MESSAGE: intro self, 911 – ATMS integration, surface streets and highways

My name is Mike Haas. I'm with Open Roads and today I'm going to talk to you about a project we're working on in Hampton Roads with the local municipalities, MPO, and VDOT to integrate 911 dispatch data with traffic operations center data from state and local agencies in to a common picture, showing surface street and freeway data. The initial goal of this integration is improving traffic incident management within the region.
There are many stakeholders involved in incident management including law enforcement, emergency management, transportation departments, towing companies, the media, and others. Each stakeholder plays a particular role in traffic incident management, but generally speaking we all share the same overarching goal:

we want to help the people who need it, protect the responders, and then get things moving – “maximize the safe and effective use of the infrastructure.”

There is a tremendously valuable resource that can help accomplish this goal which we are currently not coming close to taking full advantage of: INFORMATION. Timely, accurate, information that could support the activities numerous agencies and jurisdictions across Hampton Roads is currently collected and maintained independently by stakeholders in support of their own respective missions.

RTIMIS is a software tool to gather and consolidate this information into a common picture of the real-time status of transportation within the region.
The Scenario

I want to look at how building a common picture of transportation within a region improves traffic incident management, and why it is hard to share information across agencies and jurisdictions, by considering a real traffic incident and the impact shared information could have had on the response.

Tractor Trailer crashes into buffer vehicle in a workzone
   Truck driver killed
   Other driver injured
   Highway closed for over 7 hours
Rebuild the Crash Response

- t - 0:00 Traffic Incident reported
- t - 0:07 Detour initiated
- t - 1:00 Detour re-set further back
- t - 2:37 Salvage/Wrecker notified
- t - 3:28 Forensic investigation complete
- t - 3:37 Salvage on scene and discovered different equipment required
- t - 4:37 Salvage team began cutting guard rail
- t - 7:07 truck upright
- t - 8:07 lanes open

It’s important to realize that none of the responders or coordinators in this incident were negligent in their particular role, but by not having the ability to consider the whole incident, the response unavoidably becomes a patchwork of best efforts instead of an coordinated response that allows all the resources involved to add the most value possible.
The Cost of Congestion

- $580,000 in driver time and fuel
- Poor Publicity for all involved
- Significant risk for secondary crashes

The cost of the incident in terms of injury, lives lost, and property damage is tragic and a strong motivator to continue work towards reducing the number of incidents. This analysis is looking at the cost in lost time and fuel wasted that was paid due to congestion after the incident.

\[ ((\text{Car volume} \times \text{cost}) + (\text{truck volume} \times \text{cost})) \times \text{hours closed} \]

PR – You may have noticed that the media, occasionally, can be a bit critical. As this incident was extending into the morning commute, the statement went out in local press that state police had closed the roads while they tried to figure out what happened. Although mostly accurate, this did nothing to endear the responders to the public.

Potential for secondary crashes – although conclusive data on secondary crash statistics is lacking right now, it’s intuitive that there are increased risks the longer there are vehicles stopped on the highway. The data that is available suggests secondary crashes are as much as 25% more deadly than initial crashes.

Back up data on claims:
18% of fatalities occur in secondary crashes where the number of secondary crashes may be as low as 14% of incidents in general.
On the accident scene, first responders priorities are providing aid, keeping the scene as safe as possible, and getting things cleaned up. In this accident, the police, fire & rescue, tow companies, DOT personnel, and others were aware of each other and coordinated as best they were able. Unfortunately their individual lines of communication led back to stovepipe operations centers that had limited information, at best, regarding incident response activities outside of their own agency.

First responders are the tactical element of the response. Everyone else involved in real time incident response activities make up the operational element and are largely responsible for coordinating the response. I refer to dispatchers, traffic management operators, and other off-scene participants as operations coordinators and RTIMIS is a tool to support these folks. Their job is to make good decisions based on everything that is going on – RTIMIS is built to improve their situational awareness and allow more informed decisions.
We’re all in the same boat!

How can we work toward a common solution if we aren’t seeing the same problem?

So if we go back to the first slide, we all want the same thing safety and mobility. But at the operations coordination level, resources are stretched thin and in the chaos of a major incident, it’s everything they can do to keep their heads above water. We’re all in the same boat, how do we get in synch?

