### Dashboards

## Portals to Organizational Performance Management





# Session agenda

- Define dashboards and their uses
- Where dashboards fit in an organizational business intelligence/ business performance management environment
- Reasons for dashboard use
- Examples of private sector and public sector dashboards, focusing on DOTs
- Importance of data validity
- A preview of what TxDOT is doing



# Business Performance Management (BPM)

- Definition
- The need for organizational BPM
- BPM drivers
- BPM audiences
- Dashboard placement in a BPM/BI suite



### **BPM** defined

"Performance management is the combination of management methodologies, metrics, and IT that enable users to define, monitor, and optimize results and outcomes to achieve personal or departmental objectives while enabling alignment with strategic objectives across multiple organizational levels."

Source: Gartner

"You can't manage what you can't measure."

Source: Jack Welch, former CEO General Electric



# Organization need for BPM

- To better understand and manage the key business drivers of an organization
- Private sector Obtain a competitive advantage by refining and improving business processes
- Public sector to provide more transparency and accountability to our constituents and legislative oversight agencies



#### Public sector BPM drivers

- Change in political leadership
- Dissatisfaction with hard-to-decipher reporting of agency performance
- Public trust in agency
- Legislative mandates



### Public sector BPM audiences

- Public
- Legislative and oversight agencies
- Opinion makers and the media
- Local and regional transportation agencies
- Internal agency management



#### Dashboards

□ "Dashboards are reporting mechanisms that aggregate and display performance metrics and key performance indicators (KPIs) at a glance through visualization components such as traffic lights, gauges, and dials. "

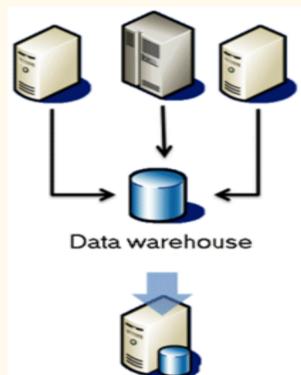
Source: Gartner

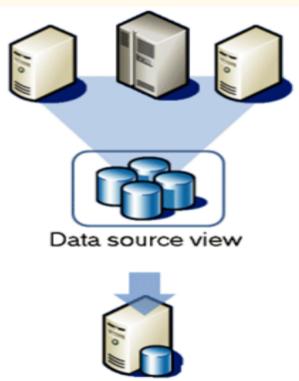
- May be either computer generated or paper based
- Agency performance data summarized
- Detailed data presented in a drill down of the summarized data



### Dashboard Architecture

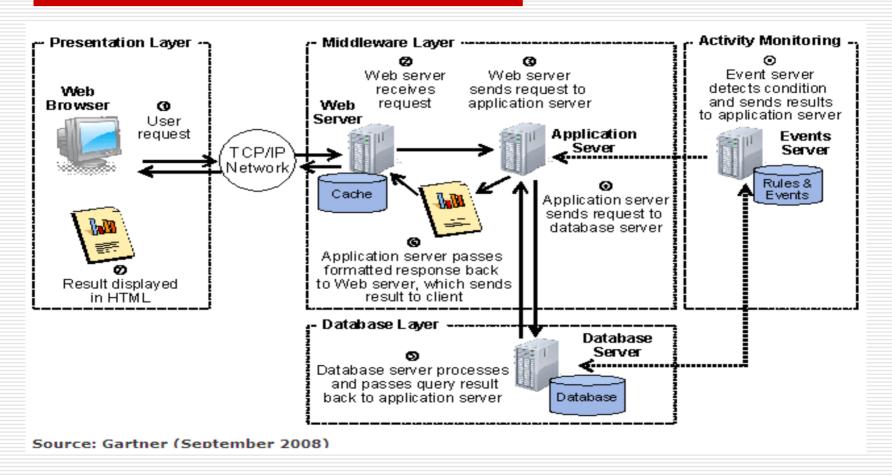
These approaches are shown in the following illustration. With SQL Server 2008, you can use either one or a combination of the two.





