



MAG Management Committee

January 13, 2010



Performance Measurement Framework and Congestion Management Update



Performance Measurement and Congestion Management



PHASE
I

PHASE
II

PHASE
III

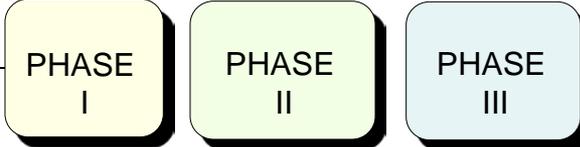
- Best Practices
- Technical Advisory Group

- Congestion Management Strategies
- CMP Update

- Data Assessment and Gap Analysis
- Performance Measurement Framework
- Performance Measurement Template Report
- Web-site Interface



Performance Measurement and Congestion Management



• CMP Update

Mode Split for Maryland Commuters (2000 and 2006)

Mode	2000 (%)	2006 (%)
Car	80.0%	78.0%
Van	1.0%	1.0%
Bus	1.0%	1.0%
Light Rail	0.0%	0.0%
Bike	1.0%	1.0%
Walk	15.0%	15.0%
Other	2.0%	2.0%
Transit	1.0%	1.0%
Other	1.0%	1.0%
Other	1.0%	1.0%
Other	1.0%	1.0%

CONSTRUCTION 90%

PERFORMANCE MEASUREMENT Best Practices



Performance Measurement Data Assessment and Data Gap Analysis

Performance Measurement Framework and Congestion Management Update Study

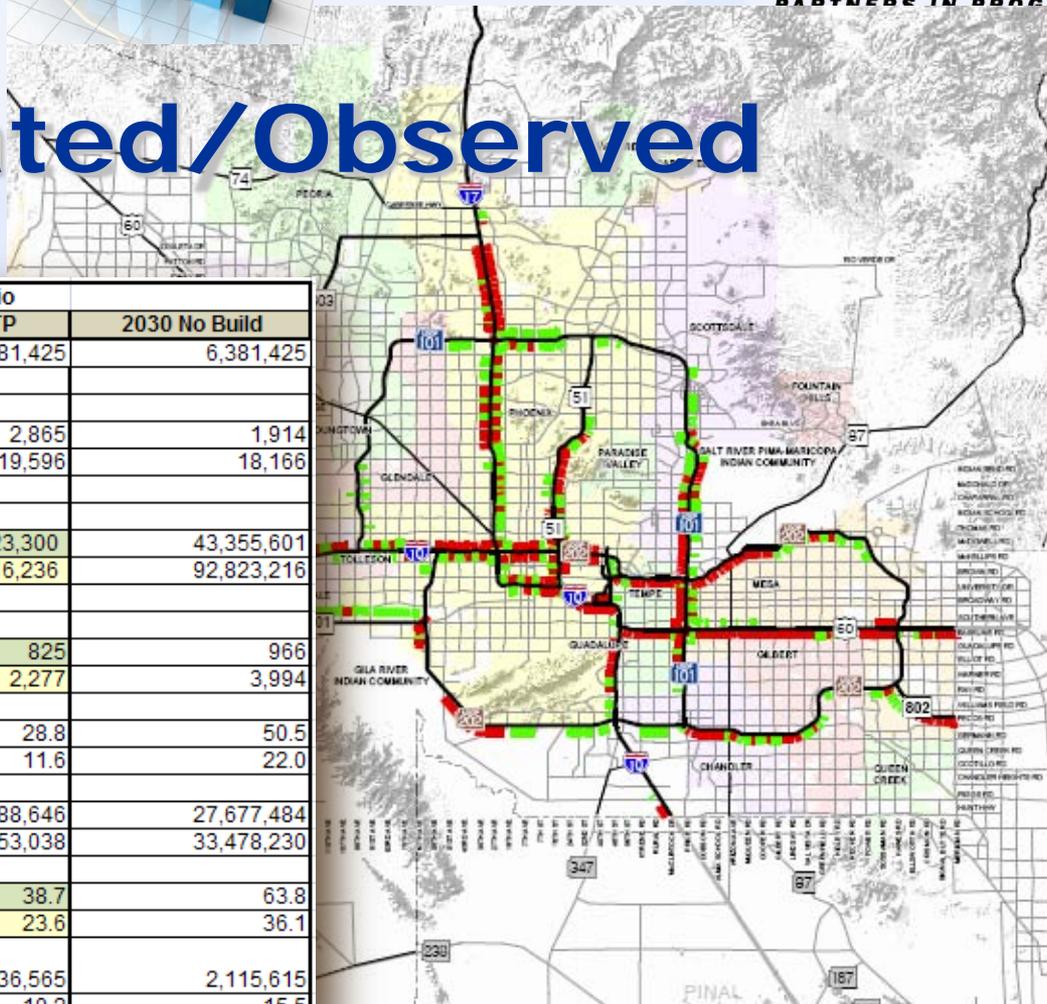
Phase II Performance Measures Report

MAG PERFORMANCE MEASUREMENT FRAMEWORK





Simulated/Observed

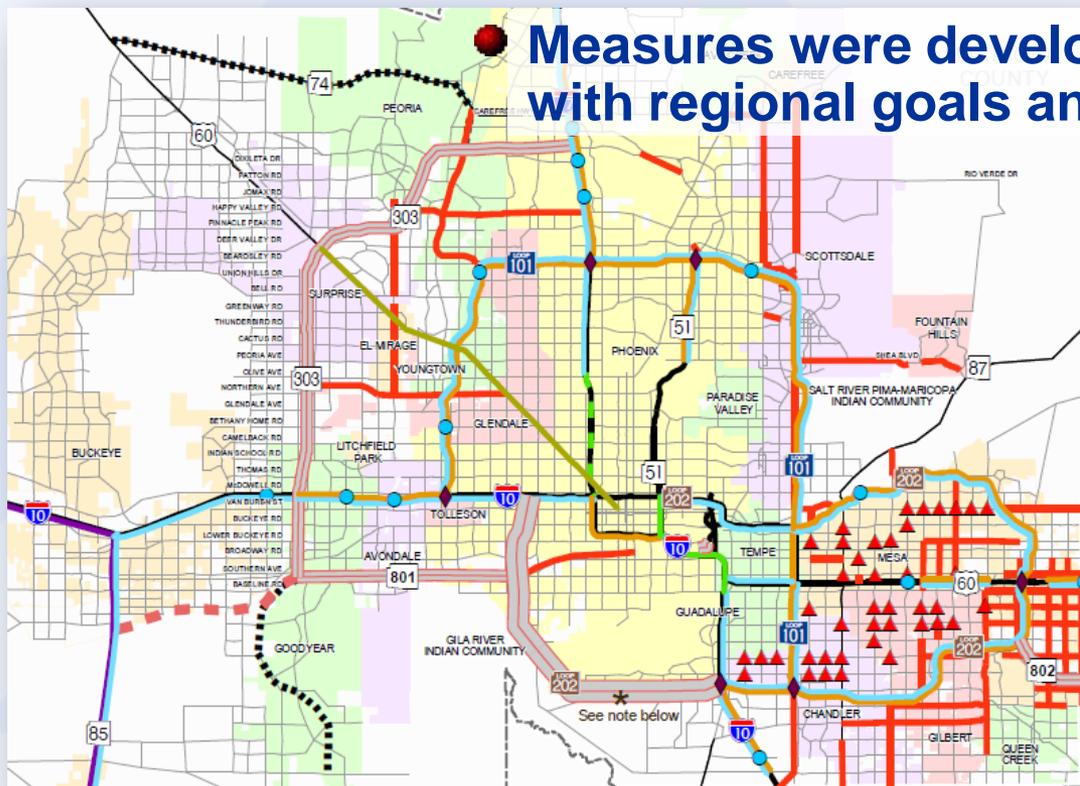


	2008 Base Year	Scenario	
		2030 RTP	2030 No Build
Population	4,171,184	6,381,425	6,381,425
Supply Measures			
Lane-Miles			
Freeway	1,920	2,865	1,914
Arterial	10,270	19,596	18,166
Demand Measures			
Daily VMT			
Freeways	33,721,948	58,423,300	43,355,601
Arterials	46,296,429	81,316,236	92,823,216
Level of Service Measures			
Congested Lane-Miles			
Freeways	433	825	966
Arterials	1,236	2,277	3,994
% Congested Lane-Miles			
Freeways	22.6	28.8	50.5
Arterials	12.0	11.6	22.0
Daily Congested VMT			
Freeways	11,777,622	22,588,646	27,677,484
Arterials	10,095,551	19,153,038	33,478,230
% Congested VMT			
Freeways	34.9	38.7	63.8
Arterials	21.8	23.6	36.1
Daily Vehicle Hours of Delay (000's)	686,069	1,436,565	2,115,615
Hrs of Delay per 1000 VMT	8.50	10.2	15.5



RTP Goals and Objectives

Measures were developed to ensure consistency with regional goals and objectives



- System Preservation and Safety
- Access and Mobility
- Sustaining the Environment
- Accountability and Planning

Performance Measures

- **Freeway GP lanes and HOV Lanes**

- Access and Mobility Measures
 - Travel Time, Travel Time Variability, and Delay Measures
 - Safety Measures

- **Arterial Performance**

- Access and Mobility Measures
 - Safety Measures

- **Transit Performance**

- Access and Mobility Measures
 - Effectiveness and Efficiency Measures
 - System Accessibility and Modal Options

- **Bicycle and Pedestrian Performance**

- Access and Mobility Measures
 - Safety Measures



Performance Measures

- **Freeway GP lanes and HOV Lanes**

- Access and Mobility Measures

- Throughput** – Vehicle ((AADT) and (AAWDT)

- Throughput – Freight (Estimated Truck Volume)

- Per Capita Vehicle-Miles of Travel (VMT)

- Lost Productivity (Percent of Productivity Lost)

