

PM-10 Mitigation Efforts by MCDOT

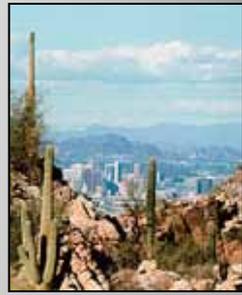
Presented to the MAG Executive
Committee on May 16th, 2011
John Hauskins, MCDOT Director



Here are the topics for today

- Our work with shoulder paving and sidewalk installation
- The development of our Low Volume Road and Dirt Road paving program
- Establishing Design Standards
- Some examples of the types of Roadway segments we are paving
- A summary of our work to date both recent and long term
- Some other related efforts in the ITS area

MCDOT PM-10 Initiative near 43rd Ave Sensor



- Vicinity of 43rd Avenue, between Southern and Broadway Avenues
- Paving of shoulders and adding sidewalks & curbing to reduce PM-10 dust generation
- BOS approved contract (up to \$3M) with FNF
- Work began May 23, 2007; completed by Sept.
- An important Part of overall regional strategy

Aerial showing roads worked on during project



**43rd Avenue Area
Dust Abatement Project
“Before” and “After” Photos**



Broadway Road at 39th Avenue Alignment (looking west) 5/25/07



Broadway Road at 39th Avenue Alignment (looking west) 9/11/07



43rd Avenue south of Broadway Road (looking south) 5/25/07



43rd Avenue south of Broadway Road (looking south) 9/11/07



Southern Avenue at 39th Avenue (looking west) 5/25/07



Southern Avenue at 39th Avenue (looking west) 9/11/07



Wier Avenue at 43rd Avenue (looking east) 5/25/07



Wier Avenue at 43rd Avenue (looking east) 9/11/07



Additional effort add sidewalks in the
area

41st Avenue at Hidalgo Avenue (looking south) 5/25/07



41st Avenue at Hidalgo Avenue (looking south) 9/11/07



**41st Place at Huntington Drive
(looking northeast) 9/11/07
ADA Ramps Installed**



Development of the Low Volume Road program

MCDOT Low Volume Roads Process until 2007

- Developed ad hoc list for paving
- Chip Sealed or paved dirt roads in County
- No established standards
- Results were mixed
- Problems such as Drainage, ROW, Utilities
- A need arose to develop a set of Design Standards and a process

**Current Conditions on
A typical Low Volume
Road**



Desired Results



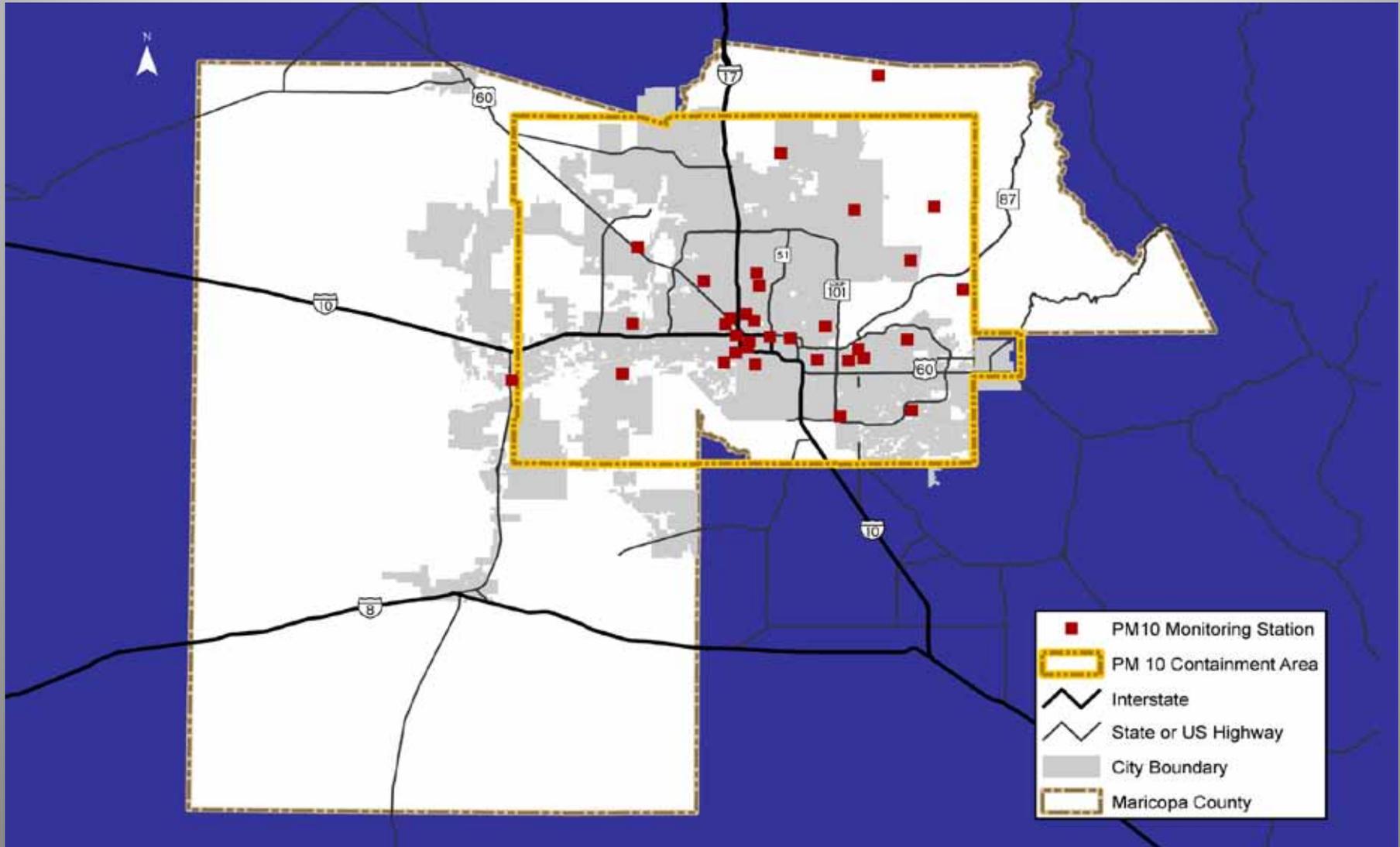
List of Low Volume roads

- Developed in 2006 and submitted to Engineering in 2007
- A new process was needed
- Discussions were held and a plan was initiated

