US 75 Integrated Corridor Management System

“Using Technology and Partnership to Maximize Transportation System Capacity”

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Schneider Electric
US 75 Corridor Networks

- Freeway with continuous Frontage Roads
- Managed HOV lanes
- Dallas North Tollway
- 167 Miles of Arterials
- DART Bus Network
- DART Light Rail
- 900 Signals
- Multiple TMCs
- Regional ATIS
## Analysis, Modeling & Simulation

<table>
<thead>
<tr>
<th></th>
<th>San Diego</th>
<th>Dallas</th>
<th>Minneapolis</th>
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</thead>
<tbody>
<tr>
<td>Annual Travel Time Savings</td>
<td>246,000</td>
<td>740,000</td>
<td>132,000</td>
</tr>
<tr>
<td>(Person-Hours)</td>
<td></td>
<td></td>
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<tr>
<td>Improvement in Travel Time</td>
<td>10.6%</td>
<td>3%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Reliability (Reduction in</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Travel Time Variance)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gallons of Fuel Saved Annually</td>
<td>323,000</td>
<td>981,000</td>
<td>17,600</td>
</tr>
<tr>
<td>Tons of Mobile Emissions Saved</td>
<td>3,100</td>
<td>9,400</td>
<td>175</td>
</tr>
<tr>
<td>Annually</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Year Net Benefit</td>
<td>$104M</td>
<td>$264M</td>
<td>$82M</td>
</tr>
<tr>
<td>10-Year Cost</td>
<td>$12M</td>
<td>$14M</td>
<td>$4M</td>
</tr>
<tr>
<td>Benefit-Cost Ratio</td>
<td>10:1</td>
<td>20:1</td>
<td>22:1</td>
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</table>
Committees & Lead Agencies

- Operations / DSS: TxDOT
- Policy & Programming: NCTCOG
- Signal Systems: Richardson
- Transit Applications: DART
- Outreach & Marketing: DART
- SmartNet / SmartFusion: DART
- Parking Management: Plano
- Arterial Street Monitoring: Dallas
- Video Sharing: NCTCOG
- 511 System: DART
- DART Data Portal: DART
- C2C: NCTCOG
- AMS / Evaluation: DART
SmartFusion Data Feeds
ICM Applications

- Responsive Traffic Signal System
- Arterial Street Monitoring System
- Third Party Data
- Parking Management
- Real-Time Transit Vehicle Information
- Freeway & HOV Systems
- Weather
- SmartNET
- Decision Support System
- 511
Responsive Traffic Signal System

- Cluster Analysis of Intersections with impact
- Modeling of Arterials using macroscopic model for initial plans
- Develop new Event Specific Traffic Signal Timing Plans
Bluetooth & 3rd Party Data
Parking Management

• 5 Park & Ride lots along LRT Red Line
• Monitor availability at each Park & Ride lot
• Publish to 511 System
• Publish to TxDOT DMS
• Integrate with DSS
Real Time Transit Vehicle Information

• Install APC on all Red Line cars.

• Transmit and integrate real time AVL and APC data to ICM System.
Freeway & HOV Systems
Real Time Weather Information

- Current weather conditions
- 5-day forecast
- Weather alerts by roadway
ICMS - SmartNET/ SmartFusion

• Information Exchange Tool & Backbone of ICM Network
  – Web Based Interface to ICM System
  – Data Fusion Engine
  – Allows entry and management of Incidents, Planned Events
  – Receives and Publishes data to the Regional C2C System & Other External Systems
  – Feeds Data to the 511 System, Decision Support System and Public
SmartNET Map Interface

1xDOT Dallas: construction on US 75 Southbound between Woodall Rodgers Fwy (Spur 366) and Live Oak St. 5/24/2013 5:00:00 AM through 8/23/2013 5:00:00 AM. The right lane of southbound US-75 and the exit ramp to Live Oak St. just south of Woodall Rodgers will be closed continuously day and night for three months for new road construction.
Decision Support System (DSS)

• Will assist operating ICM agencies with responding to incidents in a coordinated manner

• Multiple stage implementation
  – Manual Interaction – use developed response plans
  – Real-time Data Integration
  – Predictive Model Integration - Utilize Model to Predict 30 minutes into future
DSS Concept

Monitor US 75 Congestion

Divert to Frontage Road

Divert to Frontage Road and Greenville Ave

Divert to Frontage Road, Greenville & the Red Line
## DSS Rules for Response Plan Development

