System for Multi-Modal Incident Information Sharing and Collaboration

REUBEN JUSTER, EIT
UNIVERSITY OF MARYLAND CENTER FOR ADVANCED TRANSPORTATION TECHNOLOGY
CATT Lab
What is the CATT Lab

• 60+ Undergrad Student Researchers
  – Civil Engineering
  – Computer Science
  – Mechanical Engineering
  – Aerospace Engineering
  – Computer Engineering
  – Geography & GIS
  – Telecommunications
  – Electrical Engineering
  – Art
  – Graphics
  – Digital Entertainment
  – English
  – Archaeology

10 Graduate Students
25 Full-time Software Developers
Research Areas...

Intelligent Transportation Systems
Transportation Data Archiving
Data Visualization Techniques
Visual Analytics
User Interface Design/Human Factors
Serious Games Development
Data fusion, interpolation, and forecasting
Incident Management
Traveler Information
Image processing
How can we make the data useful?

Transform data into actionable information
Our Mission

- Reduce Agency Operations Integration Costs
- Reduce 3rd Party Developer Costs
- Encourage and Facilitate Innovation by Others
- Create an accessible transportation data archive for
  - Performance Reporting
  - Research
  - Operations
  - Planning
- Decrease % of Wasted Research Dollars

Improve accessibility to data
Improve data quality
Facilitate Operations Coordination
What data would you need to address an incident?
Transportation in and Around Washington D.C.

- Many traffic management centers collecting large amounts of data:
  - Washington, D.C. TMC
  - Maryland CHART TMC
  - Northern Virginia TMC
  - Several Large County TMCs
  - Several Transit Agencies
  - Emergency Management Agencies
  - Computer Aided Dispatch

- **Coordination**?!—does it exist?
- **How is safety and performance measured/analyzed?**
- **How are investment decisions made?**
- **Why isn’t there more innovation—private sector or otherwise?**
Regional Integrated Transportation Information System (RITIS)
RITIS – Local and County Level Operations and Situational Awareness
RITIS Chat

Metropolitan Area Transportation Operations Coordination, MATOC (J)

Potomac and Rappahannock Transportation Commission (D)
RITIS Chat Options
RITIS Chat Evaluation Activity
Participants

CATT Laboratory

PRTC

DEPARTMENT OF DEFENSE
WASHINGTON HEADQUARTERS SERVICES
SERVICES THAT MAKE A DIFFERENCE

MATOC

CATT Works
Pre-activity Questions

Phone, email, text, and radio is used to contact internal personnel

Sometimes RITIS Chat is used to contact other agencies

Both agencies act immediately if an event happening service occurs

Both agencies use multiple sources, including RITIS/MATOC to gather event information
Activity

Showed a series of time-stamped slides that took participants from beginning to end.

Participants used RITIS Chat and telecon to communicate.
Post-Activity Questions

Participants emphasized the importance of knowing when and the affects of events

Participants satisfied with RITIS Chat

Recommended mobile version, alerts, ability to add attachments to RITIS Chat*, and up to date address book

All parties found the activity useful
RITIS Chat and the News (Ebola)

