brings traffic down the same route in Area B, where the request for the closure originated. The STMC says this closure does not make sense because traffic on J80 (close in before turning west) are staying on the route now that the small cluster that initiated the problem has moved off. The Area B Supervisor used CIWS to see that more of the same is expected to approach the route. This illustrates the internal ZNY struggle to keep pressure on the route vs. proactively avoiding chaos and potentially escalating impacts. This may make sense because a full flow could start significant deviations and perhaps shut down ALL of the ELIOT departures instead of just J80.	*(RO, I/IC, SA-3)	TMD, TMD-LOU		CIWS Forecast
ZNY-7-3-	41	1356	The CWSU reports that level 5 cells east of PARKE will be on PARKE/ELIOT in 30 minutes. CIWS forecasts 15 minutes. J80 is closed and swapped to J60/J64. RAPT shows J60, J64, and J80 red, J6 yellow.		TMD, RP		

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ZNY-7-3-	42	1356	Weather to north between J36 and J95. Some lightning north of J95, which is still closed. RAPT shows CAM/GREKI tops 30 ENR, GAYEL J95 tops 290.				
ZNY-7-3-	43	1402	J80 is reopened by Area B. The STMC believes the AREA Supervisor was being too conservative and the closure was not really needed in the first place. RAPT shows J80 red.		RP, EO , TMD		
ZNY-7-3-	44	1405	An embedded level 6 cell is moving northeast between ELIOT and LANNA. J80 is reopened by Area B. N90 implements ELIOT/PARKE 15 MIT as one. RAPT shows J60, J64, and J80 red. The STMC says that RAPT is wrong because it shows the routes closed. The observer reminds the STMC that RAPT is showing a forecast, not a current state of the route. Even so, the forecast only takes a short time to get to the impact region. The STMC says that RAPT is too aggressive in estimating blockage in these scenarios, given that aircraft can deviate. This is a borderline storm but if this cell, in the same location, was very electrically active with 45 kft tops, ELIOT would likely be closed.		TMD, RP, EO		CIWS VIL, Echo Tops, Storm Motion
ZNY-7-3-	45	1408	Weather with tops to 35 kft is approaching ELIOT and PARKE. RAPT shows ELIOT red and PARKE J6 yellow.		RP		
ZNY-7-3-	46	1410	The STMC notes that weather is moving fast (via CIWS) and comments that it must be true because he can see the weather updating on the scope.		TMD		
ZNY-7-3-	47	1426	J95 is still closed. J36 is 10 MIT as one. The Area Supervisor will not open J95. RAPT shows GREKI CAM red.	*(RO, I/IC)	TMD, RP		
ZNY-7-3-	48	1430	N90 is ground stopped until 1530, excluding JFK, for ZBW, ZOB, and CZY due to en route weather. This ground stop was subsequently extended to 1600 and then 1700.		TMD		
ZNY-7-3-	49	1432	The STMC looks at RAPT for situational awareness. He wants to open J95 with 15 MIT but the Area Supervisor will not agree. RAPT shows J95 green to yellow for 1450 departures.	SA-1	TMD, RP		
ZNY-7-3-	50	1500	BOS is ground stopped for N90 due to thunderstorms.		TMD		

