TODSS T3 Webinar

Transit Operations Decision Support System Demonstration Overview

October 21, 2009

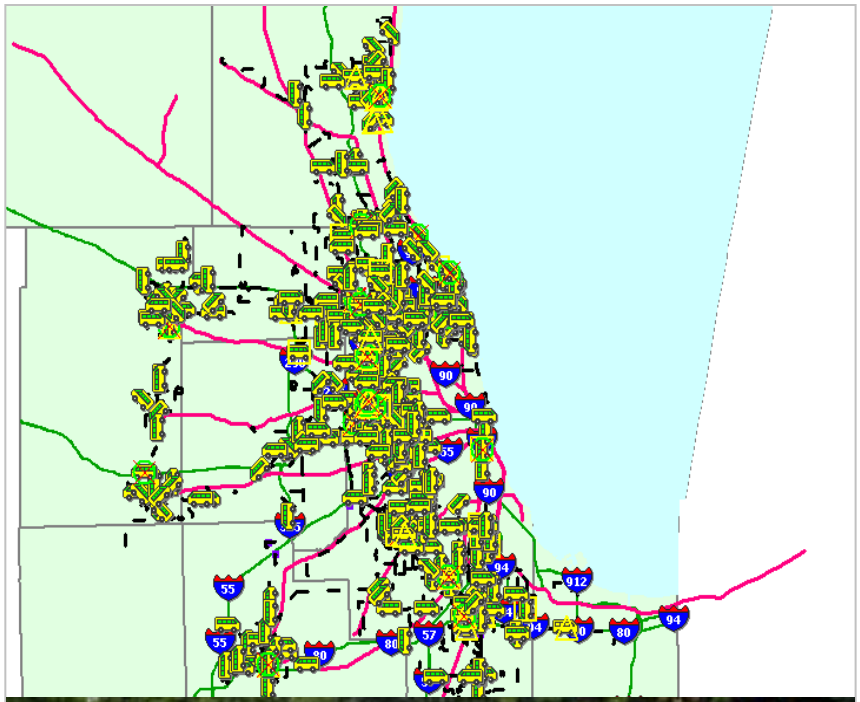
Booz | Allen | Hamilton

Agenda

- Project Background
- Live Demonstration of IBS/TODSS
- Transit Business Rules Configuration
- Results and Lessons Learned

Pace operating and service characteristics are representative of the transit industry and serves as a good demonstration site

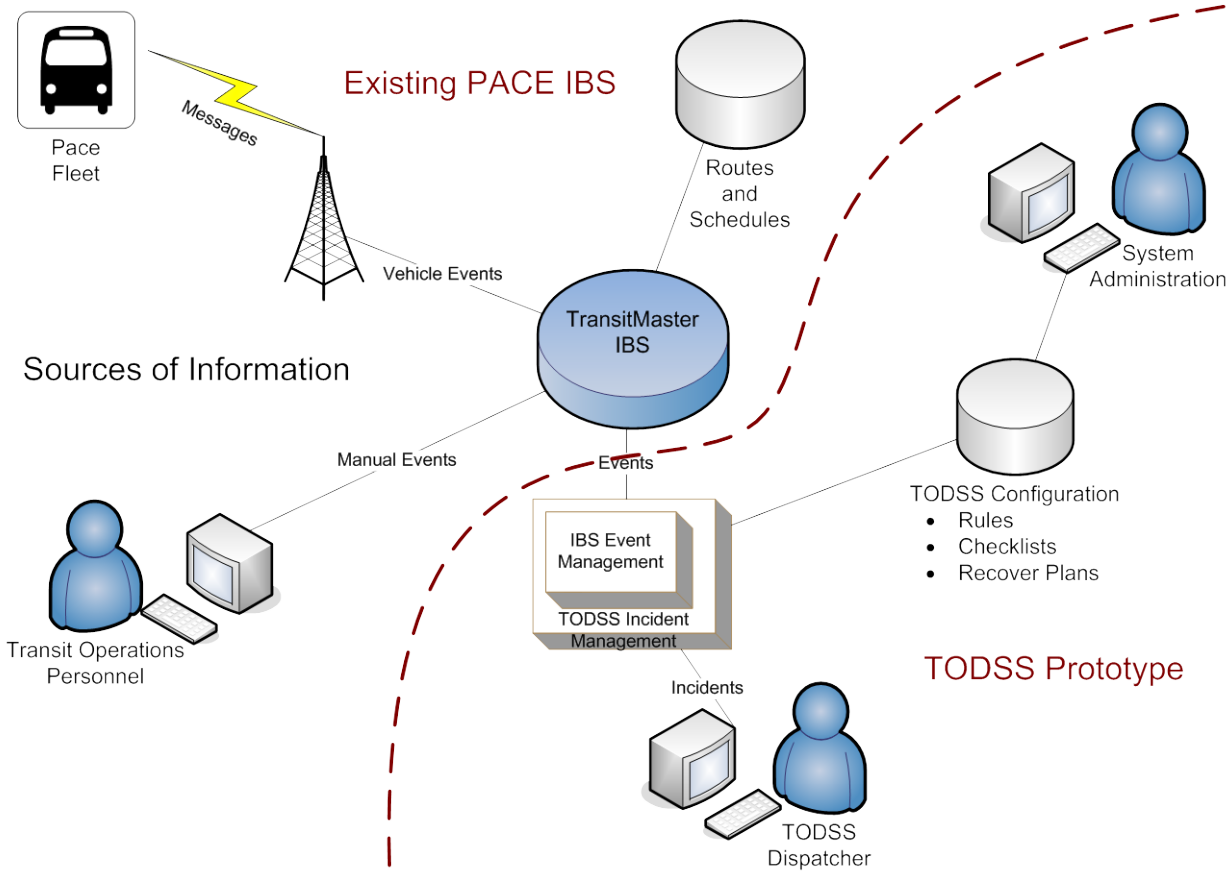
- 9 Operating Divisions
- Small and large divisions from 30 to 200+ vehicles
- Transit Bus, Van Pool, ADA Service
- Serves 6 county Chicago Metropolitan area with over 240 fixed routes
- Total ridership in 2008 over 45 million
- Service area population 5.2 million