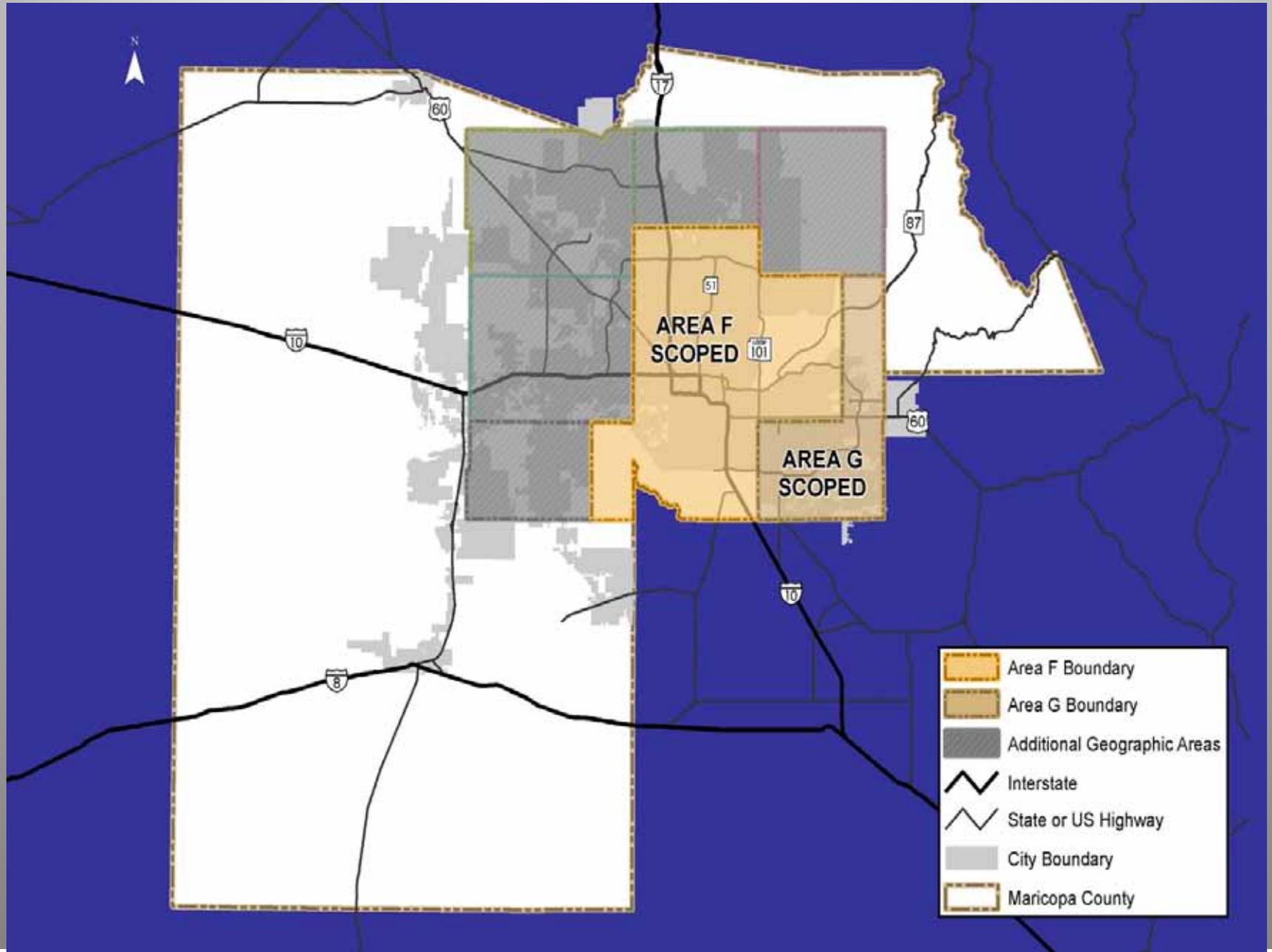
All Roadway Segments need to be Scoped

- So that they can be evaluated for category type
- A good cost estimate can be developed for programmatic decision making
- Any time sensitive elements can be worked into the plan
- Budgeting can be better defined