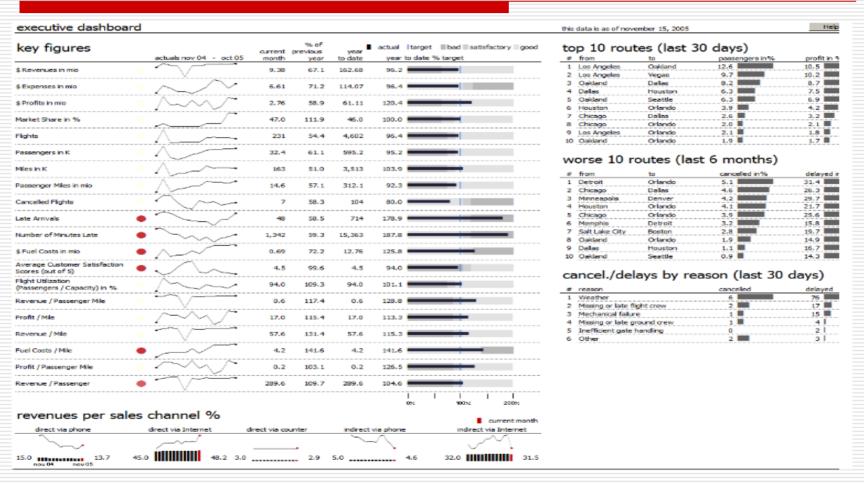


### Dashboard Architecture



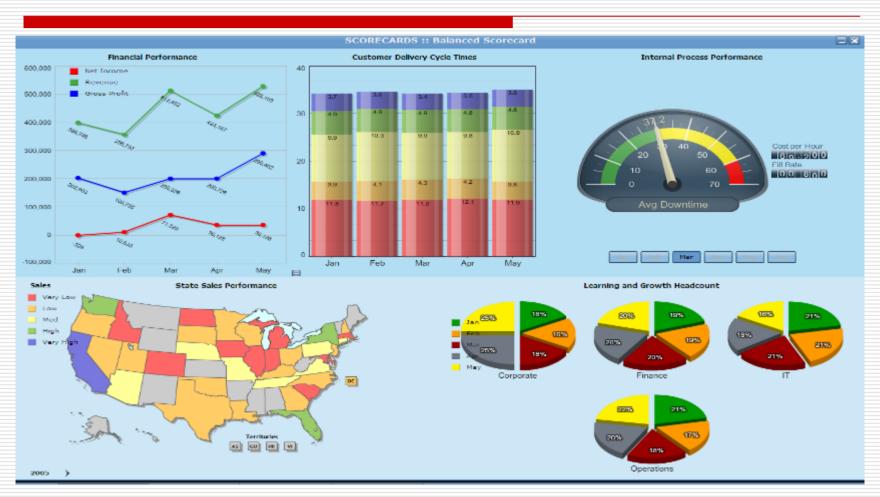


## Private Sector Executive Dashboard





## Private Sector Executive Overview



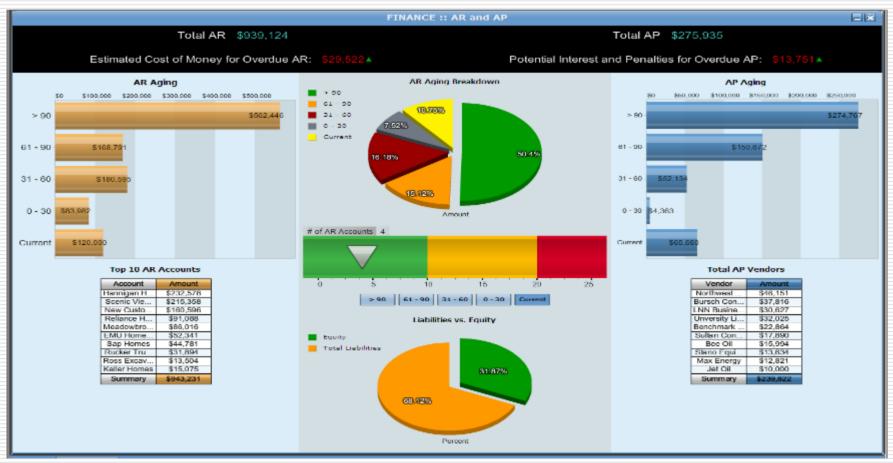


## Private Sector Personnel





# Private Sector Financials





### Federal IT Dashboard

HOME | INVESTMENTS | DATA FEEDS | ANALYSIS + | FAQ + | Department of Transportation DOD Major Investments: 48 your window Spending on Major Investments: \$2.4 B (FY 2009) into the Overall Rating Billions federal portfolio 8 Others DHS HHS Treasury USDA DOT DOJ Agency Agency Agency Updates



#### Blog 🖾

Friday, August 14, 2009 Learning from best practices Vivek Kundra, Federal CIO

On August 7, CIOs from across the Federal government gathered to share their experiences using the IT Dashboard and to discuss how to effectively manage their agency portfolios. There was vigorous debate and lots of energy in the room - and a clear message emerged: the IT Dashboard provides a powerful new tool for agency CIOs to use. However, no tool can replace good management. Ultimately. accountability for the performance of agency IT investments rests with agency CIOs.

Read This Post

Monday, August31, 2009 National Science Foundation is the first agency to accurately match 100% of major investment contracts to USAspending.gov.

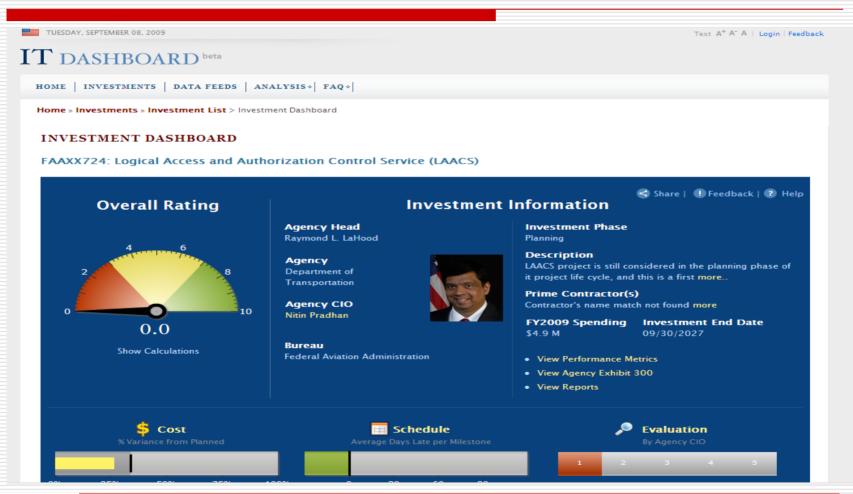
Wednesday, August 5, 2009 All agencies have now finished rating 100% of their major investments.