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ZNY-7-3-	51	1500	Large swath of heavy rain, with embedded stronger clusters in ZNY. Tops generally lower, maxing in the mid 30s. RAPT shows generally yellow.				
ZNY-7-3-	52	1504	Area D opens J95. RAPT shows GAYEL J95 yellow.		TMD, RP		
ZNY-7-3-	53	1515	A large region of level 4/5 is in upstate NY (in ZBW). Heavy rain is more broken back into ZNY and more convective-looking precipitation is along J80 in southern ZOB. GREKI is closed. ELIOT/PARKE are 15 as one. RAPT shows GREKI red; J95, J36, and J60 yellow; J64 and J80 green; J6 yellow to green to yellow; J48 green to yellow, and JFK: RBV J80 green to yellow ENR to green. The last guidance matches ELIOT/TMI and not J80 TMI since RBV/J80 is fine.		RP		
ZNY-7-3-	54	1520	Embedded level 3-5 cells in eastern ZNY moving quickly towards N90 boundary. RAPT shows all routes going yellow by 1540 departure time, coinciding with forecast of cells reaching departure fixes.				
ZNY-7-3-	55	1525	PHL arrivals are holding at BUNTZ in moderate chop. The Area A Supervisor asks the STMC to call PHL and ask that they give preference to these aircraft to get them out of the turbulence.		TMD		
ZNY-7-3-	56	1530	ZBW reports airspace closures that neither ZNY nor ATCSCC understand, given the lack of lightning and that flights are getting through. ZBW says they are dealing with moderate chop. RAPT shows GREKI yellow.		TMD-LOU, RP		
ZNY-7-3-	57	1535	Area A reports no problems on J48, except report of chop. PHL departures are reporting heavy rain only. The biggest issues in Area A are turbulence associated with the cold front and jet stream. RAPT shows GREKI CAM yellow and J95 yellow until 1550 departures then green. ELIOT J64 has some yellow. LANNA J48 and BIGGY J75 are yellow.		RP, PB, TMD		TSD
ZNY-7-3-	58	1558	JFK departures over RBV and then west are deviating near Pottstown. Pilots are reporting tops of 25 kft, which agrees with CIWS. RAPT shows JFK: RBV yellow.		RP, PB, TMD		



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ZNY-7-3-	59	1615	A line of weather, containing level 5 and some level 6, extends from LANNA to PHL and is moving northeast at 40 kts. RAPT shows BIGGY J75 yellow to red to yellow to red and J48 yellow to red for 1630 departures.		RP		
ZNY-7-3-	60	1615	The weather near Pottstown is filling and tops are increasing. RAPT LANNA J48 red for 1630 departures and BIGGY J75 red for 1615 departures.		RP		
ZNY-7-3-	61	1620	ZNY is holding EWR and LGA arrivals. N90 brought up on hotline, which has been active since 1530.		TMD		
ZNY-7-3-	62	1629	The line from BIGGY to PHL is intensifying. RAPT shows LANNA/BIGGY yellow and RBV J75 green to yellow to red.		RP		
ZNY-7-3-	63	1630	EWR west departures are stopped. N90 requests that some ATL flights be rerouted south via WHITE. The STMC agrees. RAPT shows J60, J64, J80, J6, J48, and J75 yellow (next update showed red for 1655 departures on all these routes); WHITE is clear to green.	SA-1, I/IC, RRP, EP	TMD, RP		
ZNY-7-3-	64	1635	The STMC is concerned that the current EWR west-stop will become and EWR all-stop. Lightning is increasing in the growing line from EWR to PHL. Tops have increased dramatically. EWR is ground stopped beginning 1630 for the second tier and ZMP due to low C&V. The STMC uses CIWS to focus on J80. He notes the level 5, high-topped weather moving at 40 knots and estimates the impact at the field in 5 to 10 minutes. This increases his concern for EWR arrivals that are holding. He wants to get them in before weather shuts the airport.		TMD, EO		CIWS VIL, Echo Tops, Storm Motion
ZNY-7-3-	65	1640	Area B reports that RBV departures are deviating north and west. ZDC inbound traffic to LGA on DITCH J225 is deviating. RAPT shows RBV red until 1700 departures then yellow.	*(SA-2, EP, I/IC)	TMD, PB, RP		DSR, TSD