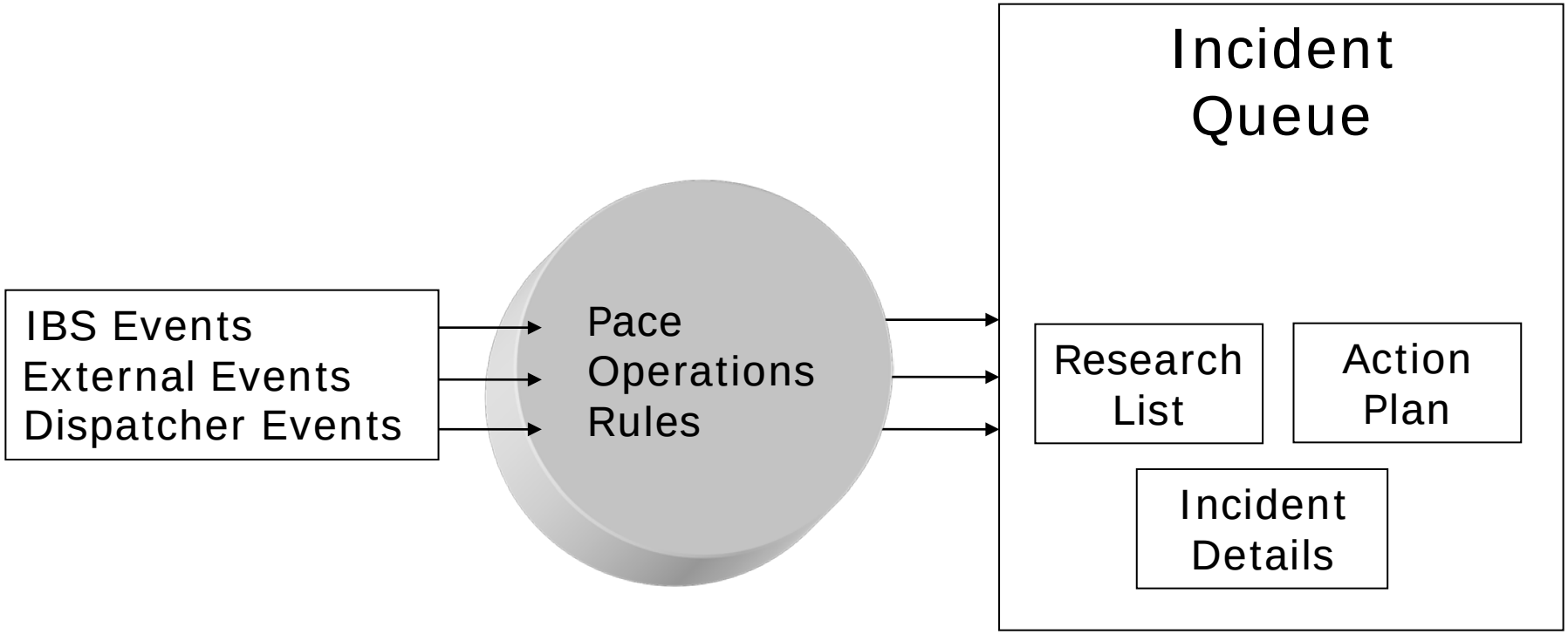
The Project Started 4/06 and the Operational Test Ended 5/2009

- Pace and FTA defined the Project Plan
- Pace and Continental entered into contract that included the Statement of Work
  - This was difficult process due to all parties unfamiliar with mechanics of an R&D project
- Pace Developed Concept of Operations and Local Requirements for TODSS Operational Scenarios
  - A series of Team TODSS meetings identified the needs and operational requirements
- Continental developed Detailed Requirements and System Architecture
  - April 08 through Sep 08
- System Development and Testing
  - July 2008 through February 2009
- Implementation and Operational Test Period
  - Went live March 3, 2009

The approach to the pilot was to build the TODSS engine beside the CAD/AVL system using the Decision support engine as the interface

