Congest-Shun
An SEC Rival Discusses Mobility Data & How It Might Be Used to Design and Market Transportation Projects

58th Annual Transportation Conference
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Texas A&M Transportation Institute
http://mobility.tamu.edu
Project Design, Selection & Marketing

- More diverse set of project proposals
- More diverse information needs also include:
  - Legislative mandate
  - Agency accountability and transparency initiative
  - Funding increase proposal
- Projects focused on problem locations
  - Data and analysis needs
- Proactive public relations for the agency
  - Maintain visibility of transportation
Congestion is Worse in Cities of All Sizes
But the Recession Has Caused a “Reset”

Delay per Commuter

- Very Large = 3 M +
- Large = 1 M - 3 M
- Medium = 500 K - 1 M
- Small = Below 500 K

- 1982
- 1997
- 2011
Birmingham “Rush Hour”

- $460 Million Congestion Cost
- 35 Hours Delay per Commuter
- $775 Per Commuter

2011 Total Delay = 21 Million Hours

Wasted Fuel
10 Million Gallons in 2011

Also: Huntsville, Mobile, Montgomery, Tuscaloosa

Pie Chart:
- Light: 20%
- Moderate: 43%
- Heavy: 16%
- Severe: 14%
- Extreme: 5%

Also: Huntsville, Mobile, Montgomery, Tuscaloosa
Congestion Has Many Causes

- Bottlenecks: 40%
- Traffic Incidents: 25%
- Bad Weather: 15%
- Work Zones: 10%
- Poor Signal Timing: 5%
- Special Events/Other: 5%
...But No Single Solution

- Accept Some Congestion
- Diversified Development Patterns
- Less Construction Delay
- Commute & Travel Options
- Improve System Efficiency
- Build More Capacity

% Varies for Each City

100%

0%
What’s the Aggie Gonna Talk About?

• Why is transportation important?
• Importance of a ‘value for money’ proposition
• What are the real choices? What are the expectations?
• Getting the data and using it
• Evaluating decisions and engaging the public
Pay More in Taxes But Less Overall

Wait... What's The Question?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Wasted Fuel, Time &amp; Maintenance Costs</th>
<th>Taxes &amp; Fees</th>
<th>Household Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Unacceptable</td>
<td>$6,095</td>
<td>$232</td>
<td>$6,340</td>
</tr>
<tr>
<td>D-Worst Acceptable</td>
<td>$4,825</td>
<td>$406</td>
<td>$5,231</td>
</tr>
<tr>
<td>C-Minimum Competitive</td>
<td>$4,228</td>
<td>$511</td>
<td>$4,739</td>
</tr>
<tr>
<td>B-Continue 2010 Conditions</td>
<td>$3,652</td>
<td>$634</td>
<td>$4,286</td>
</tr>
</tbody>
</table>

2011 to 2035
Household Cost

http://texas2030committee.tamu.edu
What does this mean to me?

The average Texan pays:

- $22/month in state/federal gas taxes and auto fees
- $128/month Internet, phone, cable TV
- $139/month cell phone
Fewer Consumers, Workers, Jobs Within Marketshed

1 Hour Commute

Payroll & turnover increases;
More trucks to maintain service standards
More distribution centers
Texas Legislature Mandate

- TxDOT Appropriations Rider: 100 most congested sections (post on website every year)
- Travel delay per mile - find the biggest & slowest traffic streams
- What are the projects that will attack congestion for each section?
- Projects that will “get the most bang for the buck”
- Targeted funding (Not the typical “creamy peanut butter” process)
- What are economic benefits of projects?
Texas 100 Most Congested Methodology

- Traffic volume GIS dataset (TxDOT)
- Speed GIS dataset (INRIX)
- Combine the two
- Make the sets comparable
- Calculate congestion statistics by direction and segment
  - Find problems – location, time, cause
  - Solution – Operation, Design, Policy, Kitchen Sink?
“Texas 100” Data

- INRIX – Selected Bidder for 2013 Data
- $125,000
- Licensed to TxDOT and all MPOs
- Unlimited use of derivative data for corridor level
- Average & percentile speeds by direction
- 15-Minute Intervals for average week
The Data We Would Like To Have

• Archived 15-minute speeds
• Traffic volume by 15-minute throughout the year (or estimated)
• Average passenger vehicle occupancy
• Roadway inventory data
• The ‘Whys’ – Weather, Incidents, Events, Road Work, Agency Actions
24-Hour Volume Profiles

Example: Weekday Traffic, No to Low Congestion

Percent of Daily Volume

<table>
<thead>
<tr>
<th>AM Peak, Frwy Wkday</th>
<th>PM Peak, Frwy Wkday</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak, Non-Frwy Wkday</td>
<td>PM Peak, Non-Frwy Wkday</td>
</tr>
</tbody>
</table>

Mid 4:00 8:00 Noon 4:00 8:00 Mid
2013 Data Comparison

Texas
• 130,000 directional miles
• 110,000 directional miles matched to roadway inventory

Alabama
• 30,000 directional miles
• 26,000 directional miles matched to roadway inventory

Speeds by direction, every 15 minutes of average day
Where is Congestion in Texas?

…numerically, only a few places…..