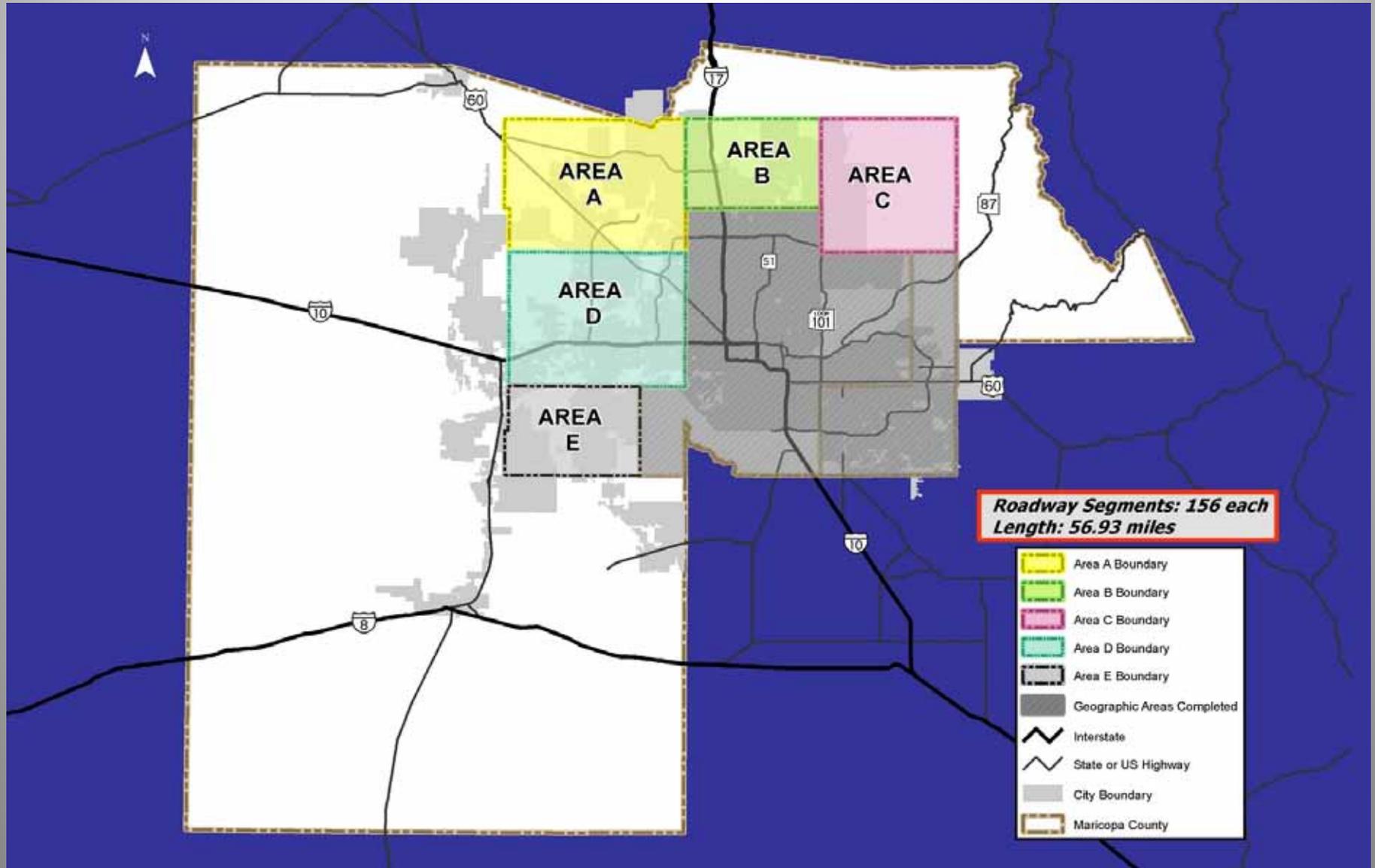
PM10 non-Attainment Area



Geographic Areas - Scoping Completed



Upcoming Roadway Scoping for FY 2011-12



Roadway segment Evaluation Process



MCDOT Identifies Roadway Segments



Consultant Performs Evaluation



Preliminary Scoping Letters

Category I
Immediate Construction



Category II
Minor R/W Acquisition
Utility Coordination
Environmental Clearance
Minor Delayed Construction



Category III
Major R/W Acquisition
Utility Relocation
Drainage Mitigation
Postponed Construction



Category IV
Ineligible for
LVR Program



Original Road List from Planning Division 2006

FY	ROAD NAME	DESIGN	NEED ROW	OPS PROJ	TAB PROJ	MILES	NOTES
2008	Hidalgo Ave: End Of Maint To El Mirage Rd			Y	Y	0.19	
2008	Old Mine Rd: Deer Trail Rd To Sombrero Rd				Y	0.24	
2008	Vista Ave: 83rd Ave To 81st Ave				Y	0.24	
2009	3rd Ave: Honda Bow Rd To Circle Mtn Rd	Y	Y		Y	0.99	
2009	26th St: Old New River Rd To Carlisle Rd		Y	Y	Y	0.32	
2009	29th Ave: Cloud Rd N To Dolores Rd	Y		Y	Y	0.39	
2009	44th Ave: End Of Maint To Carver Rd		Y	Y	Y	0.25	
2009	87th Ave: Deer Valley Dr To Peoria C/L		Y		Y	0.25	
2009	88th Ave: Deer Valley Dr To Williams Rd				Y	0.51	
2009	117th Ave: Rose Garden Ln To Harmony Ln		Y	Y	Y	0.12	
2009	118th Ave: Sun Valley Ln To Rose Garden Ln			Y	Y	0.25	
2009	119th Ave: Sun Valley Ln To Rose Garden Ln		Y	Y	Y	0.24	
2009	119th Ave: Rose Garden Ln To Harmony Ln		Y	Y	Y	0.12	
2009	Harmony Ln: 119th Ave To 117th Ave		Y	Y	Y	0.25	
2009	Harmony Ln: 117th Ave To 115th Ave			Y	Y	0.25	
2009	Rose Garden Ln: 119th Ave To 115th Ave		Y	Y	Y	0.65	
2009	Sunrise Dr: 51st Ave To 49th Dr			Y	Y	0.19	
2009	Villa Lindo: 91st Ave To 89th Ave		Y	Y	Y	0.25	
2010	11th Ave: Irvine Rd To Desert Hills Dr		Y	Y	Y	0.49	
2010	11th Ave: Maddock Rd To Joy Ranch Rd		Y	Y	Y	0.51	
2010	15th Ave: Irvine Rd To Desert Hills Dr			Y	Y	0.49	
2010	88th Ave: Calle Lejos to Peoria C/L					0.15	
2010	93rd Ave: Calle Lejos To Villa Lindo		Y	Y	Y	0.13	
2010	93rd Ave: Mariposa Grande To Calle Lejos		Y	Y	Y	0.12	
2010	223rd Ave: Ocupado Dr Align To Dove Valley Rd	Y			Y	0.25	
2010	Avenida Del Sol: 89th Ave To 87th Ave	Y			Y	0.24	
2010	Avenida Del Sol: 87th Ave To 85th Ave	Y	Y		Y	0.25	
2010	Avenida Del Sol: 85th Ave To 83rd Ave	Y	Y		Y	0.25	
2010	Briles Rd: Reems Rd To End Of Maint	Y	Y		Y	0.50	
2010	Williams Rd: 81st Ave To Peoria C/l				Y	0.25	
2011	17th Ave: Maddock Rd To Joy Ranch Rd		Y	Y	Y	0.49	
2011	Hatfield Rd: End Of Maint To 115th Ave		Y		Y	0.51	
2011	Hatfield Rd: 115th Ave To Agua Fria River		Y		Y	0.30	
2011	Hatfield Rd: Agua Fria River To 109th Ave				Y	0.49	
2011	Hatfield Rd: 109th Ave To 107th Ave		Y		Y	0.28	
2011	White Wing Rd: Cotton Ln To Sarival Ave		Y	Y	Y	1.03	
2012	30th Dr: Olney Ave Align To Elliot Rd	Y	Y		Y	0.24	
2012	McNeil St: 35th Ave To 31st Ave				Y	0.49	