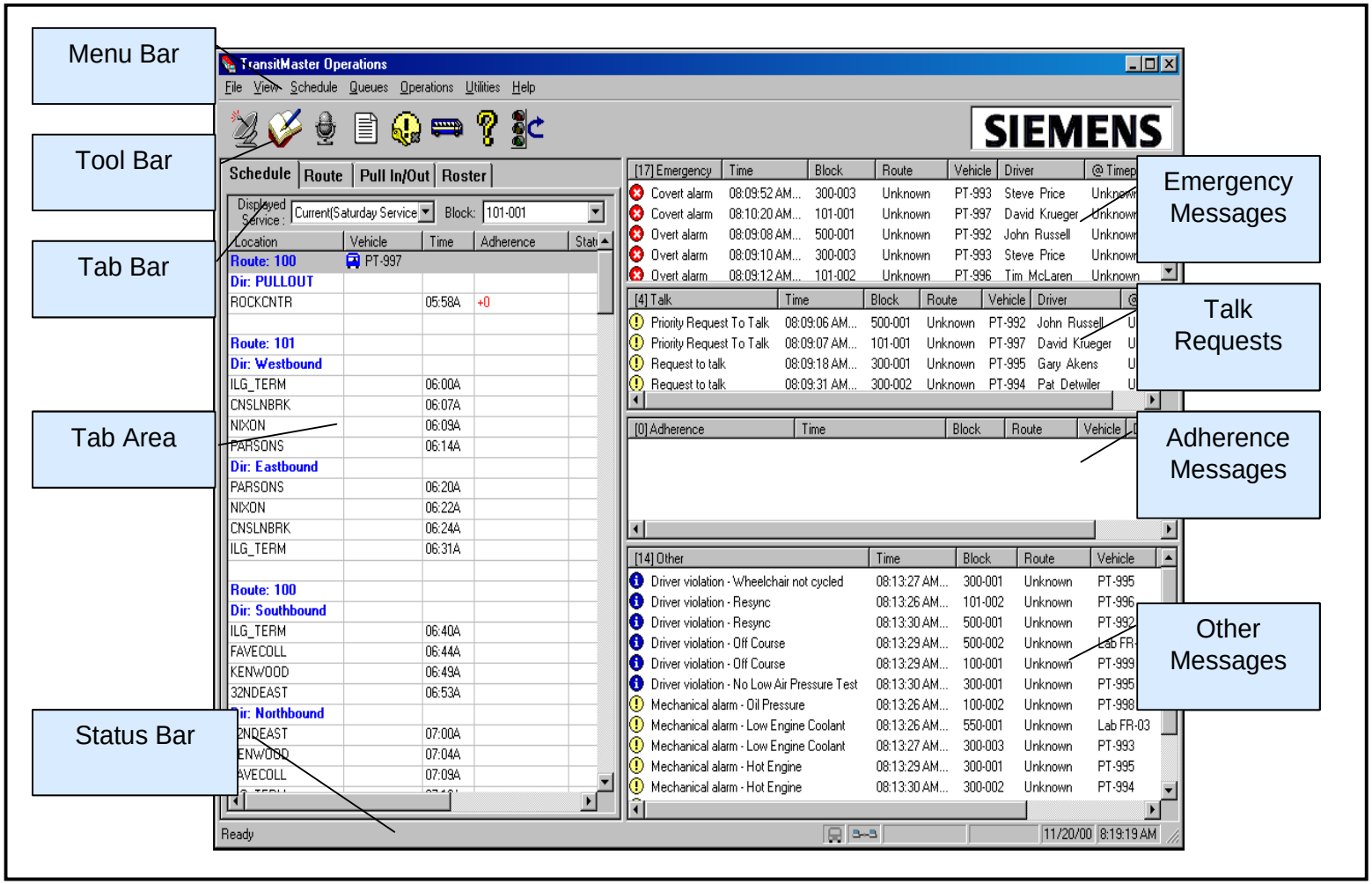


All inputs, from all available sources of information, are evaluated, prioritized, and potential restoration actions provided to Pace dispatchers



The cost of developing the IDS prototype including the design, build, and evaluation was a fraction of the cost of a CAD/AVL procurement.

Pre-TODSS Incident Queue



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John Braband from Pace Headquarters

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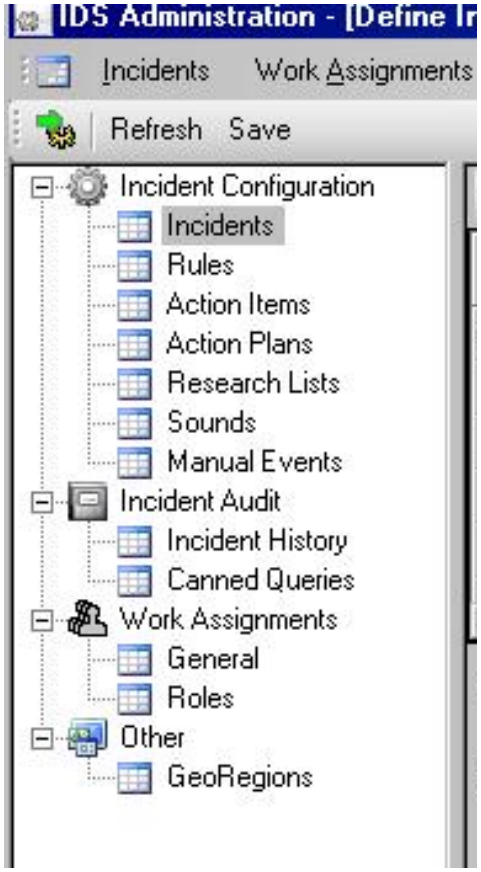
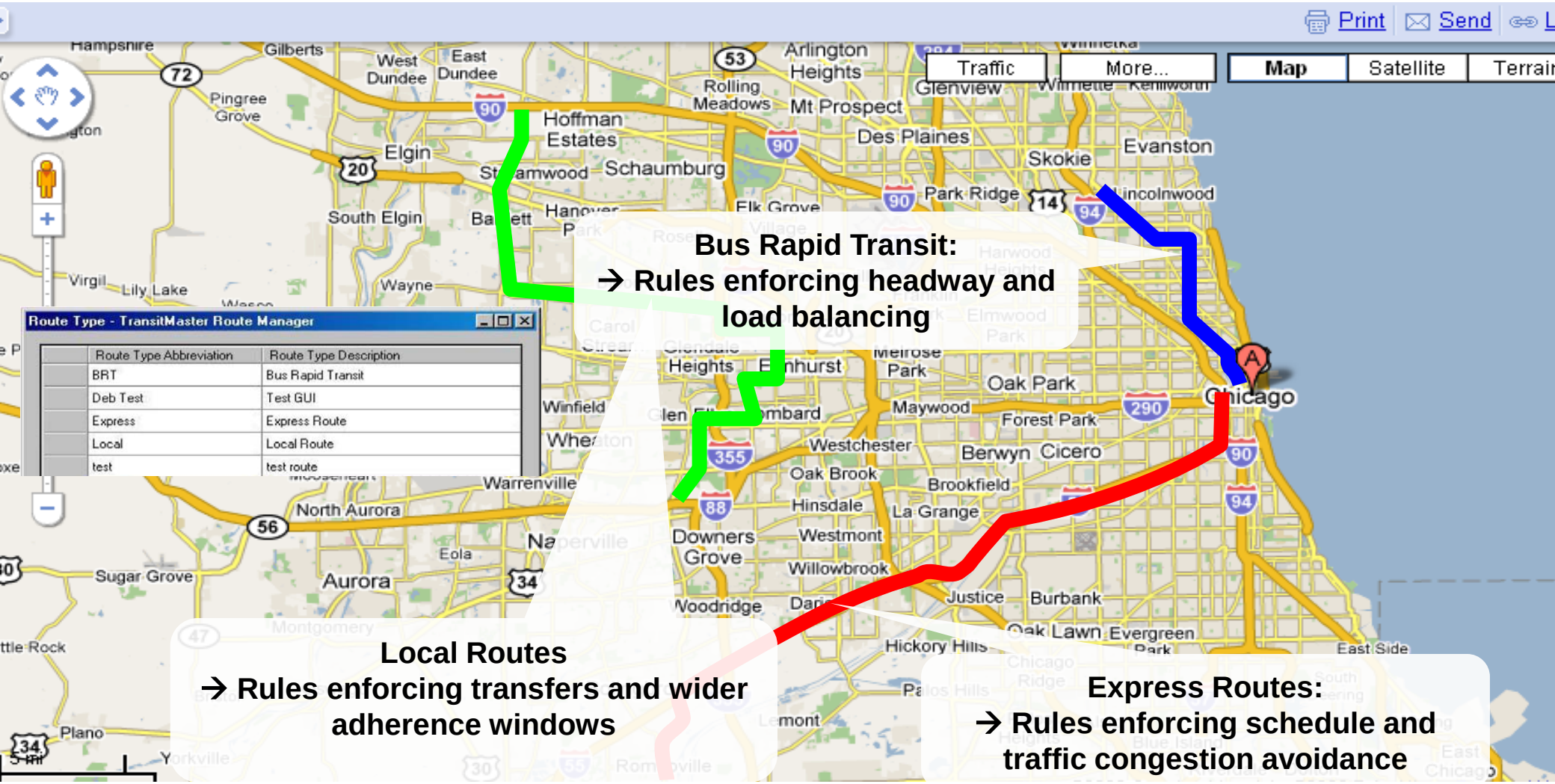
Team TODSS provided the input to implement the set of business rules used for the TODSS Operational Test that lasted 60 days