Monday, July 13, 2009 Nine agencies have now finished rating 100% of their major investments.

Note: All descriptions, dates, and costs are as reported by agencies. Major investments (Investments Evaluated) represent only a portion of the agency's entire IT portfolio reported in Exhibit 53.



### Federal IT Dashboard



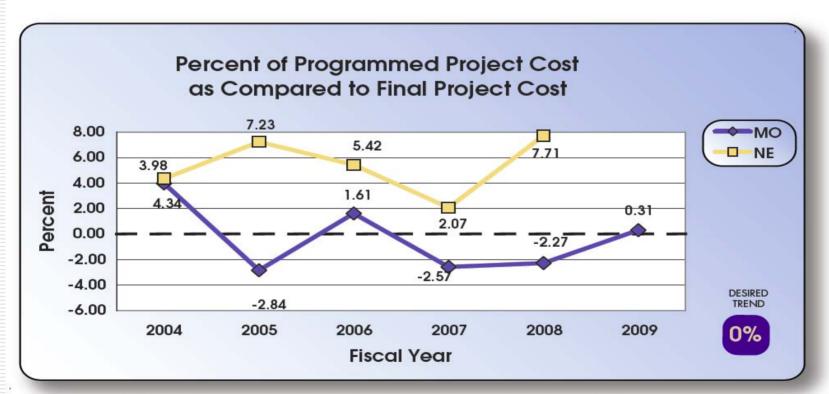


#### Federal IT Dashboard





# MODOT Tracker Printed Performance Measures



Positive numbers indicate the final (completed) cost was higher than the programmed cost. Data from Nebraska Department of Roads, one-year schedule of highway improvement projects.



# MODOT Tracker Printed Performance Measures

**ENVIRONMENTALLY RESPONSIBLE** 





# MDOT SHA Attainment Report Printed Performance Measures

#### WHY DID PERFORMANCE CHANGE?

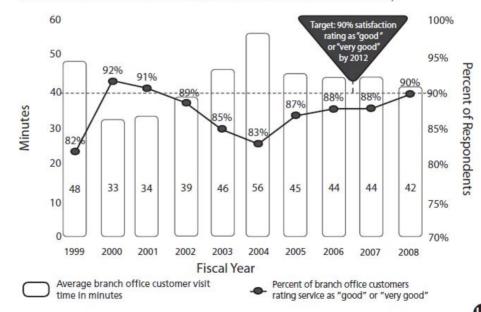
 Average customer visit time decreased by two minutes, which improved service ratings

#### WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- Continue to train all Customer Service Representatives and Driver's License Examiners to provide timely, consistent and effective service
- Continue to coordinate automobile dealer investigations and information exchange between Business Licensing and Investigations

#### MVA: BRANCH OFFICE CUSTOMER VISIT TIME VERSUS CUSTOMER SATISFACTION RATING

Average customer visit time is a key indicator of the quality and efficiency of service delivery to customers, and is directly related to customer satisfaction (i.e., as MVA branch customer visit time decreases, customer satisfaction increases).





# MDOT SHA Attainment Report Printed Performance Measures

#### WHY DID PERFORMANCE CHANGE?

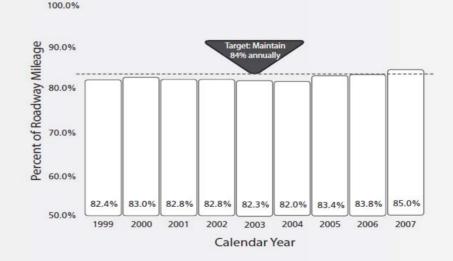
- Emphasis on reducing skid resistance resulted in improved quality
- Thinner, smaller overlays of pavement on roads kept projects within budget
- O Costs of highway materials continue to rise

#### WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- Utilize the Pavement System Preservation (Fund 77) to increase the ride quality and service life of roadways through performance monitoring, allocation planning, project selection, and program development
- Expand usage of recycled materials for highway applications
- Continue to use a high-speed laser profiler designed to better link construction standards to ride quality targets
- When identifying roadways to improve, continue to use an optimization process to achieve a high benefit-cost ratio of available funding
- Continue to pursue funding for pavement preservation, given escalating construction and material costs

#### SHA & MDTA: PERCENT OF ROADWAY MILES WITH ACCEPTABLE RIDE CONDITION

The traveling public has identified acceptable ride quality (i.e., the smoothness or roughness of the pavement) as a priority. Ride quality facilitates mobility, efficiency, and safe movement of people and goods within Maryland.