The topic is: Incident at I-395N north @ MM 8.000

12:19:46 PM The topic is: Incident at I-395N north @ MM 8.000
12:38:34 PM T : 10-4. Does the name "K" sound familiar? it's on the back of the bus in question.
12:39:08 PM D : Not to me.
12:40:47 PM J : is this it? http://www.k.com/
12:41:36 PM T : May be a contractor for MTA Commuter Bus.
12:42:22 PM D : Does anyone know what they will be doing with the bus? Towing it someplace?
Trying to gauge whether it will disrupt service at the Pentagon beginning around the 14:00 hour.
12:42:28 PM J : Yeah, description on the site says they provide commuter bus service.
12:44:16 PM T : The bus is located in SE DC at the moment, just of the SE Freeway on I St SE.
12:44:28 PM T : MPD is on scene.
12:45:03 PM D : Do you know whether or not any buses are there? We have someone on the phone that says they are at the Pentagon and there are other buses there.
12:47:14 PM T : No info on the number of buses at the Pentagon at the moment.
12:50:54 PM D : Please confirm, the affected bus has been moved from the Pentagon.
1:03:07 PM T : All we know is that they have a the bus pulled over on I St SE in.
1:05:16 PM D : Ok, thanks.
1:13:09 PM D : Hey! is there any way to get a status update for the Pentagon bus?
1:17:11 PM J : No updates on that but we'll check.
1:27:00 PM T : L says Pentagon Bus Bays are not affected and are open.
1:27:10 PM T : no need to redirect at the moment.
1:29:14 PM D : Thanks. We can't confirm which streets are closed around the Pentagon. We don't know if our normal routing needs to be changed. Any word on that?
1:30:09 PM T : We now the ramp from VA-27 to Pentagon South Parking is blocked.
1:30:34 PM T : She is checking on other access points to South Parking.
1:31:05 PM D : Yes, we're aware of that. We've heard Fern is closed and the ramps to 395 HOV lanes are closed. Haven't been able to confirm this.
2:15:21 PM T : PD units left ramp from VA-27 to South Parking.
2:15:46 PM T : Ramp has reopened.
2:16:19 PM T : Ramps to/from I-395 HOV are open.
2:17:41 PM T : All closures lifted 5 minutes ago. Decontamination underway for responders, the Pentagon grounds should be returning to normal access, per PFPA Police.
Collaborative Decision Tool – Meeting in Progress
Collaborative Decision Tool – Meeting in Progress
Collaborative Decision Tool – Meeting Results

Winter Storm Preparedness - Test
9/17/14 2:00 PM
Host: Nikola Ivanov
Maryland

Recommendation:
Close everything at 8am.

Number of Attending: 7

Forecast:
8am - 12pm
A strong storm will be advancing through the area with potential wind gusts of 35mph.
12pm - 4pm
The storm will move to the east of Springfield by 3pm, and weaken as it approaches St. Louis.
4pm - 8pm
The storm will move out of the region completely by 8pm.
5pm - 12am
Significantly cooler air will settle over the region causing rapid freezing on the roadways.

POLL:

Poll: School Closing
2:12 PM
When should the schools be closed?
8am
10am
12pm
No closing needed
4 of 6 Attendance Voted

Thanks
2:20 PM
Thank you all - you may log out!
Yes
No
4 of 6 Attendance Voted

Attendance:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Participant</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATT Lab</td>
<td>Ben Chang</td>
<td><a href="mailto:benchang65@gmail.com">benchang65@gmail.com</a></td>
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<td>DDOT</td>
<td>JJ Briel-Sboebel</td>
<td><a href="mailto:jbiegel@umd.edu">jbiegel@umd.edu</a></td>
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<td>CATT Lab</td>
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<td><a href="mailto:kevinvan@umd.edu">kevinvan@umd.edu</a></td>
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<tr>
<td>CATT Lab</td>
<td>Nikola Ivanov</td>
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</tr>
<tr>
<td>PATT Lab</td>
<td>Pat Redding</td>
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<td>CATT Lab</td>
<td>Pyre</td>
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<tr>
<td>CATT Lab</td>
<td>Walter</td>
<td><a href="mailto:walter@cattlab.umd.edu">walter@cattlab.umd.edu</a></td>
</tr>
</tbody>
</table>

Poll Information:

School Closing: When should the schools be closed?

<table>
<thead>
<tr>
<th>Participant</th>
<th>Vote</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nikola Ivanov</td>
<td>8am</td>
<td></td>
</tr>
<tr>
<td>Kevin Van</td>
<td>8am</td>
<td></td>
</tr>
<tr>
<td>Walter</td>
<td>12pm</td>
<td></td>
</tr>
<tr>
<td>Pat Redding</td>
<td>12pm</td>
<td></td>
</tr>
</tbody>
</table>

Shared Media:

1 / 3
RITIS for Rural Settings

Information is power

Many agencies involved in incidents

Ensures everyone is on the same page (weather, construction, etc.)