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ZNY-7-3-	66	1645	The line of weather from TEB/EWR to PHL is still growing. West gates are closed by N90. LGA is ground stopped. North gates are closed for EWR, LGA, and TEB, but are still open for JFK. RAPT shows J60, J64, J80, J6, J48, and J79 red to yellow; WHITE clear to green to yellow to red; RBV J60 and RBV J64 red to yellow; and RBV J80 yellow.		TMD, RP		
ZNY-7-3-	67	1658	North gates are closed (frequency problems in Area C and ZBW). LGA and EWR departures are stopped. JFK departures will probably stop in 20 to 25 minutes.		TMD		
ZNY-7-3-	68	1700	A line of weather is over EWR. RAPT shows EWR yellow to green by 1710 departures, LGA clear to cautious to closed by 1705 departures. The observer used the current weather as a training opportunity to show how RAPT can provide a heads-up on improving/worsening trends.	*(AHD, I/IC, SA-2, EP)	TMD, RP	Yes	
ZNY-7-3-	69	1705	A level 6 cell is over EWR and will soon impact LGA. RAPT shows EWR routes largely clearing for 1710 departures. (EWR cleared by 1713.) The STMC viewed RAPT to identify when EWR would clear.	SA-2, I/IC	RP, TMD		CIWS VIL, Storm Motion
ZNY-7-3-	70	1708	Weather is moving over EWR and onto LGA.		TMD		
ZNY-7-3-	71	1710	A line of weather is approaching WHITE from RBV. WHITE is still open. RAPT shows WHITE red to yellow.		TMD, RP		
ZNY-7-3-	72	1715	The squall line is over LGA. RAPT shows routes to the west clearing for 1740 departures. The observer brought this to the attention of the STMC as another training opportunity.	*(RO, I/IC, SA-2)	TMD, RP	Yes	CIWS VIL, Storm Motion

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ZNY-7-3-	73	1720	RAPT shows that LGA red ends for 1735 departures, JFK red, and EWR much improved. The STMC steps through the routes for each airport individually to determine when clearing for each airport occurs. The STMC then relayed RAPT information on specific timing of LGA clearing to Area D, so they will know when to start expecting traffic. The STMC asks the hotline STMC if he wants to push N90 to restart LGA arrivals, based on RAPT guidance that LGA clears in about 10 minutes. The hotline STMC calls N90 to get arrivals that are currently being held, moving inbound to avoid diversions.	SA-1, SA-2, I/IC, EP, AHD	TMD, RP, EO		
ZNY-7-3-	74	1729	RAPT and CIWS are being used to start landing LGA at about 1740 instead of previous plan of after 1800.				
ZNY-7-3-	75	1744	Traffic for JFK is being held due to weather.		TMD		
ZNY-7-3-	76	1745	ZNY is holding ZBW traffic for JFK. Based on the CIWS forecast, ZNY is telling ZBW to bring JFK arrivals over Kingston.		TMD		CIWS Forecast
ZNY-7-3-	77	1752	The first LGA flight leaves holding and enters N90 airspace. (Reference the 1720 observation.)		TMD		
ZNY-7-3-	78	1755	A strong line of weather is located in N90. RAPT shows JFK clearing west for 1805 departures. (Level 3 cleared the route at 1803.) The STMC is monitoring CIWS.	*(SA-2, I/IC, EP)	EO, TMD, RP		CIWS VIL, Echo Tops
ZNY-7-3-	79	1757	Weather is moving off JFK, but is a little heavier to the south. RAPT shows JFK: RBV west and south red until 1800 departures then yellow to green, WAVEY red until 1810 departures then yellow.		RP		
ZNY-7-3-	80	1800	N90 is allowing one departure from LGA over WHITE. WHITE is not closed, but N90 is hesitant due to the weather at JFK. RAPT shows LGA WHITE green.	*(RO, I/IC, EP)	TMD, RP		
ZNY-7-3-	81	1806	The WHITE pathfinder departs.		TMD		
ZNY-7-3-	82	1809	The WHITE pathfinder is successful.		TMD		
ZNY-7-3-	83	1812	First LGA lander approximately 2 minutes from touchdown.				