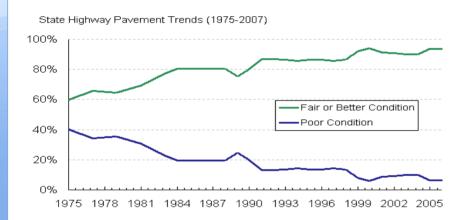
# Washington GMAP Dashboard Transportation





# Washington GMAP Dashboard Transportation

#### What is the condition of pavement on WSDOT-managed roadways?



#### **Data Notes**

Data Source: WSDOT Materials Lab.

Measure Definition:

Target Rationale:

Link to Agency Strategic Plan:

Relevance: Notes: (optional)

WSDOT is one of a few states to perform its pavement condition survey using an automated pavement condition vehicle on 100% of the surveyed lanes, allowing WSDOT to complete an evaluation of all state highways. WSDOT's vehicle travels at highway speeds and collects data through the use of high-resolution digital imaging to determine the amount of cracking and patching,

#### **Drill Down Measures**

#### Summary Analysis

In 2007, roughly 93.3% of WSDOT's highway pavement was in fair or better condition, slightly down from the previous year by 0.2%.

 In comparison, 33% of major roads are in poor or mediocre condition, according to The Road Information Project.

#### CONDITION BY PAVEMENT TYPE

- WSDOT currently maintains over 18,000 lane miles of state highway pavement consisting of three pavement types: chip seal (Bituminous Surface Treatment), hot mix asphalt (HMA), and concrete.
- WSDOT's pavement management system is one of the best in the world, called a "model" for other states by FHWA. WSDOT developed an alternative strategy to lowest life-cycle costs in the face of sharp cost increases, reduced revenues, and accelerated deterioration of concrete pavements.
- Hot mix asphalt—nearly two-thirds of WSDOT's roadway network—doubled in price over the last five years, impacting the number of miles WSDOT can overlay.
- Using less-expensive chip seals to resurface HMA roads with lower traffic volumes (less than 5,000 vehicles per day) rather than HMA, WSDOT has minimized the growth of the backlog requiring rehabilitation at one third the equivalent annual cost: \$5,000/per lane mile per year vs. \$15,000/per lane mile per year.
  - The 2009-11 investment plan includes \$18 million for these resurfacings, generating efficiencies of approximately \$56 million that WSDOT will transfer to concrete pavement investments.



# Washington GMAP Dashboard Transportation

Title	Who	Due Date	Status	Status Date
ForumDate: (4)				
Implement findings of UW concrete report into assessment of the concrete pavements for the 2009 Pavement Management System report	WSDOT Pavement Office	6/30/2009	In Progress	
Preserve chip seal pavement	WSDOT Pavement Office	6/30/2011	In Progress	
Preserve asphalt roadways	WSDOT Pavement Office	6/30/2011	In Progress	
Preserve concrete roadways	WSDOT Pavement Office	6/30/2011	In Progress	

#### **Extended Analysis**

#### Hot Mix Asphalt (flexible pavements)

Hot mix asphalt pavements are preserved through resurfacing, which protects the underlying layers of pavement. By resurfacing lower-volume, hot mix asphalt pavements with chip seal, WSDOT has added about 5-7 more years onto its life for one-third the equivalent annual cost (\$5,000 vs. \$15,000 per lane mile per year).

 Approximately 40% of HMA roads are "lower volume" (average daily traffic of 5,000 or less)

Chip seals help delay the eventual rehabilitation of the pavement structure: there are currently 550 lane miles of hot mix asphalt pavement that are past due for rehabilitation, and by 2011 this is estimated to increase to 1,774 lane miles.

#### Concrete (rigid pavements)

Efficiencies from the asphalt program will be transferred to concrete pavements for dowel bar retrofitting in critical areas that have not yet cracked. Investments in dowel bar retrofitting will extend much of the state's concrete pavements by 15 years or more before additional cost is incurred to replace badly broken concrete panels.

WSDOT estimates that 400 lane miles should be replaced in the next 20 years (\$2.5 million per lane mile), while another 1,000 lane miles should be dowel bar retrofitted in the next 12 years at an estimated cost of \$600,000 per lane mile.



# WSDOT Gray Book Performance Dashboard



Goal has been met.



Performance is trending in a favorable direction.



Trend is holding.

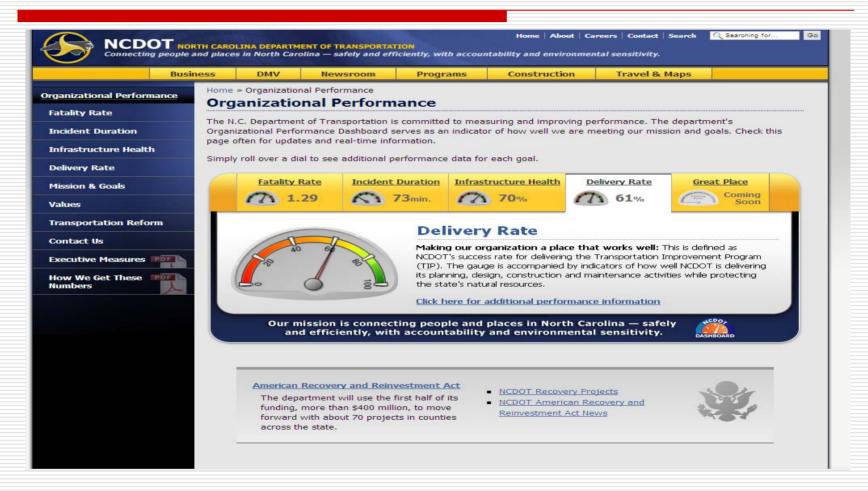


Performance is trending in a unfavorable direction.