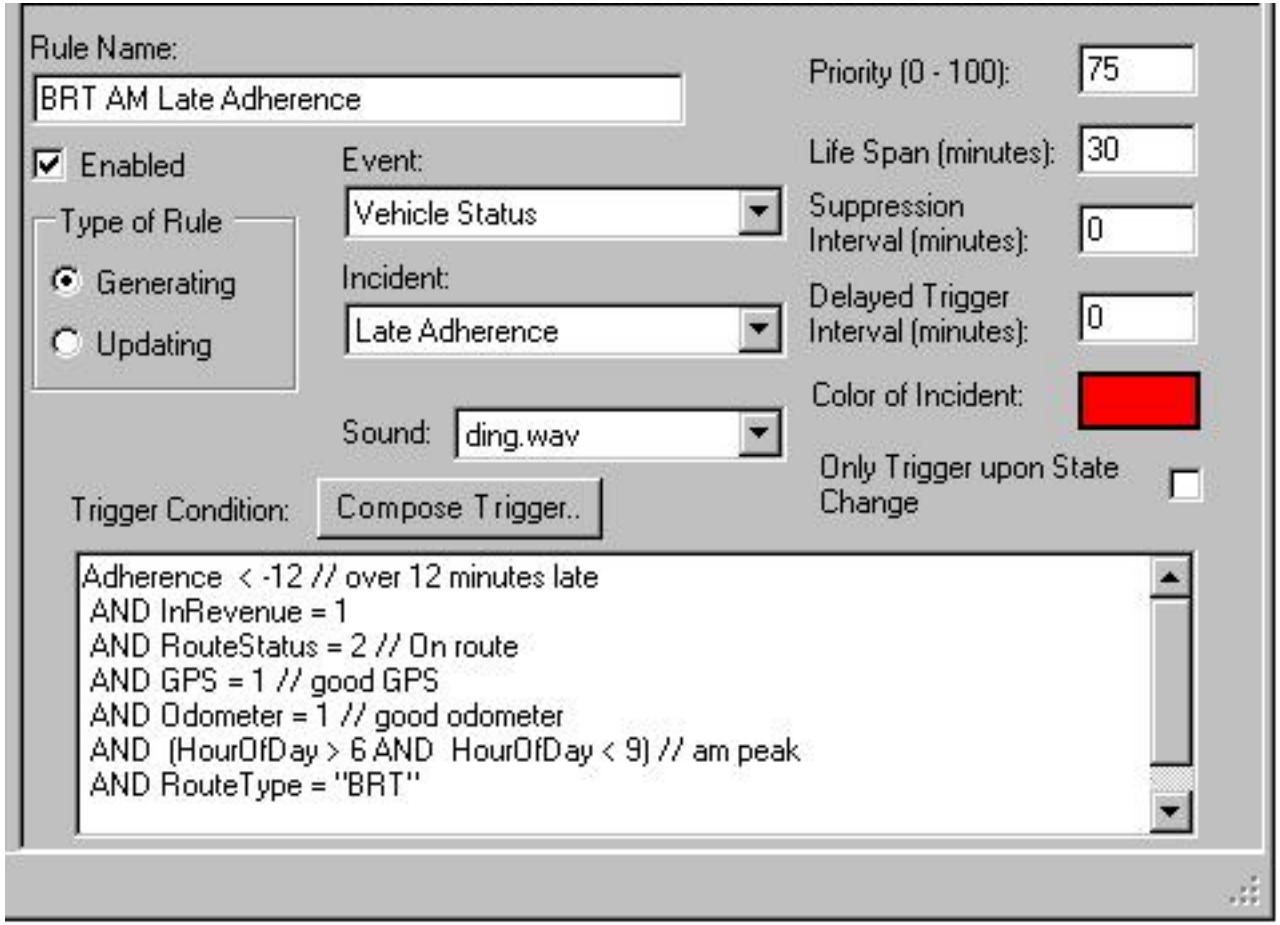
- Team TODSS process to configure TODSS
  - Decide what incidents dispatchers must actively manage and provide oversight
  - Decide what triggers each incident
  - Build an Action Plan(s) to assign to each incident
  - Build a Research List to assign to each incident
- Create a set of Action Items that could be re-used wherever possible
- Create a set of Research Lists and Action Plans that could be re-used wherever possible
- Pace re-defined the driver initiated (canned) data messaging to improve safety and fit within the TODSS concept