Performance

- Freeway GP lanes and

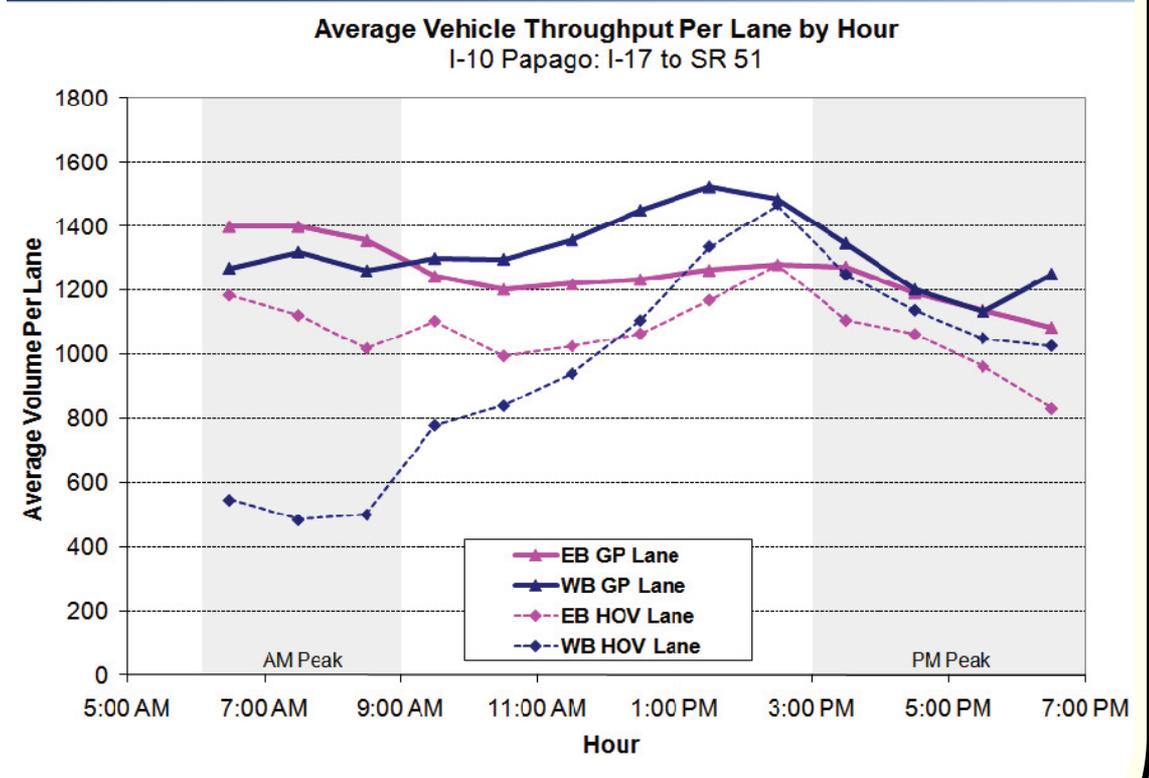
Access and Mobility

Throughput – Vehicle

Throughput – Freight (E

Per Capita Vehicle-Mile

Lost Productivity (Perce



Performance Measures

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Performance

- Freeway GP lanes and H

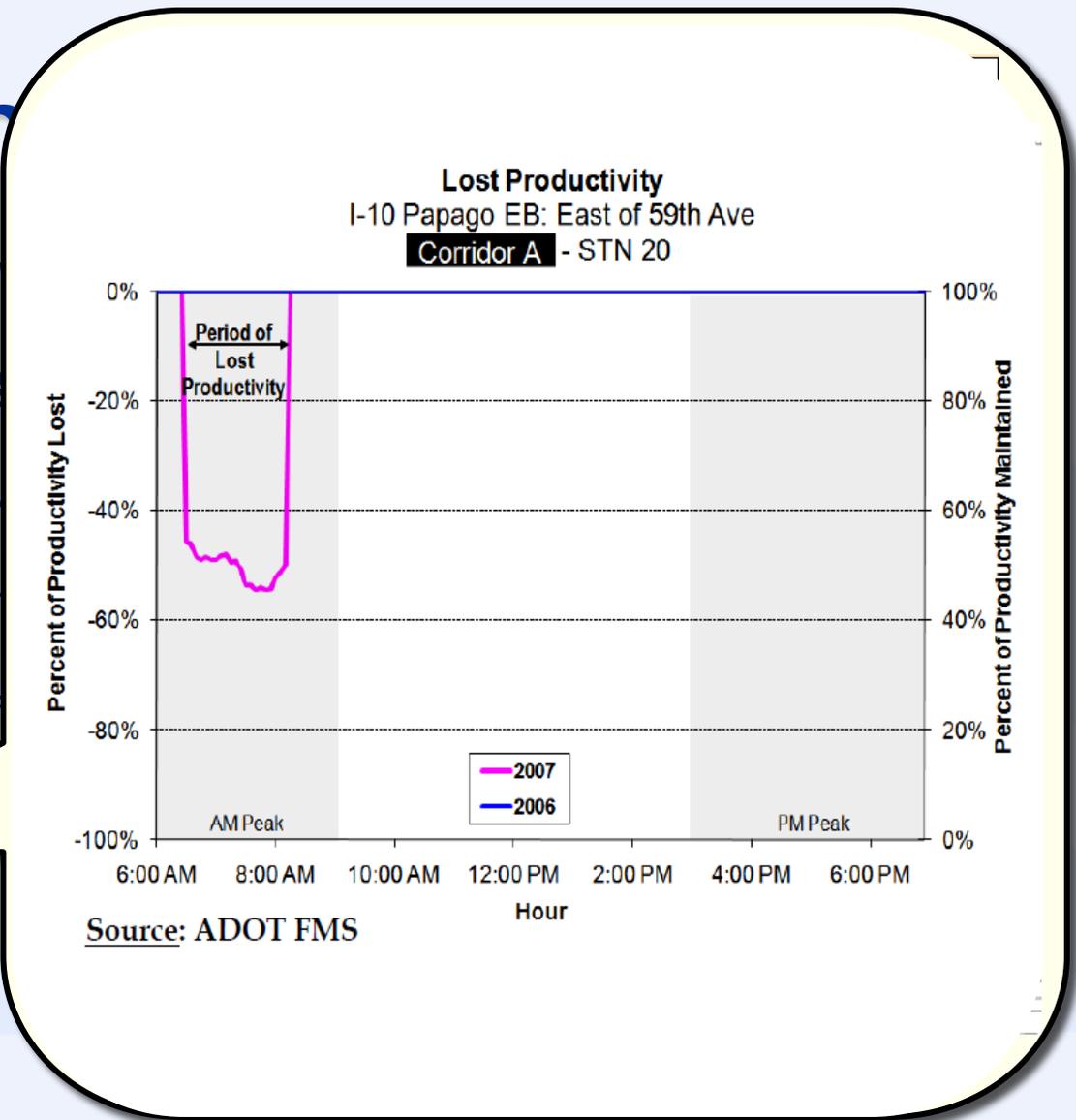
Access and Mobility Meas

Throughput – Vehicle ((AA

Throughput – Freight (Estir

Per Capita Vehicle-Miles of

Lost Productivity



Performance Measures

- **Arterial Performance**

- Access and Mobility Measures

- Throughput – Vehicle (Weighted Corridor Throughput)

- Travel Time, Travel Time Variability, and Delay Measures

- Spatial Extent of Congestion** (Percent of Time Congested)

- Safety Measures

- Intersection Crash Ranking

- Crash/Injury/Fatality Totals for Large Truck-Involved Crashes on

- the Arterial System (Total Number of Truck-Involved Crashes)

Performance

- **Arterial Performance**
- Access and Mobility
- Throughput – Vehicle
- Travel Time, Travel
- Spatial Extent** of Cor
- Safety Measures
- Intersection Crash Ra
- Crash/Injury/Fatality T

Table 3.2 Arterial Spatial Extent of Congestion

