From Integrated Corridor Management to Integrated Regional Management
Dallas Experience

November 20, 2015
13 Additional ICM Planning Sites Selected Including; NYC and Buffalo.
US 75 Corridor Networks

- Freeway with continuous Frontage Roads
- Managed HOV lanes
- Dallas North Toll way
- DART Bus and Light Rail Network
- Three Cities, 900 Signals, 167 Miles of Arterials
- Multiple TMCs
- Regional ATIS
Dallas ICMS Architecture - operations

DSS Sub-System
- Expert Rules
- Prediction
- Evaluation

SmartNET (EcoTrafiX) Sub-System
- DSS Dialogue
- SmartNET (EcoTrafiX)
- ICM Coordinator
- Agency User
- Agency Administrator

SmartFusion Sub-System
- Collection & Fusion platform
- C2C
- DART Events
- AVL/APC
- DART GTFS
- Weather
- NAVTEQ Arterials
- Parking Management
- TxDOT XML (HOV)

511DFW
- Public Web
- IVR
- Public XML
- Trip Planner
- Social Media
- My511 - Alerts
- Mobile Application
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
Response Plan: J75N271 X AM

J 75 N 271 X
Major Incident between
Galatyn-Renner Exit and
Plano Pkwy Exit

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

Involved Agencies

1. Richardson
2. Plano
3. DART
Incident Creation

(201511608082305074) Traffic incl...

Incident Details:

**Location:** Dallas-Fort Worth Area, US 75 Northbound (Texas DOT Dallas) at Galatyn Pkwy (8.79)

**Affected Lanes:** Right shoulder (closed), lane 1 (closed), lane 2 (narrowing)

**Owner:** You (Texas DOT Dallas), Texas DOT Dallas

**Created By:** Texas DOT Dallas

**Start Time:** Today 08:08 AM

**Status:** Unknown

**Description:** Due to accident on US 75 Northbound (Texas DOT Dallas) at Galatyn Pkwy (8.79), affected lanes: right shoulder (closed), lane 1 (closed), lane 2 (narrowing)
Recommended Plan

(2015111608082305074) Traffic include... Dallas-Fort Worth Area, US 75 Northbound (TxDOT Dallas) at Gala...

**AFFECTED LANES**

- Up
- Up
- Down
- Down

**QUICK COMMANDS**

- Map
- Search
- Info
- On/Off

**DESCRIPTION**

**TxDOT Dallas**: Due to accident on US 75 Northbound (TxDOT Dallas) at Galatyn Pkwy (8.79), Affected Lanes: right shoulder (closed), lane 1 (closed), lane 2 (narrowing)

**OWNED BY**: You (TxDOTAdmin) (TxDOT Dallas)  TxDOTAdmin (TxDOT Dallas)

**START**: Today 08:08 AM

**END**: Unknown

**Status**

- Devices/Resources
- Plans

**Find candidates**
Agencies Readiness

Traffic incident: Due to accident on US 75 Northbound (TxDOT Dallas) at Galatyn Pkwy (8.79). Affected Lanes: right shoulder (closed), lane 1 (closed), lane 2 (narrowing).

START: Today 08:08 AM
END: Unknown

You (TxDOTAdmin) (TxDOT Dallas) TxDOTAdmin (TxDOT Dallas)

CONFIRM
DU - DART
CORU - Richardson
COPU - Plano

Plan Implementation

Plano: Activate Flex Group 19
Richardson: Activate Flex...
DART: Monitor every 15 min.
TxDOT Dallas: Enable DMS Message#1

Plan Termination

ICM: Wait time: 0:00:01
(2015111608082305074) Traffic inc... Dallas-Fort Worth Area, US 75 Northbound (TxDOT Dallas) at Gala...

**AFFECTED LANES**

- Affected Lanes: right shoulder (closed), lane 1 (closed), lane 2 (narrowing)

**QUICK COMMANDS**

**DESCRIPTION**

TxDOT Dallas: Due to accident on US 75 Northbound (TxDOT Dallas) at Galatyn Pkwy (8.79). Affected Lanes: right shoulder (closed), lane 1 (closed), lane 2 (narrowing)

**OWNED BY**

You (TxDOTAdmin) (TxDOT Dallas) TxDOTAdmin (TxDOT Dallas)

**START**

Today 08:08 AM

**END**

Unknown

**Plan Implementation**

- Plano: Plano: Activate Flex Group 19
  - +00:08:01
- Richardson: Richardson: Activate Flex ...
  - +00:08:01
- DART: DART: Monitor every 15 min.
  - +00:08:01
- TxDOT Dallas: Enable DMS Message#1
  - YES
- Plan Termination
- ICM: Wait time: 0:00:01

**SYNC**

SYNC

**PLANS**
Incident Closed, Plan Terminated
Operational Needs

- Regional Expansion
- Resources and Responsibilities Sharing
- Sharing of ICM Coordinator Responsibility
- Improved User Interface
- Map Centric
- Situation Awareness
- ATMS and DSS Automation
- Transit Applications
- Dynamic Performance Measures
NCTCOG Coverage Area
Improved Event Management
Event Ownership / Transfer

(2015090311103005074) Traffic inc...
Dallas-Fort Worth Area, SH 114 Eastbound/TxDOT Dallas at SH...