Business rules mean:
Different parameters for different situations

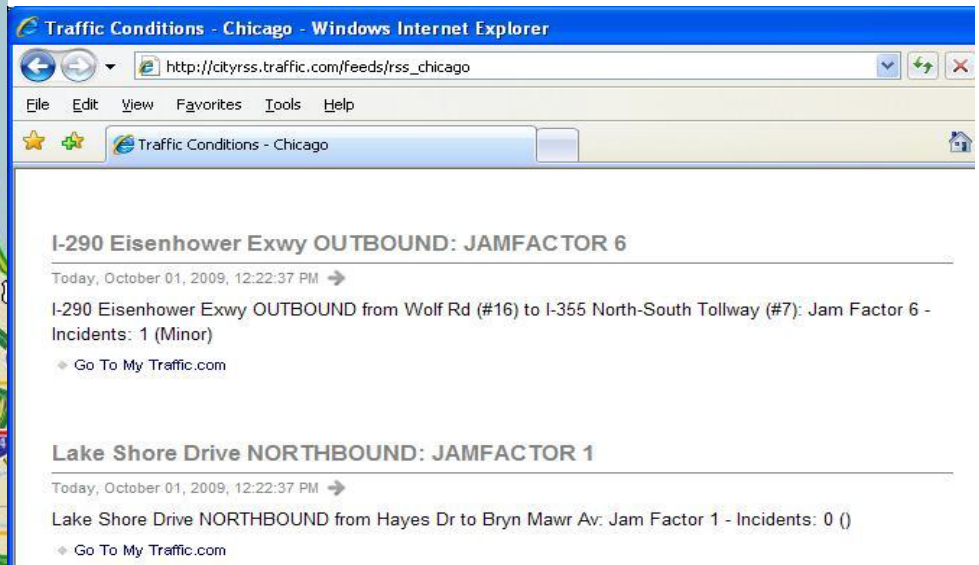


Configuration of a BRT adherence incident trigger for morning peak, in revenue, on course and with working AVL equipment



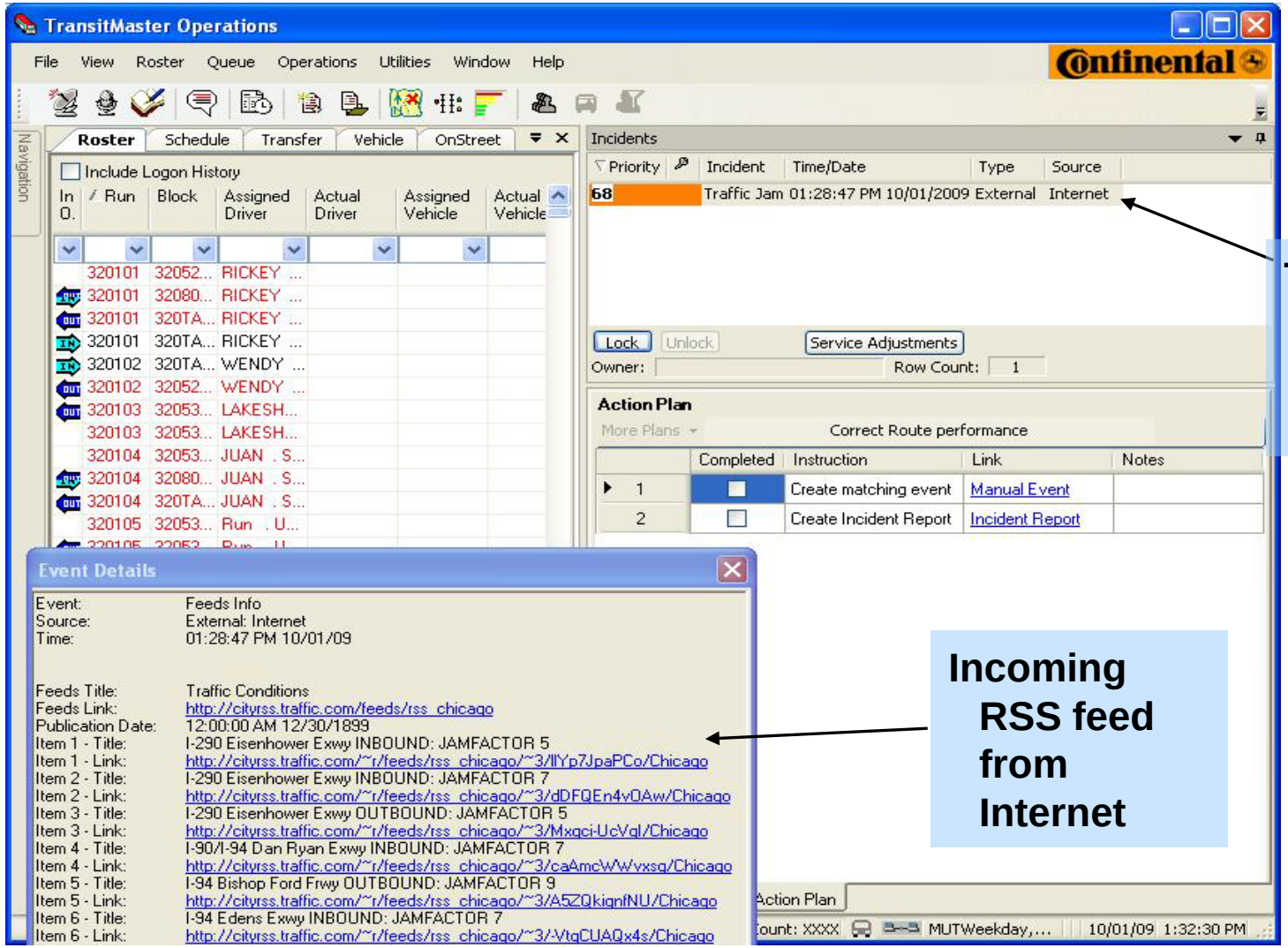
External sources of information now included in the CAD system

