

# Memorandum



CITY OF DALLAS

DATE: August 19, 2011

TO: Honorable Mayor and Members of the City Council

SUBJECT: Capital Construction, Operations & Maintenance of Dallas Streets & Thoroughfares Briefing

On Monday, August 22, 2011, you will be briefed on the Capital Construction, Operations & Maintenance of Dallas Streets & Thoroughfares. The presentation material is attached for your review.

If you have questions or need additional information, please let me know.

A handwritten signature in black ink, appearing to read 'Forest E. Turner'.

Forest E. Turner  
Assistant City Manager

Attachment

cc: Mary K. Suhm, City Manager  
Rosa Rios, Interim City Secretary  
Thomas P. Perkins, Jr., City Attorney  
Craig D. Kinton, City Auditor  
C. Victor Lander, Administrative Judge  
A.C. Gonzalez, First Assistant City Manager  
Ryan S. Evans, Assistant City Manager  
Jill A. Jordan, P.E., Assistant City Manager  
Joey Zapata, Interim Assistant City Manager  
Jeanne Chipperfield, Chief Financial Officer  
Frank Libro, Public Information Office  
Helena Stevens-Thompson, Assistant to the City Manager

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# Capital Construction, Operations, & Maintenance of Dallas Streets & Thoroughfares

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Presented to the  
Dallas City Council  
August 22, 2011



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# Purpose

- Provide an overview of the Street Services and Public Works Departments
- Review street condition ratings
  - Rating descriptions
  - Street condition timeline
  - FY 2011-12 street condition projection

# Interrelationship between Street Services and Public Works Departments

- The Bond Program invests in construction and reconstruction of street and alley projects and street resurfacing projects. Preventive maintenance is required to extend the service life of infrastructure improvements.

## Street Services – General Fund

### Routine maintenance

- Potholes
- Full depth repairs
- Level ups

### Preventive maintenance

- Slurry seal
- Micro surfacing
- Crack sealing

### Major maintenance

- Partial reconstruction
- Rehabilitation
- Restoration

## Public Works – Capital Fund

### Bond Program implementation including:

- Construction and reconstruction of streets and alleys
- Street resurfacing
- Street and alley petitions
- Bridge rehabilitation
- Sidewalks and barrier free ramps

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# Street Services Department

- \$72M budget with 563 positions
- Maintains over 11,800 lane miles of streets
- Organized into five business units:
  - Street Repair Division – Asphalt
  - Street Repair Division - Concrete
  - Service Districts (4 plus Night Operations)
  - Contracts, Finance and Inspections
  - Transportation Operations

# Street Services: What do we do?

- Street Repair Division Asphalt, Street Repair Division Concrete, Service Districts
  - ❑ Pothole repair
  - ❑ Street & Alley repair
  - ❑ Litter removal
  - ❑ Response to roadway hazards
  - ❑ Roadside drainage
  - ❑ Guard rail repair
  - ❑ Inlet cleaning
  - ❑ Severe weather response
- Contracts, Finance and Inspection
  - ❑ Street sweeping (major thoroughfares)
  - ❑ Mowing of medians/ TXDOT rights-of-way
  - ❑ Sealing of streets (prevent water infiltration)
  - ❑ Environmental and Quality Management (ISO 9001 and 14001 certified)
- Transportation Operations
  - ❑ Traffic Studies
  - ❑ Signs & Signals
  - ❑ Street Striping
  - ❑ Street Lighting
  - ❑ Congestion Management
  - ❑ Lane Closure Permits



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# Public Works Department

- \$12.9M annual operating budget with 158 positions of which \$7.9M and 107 positions are dedicated to streets
- \$117.7M capital budget for street and thoroughfare improvements in FY 11-12
- Organized into 3 main work units
  - Street and paving infrastructure
  - New facility and facility major maintenance
  - Air Quality, Parking Adjudication, and Finance


# Public Works: What do we do?

- Street and Paving Infrastructure – Design and Construction Through Contracting
  - Street and alley reconstruction and street resurfacing
  - New street and alley petitions
  - Sidewalk - new and replacement; barrier free ramps
  - Thoroughfares and urban design / streetscaping
  - Intergovernmental partnerships and bridge repairs
  - Pavement management and life cycle analysis (in house)
  - Survey (in house)
  - Needs Inventory (in house)
  - Bond Program preparation (in house)





# Street Condition Ratings



Rating	Description
<b>A</b>	<b>Excellent</b> Pavements that have no distress (mostly new or newly rehabilitated surfaces)
<b>B</b>	<b>Very Good</b> Very good ride quality - require preventive maintenance (slurry seal or similar) if any
<b>C</b>	<b>Good</b> Acceptable ride quality, though road surfaces are becoming worn – slurry, microsurfacing, or similar is needed to prevent rapid deterioration
<b>D</b>	<b>Fair</b> Marginally acceptable ride quality – microsurfacing , chip sealing, or partial reconstruction is needed to prevent rapid deterioration
<b>E</b>	<b>Poor</b> Pavements that have extensive amounts of distress and require partial or full reconstruction