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</tr>
</thead>
<tbody>
<tr>
<td>Minor Incident : Short Diversion to FR</td>
<td>0.5 &lt; Q &lt; 1</td>
<td>&lt; 30</td>
<td>&lt; 2</td>
<td>&gt; 20</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Major Incident: Long Diversion to FR</td>
<td>1 &lt; Q ≤ 4</td>
<td>&lt; 30</td>
<td>≥ 2</td>
<td>&gt; 20</td>
<td>N/A</td>
<td>?</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Major Incident: Diversion to FR. &amp; GV.</td>
<td>1 &lt; Q ≤ 4</td>
<td>&lt; 30</td>
<td>≥ 2</td>
<td>&gt; 20 &gt; 20</td>
<td>?</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Major Incident: Diversion to FR. &amp; GV., Transit</td>
<td>Q &gt; 4</td>
<td>&lt; 30</td>
<td>≥ 2</td>
<td>&gt; 20 &gt; 20</td>
<td>?</td>
<td>&lt;90%</td>
<td>&lt;90%</td>
<td></td>
<td></td>
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</tbody>
</table>

**Alert (Send Heads Up Notification to ICM Coordinator, “N-1”)**

FR = Frontage Rd.
GV = Greenville
Q = Queue in US-75 main lanes
Integrated Corridor Management (ICM) Decision Support System (DSS)
Alternatives for Agencies, Options for Commuters When Incidents Occur on US 75

THE PROCESS

An incident occurs on US 75 and is entered into SmartNET by agency staff

SmartNET relays the incident information to DSS

DSS evaluates the incident and commuting alternatives using expert rules

DSS recommends solutions to multiple operating agencies

ICM coordinator recommends DSS solution implementation

Commuters receive information and make alternative travel choices

DSS reevaluates solution based on roadway conditions and incident status

Examines current roadway conditions such as: incident location, light rail utilization, lanes blocked, available capacity of alternative routes

Forecasts 30-minute impact of implementing the recommendation to ensure value added

Agency implements the recommended solution

THE BENEFITS

Improved travel time reliability for commuters

Enhanced decision making support for operating agencies

Achieves a 20:1 return ($278.8 million) on the project’s cost over 10 years

Less pollution from idling vehicles in congested traffic
Typical DSS Response Plan

J 75 S 266
Major Incident between Renner Exit and Campbell-Galatyn Exit

LEGEND
- Diversion Route
- Incident Segment
- Dynamic Message Sign
  - TxDOT
  - DART
  - NTTA
  - Dallas
  - LBJ Express
  - Park-n-Ride Rail Station

Not To Scale

Approved: 1/11/13
Revised:
Plano

- Frontage road: activate signal timing signal plan #32 and monitor every 15 min.

<table>
<thead>
<tr>
<th>Native Signal ID</th>
<th>Name</th>
<th>SmartNet Signal ID</th>
<th>DIRECT Signal ID</th>
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</thead>
<tbody>
<tr>
<td>4324</td>
<td>CENTRAL @ NORMAN WHITSITT</td>
<td>1010147250</td>
<td>4408</td>
</tr>
<tr>
<td>4318</td>
<td>CENTRAL @ PLANO</td>
<td>1010147190</td>
<td>4418</td>
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<tr>
<td>4331</td>
<td>CENTRAL @ PARK</td>
<td>1010147320</td>
<td>17</td>
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</tbody>
</table>

- Greenville/K Avenue: activate signal timing signal plan #34 and monitor every 15 min.

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<tr>
<th>Native Signal ID</th>
<th>Name</th>
<th>SmartNet Signal ID</th>
<th>DIRECT Signal ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>4695</td>
<td>PARK @ STATE HWY 5</td>
<td>1010151710</td>
<td>18</td>
</tr>
<tr>
<td>4332</td>
<td>18TH @ STATE HWY 5</td>
<td>1010147330</td>
<td>78</td>
</tr>
<tr>
<td>4330</td>
<td>15TH @ STATE HWY 5</td>
<td>1010147310</td>
<td>N/A</td>
</tr>
<tr>
<td>4329</td>
<td>14TH @ STATE HWY 5</td>
<td>1010147300</td>
<td>4280</td>
</tr>
<tr>
<td>4322</td>
<td>PLANO @ STATE HWY 5</td>
<td>1010147230</td>
<td>4282</td>
</tr>
<tr>
<td>4321</td>
<td>PLANO RD @ PGBT WB FR</td>
<td>1010147220</td>
<td>4286</td>
</tr>
<tr>
<td>4697</td>
<td>FM 2514 @ STATE HWY 5</td>
<td>1010151730</td>
<td>5708</td>
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</table>
511DFW Public Website

Welcome to 511DFW

511DFW is Dallas and Fort Worth region's official traffic and travel info source. Whether you drive or take public transit, 511DFW will help you reach your destination in the most efficient manner. Wherever you're going, 511DFW will get you there from here.

To learn more about 511DFW, see our Frequently Asked Questions (FAQs)
Schedule

• Soft Launch – April 26, 2013
• Shake out period – Six months
• Hard Launch – October 2013
For More Information

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