Route Name	AM Peak Period	Midday Period	PM Peak Period
19th Ave - NB	41.2%	19.6%	43.8%
19th Ave - SB	27.7%	21.6%	45.5%
59th Ave - NB	15.8%	12.0%	30.6%
59th Ave - SB	28.6%	25.0%	36.6%
Baseline RD - EB	29.9%	14.4%	37.6%
Baseline RD - WB	14.2%	14.9%	28.6%
Bell Rd / Sun Valley Pkwy - EB	31.5%	26.0%	33.2%
Bell Rd / Sun Valley Pkwy - WB	21.6%	35.6%	46.5%
Chandler Blvd - EB	32.1%	13.8%	37.2%
Chandler Blvd - WB	17.0%	16.5%	16.4%
Country Club Dr - NB	34.0%	21.6%	49.2%
Country Club Dr - SB	41.0%	35.1%	60.2%
Dysart - NB	21.9%	12.0%	39.0%
Dysart - SB	61.1%	20.3%	18.6%
Frank Lloyd Wright Blvd - EB	13.9%	14.3%	45.4%
Frank Lloyd Wright Blvd - WB	36.0%	39.8%	18.4%
Glendale Ave / Lincoln Dr - EB	40.9%	14.6%	21.8%
Glendale Ave / Lincoln Dr - WB	14.6%	10.6%	75.9%
Grand Ave - NW	14.7%	11.2%	46.8%
Grand Ave - SE	38.5%	11.2%	24.4%
Happy Valley Rd/7th St - NB	23.0%	21.6%	43.6%
Happy Valley Rd/7th St - SB	31.8%	38.3%	36.7%
Indian School Rd - EB	39.2%	15.6%	35.4%
Indian School Rd - WB	37.8%	32.4%	51.4%
McDowell Rd - EB	37.7%	25.1%	46.1%
McDowell Rd - WB	35.0%	29.4%	57.3%
Power Rd - NB	47.2%	49.5%	42.0%
Power Rd - SB	46.8%	54.0%	32.3%

the Arterial System (Total Number of Truck-Involved Crashes)