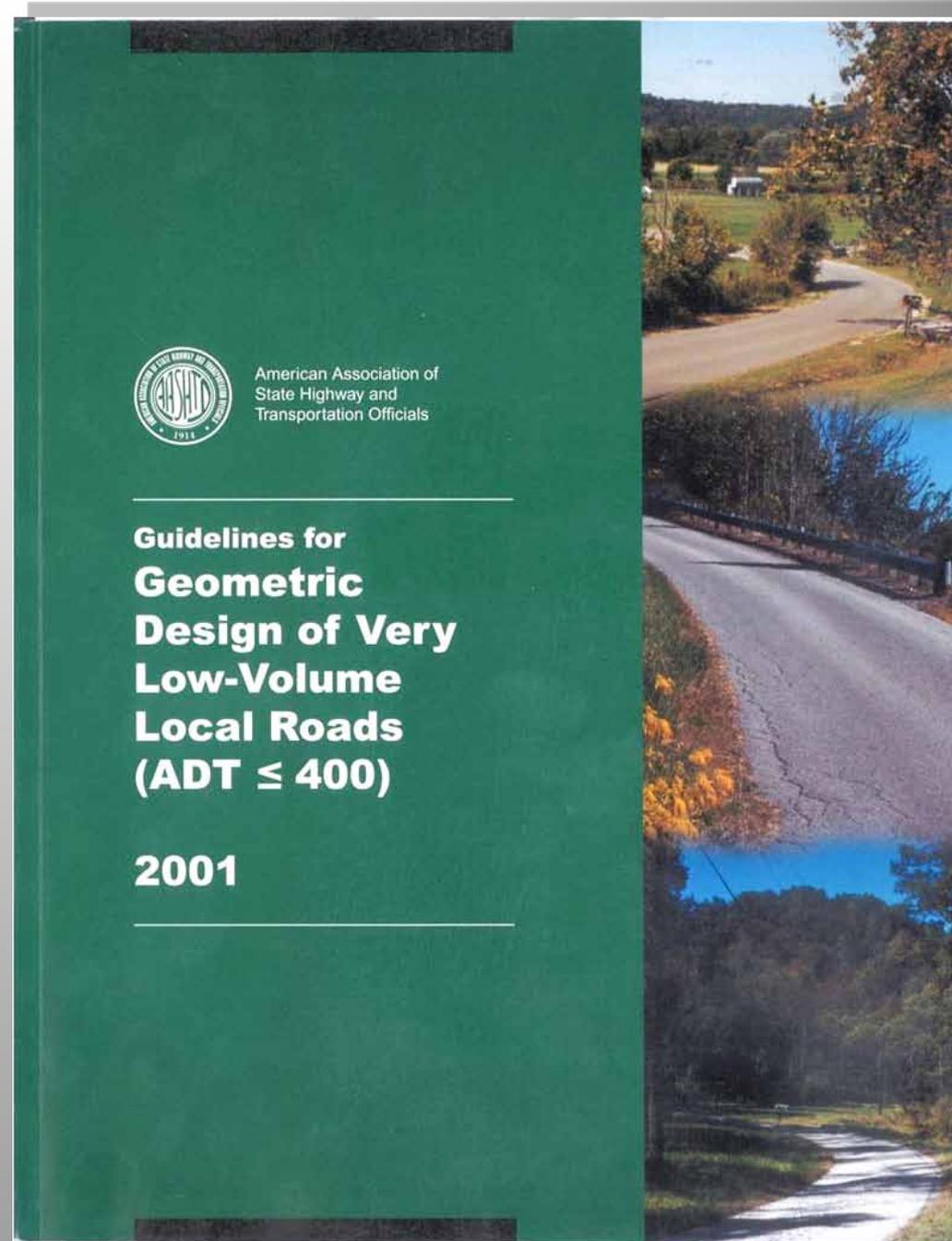
TOTAL = 13.16 Miles

Roads were then arranged in Categories

- Category I
 - No Right of Way, Utilities, Environmental and very few drainage improvements needed
- Category II
 - some ROW, Some Utility issues, minor drainage and Environmental
- Category III
 - Major ROW needed, Utility issues allowed, Major drainage allowed and Environmental Clearance may be needed

Develop Design Criteria

AASHTO Design Guidelines



Low Volume Roads Design Memo

Dated January 31, 2008

Details:

- Ø Roads that serve an area with limited development and no potential to carry through traffic.**
- Ø Average daily traffic volume of 400 vehicles per day or less.**
- Ø Design speed of 25 MPH will be used.**
- Ø Minimum cross section width 20-feet.**
- Ø Minimum sight distances of 125-feet.**
- Ø Clear zone hazards located within 6-feet of the proposed new pavement edge will be identified.**

“Where constraints of cost, terrain, right of way or potential social/environmental impacts make the provision of a 6-foot clear recovery area impractical, clear recover areas less than 6-feet in width may be used, including designs with 0-foot clear recovery areas.”

Recommendations

<u>Roadway Improvements</u>	Minimum	Preferred	Maximum
Cross Section Elements	20-feet	24-feet	24-feet
Clear Zone	0-feet	6-feet	N/A
Cross Slope θ	1%	2%	3%

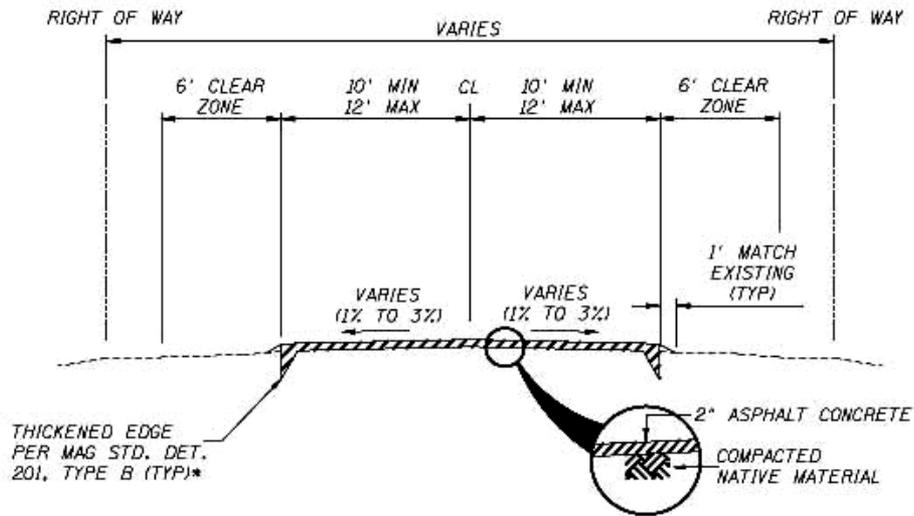
Dust proofing measures will include grading, watering and compaction and 2-inch AC pavement section. Cross sections may be a one-way slope or a two-way crowned section.