Traffic congestion in Chicago from Traffic.com



Traffic congestion RSS Feed

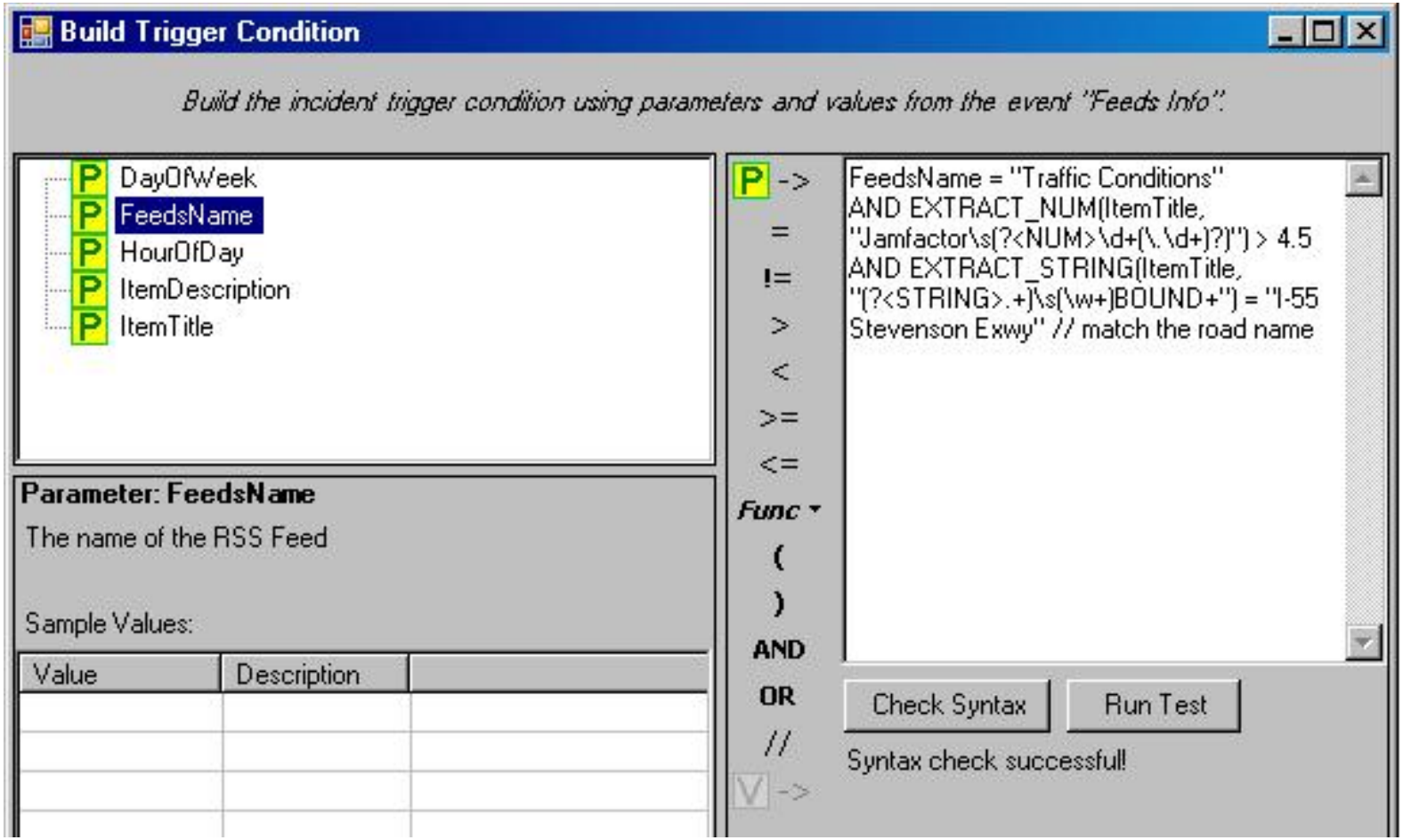
End result is an IDS message in CAD from the Internet