	V					
Policy goal/Performance measure	Previous reporting period	Current reporting period	Goal	Goal met	Progress	Comments
Safety						
Number of <b>traffic fatalities</b> per 100 million vehicle miles traveled (VMT) in Washington State (annual measure, calendar years 2006 & 2007)	1.00	0.94	1.00	I	企	Highway fatalities continue to decline, even lower rate (0.76) for state/interstate highways
Yearly OSHA-recordable injury and illness rate per 100 WSDOT maintenance & engineering workers (annualized: FY09 Q3, FY09 Q4°)	5.2	5.8	6.0	I	$\bigcirc$	Meets federal benchmark, bu injuries increasing. New strate gies being implemented
Preservation						
Percentage of state <b>highway</b> pavements in fair or better condition (annual measure, calendar years 2006 & 2007)	93.5%	93.3%	90.0%	I	$\Leftrightarrow$	Recent Recovery Act funded projects may improve future condition ratings
Percentage of state bridges in fair or better condition (annual measure, calendar years 2007 & 2008)	97.0%	97.0%	97.0%	1	$\langle  \rangle$	Performance level meets goal - trend remains Mat
Mobility (Congestion Relief)						
Average clearance times for major (90+ minute) incidents on key Puget Sound corridors (quarterly: FY09 Q3, FY09 Q4 <sup>e</sup> ))	153 minutes	154 minutes	155 minutes	I	$\bigcirc$	Average clearance time increased while over-90 minut incident calls dropped 19%
Percentage of Washington State Ferries trips departing on-time <sup>2</sup> (year to year: FY08 Q4, FY09 Q4°)	92%	94%	90%	1	$\bigcirc$	On-time performance improve compared with last-year's rate
Percentage of <b>Amtrak Cascades</b> trips arriving on-time <sup>3</sup> (year to year FY08 Q4, FY09 Q4 <sup>6</sup> )	67%	75%	80%		$\bigcirc$	Best on-time performance every close to meeting goal
Annual weekday hours of delay statewide on highways compared to maximum throughput (51 MPH)¹ in thousands of hours (annual measure, calendar years 2006 & 2007)	23,330	25,490	N/A		$\bigcirc$	Growth in delay slowed from 35% to 8% between 2005 and 2007's recorded delay hours

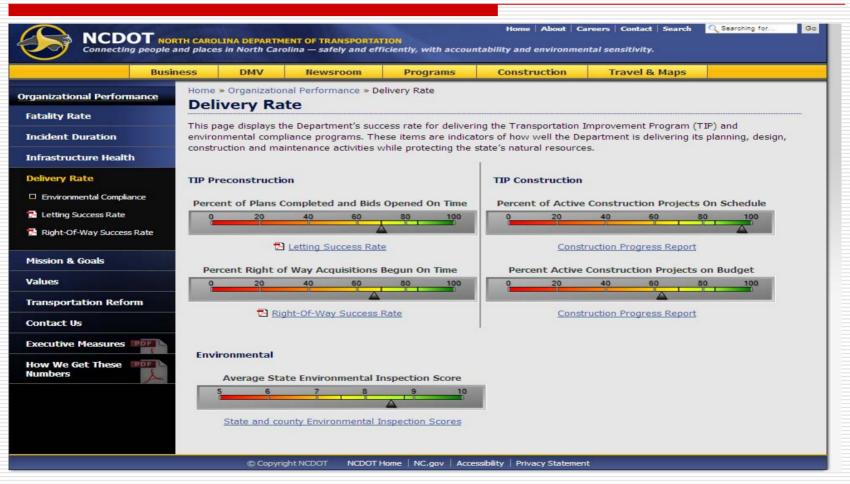


## North Carolina DOT Dashboard





#### NCDOT Dashboard drilldown



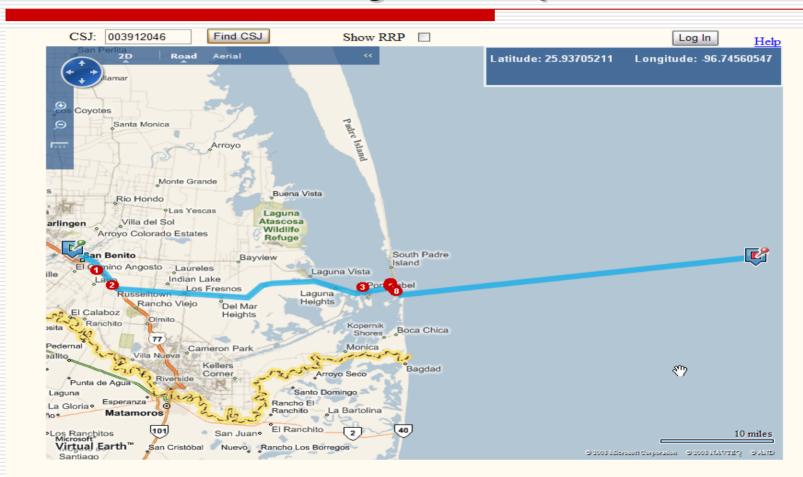


# Dashboard Data Validity

- Audience
  - Public
  - Media
  - Oversight agencies
  - Agency decision makers
- Credibility of the reporting agency
  - Dashboard presentation must match required reporting
  - Ensure public, oversight agency trust in the numbers
  - Reinforce the validity of strategic and tactical business decisions
  - A single version of the truth