AFFECTED LANES

QUICK COMMANDS
DESCRIPTION
TRANSFER OWNERSHIP
TxDOT Dallas: Due to accident on SH 114 Eastbound/TxDOT Dallas at SH 183(eastbound). Affected Lanes: right shoulder (narrowing), lane 1 (closed)

OWNED BY
You (TxDOTAdmin) (TxDOT Dallas)
sysadmin (TxDOT Dallas)
CREATED BY
START
Unknown
END

09/03/15 11:09 AM

Status
Devices/Resources
Plans

Map
## ICM Coordinator Flexibility

### User Profiles

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Active</th>
<th>Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORUser</td>
<td>Richardson</td>
<td>Yes</td>
<td>Richardson: ICM User, Operator, Operator</td>
</tr>
<tr>
<td>Craig Burgan</td>
<td>TxDOT Dallas</td>
<td>Yes</td>
<td>TxDOT Dallas: Operator</td>
</tr>
<tr>
<td>Curtis Jarecki</td>
<td>TxDOT Dallas</td>
<td>Yes</td>
<td>TxDOT Dallas: Operator</td>
</tr>
<tr>
<td>DallasAdmin</td>
<td>Dallas</td>
<td>Yes</td>
<td>Dallas: ICM User, Operator, Operator, Operator</td>
</tr>
<tr>
<td>DallasUser</td>
<td>Dallas</td>
<td>Yes</td>
<td>Dallas: ICM User, Operator, Operator, Operator</td>
</tr>
<tr>
<td>DalTrans Admin</td>
<td>DalTrans</td>
<td>Yes</td>
<td>DalTrans: Manager, Operator</td>
</tr>
<tr>
<td>DalTransUser</td>
<td>DalTrans</td>
<td>Yes</td>
<td>DalTrans: Operator</td>
</tr>
<tr>
<td>Dan Loving</td>
<td>DART</td>
<td>Yes</td>
<td>DART: Operator</td>
</tr>
<tr>
<td>DARTAdmin</td>
<td>DART</td>
<td>Yes</td>
<td>DART: ICM Coordinator, Operator</td>
</tr>
<tr>
<td>DARTAdmin1</td>
<td>DART</td>
<td>Yes</td>
<td>DART: Operator, Organization administrator</td>
</tr>
<tr>
<td>DARTUser</td>
<td>DART</td>
<td>Yes</td>
<td>DART: ICM User, Operator</td>
</tr>
</tbody>
</table>

### Filters

- ATMS Dispatcher: 1
- ATMS System Administrator: 2
- ATMS Traffic Operator: 1
- Basic user: 6
- Basic User (Demo): 0
- C2C_DL_Profile: 19
- EventsManagement: 14
- Head of hall: 1
- ICM Coordinator (11)
- ICM System Administrator: 10
- ICM System Administrator Level: 1

[Map Image with User Interface Elements]
Situation Awareness

(EcoTrafix) Traffic incident
Dallas-Fort Worth Area, US 75 Northbound (TxDOT Dallas) in...
Device Control
<table>
<thead>
<tr>
<th>Incident Management Systems</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incident is Logged in</td>
<td>OCC LOG</td>
</tr>
<tr>
<td>Supervisory Control and Data Acquisition</td>
<td>SCADA</td>
</tr>
<tr>
<td>Vehicle Business Systems</td>
<td>VBS</td>
</tr>
<tr>
<td>DART Staff informed regarding Incident</td>
<td>EVERBRIDGE</td>
</tr>
<tr>
<td>Public informed via Facebook/Twitter/DART.org, etc.</td>
<td>PUBLISHER</td>
</tr>
<tr>
<td>Public Announcements on Platforms</td>
<td>Platform PA System</td>
</tr>
<tr>
<td>Messages on Platform Visual Message Boards</td>
<td>Platform PAVMB</td>
</tr>
<tr>
<td>Onboard announcement by Rail Operator</td>
<td>Rail PA System</td>
</tr>
<tr>
<td>Activity on the Platforms</td>
<td>Platform CCTV</td>
</tr>
<tr>
<td>Monitoring Weather</td>
<td>Weather DTN</td>
</tr>
<tr>
<td>Monitor Bus Location &amp; Request for Bus Bridge</td>
<td>TRANSIT MASTER</td>
</tr>
<tr>
<td>Establish Bus Bridge by Station Office</td>
<td>TRAPEZE</td>
</tr>
</tbody>
</table>
| Other Technology                            | TVMs INFOTAINMENT HEAD SIGNS FAREBOXES TRANSIT CAMERAS WHERE IS MY BUS WHERE IS MY TRAIN SMART DRIVE
DART Supervisory System