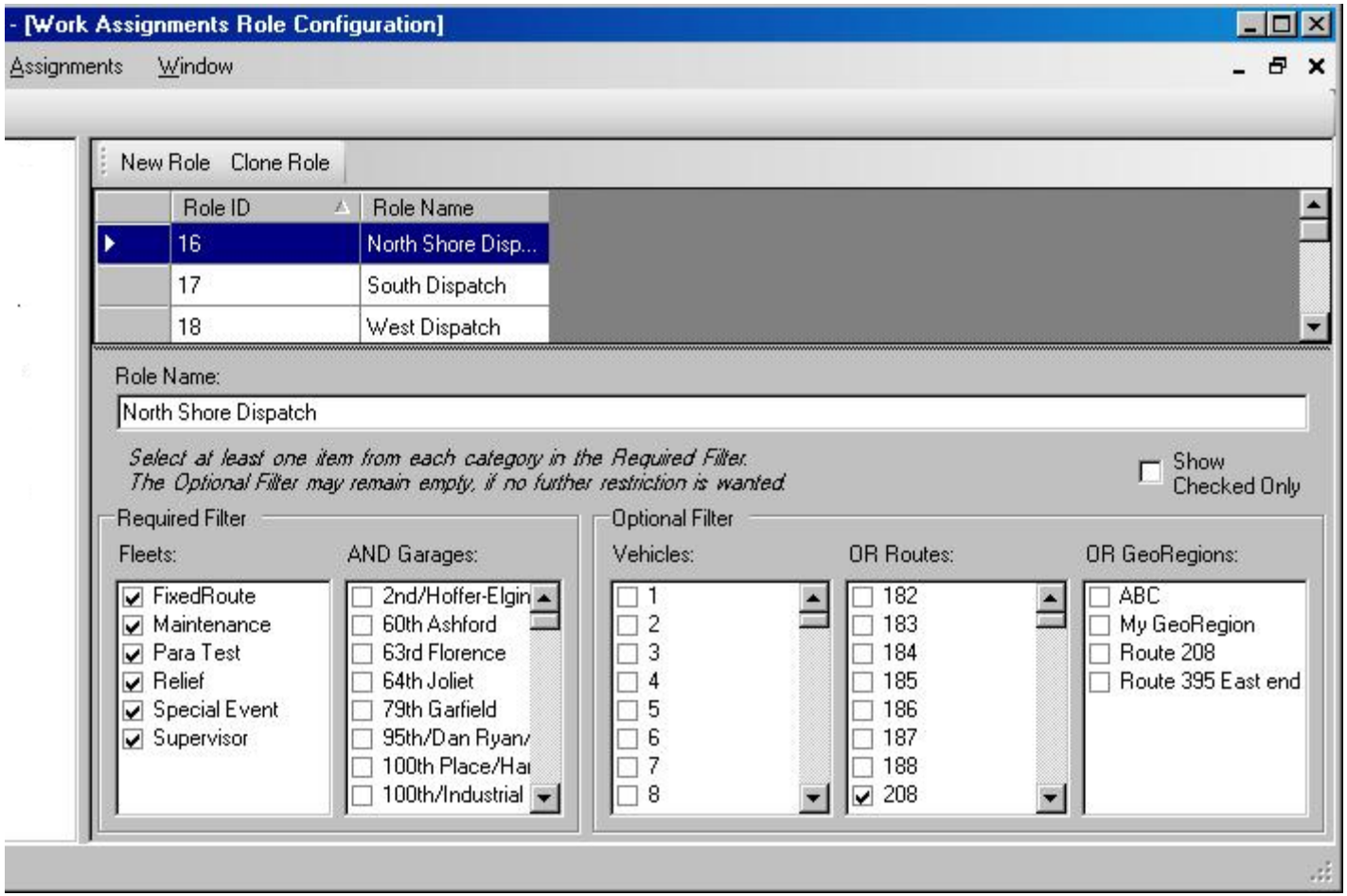
Traffic message from Traffic.com

Incoming RSS feed from Internet

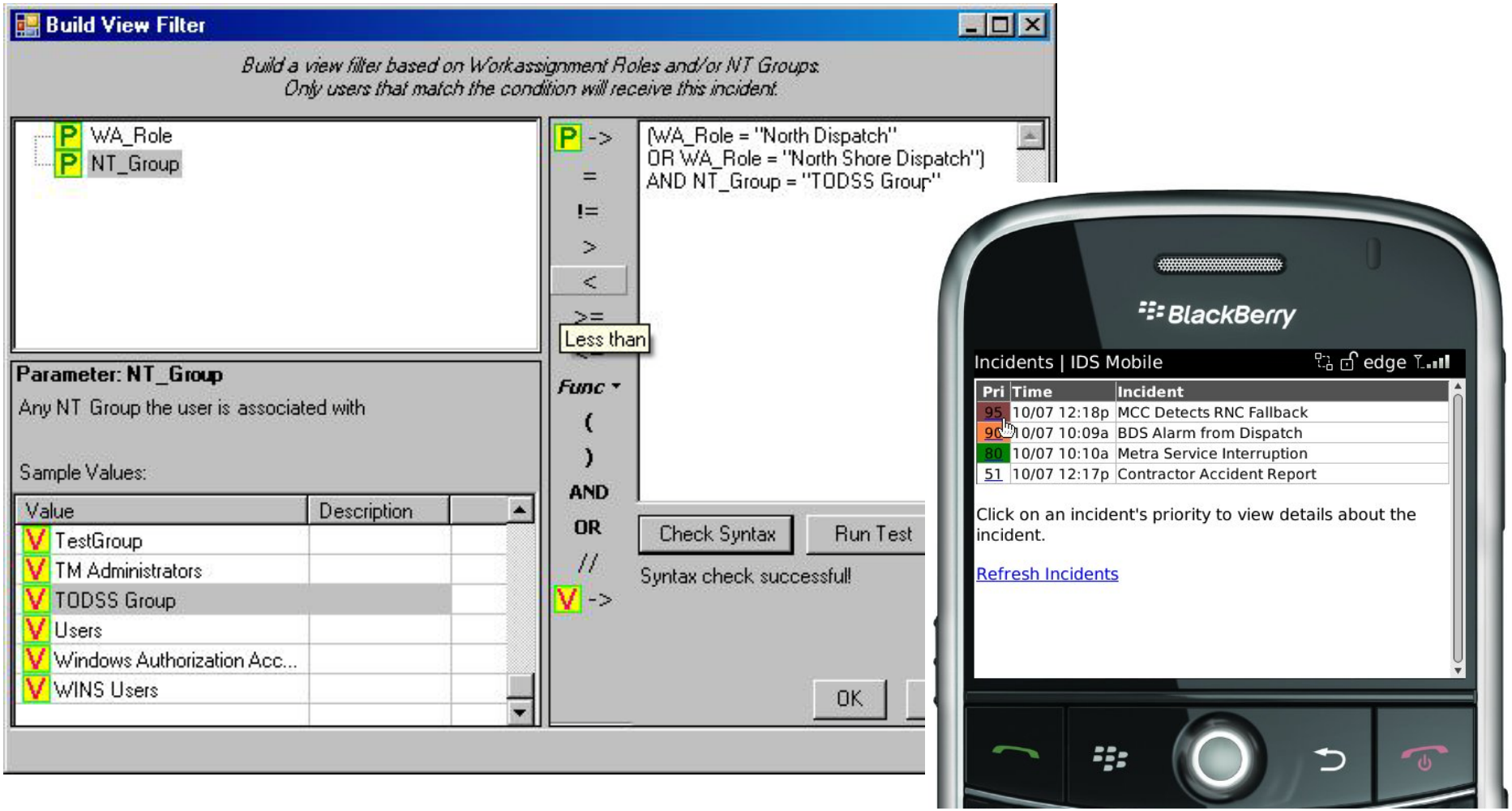
Using the graphical programming tool the trigger is built for the traffic congestion incident