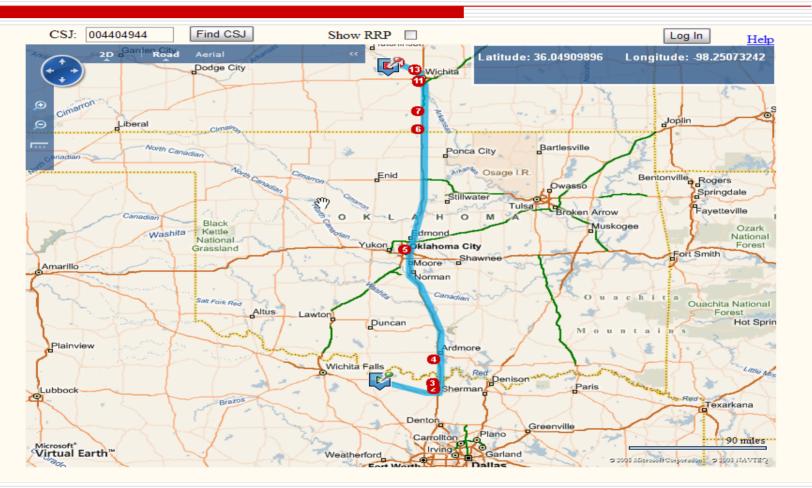


# Data Accuracy is important!





# Data Accuracy





# Data Accuracy

#### Project Detail Return to: Report List or Main Query Page Data updated on: 9/02/2009 8:44 AM Print This Page **Project Summary** Project ID 004404044 TxDOT District Wichita Falls County Name Montague Funding Status Unfunded Highway US 82 Project Length .100 Miles District Est. Bid Date 2015-Apr Project Type Traditional Work From AT UP RR. 0.8 MI WEST OF US 81 Work To NEAR RINGGOLD Description Replace Bridge This project is being developed by non-TxDOT resources. Estimates have been provided to TxDOT by these resources. Project Note Show Project Location Contact Information TxDOT Contact Adele Lewis Phone: (940) 720-7728 **Project Development Milestones** Receive Design Submittal Right of Way Project Ready to Environmental Utility 30% Complete (2) 60% Complete (2) 100% Complete @ Start Design Clearance (2) Coordination (2) Coordination (2) Bid (2) 05/2009 08/2009 03/2010 01/2015 04/2015 01/2015 Target Date 11/2009 08/2008 07/2007 09/2007 Actual Date 02/2007 07/2008 **Budget Information** Project Cost Amount Paid to Date Original Budget Current Estimate Project Engineering @ \$143,307,67 \$418,197.91 \$1,203,773,44 Construction \$2,924,646,40 \$7.014.866.38 Construction Engineering (2) \$175,478,78 \$426,732,56 \$204,725.24 Contingency (2) \$554,752.33