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ZNY-7-3-	84	1815	JFK calls N90 with regard to RBV status (closed). N90 agrees to open the fix and calls the ZNY STMC to coordinate. The ZNY STMC approves the request with 15 MIT. Four departures off JFK are allowed. RAPT shows RBV J60, J64, J48, and J75; RBV J64 green, and RBV J80 yellow to green.	RO, I/IC, SA-1, EP	TMD, RP		
ZNY-7-3-	85	1816	J36 is closed AOA FL310 because of interference with aircraft holding in ZOB for NY metros.		TMD		
ZNY-7-3-	86	1820	The Area E Supervisor stops WAVEY/SHIPP departures because they are deviating. There is level 4/5 weather north of WAVEY/SHIPP. RAPT shows WAVEY yellow to green.		TMD, RP, EO, PB		
ZNY-7-3-	87	1823	All north and west gates are open. SHIPP and WAVEY are stopped. RAPT shows all north and west routes green to yellow, WAVEY yellow until 1830 departures.		TMD, RP		
ZNY-7-3-	88	1825	The line of weather in N90 is decaying as it exits N90 into ZBW. The southern end of the line (from DIXIE south to the south NJ shore) is building; increasing to level 6. RAPT shows EWR: WHITE clear, JFK: WAVEY green to clear. The STMC consults CIWS, wondering why JFK is still not accepting arrivals.		TMD, RP		
ZNY-7-3-	89	1830	LGA and EWR are running traffic.				
ZNY-7-3-	90	1915	A line of level 6 weather lies along the east NJ coast, between WHITE and WAVEY. More severe cells are further south in eastern MD. WHITE and WAVEY are stopped by ZDC. The ZDC STMC states that the stop will last 30 to 60 minutes. RAPT shows WHITE green to yellow to red; WAVEY green to yellow. The STMC is monitoring CIWS during the SPT to help with orientation during the discussion.		EO, TMD, RP		CIWS
ZNY-7-3-	91	1936	A line of weather is starting to build west-northwest of ZNY into ZBW, with some scattered cells in southeast ZOB. RAPT shows WHITE red and WAVEY yellow until 1955 departures. WHITE, WAVEY, and Woodstown are closed.		EO, RP		

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ZNY-7-3-	92	1945	A broken line of new convection is forming along the cold front in western ZBW/eastern ZOB. RAPT shows routes associated with this weather clear. Elsewhere, a cluster in ZDC contains level 5/6. RAPT shows WHITE J79 red, WHITE J209 yellow to red, and WAVEY yellow to red.		RP		
ZNY-7-3-	93	2005	The convective cluster in south Chesapeake contains lightning and tops to 43 kft. RAPT shows WHITE J79 red to yellow to green, WHITE J209 red to yellow to green.		EO, RP		
ZNY-7-3-	94	2030	ZDC reopens WHITE with 30 MIT, no exclusions. There is level 5 weather on WHITE, but CIWS and RAPT show it clearing in 15 to 20 minutes. RAPT shows WHITE clear.	*(RO, I/IC, SA-2)	TMD, RP		
ZNY-7-3-	95	2031	ZDC restricts WHITE 30 MIT with no exclusions. Weather is clearing off WHITE. RAPT showed WHITE clearing by 2020 departures, so RAPT guidance is good.				
ZNY-7-3-	96	2120	Eastern Region radars are dropping out of the CIWS mosaics. The STMC expresses concern about the loss of data. The observer called Lincoln Laboratory for status.		EO, RP		CIWS
ZNY-7-3-	98	Note	The observer suggests adding prescribed holding region overlays to CIWS.		TMD		

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ZDC-7-3-	1	1102		TMD		
		<p>Mostly level 1/2 precipitation is in ZNY and northern ZDC airspace with level 3/4 cells west of NY metro airports. A line of level 4/5 weather is in western ZNY and southeast ZOB over NY western departure routes, moving NE. Current restrictions are:</p> <p>LGA RBV 15 MIT 1030 – 1600 N90:ZDC  LGA 30 MIT PER ROUTE 1100 – 1345 ZDC:ZTL  Overflow:  PHL VCN 15 MIT JETS 1200 – 1300 PHL:ZDC  PHL TERRI 15 MIT JETS 1200 – 1300 PHL:ZDC  PHL VCN 25 MIT JETS 1145 – 1300 ZDC:ZNY  No GDPs  J6 10 MIT PER STRAT 1100 – 1300 ZDC:ZNY  IAD/DCA/BWI LDN/AML 15 MIT PER FIX PER ARPT:APREQS 1100- 1300 ZDC:PCT  IAD/DCA/BWI J518 15 MIT PER ARPT:APREQS 1100 – 1300 ZDC:PCT  IAD/DCA/BWI J211 15 MIT PER ARPT:APREQS 1100 – 1300 ZDC:PCT</p>				
ZDC-7-3-	2	1140		TMD		
		ZID is requesting 15 MIT per strat on J6 from ZDC due to weather. ZDC passes the restriction back to ZNY. RAPT shows all routes green except J36 yellow.				
ZDC-7-3-	3	1210		TMD		
		Area 7 is to hold for LGA for 10 minutes. RAPT shows J6 green.				
ZDC-7-3-	4	1223		RP		
		Weather along J6 is moving northeast toward J80. RAPT shows J80 yellow ENR.				
ZDC-7-3-	5	1322		TMD		
		ZNY requests ZDC to shut off traffic through ZNY Sector 56 because of weather in ZBW. Area 8: NY is stopping NY metros for weather, excluding anything going over JFK, and needs WAVEY now. All SWANNs were stopped about 15 minutes ago for ZBW are swapping to east and going to PALEO or J220. Still holding for LGA.				