MAP CENTRIC

- Where is my Bus?
- Where is my Train?
- What is the load on the train?
- How is the weather? Past 30 mins, Projected 30 mins
- What is going on the platform?
- Are there any stranded passengers?
- How heavy is the traffic?
- How heavy is the snow falling?
- Are the streets clear?
- Has the accident been cleared?

Input Form(s):
- Incidents Details
- Alerts
- Public Input
- Employee Input

Report Generator:
- Post Incident Summaries
- Incident Queries by Date / Incident Type/Class, etc.
- Automated Periodic reports
- (OCC Logs/Business)

Core Intelligence: TTA optimized modeling engine against Data Repository (Historical, Real-Time, Projected)

External Sources
- Transit Master
  Bus/Rail - AVL/CAD
- Vehicle Load
  APC Data Feed
- Weather
  Data Feed
- Surveillance Cameras
  DART (Police, Safety, Rail Platform, Transit Centers, Operations / Maintenance Facilities, Revenue, etc)
  NTTA, TXDOT
- GIS Data Layers

Public Facing
- Everbridge
- Publisher
- DARTNet
- PAVMBs

Controlled Views/Access
- Public
- DART User
- Power Viewer
- Administrator

Real Time Transit Information

213 RED
(-96.7372, 32.94107)

DETAILED INFORMATION

OCCUPANCY: 10%
LAST UPDATE 09/06/15 04:04 PM
Incident Response Plan #1:
LRT RAIL DISRUPTION SHUTTLE
LOVERS LANE STATION & MOCKINGBIRD STATION

Instruction: Initiate Bus Bridge to transport passengers between Lover’s Lane Station and Mockingbird Station.

ROUTING TO MOCKINGBIRD STATION (Use Destination Code 04) FROM LOVERS LANE STATION
L. MILTON TO EXIT LOVERS LANE STATION
R. GREENVILLE
R. YALE
L. WORCOLA
R. INTO MOCKINGBIRD STATION

ROUTING TO LOVERS LANE STATION (Use Destination Code 06) FROM MOCKINGBIRD STATION
L. OUTER ROAD TO EXIT MOCKINGBIRD STATION
L. TWIN SIXTIES
R. US 75 FRONTAGE ROAD
R. LOVERS LANE
R. GREENVILLE
R. INTO LOVERS LANE STATION

Use bus requirements and supervisory staff for Bus Bridge

Step #1: Announce Change in Operation to Train operators and trains supervisors.
Step #2: Notify Bus Control to Set up Bus Bridge #1 between Lovers Lane Station and Mockingbird at 9:00 am.
Step #3: Order 10 buses including 5 at Mockingbird and 5 at Lovers
Step 4: Request DART Police, Fare Enforcement, Bus Supervisors.
Step 5: Notify DART PIO to inform community and users

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Pass/Hr</th>
<th>Bus Require.</th>
<th>Supervisors Required at each station</th>
<th>Police or fare enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 6:00 am</td>
<td>600/hr</td>
<td>8 buses</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6:00 am to 9:00 am</td>
<td>1600/hr</td>
<td>20 buses</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>9:00 am until 3:00 pm</td>
<td>600</td>
<td>10 buses</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3:00 pm until 7:00 pm</td>
<td>1600</td>
<td>20 buses</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>After 7:00 pm</td>
<td>600</td>
<td>8 buses</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Bus Bridge Response Plan

(196966) Transit incident
(DART: Due to building collapse on LR-RED-SB (DART LIGHT RAIL RED LINE SOUTHBOUND) - LR-RED-SB LOVERS LANE STATION -> MOCKINGBIRD STATION)

Quick Commands

Description
DART: Due to building collapse on LR-RED-SB (DART LIGHT RAIL RED LINE SOUTHBOUND) - LR-RED-SB LOVERS LANE STATION -> MOCKINGBIRD STATION

Owned by:
You (DARTAdmin) (DART)

Start: Today 12:50 AM
End: Unknown

Status
Devices/Resources
Plans

Light Rail Response Plan...

Plan Implementation
- Notification
- DART: Activate BUS Bridge
- DART: Activate DMS Message
- TxDOT Dallas: TxDOT Dallas: Activate ...

Plan Termination
- LRT Service disruption cleared
Data Archival
Performance Measures
Thanks