θ Match existing cross slope as close as possible to eliminate the need for imported material.

Shoulder Improvements for Existing Paved Roads

Paved Width	5-foot from outside edge of pavement.
Cross Slope	Match existing cross slope

Shoulder dust proofing measures will include removal to a 2-inch depth of soil shoulder, compaction and 2-inch AC pavement section.



TYPICAL CROSS SECTION-CROWNED

* UNLESS OTHERWISE DIRECTED BY THE ENGINEER

LOW VOLUME ROAD EXHIBIT	JOB NUMBER 193141.401
JACOBS CARTER BURGESS	101 N. FIRST AVE., #3100 PHOENIX, AZ 85003 TEL: 602.253.1200 FAX: 602.253.1202

DATE: JAN. 2008
DRAWING:

Examples of Roadway Segments

Category I Road Example

Right-of-Way, Utility, and Environmental Issues

= None (or Very Minor)

Preliminary Scoping Document – Hidalgo Ave

Fiscal Year 2008 Hidalgo Avenue (0.19 miles) End of Maintenance to El Mirage Road



Hidalgo, 100' west of El Mirage facing west.



200' east of end of maintenance facing west.

I. Existing Conditions

Roadway

Between End of Maintenance and El Mirage Road is a 20'-25' wide graded local road that provides access to residences and other local roads. ADT is 165. The roadway grade is fairly flat with irrigated lots on either side.

Adjacent Property

All of the adjacent property is irrigated residential with lot sizes larger than one acre.

Utilities

There is an existing low hanging aerial line and irrigation pipe that crosses Hidalgo Avenue at El Mirage.

Drainage

The project is located within an active floodplain. The overall drainage for this roadway ponds where it falls however it does slope slightly to the west. There appears to be no offsite flows impacting the roadway prism as the adjacent lots are bermed to hold irrigation for pasture.

Right-of-Way

The existing right-of-way width is 25' north and south of the centerline.

EXISTING CONDITIONS:

Roadway

20' to 25' Graded – Fairly Flat
ADT = 165

Adjacent Property

Irrigated Residential > 1 Acre

Utilities

Low Hanging Aerial Line
& Irrigation Pipe

Drainage

Active Floodplain

Right-of-Way

Existing 50'

PROPOSED IMPROVEMENTS:

Roadway Section

Place 24' Crowned Pavement

Signing & Striping

Existing to be Maintained

Topographical Issues

No Topographical Issues

Environmental Observations

No Environmental Impacts

Design Considerations

Irrigation Berms to be Maintained

Recommended Category Class

Category I

ESTIMATE

Description	Unit	Quantity	Unit Price	Amount
Asphalt Pavement (2" Depth)	SY	2675	\$10	\$26,750
Subgrade Preparation	SY	2675	\$9	\$24,075
Subtotal				\$50,825
Misc. Work (20%)				\$10,165
Subtotal				\$60,990
Erosion Control (1%)	LS	1		\$610
Quality Control (2%)	LS	1		\$1,220
Water Supply (1%)	LS	1		\$610
Dust Palliative (1%)	LS	1		\$610
Maintenance & Protection Traffic(10%)	LS	1		\$6,099
Subtotal				\$70,139
CM & Contingency 20%				\$14,028
Total				\$94,331





Category II Road Example

Right-of-Way, Utility, and Environmental Issues

= Manageable

Preliminary Scoping Document – Rose Garden Ln

Fiscal Year 2009
Rose Garden Lane (0.65 miles)
119th Avenue to 115th Avenue



Intersection Rose Garden and 115th Ave facing west.



200' west of 118th Ave facing west.

I. Existing Conditions

Roadway

Between 119th Avenue and 115th Avenue is a 25' wide graded local road that provides access to residences and other local roads. ADT is 172. The roadway grade is fairly flat with loose heaped material at the edges.

Adjacent Property

All of the adjacent property is residential with lot sizes larger than one acre. An operational sand and gravel operation is located to the south from 115th Avenue to 117th Avenue.

Utilities

There are existing power poles located on the south side of the road from 117th Avenue to 115th Avenue. An existing telephone riser 200' east of 117th Avenue and water valve are located on the north side of the road. A large vent pipe with bollards is located on the northeast corner of 117th Avenue.



EXISTING CONDITIONS:

Roadway

25' Graded – Fairly Flat
ADT = 172

Adjacent Property

Residential > 1 Acre
Operational Sand & Gravel

Utilities

Existing Power Poles
Existing Telephone Riser
Force Main Vault
Large Vent Pipe in ROW

Drainage

Near Agua Fria River

Right-of-Way

Existing 40' to 80'

PROPOSED IMPROVEMENTS:

Roadway Section

Place 24' Crowned Pavement

Signing & Striping

Existing Signs to be Maintained
Double Yellow Centerline

Topographical Issues

No Topographical Issues

Environmental Observations

Existing Dirt Piles

Design Considerations

ROW Cleared
Fence in Clear Zone
Minor Trees Removed

Recommended Category Class

Category II

ESTIMATE

Description	Unit	Quantity	Unit Price	Amount
Asphalt Pavement (2" Depth)	SY	9152	\$10	\$91,520
Subgrade Preparation	SY	9152	\$9	\$82,368
Relocate Existing Fence	LF	1320	\$10	\$13,200
Subtotal				\$187,088
Misc. Work (20%)				\$37,418
Subtotal				\$224,506
Erosion Control (1%)	LS	1		\$2,245
Quality Control (2%)	LS	1		\$4,490
Water Supply (1%)	LS	1		\$2,245
Dust Palliative (1%)	LS	1		\$2,245
Maintenance & Protection Traffic (10%)	LS	1		\$22,451
Subtotal				\$258,181
Contingency 20%				\$51,636
Total				\$347,235

Category III Road example

Right-of-Way, Utility, and Environmental Issues

= Significant

Preliminary Scoping Document – Briles Rd

Fiscal Year 2010 Briles Road (0.50 Miles) Reems Road to End of Maintenance



200'± east of Intersection of Reems Road facing east. 300'± east of 151st Avenue facing west.