Hours Per Mile (1000s)

- 1,200
- 1,100
- 1,000
- 900
- 800
- 700
- 600
- 500
- 400
- 300
- 200
- 100
- 0

Top 20 Cost - $1,590M (43%)

Cost of 21-50 : $1,110M (30%)

Cost of 51-100 : $1,000M (27%)
The Texas Freight Network

- Cornerstone of Texas Freight Mobility Plan
- Defines an all-mode Texas Freight Network
  - Transportation corridors
  - Key freight generators and gateways

Source: Texas Freight Advisory Committee
Freight Congestion
A Key Element of the 21st Century Economy

- U.S. urban truck delay
  - 350 million truck hours
  - $27 billion
- Inventory costs
- Just-in-time operations
- Fleet productivity
- Distribution centers
- Public & private sector decision structures
• Decisions aren’t just about congestion
• 1st Step: Better public engagement
• Discuss all project effects
• Use geographic information tools
• Mapping, graphics, data, stories
  ❖ Yes, we started with the food, then developed the name
Congestion

[Map showing traffic congestion levels with varying colors indicating congestion severity.]
Pavement Condition
Bridge Condition
Safety
Freight Commodity Value
# Use Case – US 281 at Loop 1604

<table>
<thead>
<tr>
<th>Category</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges</td>
<td>good / fair</td>
</tr>
<tr>
<td>Congestion</td>
<td>high</td>
</tr>
<tr>
<td>Freight Value</td>
<td>medium-high / high</td>
</tr>
<tr>
<td>Pavement</td>
<td>very good / good</td>
</tr>
<tr>
<td>Crash Risk</td>
<td>very high / high</td>
</tr>
</tbody>
</table>

- **Spend resources here?**
- **If so, what type & amount?**
- **Take resources elsewhere?**
TOSTADA – The Next Course

• More data, more collaboration
• Brings traditional “silo” data together
• Helps frame project design and benefit messaging
• Consistent format for easier at-a-glance understanding
• Policy-makers can use results to better understand problems

http://mobility.tamu.edu/mip/
What’s Next?

• Local Input and MAP 21 Performance Measures
  – MPOs, municipalities, transit agencies
• Use performance data to find problems and identify broad range of solutions
  – Operations, design, travel options, pricing, policy
• Dashboards and Reports
  – Facilitates transferability and accountability
• Engage the public more aggressively
  – Projects, Long-range plans, Funding discussions
Kyle Field Gameday Transportation Plan

20,000 More Fans, No More Congestion

Texas A&M Transportation Institute
(with TAMU Transportation Services, City of College Station, City of Bryan, BCS Chamber of Commerce, Convention and Visitors Bureau, Downtown Bryan Association, TAMU Athletics, 12th Man Foundation, TxDOT, Safety and Law Enforcement Agencies)
Kyle Field Gameday: 4th Largest Downtown in Texas

Kyle Field Gameday
- 120,000+ attendees/workers
- 2 Freeways

Downtown Austin
- 125,000 workers
- 4 Freeways

Downtown Dallas
- 145,000 workers
- 6 Freeways

Downtown Houston
- 150,000 workers
- 7 Freeways

Some Perspective
Real time traffic
Real time parking
Shuttle bus service maps
Parking cost information, pay through app
Game weekend in BCS – Dining, Activities, Hotels, Tickets
App will evolve in 2015
Connected to: 
gameday.12thman.com

Bandwidth?
Ole Miss: Medical emergency on George Bush West & DWI crash on Stotzer at FM 2818
So now what?

**Use our existing roads smarter**

- **Move** crashes and stalls out of the way
- **Time** traffic signals so more see green
- **Encourage** carpooling
- **Change** rush hour nightmares through flex-time, telecommuting, etc.
So now what?

Get the biggest bang for the buck

**Tackle** most congested roadways

**Improve** safety

**Support** biking, walking and mass transit options
Mobility Investment Priorities

The Take-Aways

- Agencies must involve their stakeholders
- Go meet the public where they are
- Innovative designs and operating ideas are needed
- Multiple funding sources will be needed
- Technology can play a role
- Public-private partnerships - leading construction practice to the future
- Incentivize the market and encourage creativity

[link to mobility.tamu.edu/mip]
Expanding Travel Delay & Shrinking Free-Flow Hours

1982
- Uncongested: 73%
- Severe: 6%
- Heavy: 7%
- Moderate: 9%
- Extreme: 5%

Total Delay = 1.1 Billion Hours

2011
- Uncongested: 21%
- Light: 31%
- Moderate: 18%
- Severe: 8%
- Heavy: 9%
- Extreme: 13%

Total Delay = 5.5 Billion Hours

Wasted Fuel
(Same Trend)
2.9 B Gallons in 2011
What’s New: Daily Volume Profiles

Time-of-day profile for truck volumes differs from “mixed vehicle”
Reliability: The Profession Catches Up to the Public

Number of Trips (in thousands)

Travel Time (in Minutes)
How is This Information Used in the Public Sector?

- Monitoring performance
- What if........? 
- Project prioritization, decision-making
- Special events, what is the effect of X?
- Related policy/funding decisions
How Can This Information be Useful to Private Industry?

• Understand time required to traverse the network
• Understand “risk” by using variability of travel times
• Time-of-day travel time to help schedule delivery routes
• Avoiding bottlenecks to improve efficiency
• Distribution center location