St. Louis District

Freeway Diversions onto Arterials
Tools and Early Lessons from an Integrated System

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MoDOT’s St. Louis District

- Nearly 2 million people
- 5 county region
- Over 1,677 centerline miles of highways
- Core of 19th Largest Urban Area
Freeway Mitigation Tools

- Well saturated freeway CCTV coverage
- Central signal system with remote access to most controllers
- Good CCTV coverage on major arterials
- TMC with video wall & workstations
Most Important Tool In Toolbox

Trained Staff!

- Operators
- Engineers
- Maintenance
- Network
- Incident Management
Using the Tools - Practice First!

Inventory of potential situations: At every interchange ask “What will happen if freeway closed here?”

- Can traffic be routed “up and over”?  
- Is there a good path (capacity) for traffic to get back on freeway?  
- Will traffic be going left or right?  
- How will diverted traffic flow onto likely diversion route?  
- Jurisdictional concerns?  
- Diversion route characteristics?
Information Overload!!!

Lots of interchanges with lots of options – how to catalogue everything??

Click the map to select the appropriate interstate diversion route.
Arterial Management Interface

With a few clicks, any diversion point can be brought up with needed instructions

WESTBOUND CORRIDOR MAP – ST. CHARLES COUNTY

Click the exit number on the map for the location of the westbound diversion route.
## SIGNAL TIMING ACTIONS

Implement the following diversion timing plans per detour and time of day:

<table>
<thead>
<tr>
<th>Use with Detours:</th>
<th>Interchange &amp; Affected Signals:</th>
<th>Timing Plan &amp; Cycle Length:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B, C</td>
<td>EXIT 214 - Lake Saint Louis Blvd</td>
<td><strong>AM</strong> 2/4/1, <strong>PM</strong> 3/4/1, <strong>OFF</strong> N/A</td>
</tr>
<tr>
<td></td>
<td>C-70 LakeSt @01 NOR</td>
<td><strong>120s</strong></td>
</tr>
<tr>
<td></td>
<td>C-70 LakeSt @02 WB Ramp</td>
<td><strong>120s</strong></td>
</tr>
<tr>
<td></td>
<td>C-70 LakeSt @03 SOR</td>
<td></td>
</tr>
</tbody>
</table>
When To Open the Toolbox?

Don’t “Do **SOME**thing” – Instead “Do the **RI GHT** Thing”

- Time of Day
- Duration of Incident
- Lanes Closed
- Direction of Diversion
- Effects on Alternate Paths
- Timeliness of Implementation

All must be evaluated carefully and quickly!
Driver Notification – Advertise?

Most diversion routes have a full time job already!
LEGEND

- EX. SIGNAL EAG
- EX. CONTROLLER
- EX. ENCOUNTER
- EX. CANDINAT
- EX. CCTV CAMERA

INSTALLED EXTENSION POLE WITH CCTV CAMERA (MRO675054.4C) ON EX. SIGNAL POST

UIP EXISTING CONTROLLER, PULLBOXES, CONDUIT, SIGNALS, SIGNAL POSTS, AND SIGNAL POST BASES

61/67 LOG MILE 54.440

RT 61/67 C

IP CCTV CAMERA CABLE

BYPASS ROUTE

IP CCTV CAMERA CABLE

SCALE
A Chain is Only As Strong As It’s Weakest Link

The best diversion route is useless without suitable capacity to it.
Other Lessons

Time is NOT on your side!

- Is an engineer needed to change signal plans?
- Is a specific engineer needed to change signal plans?

Do NOT expect miracles!

- Longer the incident - more likely arterial saturation.
- Freeway mitigation only delays the inevitable.
- Only a freeway can fully mitigate a freeway incident.

Learn from each incident!
Debrief & document lessons learned for next time.
Associated Arterial Traffic Mitigation

6/19/14 (Thursday)

- **Location:** Northbound I-55 and Butler Hill Road, St. Louis County; Northbound I-55 and MO 141, Jefferson County
- **Event:** A chemical fire on a tractor trailer at Butler Hill Road and a fatality south of the chemical fire resulted in the closures of I-55 in both directions
- **Time:** 12:30 PM – 3:00 AM **Total Time:** 14 hours and 30 minutes
- **Action:** Two traffic engineers were present to make the adjustments for the two incidents. After assessing the initial closure on the interstate for Northbound I-55 north of Butler Hill Road, traffic was diverted off of I-55 at the Butler Hill Road and Meramec Bottom Road interchanges. Traffic was observed heading east on the two routes to get to US 61/67 and as a result the signals at US 61/67 and Butler Hill Road and US 61/67 and Baumgartner Road were adjusted to accommodate the additional traffic reaching the intersections. After southbound I-55 was shut down, the traffic was then diverted off to US 61/67. A pre-programmed diversion plan was utilized on this route in order to move as much traffic as possible. While the US 61/67 timing plan was being implemented, a closure at I-55 and MO 141 due to a fatality was realized and timing changes at the MO 141 and I-55 interchange were made to move traffic onto MO 141. Changes were also made to the signal at US 61/67 and Richardson Road when the interstate was closed at MO 141 to accommodate the influx of traffic from the interstate. Traffic was then actively monitored for the afternoon and into the evening rush with all signals monitored and adjusted as needed to move traffic as best as possible. The signals were put back into normal operation at 8:00 pm. Northbound I-55 had one lane open to traffic at 11:00 pm while emergency crews worked to repair the roadway and move the damaged vehicles from the area overnight.

- **Lesson Learned:** The police inadvertently shut down the ramp from Southbound I-55 to I-270. This ramp should have been left open with a single closure of the Collector-Distributor ramp to Southbound I-55 to allow the vehicles who wished to utilize I-255 or I-270 to move through. This would have prevented increased demand on the Lindbergh system.

- **Result:** The adjustments that were made helped stem the initial oversaturation of MO 141, US 61/67, Meramec Bottom Road, Butler Hill Road, and Richardson Road for about 30 minutes. The extended closure of the interstate made it very challenging to move interstate traffic through the area along with the normal traffic on the arterials. Coordination with the police to make the preferred closure adjustments was made allowing more traffic to move to I-270 and I-255 while keeping Southbound I-55 shut down.
Questions?

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