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ZDC-7-3-	6	1338	Current restrictions are:  J6 15 MIT PER STRAT 1100 – 1400 ZDC:ZNY J6 15 MIT PER STRAT 1200 – 1400 ZID:ZDC J42/J79 20 MIT ALL PER (PER ROUTE) 1315 – 1500 ZNY:ZDC LGA 1224 – 0259 Weather/Low Ceilings PHL1224 – 1659 Weather/Low Ceilings WAVEY 20 MIT EXL:NONE 1345 – 1530 ZDC:ZNY SWANN CLOSED J42/J79 to ZNY STOPPED – ZBW...  RAPT shows J60 and J64 red; JFK RBV J80 green, all other J80 routes red; and J6 some yellow.		TMD, RP		
ZDC-7-3-	7	1358	ZBW still cannot use normal routes, so reroutes are expected for another 2 hours. RAPT shows WAVEY green.		TMD		
ZDC-7-3-	8	1526	ZDC is holding for TEB due to weather. ZDC is having problems getting to LGA and is still holding for that airport.		TMD		
ZDC-7-3-	9	1600	Level 4/5 cells in eastern PA and western NJ with tops to 41 kft are moving rapidly ENE towards the NY metro airports. Level 4/5 cells with tops to 30 kft in western PA just north of J80 are moving east.				
ZDC-7-3-	10	1616	N90 informs ZDC to expect to hold EWR arrivals for 15 to 20 minutes due to weather between the airport and arrival fix.		TMD		
ZDC-7-3-	11	1628	A large level 6 cell is located north of ARD.				
ZDC-7-3-	12	1629	ZDC informs ZNY that they are ready to come out of holds when ZNY is ready, but weather is over ARD.		TMD, EO		
ZDC-7-3-	13	1635	N90 tells ZNY to try EWR departures over WHITE to ZJX and ZTL. RAPT shows TEB: WHITE yellow.		TMD, RP		
ZDC-7-3-	14	1638	Level 4/5 cells in eastern PA and western NJ over PHL and ARD are moving rapidly ENE towards EWR and TEB, and RBV. ZNY and N90 are coordinating to determine if traffic can reach EWR from the west.		TMD		

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ZDC-7-3-	15	1642	ZDC, ATCSCC, and ZNY confer. WHITE departures will conflict with RBV arrivals so they will try some ARD traffic. However, RBV will be lost soon due to weather. RAPT shows TEB WHITE with some red.		TMD		
ZDC-7-3-	16	1730	A large Level 6 cell is located southwest of JFK and moving rapidly northeast at 45 kn, affecting JFK/WAVEY. RAPT shows JFK: WAVEY green to yellow then to red for 1740 departures.		RP		
ZDC-7-3-	17	1747	Two level 5 cells are located south of RBV. One large level 5 cell is located northeast of RBV. RAPT shows JFK: RBV J60, J64, and J80 red until 1805 departures and yellow for 1810 departures.		RP		
ZDC-7-3-	18	1802	LGA can start departing RBV with 20 MIT. RAPT shows JFK: RBV red.		RP, TMD		
ZDC-7-3-	19	1805	A pathfinder from LGA for WHITE is released. RAPT shows WHITE green.		TMD, RP		
ZDC-7-3-	20	1808	LGA can reduce the restriction on RBV to 15 MIT.		TMD		
ZDC-7-3-	21	1810	The WHITE pathfinder departs.		TMD		
ZDC-7-3-	22	1816	N90 tells JFK to try some RBV departures. RAPT shows RBV green to yellow, WHITE green, WAVEY red to yellow for 1815 departures to green for 1835 departures.		RP		
ZDC-7-3-	23	1822	JFK is to stop SHIPP and WAVEY departures.				
ZDC-7-3-	24	1836	Status EWR, JFK, and SWANN except LGA: Stopped IAD SWANN/PALEO 15 MIT PER FIX EXCL:ZNY LANDERS/NORMAL 1700 – 2000 DCA SWANN/PALEO 25 MIT PER FIX EXCL:ZNY LANDERS/NORMAL 1700 – 2000 BWI SWANN/PALEO 25 MIT PER FIX EXCL:ZNY LANDERS/NORMAL 1700 - 2000				