Same tools can be used in rural setting

System can be purchased statewide, adopted by rural areas
Example of Rural Incident
Overview of Event Information
TMC Communications

Event Timelines

Notifications and Responders

Dynamic Message Signs
### Advanced Traffic Management System Log

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:27:37 AM</td>
<td>MSP ADVISED THAT 3 VEH HEAD ON WITH POSSIBLE FATALITY</td>
</tr>
<tr>
<td>2:28:33 AM</td>
<td>NO TROOPER ON THE SCENE YET BUT AND NO INFORMATION REGARDING LANE CLOSURE AT THIS TIME WOULD ADVISE FURTHER, WHEN THEY GET TO THE SCENE</td>
</tr>
<tr>
<td>2:40:35 AM</td>
<td>DOUBLE FATALITY: TT OT ALL LANES CLOSED EASTBOUND, CAR TRAVELING WRONG WAY. TT DRIVER DEAD, PASSENGER DEAD IN CAR. BRIDGE AT EXIT 3 WAS STRUCK.</td>
</tr>
<tr>
<td>2:43:29 AM</td>
<td>ADVISED BRIDGE DEPT THAT THE TT HIT THE OVERPASS OF THE BRIDGE</td>
</tr>
<tr>
<td>2:57:42 AM</td>
<td>ADVISED PENN DOT EVENT AND CLOSURE</td>
</tr>
<tr>
<td>4:05:49 AM</td>
<td>LVMN FOR OGRI</td>
</tr>
<tr>
<td>4:08:23 AM</td>
<td>ADVISED PDOT REGARDING SITUATION PRIMARY AND SECONDARIES AND MIGHT WANT TO ADVISE MOTORIST TO SEEK ALT ROUTES</td>
</tr>
<tr>
<td>4:18:20 AM</td>
<td>DETOUR WILL BE IN PLACE IN ABOUT 30 MINUTES PER 6200 THE DETOUR IS ON US 522 THEN LEFT ONTO MD 144 EAST BACK TO I-70 EAST</td>
</tr>
<tr>
<td>4:18:58 AM</td>
<td>511 FLOODGATE AND TICER HAVE BEEN ACTIVATED, THEY GET TO GO OFF AT 10 AM.</td>
</tr>
<tr>
<td>4:28:42 AM</td>
<td>9701 ADVISED THAT PART OPENING EXIT RAMP TO RED TRAFFIC OFF THE ROADWAY</td>
</tr>
<tr>
<td>4:29:07 AM</td>
<td>TT IF ACROSS ALL LANES</td>
</tr>
<tr>
<td>4:30:17 AM</td>
<td>THE TRAILER PORTION</td>
</tr>
<tr>
<td>4:30:03 AM</td>
<td>CORRECTION THE TRAILER PORTION OF THE UNIT IS ACROSS THE ROADWAY THE TRACTOR IS BY THE OVERPASS</td>
</tr>
<tr>
<td>4:35:50 AM</td>
<td>DID NOT ADVISED IF LOAD HAD BEEN LOST</td>
</tr>
<tr>
<td>5:21:52 AM</td>
<td>9701 ADVISES THE ACCIDENT IS UNDER INVESTIGATION. THE ROADWAY WILL REMAIN CLOSED FOR SEVERAL MORE HOURS. THEY HAVE CLEARED OUT THE TRAFFIC ON 70 VIA THE DETOUR. DETOUR WILL BE MD 522 TO MD 144 BACK TO I-70.</td>
</tr>
<tr>
<td>7:40:39 AM</td>
<td>9701 ADVISES MEDICAL TRANSPORT IS ON SCENE.</td>
</tr>
<tr>
<td>7:53:59 AM</td>
<td>9701 ADVISES TROOPER S IS OVER THE SCENE TO TAKE AERIAL PICTURES OF THE SCENE.</td>
</tr>
<tr>
<td>8:13:19 AM</td>
<td>9701 ADVISES THE VICTIMS HAVE BEEN REMOVED FROM THE SCENE. DID TOWING IS NOW ON SCENE FOR THE RECOVERY OF THE TRACTOR TRAILER.</td>
</tr>
<tr>
<td>10:12:17 AM</td>
<td>511 TICER EXTENDED UNTIL NOON</td>
</tr>
<tr>
<td>12:19:36 PM</td>
<td>CCTV TRAILER HAS BEEN LOADED.</td>
</tr>
<tr>
<td>12:10:14 PM</td>
<td>511 TICER EXTENDED UNTIL 1:30</td>
</tr>
<tr>
<td>1:22:26 PM</td>
<td>9701 ADVISED DRIVING TRAFFIC TO THE SCENE</td>
</tr>
</tbody>
</table>

People with access to RITIS can read (not edit) log
Roadway Conditions Timelines
RITIS Chat?

Could be used by other agencies to get information

- Fire Protection
- EMS
- Police
- Transit
- Schools*
Questions?

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