I. Existing Conditions

Roadway

From the intersection of Reems Road to 151st Avenue, Briles Road is a 20'± graded local road that provides access to residences and other local roads. The ADT is 178. Briles Road is offset to the north edge of the right-of-way and drifts to the center of the right-of-way at the intersection of 151st Avenue. The terrain can be considered flat. The horizontal alignment is tangent but the vertical alignment gradually slopes downward into the flood plain and slopes back upward out of the floodplain west of the intersection of 151st Avenue. Within the floodplain the vertical alignment rolls in and out of the numerous at grade wash crossings. Dual driveways compose the south leg of the 151st Avenue intersection.

Adjacent Property

All of the adjacent property is undeveloped or residential with lot sizes larger than one acre.

Utilities

Power poles parallel the north side of the roadway at the right-of-way line but cross to the south edge of the right-of-way 300'± feet west of the 151st Avenue intersection.

EXISTING CONDITIONS:

Roadway

20'± Graded Sloped Road
ADT = 178

Adjacent Property

Residential > 1 Acre

Utilities

Power Pole Lines that
Cross the Road

Drainage

Active Floodplain &
Floodway

Right-of-Way

Existing 60' in Areas
4 Acquisitions Necessary

PROPOSED IMPROVEMENTS:

Roadway Section

Place 20' Crowned Pavement

Signing & Striping

Existing to be Maintained

Topographical Issues

All-Weather Crossing should
be Considered

Environmental Observations

404 Permit Required

Design Considerations

Sight Stopping Issue

Recommended Category Class

Category III

Estimated Cost Estimate

The estimate is based upon placing a 20-foot wide pavement two inches thick on native.

Description	Unit	Quantity	Unit Price	Amount
Asphalt Pavement (2" Depth)	SY	5867	\$12	\$70,404
Subgrade Preparation	SY	5867	\$15	\$88,005
Subtotal				\$158,409
Roadway Excavation (10%)	LS	1		\$15,841
Drainage Improvements (20%)	LS	1		\$31,682
Utility Relocation (15%)	LS	1		\$23,761
Misc. Work (20%)	LS	1		\$31,682
Subtotal				\$261,375
Erosion Control (1%)	LS	1		\$2,614
Quality Control (2%)	LS	1		\$5,227
Water Supply (1%)	LS	1		\$2,614
Dust Palliative (1%)	LS	1		\$2,614
Maintenance & Protection Traffic (10%)	LS	1		\$26,137
Subtotal				\$300,581
Contingency 20%				\$60,116
Total				\$360,697



AUG 10 2006



Right-of-Way Issues: 15 Parcels, State Trust Land, BLM

Utility Issue: High Voltage Lines

Environmental Issue: Agua Fria River (1/2 Mile Wide)

This roadway would be classified as a Category IV road

AUG 10 2006



Estimated Cost Estimate

The estimate is based upon placing a 34-foot wide pavement 6-inches AC over 10" ABC.

Description	Unit	Quantity	Unit Price	Amount
Asphalt Pavement (6" Depth)	SY	25731	\$36	\$926,316
Aggregate Base Course	CY	7146	\$20	\$142,920
Subgrade Preparation	SY	25731	\$15	\$385,965
Subtotal				\$1,455,201
Roadway Excavation (15%)	LS	1		\$218,280
Drainage Improvements (25%)	LS	1		\$363,900
Utility Improvements (15%)	LS	1		\$218,280
Misc. Work (20%)	LS	1		\$291,040
Subtotal				\$2,546,602
Erosion Control (1%)	LS	1		\$25,466
Quality Control (2%)	LS	1		\$50,932
Water Supply (1%)	LS	1		\$25,466
Dust Palliative (1%)	LS	1		\$25,466
Maintenance & Protection Traffic (15%)	LS	1		\$381,990
Subtotal				\$3,055,922
Contingency 20%				\$611,184
Total				\$3,667,107

Category IV - Reasons for Ineligibility for LVR Program

- Horizontal & Vertical Realignment
- Major Drainage Concerns
- Excessive Right-of-Way Needs
- Major Environmental Involvement
- Major Utilities Relocations



Summary of Current Efforts

Roadway Segments Paved by MCDOT and
in Partnership with the City of Phoenix

18 Miles / 63 Segments

Roadway Segments Paving for FY 2012
(Category I - Areas A to E)