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ZDC-7-3-	25	1856	The Area 7 Supervisor discusses with the STMC his concerns about the level 5 weather along the NJ coast. Traffic is deviating east into the warning area, but notes that demand is low there. JFK cannot hold CAMRN any longer. The decision to proceed is based on CIWS.		TMD		CIWS Echo Tops
ZDC-7-3-	26	1901	ZBW is back to normal routes. RAPT shows J75 with some yellow, all other routes are green.		RP		
ZDC-7-3-	27	1907	ZDC informs ZNY that they will probably lose WHITE and OOD, then WAVEY.		TMD		
ZDC-7-3-	28	1912	The CWSU briefs the STMC using CIWS.		TMD		CIWS VIL, Storm Motion, Echo Tops
ZDC-7-3-	29	1921	WHITE, WAVEY, OOD, BOS, and PHL are stopped for 30 to 60 minutes. DC metro are OK for traffic south of SBY. RAPT shows WHITE J79 green to yellow for 1920 departures to red for 1935 departures, WHITE J209 green to yellow to red, WAVEY yellow to green.		TMD, RP		
ZDC-7-3-	30	1934	Level 6 cell over SBY, tops 44k ft moving rapidly ENE. RAPT shows J79 yellow to red, J209 Yellow to red and WAVEY yellow to red.				
ZDC-7-3-	31	2016	Area 5 is not taking anything northbound due to weather near SBY.		TMD		
ZDC-7-3-	32	2026	TEB, LGA, and EWR are releasing flights westbound. RAPT shows WHITE mostly green, WAVEY red to yellow for 2030 departures to green for 2045 departures.		TMD, RP		
ZDC-7-3-	33	2030	Area 8 opens WHITE with 30 MIT, no exclusions. Area 1 wants to restrict J75 for volume, but the STMC disagrees because ZNY will go into a GDP and pass that onto ZBW. RAPT shows WHITE green	*(RO, SA-2)	TMD, RP		
ZDC-7-3-	34	2100	The ZDC STMC tells ZNY to release WAVEY.		TMD		
ZDC-7-3-	35	2113	The STMC asks the TMC to find three pathfinders for OOD departures for PHL and to open WAVEY without restrictions.		TMD		
ZDC-7-3-	36	2117	The first WHITE departure takes off.		TMD		

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ZDC-7-3-	37	2140	Area 8: Cancel WHITE restrictions.				
SCC-7-3-	1	1100	Storms are building through the TN valley and extending northeast into central PA. Some light rain is around the NY metro area. RAPT shows J36, J64, and J6 yellow. The TSD is the primary tool because of the level of familiarity, comfort, real time traffic, and nationwide coverage.		TMD, RP		TSD
SCC-7-3-	2	1105	In preparing for the first telecon, the TSD is open to monitor traffic. CIWS is used to assess weather in TN.				TSD, CIWS VIL, Storm Motion
SCC-7-3-	3	1115	SPT: CIWS, ITWS, and TSD are used for situational awareness. There is not much weather at this time. All weather tools shows rain in PA and thunderstorms in TN. Traffic is easily routed around the weather. The CIWS forecast is monitored closely but there is not much growth. AFPs will not be implemented at this time based on all weather input. The location and coverage of the weather do not require AFPs.		TMD		TSD, CIWS VIL, Forecast, Echo Tops, ITWS Precipitation , Forecast
SCC-7-3-	4	1230	PHL and LGA GDPs are implemented due to low ceilings.		TMD		TSD
SCC-7-3-	5	1245	Weather is low-topped but getting closer to the terminals, making it more difficult to fly above. The local facilities have been handling issues so far and there has been no need for NSST help. CIWS is used to monitor storm speed. Storms are moving quickly and CIWS helped determine that any potential GDP extensions or ground stops would be short-lived. The CIWS forecast was used to delay the implementation of AFPs. ITWS was used to monitor conditions at airport. RAPT shows GREKI CAM, J95, J36, J60, J64, and J80 yellow.		TMD, RP		TSD, CIWS VIL, ITWS
SCC-7-3-	6	1309	Traffic through ZOB from upstate NY cannot get to the NY metro airports. ZBW wants 20 MIT as one for NY, but ZOB cannot provide that. NY airports are ground stopped. RAPT shows J95, J36, J60, J64, and J80 yellow.		TMD, RP, TMD-LOU		TSD