Performance

● Arterial Performance

Access and Mobility

Throughput – Vehicle

Travel Time, Travel

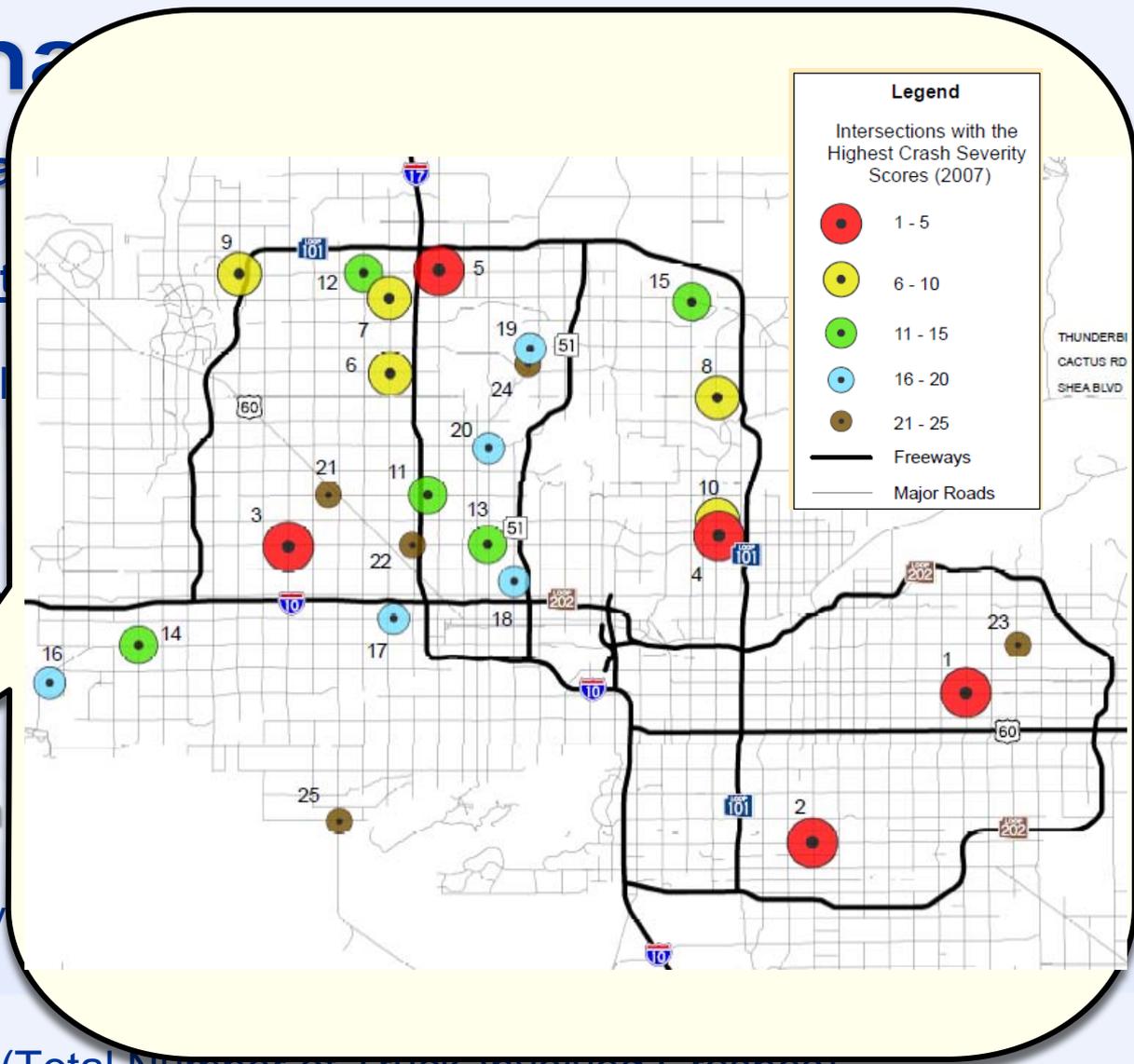
Spatial Extent of Co

Safety Measure

Intersection Crash

Crash/Injury/Fatality

the Arterial System (Total Number of Truck-Involved Crashes)



Performance Measures

- **Transit Performance**

- Access and Mobility Measures

- Transit Boardings (Total Number of Annual Transit Boardings)

- Boardings per Revenue Mile (Total Number of Annual Transit

- Boardings / Total Number of Transit Agency Revenue Miles)

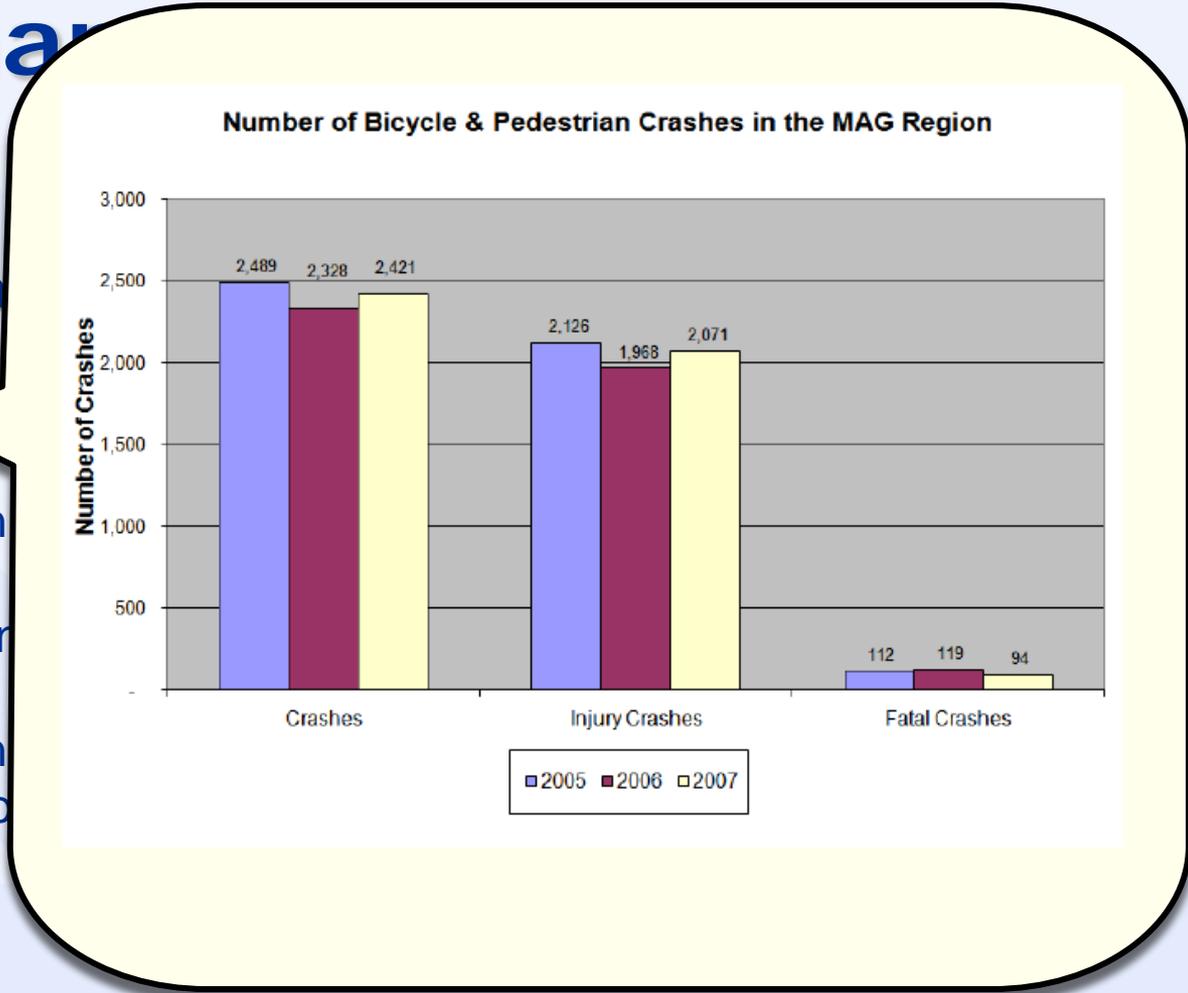
- Travel Time, Travel Variability, and Delay Measures