15 Miles / 50 Segments

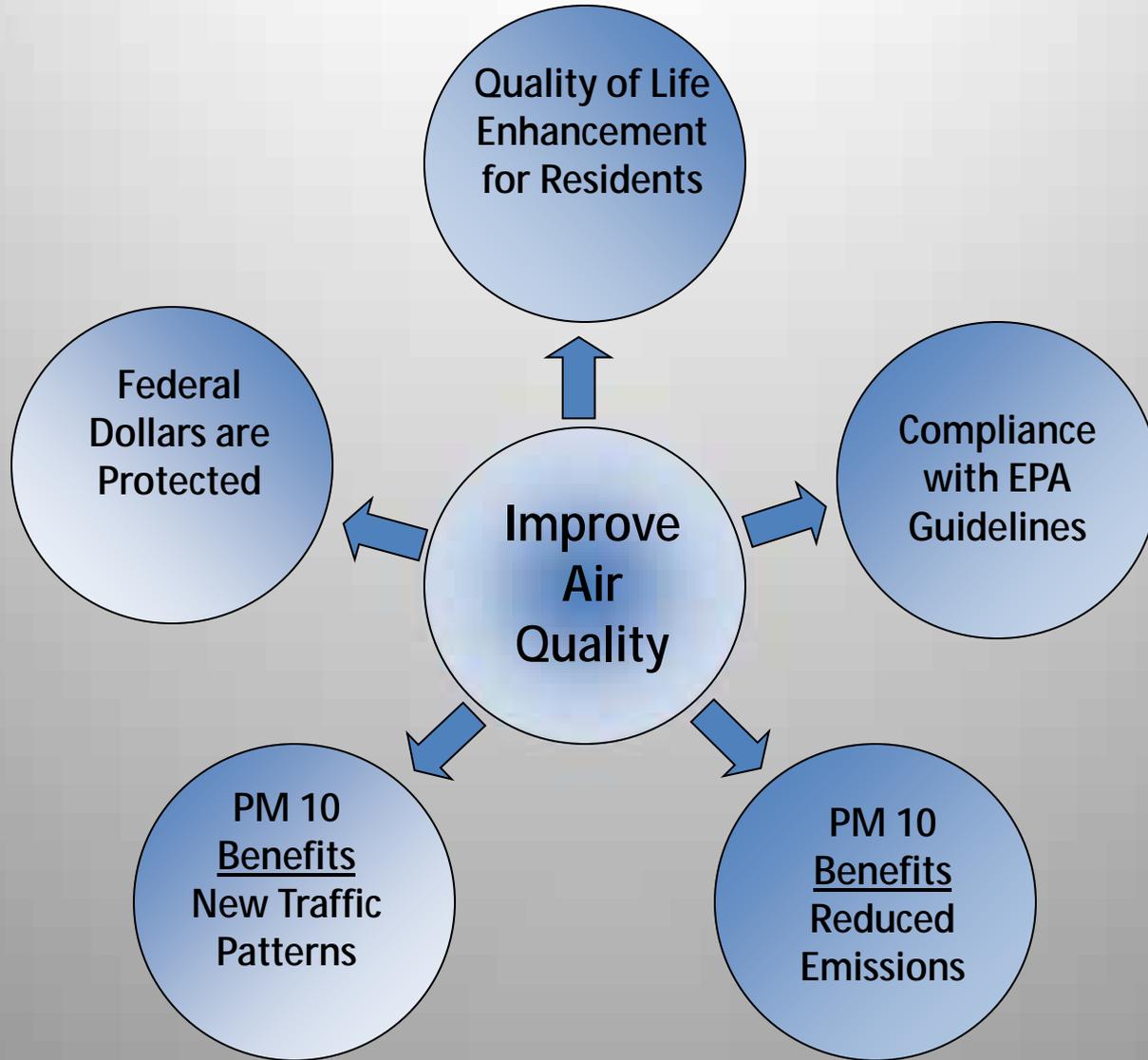
Roadway Segments Ineligible for
LVR Program (Category IV)

7.5 Miles / 16 Segments

Upcoming Roadway Segments Scoping
FY 2012 (Category II & III - Areas A to E)

