May 8, 2013 • Atlanta, Georgia
Presentation Outline

- Project Description
- Methods
- Findings
Orientation
Project Description

- 8.4 miles
- Developer: NorthGate Constructors
- $1.02 billion design-build project
- Construction Start: Feb 17, 2010
- Estimated Completion: Summer 2013
"It is a changing landscape. You can drive through there one day and it can change the next," NorthGate spokeswoman Selma Stockstill.
DFW Connector

- Allowable Mainlane Lane Closures
  - Weekdays 8 PM to 6 AM
  - Weekends

- Incident Reporting
  - Project TMC
  - Courtesy Patrol
  - Emergency Response
  - Action-oriented Culture
Contractor Tracking – Jan 2010

Damage Incident Map for January 2010

- Involving Damage
- Involving an Injury
- Involving Damage and an Injury

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Contractor Tracking – Jul 2010
Methods

• Data
  – Historical Crash Records
  – In-Construction Crash Records
  – TxDOT Traffic Data

• Analysis
  – Modified Ohio Procedures
  – Injury and Property Damage Only (PDO)
  – Expected vs. Observed Crashes
  – Statistical Significance

• Field Reviews
Creation of Small Zones
Monthly PDO Crash Trends
Monthly Injury Crash Trends

![Graph showing monthly injury crash trends from 2007 to 2010.](chart.png)
Crash Frequency within Project Limits
Q1 2011 from Baseline

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Injury Crashes</th>
<th>PDO Crashes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
<td>+32%*</td>
<td>+174%*</td>
<td>+121%*</td>
</tr>
<tr>
<td>Weeknights/Weekends</td>
<td>-27%</td>
<td>+61%*</td>
<td>+31%*</td>
</tr>
<tr>
<td>Total</td>
<td>+16%</td>
<td>+139%*</td>
<td>+94%*</td>
</tr>
</tbody>
</table>

* percent change is statistically significant at $\alpha = 0.10$

Lower than expectations
NCHRP 627

Higher than expectations
NCHRP 627

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Comparison of Actual and Expected Q1 2011 Project Limit Crashes by Time Period and Severity

<table>
<thead>
<tr>
<th></th>
<th>Weekday</th>
<th></th>
<th>Weeknights/Weekends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>Actual</td>
<td>Expected</td>
<td>Actual</td>
</tr>
<tr>
<td>PDO</td>
<td>43</td>
<td>32.5</td>
<td>54.1</td>
</tr>
<tr>
<td>Injury</td>
<td>9</td>
<td>12.3</td>
<td>39</td>
</tr>
<tr>
<td>PDO</td>
<td>24.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Change in Crashes by Location in Project Q1 2011

<table>
<thead>
<tr>
<th>Time Period</th>
<th>West Segment</th>
<th></th>
<th>East Segment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury Crashes</td>
<td>PDO Crashes</td>
<td>Injury Crashes</td>
<td>PDO Crashes</td>
</tr>
<tr>
<td>Weekdays</td>
<td>+9%</td>
<td>+99%*</td>
<td>+57%*</td>
<td>+260%*</td>
</tr>
<tr>
<td>Weeknights/Weekends</td>
<td>-24%</td>
<td>+9%</td>
<td>-30%</td>
<td>+121%*</td>
</tr>
<tr>
<td>Total</td>
<td>No change</td>
<td>+71%*</td>
<td>+33%*</td>
<td>+217%*</td>
</tr>
</tbody>
</table>

* percent change is statistically significant at $\alpha = 0.10$
Comparison of Actual and Expected Q1 2011 Project Limit Crashes by Location, Time Period, and Severity
Weekday, West Side
Injury and PDO Crashes

![Graph showing the number of crashes over quarters and years. The graph compares injury and PDO crashes with baseline data.]
Weekday, East Side
Injury and PDO Crashes

![Graph showing weekly injury and PDO crashes over quarters from 2010 to 2011. The graph includes lines for Injury 3-yr Baseline, Injury During, PDO 3-yr Baseline, and PDO During.]
Weeknight/Weekend, West Side Injury and PDO Crashes
Weeknight/Weekend, East Side Injury and PDO Crashes

![Graph showing the number of crashes for Weeknight/Weekend, East Side injury and PDO crashes from Q1 2010 to Q1 2011. The graph compares the number of crashes with Injury 3-year Baseline, Injury During, PDO 3-year Baseline, and PDO During. The data shows a general decrease in crash incidents over the quarters.](image)
Weeknight/Weekend, West Side Rear-end (RE) and Side-swipe (SS) Crashes

![Graph showing the percent of crashes over time with different lines for RE and SS crashes and their 3-year baselines.](image)
Weeknight/Weekend, East Side
Rear-end (RE) and Side-swick (SS) Crashes

2010

Percent of Crashes

0% 25% 50% 75%

Q1 Q2 Q3 Q4

RE Crashes 2010
RE Crashes 3-yr Baseline
SS Crashes 2010
SS Crashes 3-yr Baseline

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Field Review

- Observe conditions to understand nature of crashes
- Example observations
  - Pavement marking visibility under high sun reflectivity
  - Directional lighting
  - Lane shifts in/near ends of horizontal curves and ramp merges
  - Guide sign placement within 10º cone of vision
Contact Information

Jason A. Crawford, P.E.
Texas Transportation Institute
(817) 462-0534
jcrawford@tamu.edu

Jerry Ullman, P.E., Ph. D.
Stephen Ranft
Scott Cooner, P.E.