- Transit On-Time Performance** (Percentage of “On-Time” Trips)

Performance

● Bicycle/Pedestrian Safety Measures

Bicycle and Pedestrian System Accessibility and Safety (Percentage of Total Crashes or Pedestrians)

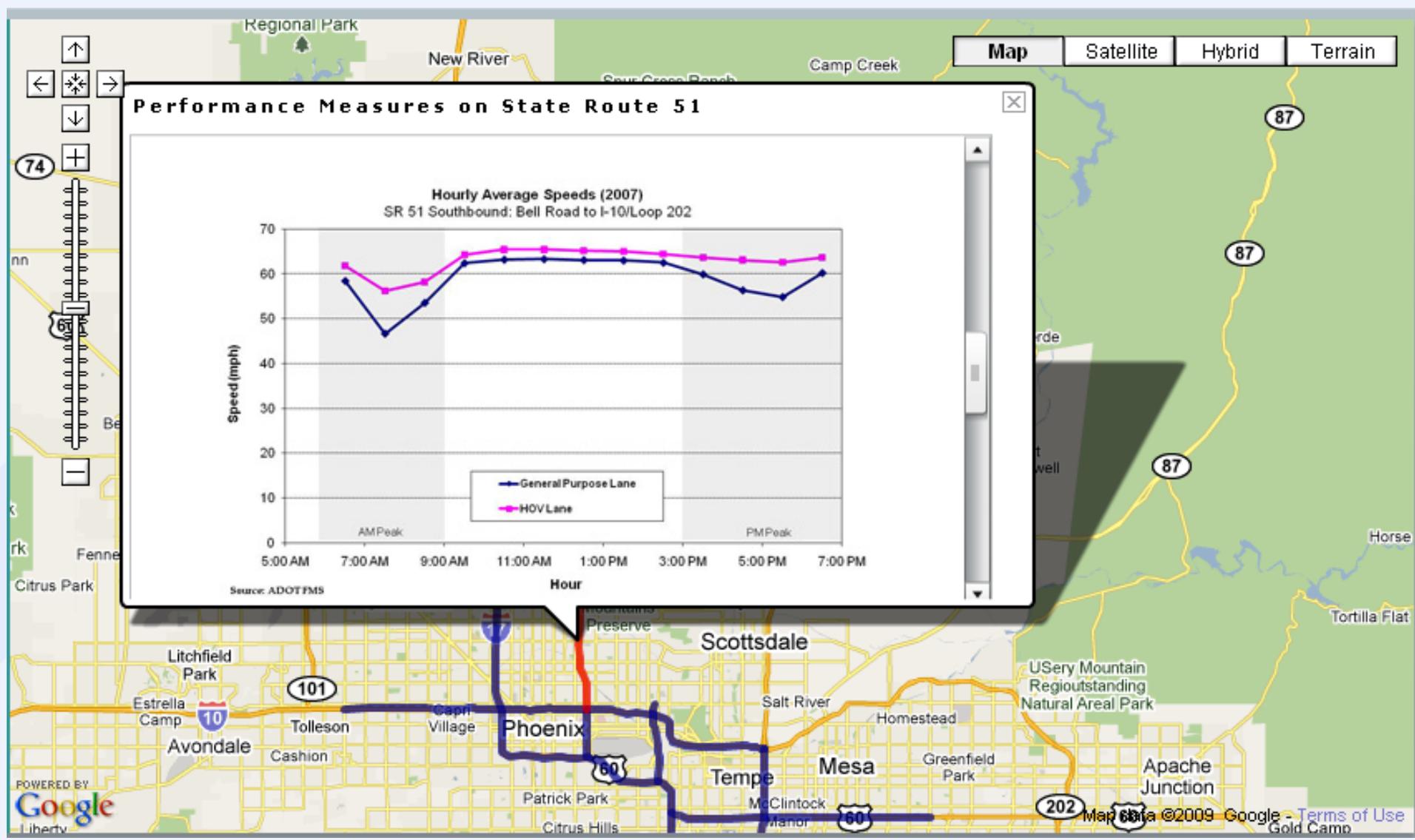


Web Interface

The screenshot displays the Performance Measures System web interface. On the left is a sidebar with the following sections:

- TCDS** **TSMS** **TIDS**
- The above buttons link to the MAG Traffic Data Retrieval System
- Filter the Performance Measure Reports **Help** **Clear**
- Modes** (indicated by a red arrow pointing to the pull-down menu):
 - Arterial Performance
 - Bicycle/Pedestrian Performance
 - Limited Access Highway and High Occupancy Vehicle (HOV) Lane Perform
 - Transit Performance
- Categories** (indicated by a red arrow pointing to the pull-down menu):
- Performance Measures** (indicated by a red arrow pointing to the pull-down menu):
- Time Period**
- Select the Performance Measure Report to Display
 - Area-wide** **Feature-specific**
 - ▶ **Maps**
 - ▶ **Figures**
 - ▶ **Tables**

On the right is a map of the Phoenix metropolitan area with various roads highlighted in blue and red. A box labeled "mode pull down menu" points to the "Modes" section, and another box labeled "measures pull down menu" points to the "Performance Measures" section.