# Satisfactory Streets

- “A” Condition

- 5200 Cedar Springs Road
- 700 S Hampton Road
- 6300-6600 Bonnie View Lane



- “B” Condition

- 6000 Frankford Road
- 3500-4300 Simpson Stuart Road
- 5300 Maple Springs Blvd
- 1500-1900 E Camp Wisdom Road



# Satisfactory Streets (cont.)

- “C” Condition
  - 5200 Harry Hines Blvd
  - 3700 N Fitzhugh Avenue
  - 9600 Webb Chapel Road
  - 5600-6300 Mockingbird Lane



# Unsatisfactory Streets

## ■ “D” Condition

- ❑ 3100 Inwood Road
- ❑ 4800-5500 Lemmon Avenue
- ❑ 2100-3200 Canada Drive
- ❑ 2500 La Prada Drive



## ■ “E” Condition

- ❑ 9600-9700 Teagarden Road
- ❑ 3100-3400 Edd Road
- ❑ 2100-2500 Greenville Avenue
- ❑ 2100-2500 N Henderson Avenue



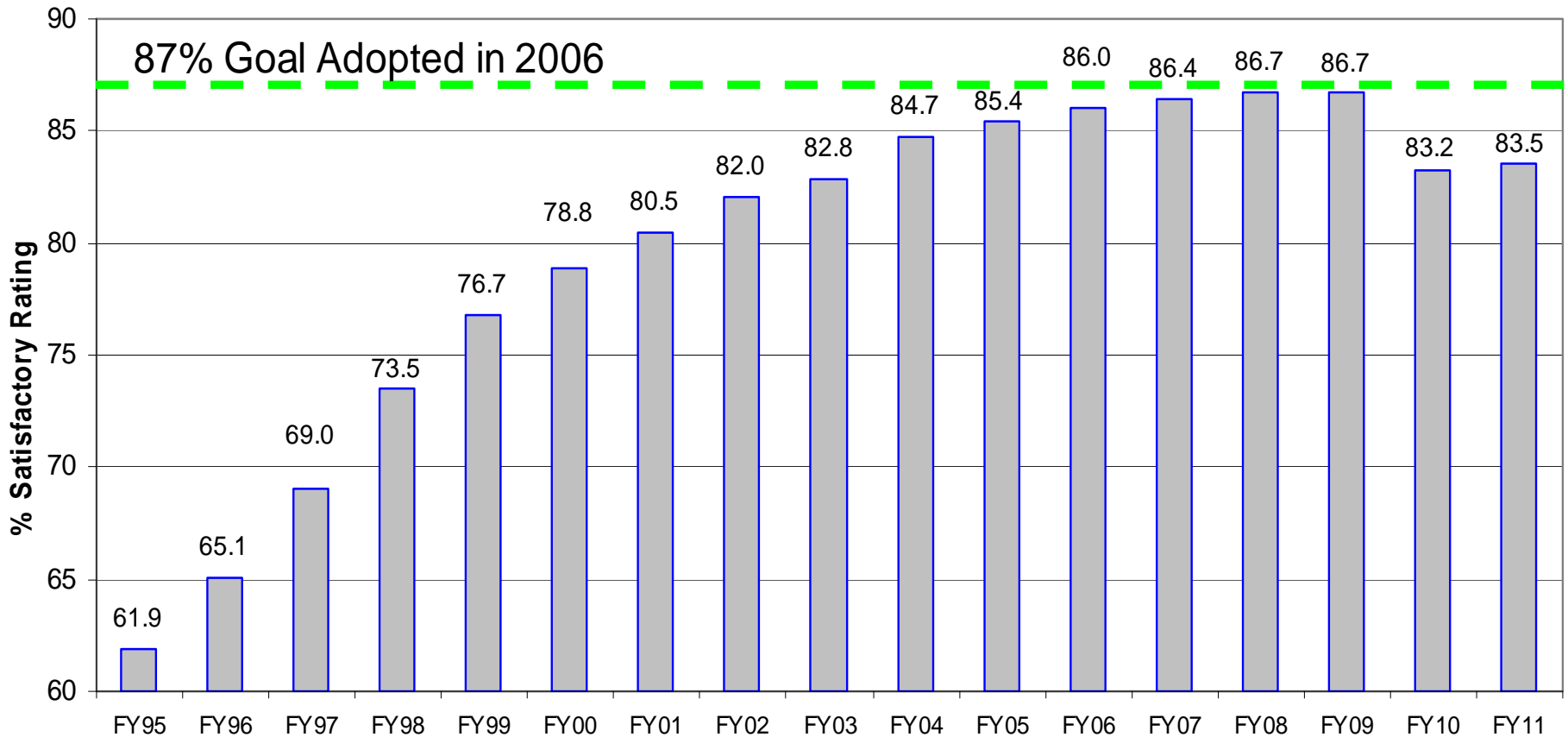
# Street Satisfactory Rating - Timeline

Year	% Satisfactory	Comment
1981	89%	Satisfactory rating high point reached
Late 1980's	71%	1985 bond program was delayed and budget cuts reduced street maintenance
1994	62%	Satisfactory rating low point reached after downturn in economy
1995	62%	Council adopted 75% satisfactory goal by 2015...goal was accelerated to 2010 in 1996
2006	86%	Council adopted 87% satisfactory goal by 2010 with all districts at a minimum of 80%
2009	86.7%	<i>15 years to improve from low of 62% in FY95 to peak in FY09</i>
2010	83.2%	Citywide rating decreased due to deferred maintenance and development of a more precise rating system