Indirect @

Total Cost

\$541,096.89

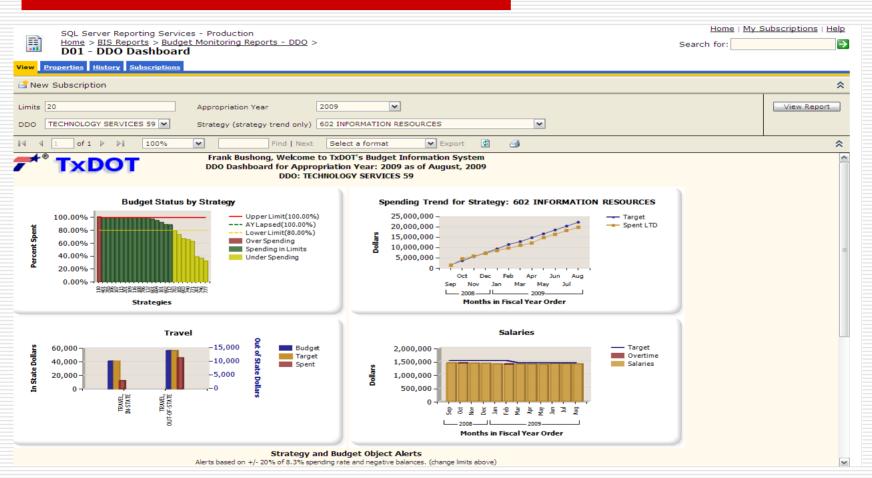
\$1,203,773,44

\$8,955,646,07

\$201,800,60

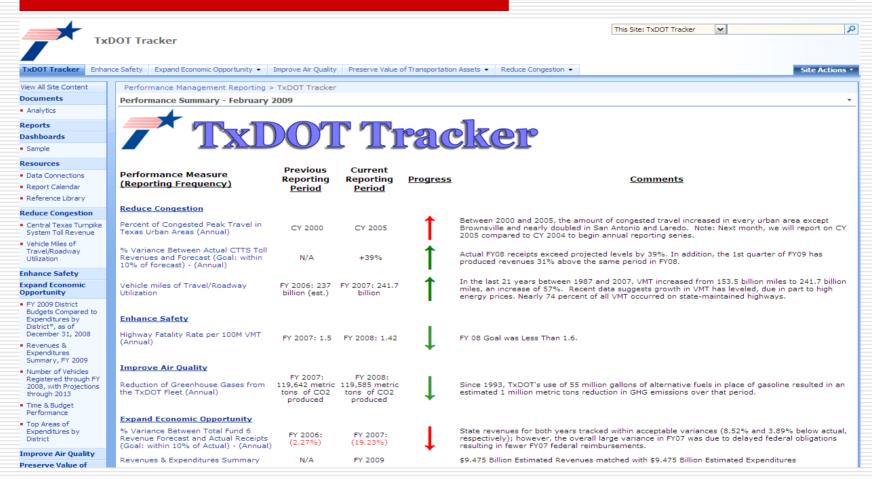
\$3,649,958,69

# TxDOT Dashboards Financial Performance



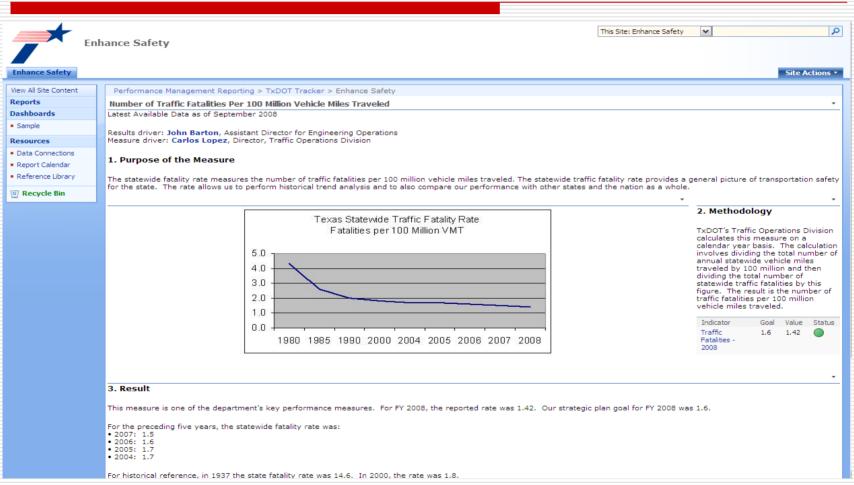


### TxDOT Tracker





### TxDOT Tracker





## **TxDOT Tracker Data**

csu E - Lufkin I		Limits From	Limits To	Type of Work	Obligated \$	Estimated \$	Over/Under %	
1676-01-007	FM 1280	END OF PAVEMENT	SH 21	SEAL COAT	\$131,416	\$133,175	1.32%	
0213-03-092	US 190	TRINITY RIVER BRIDGE	US 59 OVERPASS	SEAL COAT	\$751,581	\$761,985	1.37%	
1676-02-014	FM 1280	SH 21	SH 19	SEAL COAT	\$430,263	\$436,459	1.42%	
340-06-007	FM 358	HOUSTON COUNTY LINE	0.2 MI S	SEAL COAT	\$6,822		1.65%	
119-02-015	SH 21	SAN AUGUSTINE COUNTY LINE	FM 330	SEAL COAT	\$150,216 \$152,901		1.76%	
175-08-040	BU 59-F	FM 343	LP 224	SEAL COAT	\$86,883 \$89,103		2.49%	
176-05-163	176-05-163 US 59 1.06 MI N OF FM 942 (W)		0.67 MI N OF FM 942 (W)	\$27,444	\$28,168	2.57%		
0064-06-046	064-06-046 US 96 0.15 MI N OF FM 83		FM 83	SEAL COAT	\$6,050	\$6,328	4.39%	
Obligated Subto	tal \$6	,035,069 Estimate Subtotal	\$6,027,368				30	
109-05-036	SH 19	LP 304	1.65 MI N OF FM 231	SEAL COAT	\$172,569	\$157,558	-9.53%	
109-06-036	SH 19	1.65 MI N OF FM 231	LOVELADY S CITY LIMITS	SEAL COAT	\$204,562	\$187,109	-9.33%	
388-01-041	SH 146	US 190	0.25 MI S OF FM 2610	SEAL COAT	\$502,291 \$438,466 \$87,834 \$3,421,618	\$475,913 \$466,392 \$94,703 \$3,695,877 \$212,411	-5.54% 5.99% 7.25% 7.42%	
176-06-010	BU 59-J	JUST S OF US 190	JUST S OF GARNER ST	PLANE, SEAL, AND HMA OVERLAY				
175-04-078	US 59	BOWLIN CREEK	LIGHTFOOT CREEK	SEAL COAT				
138-06-039	US 259	RUSK COUNTY LINE	SH 204	LEVEL-UP, SEAL AND PFC				
176-05-164	US 59	0.47 MI S OF MILTON CREEK	BU 59-J OVERPASS	SEAL COAT	\$196,144		7.66%	
118-06-060	SH 21 FM 225(S)		3.48 MILES WEST OF MILL CREEK	CONST SHLDRS & SFTY TRT FXD O	\$7,259,761	\$7,911,486	8.24%	
064-01-064	SH 87	JACKSON STREET	LP 500	PLANE, SEAL AND HMA OVERLAY	\$375,206	\$414,515	9.48%	
118-09-008	LP 547	SH 21	BROADWAY ST	HMA OVERLAY	\$74,979	\$83,021	9.69%	
3315-01-021	LP 500	US 96	SH 7	HMA OVERLAY	\$191,352	\$213,034	10.18%	
0109-11-003	BU 287V	US 287 (N)	US 287 (S)	HMA OVERLAY	\$532,583	\$595,646	10.59%	
Obligated Subto	tal \$13	,457,364 Estimate Subtotal	\$14,507,667				12	
Obligated Subto	tal \$43	,769,317 Estimate Subtotal	\$51,744,907		FY:	2009 - StDev: 0.1348 -	Average: 7.91%	
Obligated Subto	tal \$176	,434,604 Estimate Subtotal \$	190,209,449		Lufkin District (R	ural) - StDev: 0.1252 -	Average: 6.28%	
							-	