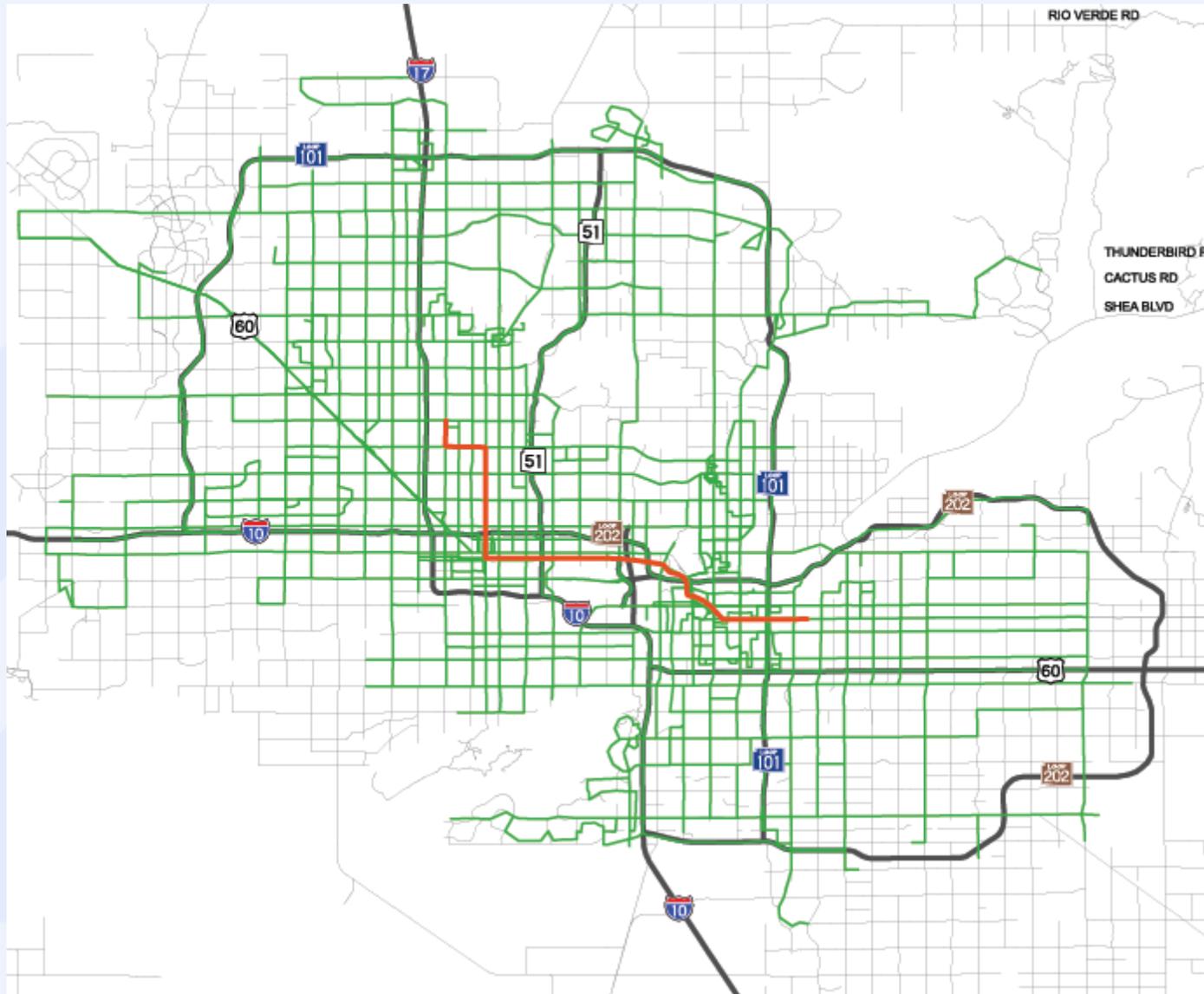
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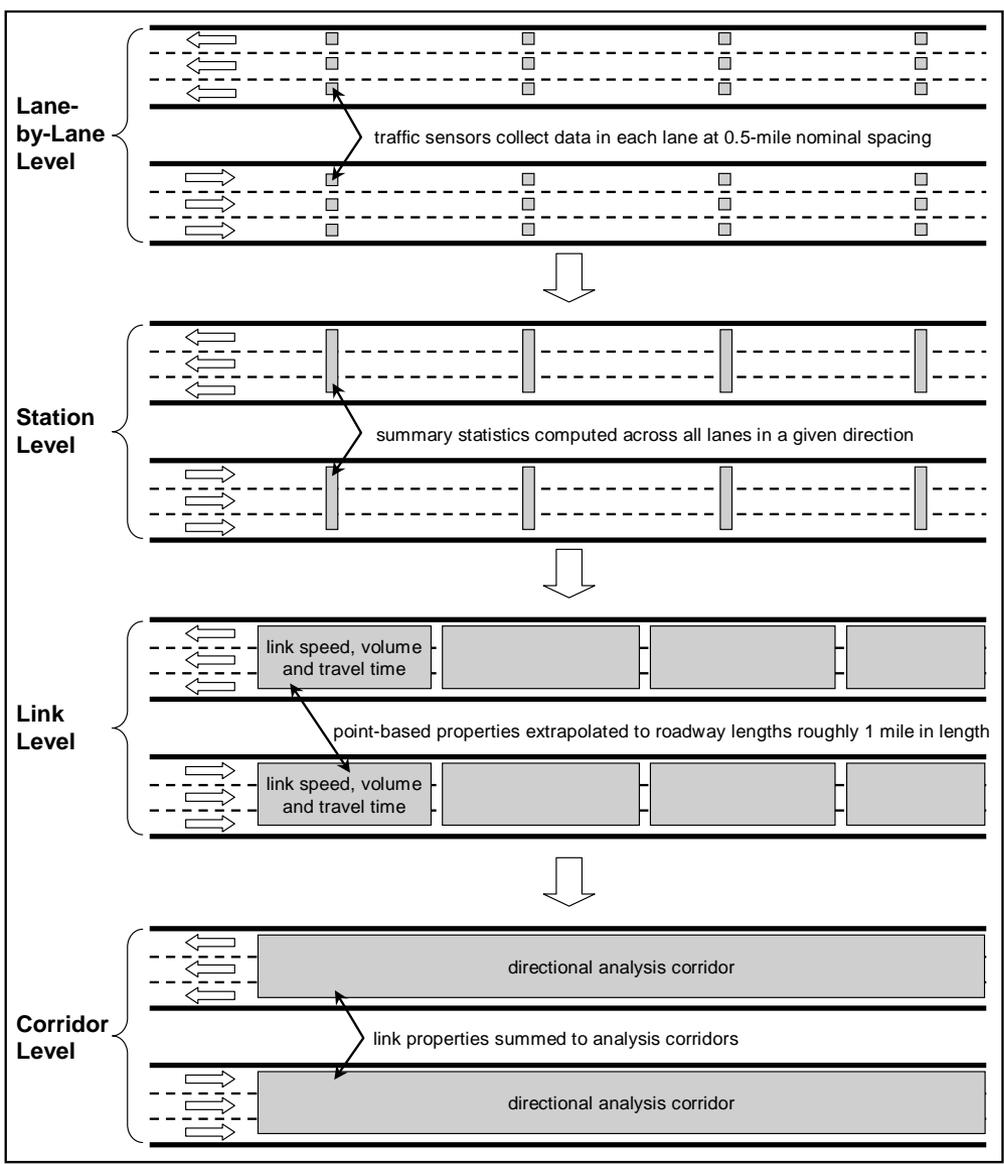
Performance Measures