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SCC-7-3-	7	1315	NY will enter SWAP at 1340 due to en route deviations. CIWS is used to determine the reason for the deviations. RAPT as previous entry.		TMD		CIWS VIL, Echo Tops
SCC-7-3-	8	1335	CAN-1E is approved for 1600 due to en route deviations. RAPT shows J95 and J36 yellow, J60 and J64 red, J80 yellow to red, and J6 green to yellow.		TMD, RP		ITWS
SCC-7-3-	9	1400	High-topped cells are moving ENE. RAPT shows J95 yellow to green; J36 green; J60, J64, and J80 red; J6 yellow; and all others green. The TSD is used for flight deviation information. CIWS is used for forecast and storm growth.		RP		TSD, CIWS VIL, Forecast, Growth and Decay Trends
SCC-7-3-	10	1412	Weather is moving northeast quickly. RAPT shows J60, J64, and J80 red; J6 yellow. CIWS and ITWS are used for situational awareness.		RP		CIWS VIL, Forecast, ITWS Precipitation, Forecast
SCC-7-3-	11	1430	Routes from northern NY are opened to NY. RAPT shows J36, J60, J64, J80, and J6 yellow. CIWS is referenced on the hotline when the northern NY routes are opened. Tops still fairly low.		RP		CIWS VIL, Storm Motion, Forecast, TSD
SCC-7-3-	12	1515	SPT: ZBW is working international arrivals that are experiencing moderate turbulence. They continue to have problems getting to NY. NSST is talking to ZBW and ZNY, referencing the TSD for international arrivals.		TMD		TSD
SCC-7-3-	13	1604	Routes are now available to all NY airports except LGA from ZBW. RAPT shows J95 yellow; J60, J64, and J80 green to yellow; J6, J48, and J75 yellow.		TMD, RP		

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SCC-7-3-	14	1637	Traffic between BOS and NY is monitored closely on the TSD for deviations around thunderstorms northeast of NY. RAPT shows J95, 36, 60, 64, 80, 6, 48, and 75 routes yellow		TMD		TSD
SCC-7-3-	15	1653	Most routes are impacted. RAPT shows J95, J6, J36 yellow; J60, J64, J80, J48, and J75 red; J79 and J209 green to yellow to red. CIWS is referenced for storm speed and length of impact. The TSD is used to monitor traffic for deviations. ITWS is used to monitor the airports.	*(SA-2, I/IC)	RP		TSD, CIWS VIL, Forecast, ITWS Precipitation
SCC-7-3-	16	1745	Weather has cleared the NY metro airports and departures should be coming out soon. RAPT shows J6 and J48 yellow.				CIWS VIL
SCC-7-3-	17	1915	SPT: Pilots are refusing routes primarily due to turbulence.		TMD, PB		
SCC-7-3-	18	1922	The EWR and JFK ground stops are cancelled. It took longer than expected to lift the ground stops due to airborne volume and international arrivals taking priority over departures.		TMD		
SCC-7-3-	19	2020	The heaviest weather is through BOS now. A new line is forming in west NY. RAPT shows J79 yellow and J203 red to yellow to green.		RP		TSD