# **TxDOT Tracker Data**

CSJ Highwa Start Design		hway From 30% Complete 60% Complete		To Ready To Let		Type of Work  Right Of Way Environmental			Let. Date Est. Const. Cost F			ng Cats
: BMT	-g	oo n oonpiete	30 N Complete	100 to Conquete	neady rozer	ragine	or villy	Environmental	Jan			
739-02-929 BLANK	IH 10 BLANK B	CHAMBERS C		HAMSHIRE RD		GR, BS	STR, PVMT		01/2013 BLANK	\$7,651,160.00 BLANK	3	No
739-01-928 BLANK	IH 10 BLANK B	SH 73, EAST LANK BLANK	BLANK BLANK	JEFFERSON CO			STR, PVMT		01/2013 BLANK	\$9,351,418.00 BLANK	3	No
739-02-140 LANK		SMITH RD, EA:		WALDEN RD	BLANK BLANK		STR, PVMT		01/2013 BLANK	\$19,627,801.00 BLANK	3	No
739-02-141 LANK		AT US 69 WES	T INTERCHANGE BLANK BLANK	BLANK BLANK	BLANK BLANK		R, BS, PVMT		01/2013 BLANK	\$23,509,228.00 BLANK	3	No
739-02-908 LANK		FM 365, EAST		SMITH RD BLANK BLANK	BLANK BLANK		S, STR, PVMT		01/2013 BLANK	\$20,985,004.00 BLANK	3	No
739-02-928 LANK		HAMSHIRE RD		FM 365 BLANK BLANK	BLANK BLANK		STR, PVMT		01/2013 BLANK	\$22,283,954.00 BLANK	3	No
306-03-118 1/01/2008 01			RAINBOW BRIDGE 02/01/2008 02/02/2008	0.32 MI EAST (V 07/01/2008 07/01/2008	VESTBOUND LANES) 08/01/2009 08/01/2008		TR, GRD, AC		09/2009 08/01/2008	\$512,066.55 08/01/2008	11	No
920-02-077 1/01/2008 01		CR 615 AT DR/ 2/01/2008 02/01/2008		(STR D0039700) 09/01/2008 09/01/2008				AND APPROACHES 9/01/2008 09/01/2008		\$152,018.53 09/01/2008	6	No
920-03-072 8/01/2008 08		COUNTYWIDE 8/01/2008 08/01/2008		3 10/01/2008 10/01/2008	01/01/2009 10/01/2008	SIGN BLANK	01/01/1900	8/01/2008 08/01/2008	09/2013 10/01/2008	\$255,811.50 10/01/2008	11	No
		0 AT UP RR 2/01/2008 02/01/2008	02/01/2008 02/02/2008	08/01/2008 08/01/2008	12/01/2008 12/01/2008			RADE SEPARATION 8/01/2008 08/01/2008		\$9,152,709.99 12/01/2008	6	No
084-08-050 1/01/2009 01			E 255, SOUTH 03/01/2009 05/01/2008	2.7 MI N OF US 04/01/2009 06/01/2008			IZE, ACP, ST 01/01/1900 0		11/2012 04/01/2009	\$6,196,270.23 05/01/2008	1	No
368-03-031 1/01/2009 11				FM 365 IN FANN 03/01/2009 03/01/2009		ACP, S		3/01/2009 03/01/2009	09/2012 03/01/2009	\$1,902,286.05 03/01/2009	1	No
920-12-038 2/01/2008 12			S FISH HATCHERY 01/01/2009 12/29/2008	04/01/2009 04/02/2009	05/01/2009 04/02/2009	GR, BS BLANK		LANK 09/08/2008	03/2010 04/01/2009	\$561,681.34 12/29/2008	10	No



# **TxDOT Tracker**





## Recommendations

- Obtain executive sponsorship and support
- Focus on performance measures meaningful to the organization
- □ Keep the effort small (controllable)
- □ Identify data sources
- Ensure that the data is valid
- Let business processes drive the effort, not technology



# **Future Dashboard**





# Questions?