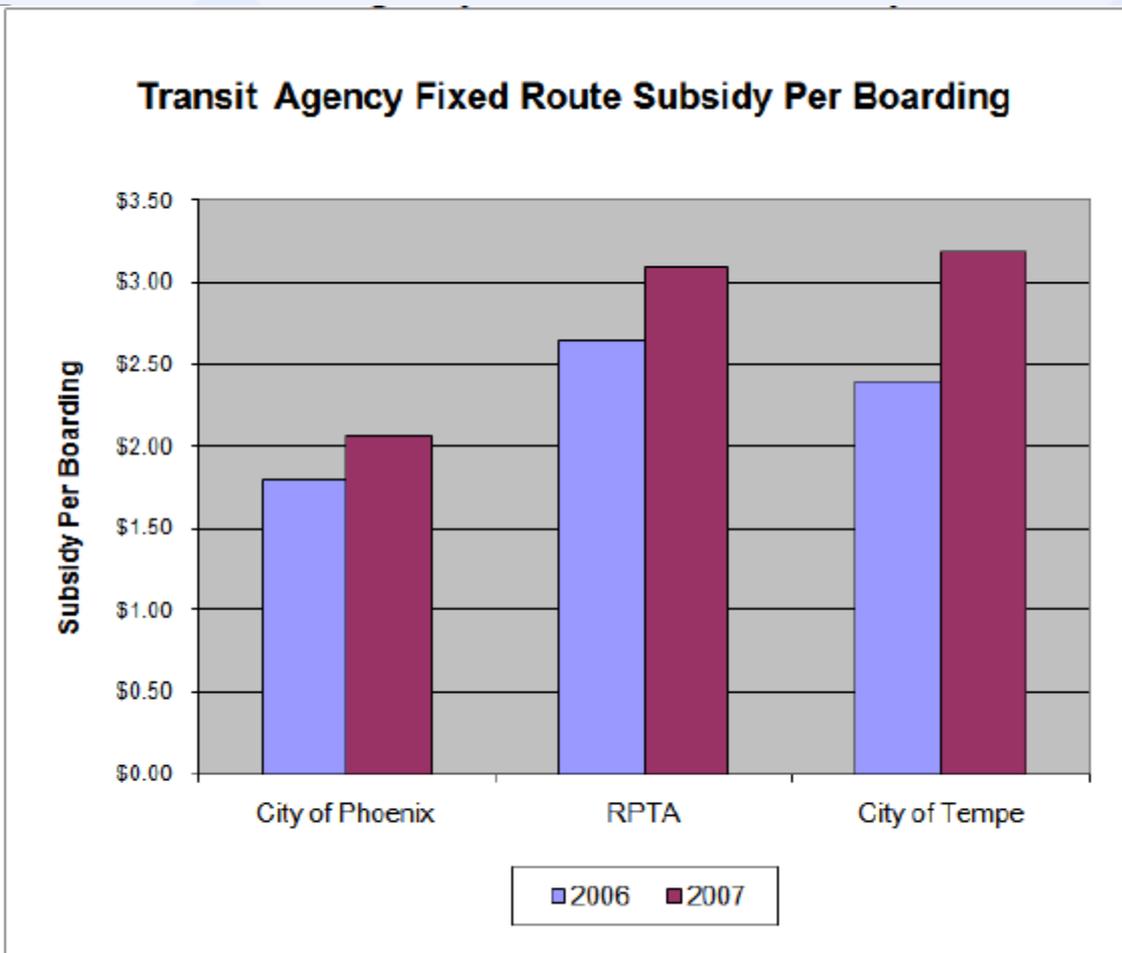
- Bicycle/Pedestrian Performance**

Table 5.1 - Growth of the MAG Region Bicycle & Pedestrian Network (Miles)²⁴

	2001	2003	2005	2008
Multi-Use Trail (Unpaved)	183.26	185.99	222.32	238.7
Multi-Use Trail (Paved)	128.47	143.11	162.38	218.8
Paved Shoulders	163.86	172.16	91.98	313.9
Bike Lanes	660.14	815.32	919.65	1,270.0
Bike Routes	374.01	393.44	477.91	480.8
Total Miles	1,509.74	1,710.03	1,874.24	2,522.2