It’s important to remember that operations coordinators already know that they need to share information cross-agency or jurisdiction. They want to coordinate with other agencies but there is a lot of chaos and pressure involved in incident responses especially in high visibility activities like this one. At the post incident analysis of this crash, it was estimated that dispatchers received an average of 75 calls per incident. The way things generally work today is that the coordination is completely manual and may be formally defined or based on the experience of the operations coordinators involved. There are three problems with this approach:

1. It’s difficult to inform everyone that may need to know in a timely manner
2. The nature of the information, especially at the beginning of an incident, is extremely dynamic or volatile – it’s likely to change. East bound lanes versus west bound, who is on scene, are there confirmed injuries, how many lanes are closed, when are they opening back up.
3. Knowing who needs the information

What is needed at the operation center level is a way to break through the information stovepipes, sharing valuable real-time information that already exists in disparate agencies, **without overwhelming the operations coordinators**.
RTIMIS is a tool that is focused on doing just exactly that. In Hampton Roads we have looked at the existing concepts of operations: who has what information, how is it currently shared or desired to be shared. By using RTIMIS to automate these information flows we aren't burdening operations coordinators, we're unburdening them. And, in the process, improving the timeliness, fidelity, and distribution of the information. By determining what systems contain critical, mutually beneficial data, across multiple agencies and jurisdictions, and sharing this information, the situational awareness of the participants is greatly enhanced. We are building a common operations picture for transportation in the region.

The technical underpinnings of RTIMIS are worth mentioning here. The system is based on the state wide data gateway Open Roads developed to distribute state police dispatch data which has been operationg 24/7 for several years in Virginia. The initial phase of RTIMIS in Hampton Roads which has been recently completed brings information in from a bi-trans traffic control system in Norfolk, a Transdyne freeway control system at the HRSTC, an Integraph 911 dispatch system in Norfolk, a Northrop Grumman dispatch system at state police, and integrates GPS probe data from INRIX. The system is standards based uses EDXL and IEEE 1512 protocol to exchange information, is GIS based, and can support redundant hot-failover capabilities, as it currently does at the state police level.

The information intended to be directly integrated into existing user interfaces where the existing systems will support it, but also has a powerful browser-based interface.
One User Interface Slide

GIS tool with Icons for alerts, incidents, workzones, and more

Tabular view of incident/alert histories

Data filters

Incident details

Video sharing

XML, MOM, Publish subscribe, filters, Data Gateway, 1512, EDXL, TMDD, CAP, Standards, Java, Browser based, COOL COOL STUFF!
By removing stove pipes, the operations coordinators will see the complete picture. This allows them to make better decisions and provide better support to their responders in the field.

Proof the benefit of this type of integration include statements from VSP on the reduction in workloads related to sharing information and documented reduction of incident clearance.
Effective tools are only one component of improving regional coordination. The will and support from the stakeholders in Hampton Roads is tremendous and was the reason this effort was undertaken in the first place. Strong leadership from the MPO, active engaged participation from the cities, and ongoing support from VDOT for the past decade has made this region an ideal location within Virginia to pioneer this type effort. The success of the regional cooperation there has gained national recognition and FHWA is including Hampton Roads with three other metropolitan areas across the country as examples of successful regional transportation operations.

NOTE: build case with audience on common user needs such as 1201 compliance, TIM guidance from FHWA, CMAQ, regional coordination, etc.
So, if we project the effects of regional cooperation combined with RTIMIS on to our crash response, the potential for improvement can be dramatic.

At the post incident analysis conducted on this event, the towing company in particular felt they could have dramatically improved their response by being aware of the incident and evaluating it much earlier in the life cycle of the response to ensure the correct equipment was staged for use when given the green light. They potentially could have begun cutting guard rail, the most time-consuming component of this recovery effort, without disturbing the scene before the forensic investigation was concluded.

VSP, York Co. Fire & rescue, and James City Sheriff’s office would all be aware of the other’s presence on the scene.

Additional benefit is that 911 dispatchers are relieved of the burden of notifying other stakeholders as well as coordinating their agency’s response.

The forensic response team could just as easily be an RTIMIS participant, filtering information based on severity or even fatality.
Conclusions

- **Objective:** Safety and mobility
- **Problem:** It’s hard to share information
- **Solution:** Regional resolve and effective tools

Objective: to accomplish in a multi-agency/jurisdictional world requires coordination
Problem: The nature of the different organizations involved makes it hard to share information within a region
Solution: Regional resolve to address the situation and effective tools to support our operations coordinators
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