Work Assignment Roles provide real-time information to user groups based on fleets, garages, vehicles, routes, or regions

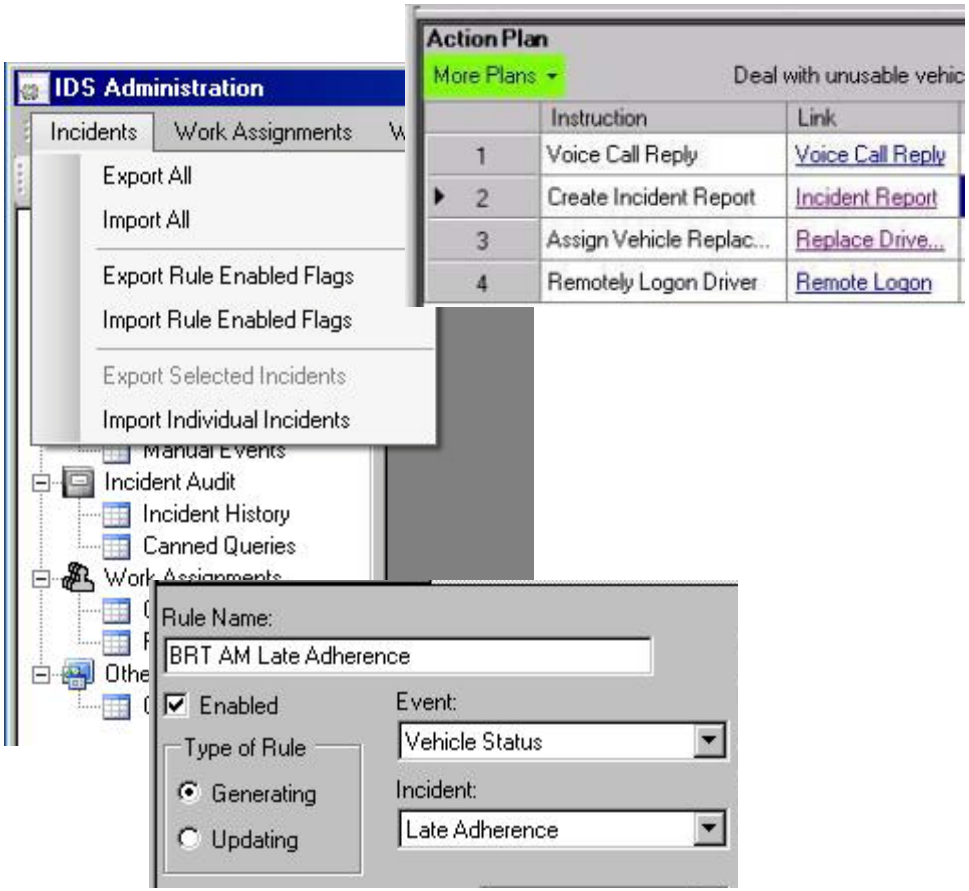


Combined with NT groups, system administrators, maintenance, supervisors, and others can have their own real-time environment defined



Several techniques are available to provide options and handle unusual operational scenarios

- Multiple Action Plans can be assigned to an incident for dispatcher options within TODSS
- Through IDS Administration individual rules can be enabled/disabled in real-time
- Complete sets of rules centered around specific operational scenarios can be created and saved and loaded when needed
  - Special Events
  - Emergency Operations
  - Weather Disruptions
- Or Work Assignment Roles can be configured for specific operational scenarios



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Project data shows IDS had the desired effect of managing the flow of information and better use of the system by dispatchers

Statistic	*Pre-TODSS*	*TODSS*
# Data Messages displayed to dispatchers down over 60%	7,927 (without adherence warnings)	2,515 (including adherence warnings
Dramatic decline (30%) in voice communications between drivers and dispatchers	~14,000	~10,000
RTT Response Time Average (hmm ...)	86 sec	88 sec
RTT Response Time Standard Deviation (but ...)	253 sec	171 sec
Incident reports decreased 36% due to automated email notifications	1417	907
Drivers use of canned messages increased 7% (there was a 2/3 reduction in available canned messages)	12,286	13,187

Before and after comparisons from the project evaluation survey, demonstrate TODSS impact on Dispatcher's attitudes

- I have time to explore all the TransitMaster information provided by IBS (↑ significantly)
- I know where to go to get the information I'm looking for (↑ significantly)
- I know how to easily access related information (↑ significantly)
- When I need information it is often hard to find in IBS (↓ significantly).

Lessons Learned

- Integrated internet and email capabilities provide immediate internal and external operations communications, where management and line staff become more directly informed and involved in the day-to-day operations
- Training for system administrators, dispatchers, and operators is critical to sustain the TODSS effort
- Color coding of priority and unique audible cues are relied on by dispatcher more than was initially understood
- Required restoration strategies, through action plans, result in a more uniform response within and throughout the divisions
- Setup of TODSS is much easier when an agency has a theory of service management articulated in defined standard operating procedures
- Incident reporting was duplicating other dispatcher actions and was not needed as much as it was previously

Development – Keys to success

- Commitment to project by key stakeholders
  - Resources
  - Time
- Joint cooperation and participation
  - Visits
  - Meetings
- Structured product life cycle
  - Requirement capture
  - Needs analysis
  - Roles/Responsibilities

Development Keys to Success

- Experienced Team Members
  - Subject matter experts
  - Effective communication/speaking "Transit Language"

Next Steps

1. Promote TODSS Knowledge and Experience through Stakeholder Outreach
2. Revise and release TODSS Core Requirements based on prototype findings and recommended changes
3. Develop “how-to” guide on planning, procuring, and implementing TODSS
4. Seek Integration of TODSS with Other ITS Efforts, such as ICM
5. Develop a business case for TODSS

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