Source: Maricopa Association of Governments





Source: 2008 Valley Metro Transit Performance Report

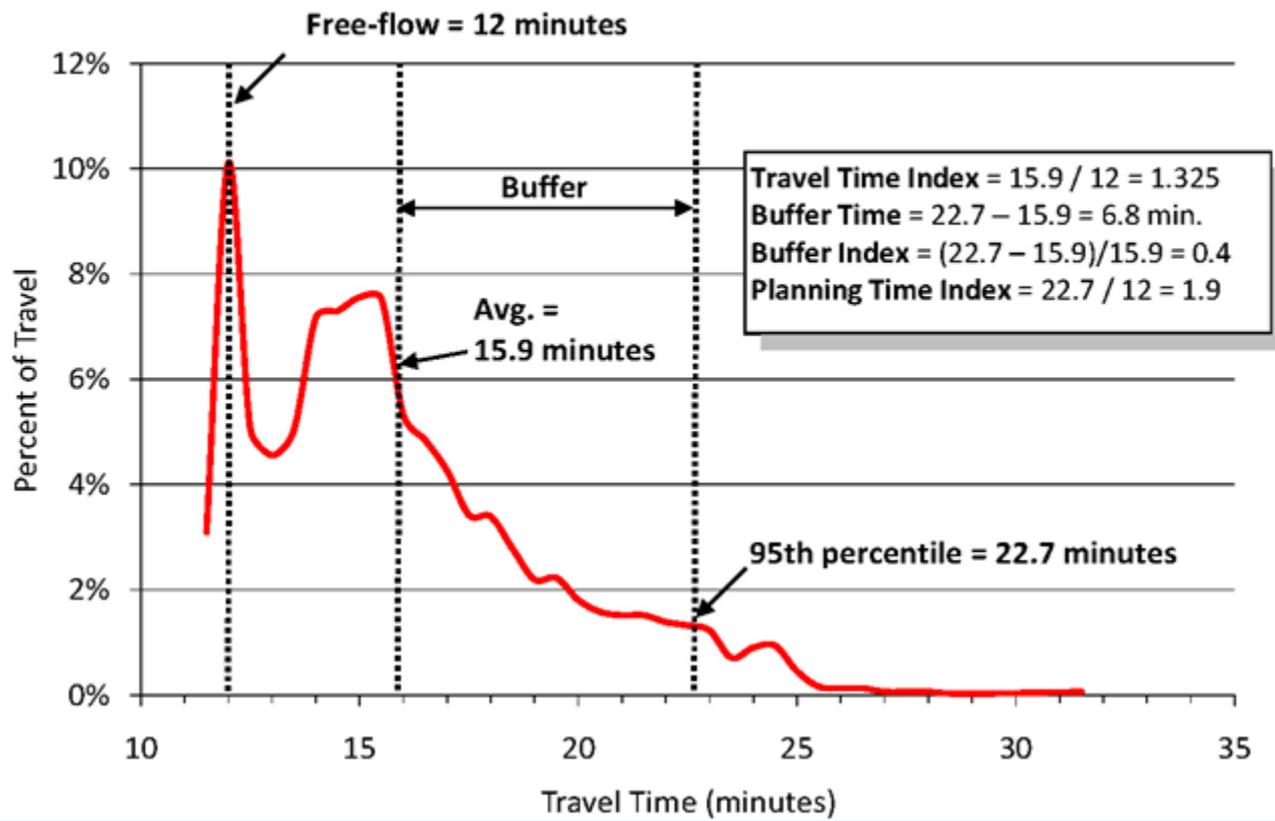
Table 2.6 Results for Per Capita Freeway VMT in the Phoenix-Mesa Urbanized Area⁸

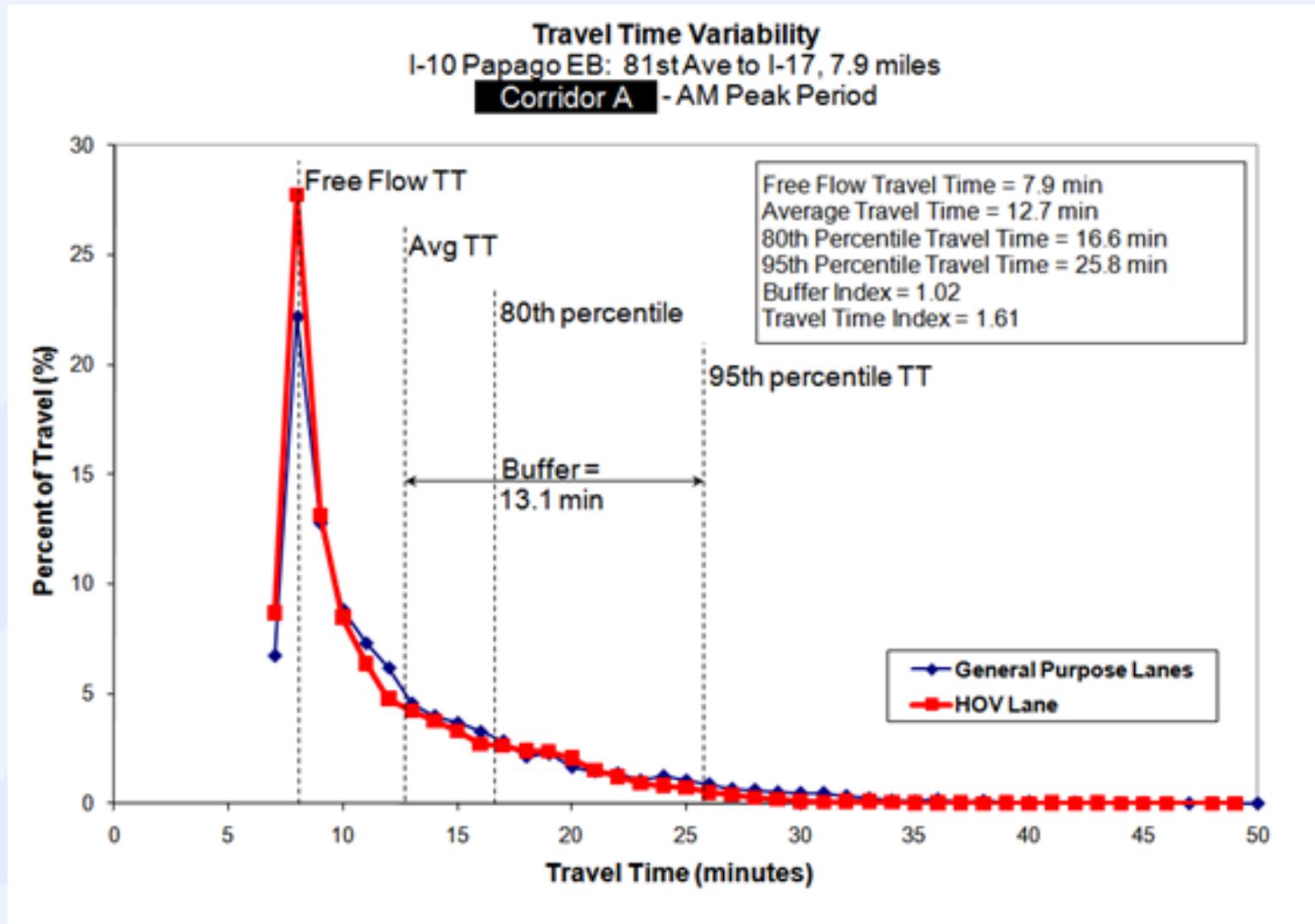
	2006	2007	% Change from 2006
VMT by Functional Class: Interstates	9,778,000	9,677,000	-1.0%
VMT by Functional Class: Other Expressways and Freeways	19,673,000	19,739,000	0.3%
Total Freeway VMT	29,451,000	29,416,000	-0.1%
Population of Phoenix-Mesa Urbanized Area	3,350,000	3,459,000	3.2%
Per Capita Freeway VMT	8.8	8.5	-3.5%

Source: ADOT HPMS

$$\text{Travel Time Index (\%)} = \frac{\text{Average Travel Time}}{\text{Free Flow Travel Time}}$$

Figure 2.19 Understanding Travel Time Variability¹¹





2007 Speed Data by Month FMS #40

I-10 EB/24th St.