42 Miles / 106 Segments

The Goals

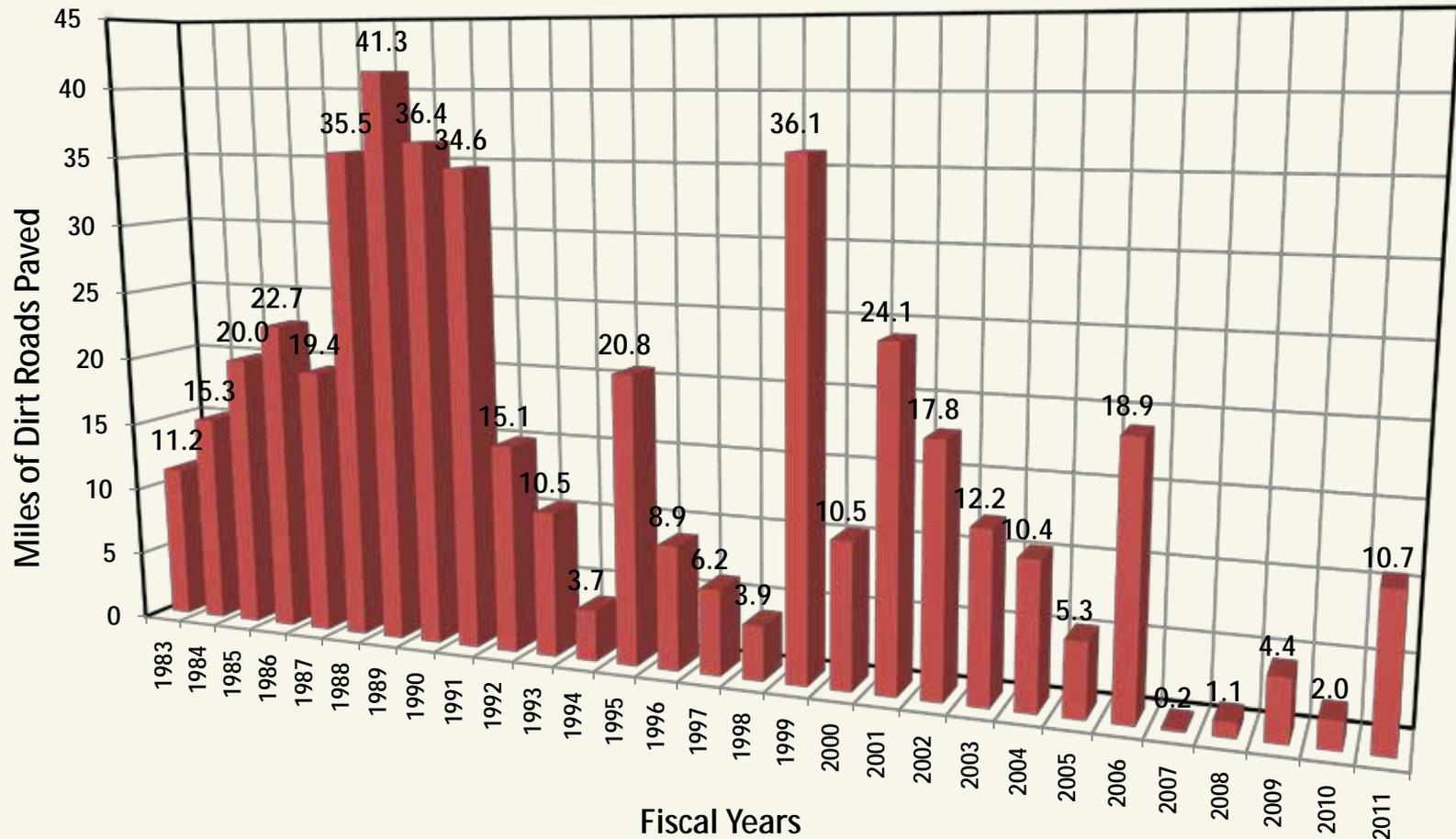


**Low Volume - Roads Program
FY 2006 to 2011 Update**

Dirt Road Paving program
Summary of Results from 1983 to 2011

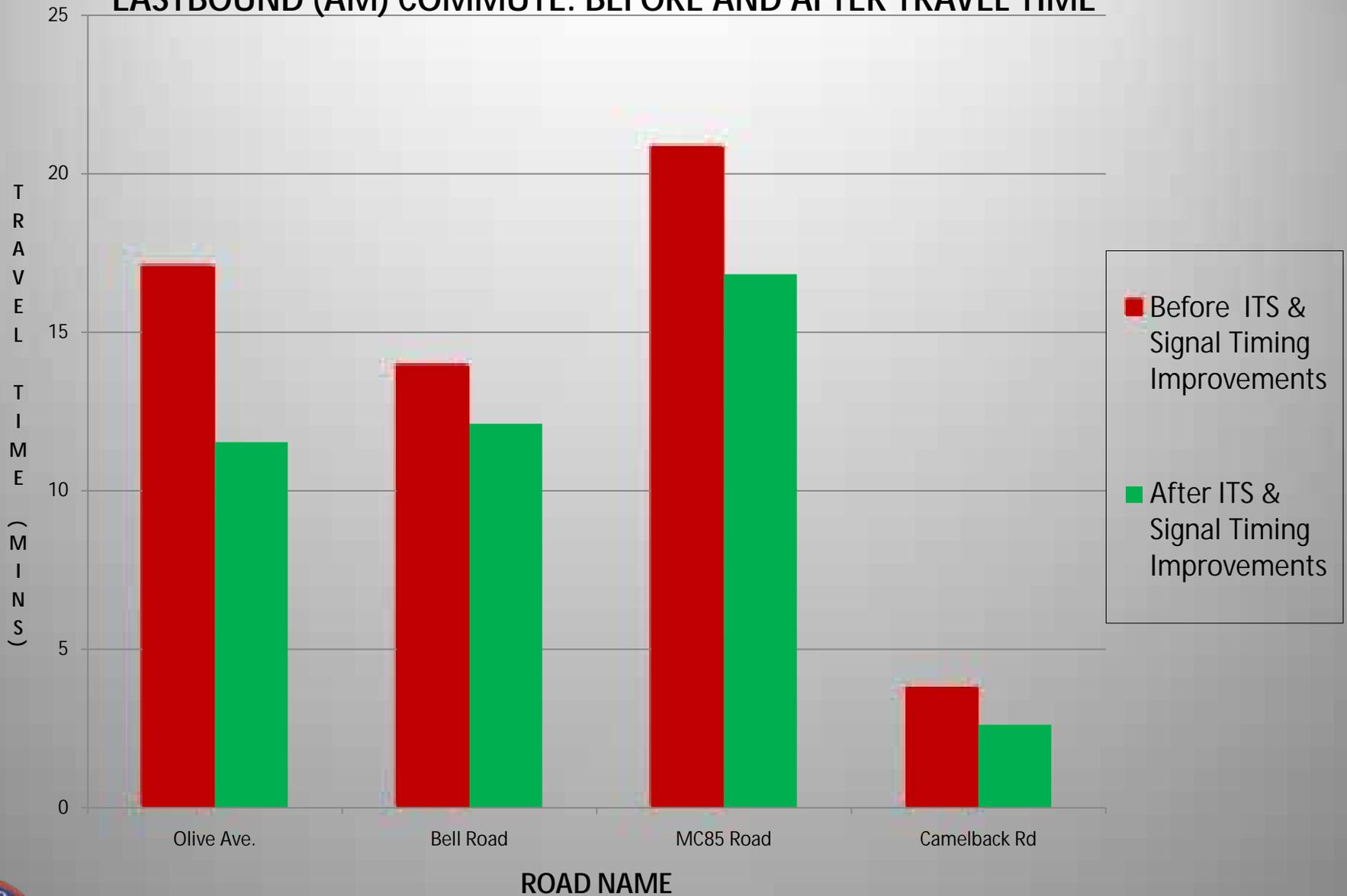
Total miles paved 459.11

Miles of Dirt Road Paving by MCDOT FY 1983-2011



ITS TRAVEL TIME REDUCTION

EASTBOUND (AM) COMMUTE: BEFORE AND AFTER TRAVEL TIME



ENVIRONMENTAL BENEFITS OF ITS AND SIGNAL TIMING ENHANCEMENTS

ROADWAY SECTION	Average Daily Traffic (ADT)	Cumulative Travel Time Reduced (EB & WB for AM, PM, Midday - minutes)	Annual Fuel Saved (Gallons)	Annual CO ₂ Not Emitted (million- lbs)
Olive Ave. (Agua Fria Ranch Pky to 67th Ave)	35,000	15.75	1,102,500	24.2
Bell Road (Grand Ave - Loop 101)	65,000	5.58	725,833	16.0
MC85 Road (Dysart Rd to 67th Ave)	20,000	2.18	87,333	1.9
Camelback Rd (Litchfield Rd - El Mirage Rd)	20,000	1.33	53,333	1.2

Reference: Anti-Idling primer - Every Minute Counts, HCF Foundation



A wide, unpaved dirt road stretches from the foreground into the distance, flanked by desert vegetation including saguaros and cholla. In the background, a large, flat-topped mountain range is visible under a clear blue sky. Utility poles with power lines are on the left side of the road.

Any Questions?