# Impacts of Maintenance on Street Condition

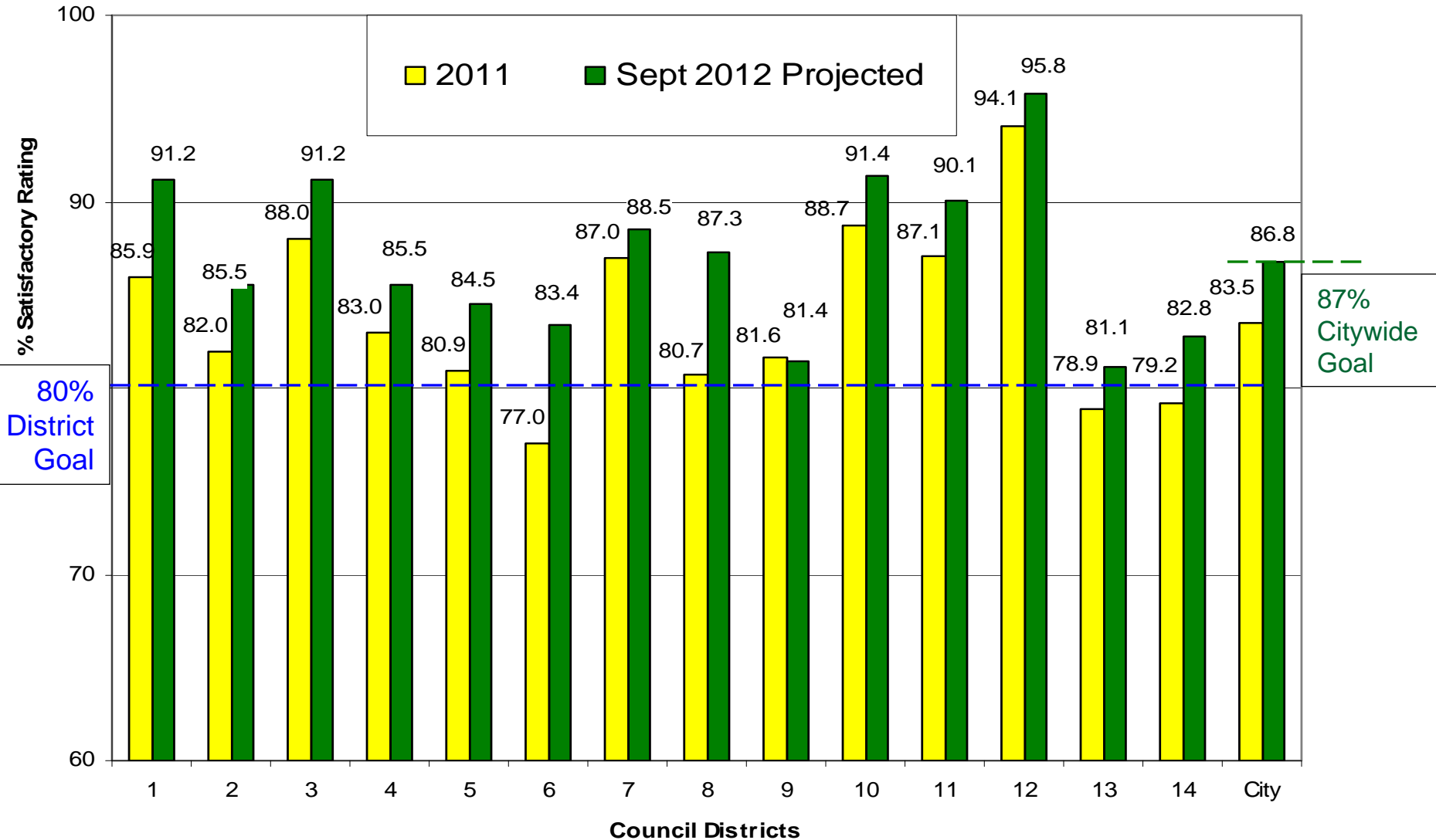
- Typical life of a street ranges from 20 to 50 years depending on a number of factors such as:
  - Pavement design
  - Traffic loads
  - Weather/precipitation patterns
  - Maintenance schedule
- Street maintenance can cost effectively extend useful lives by factors of three or more
  - **Routine maintenance** such as pothole repair **does not increase** condition ratings but slows deterioration and improves the ride surface on a small scale
  - **Preventive maintenance** such as crack sealing, slurry sealing, and micro surfacing adds years to a street's useful life at a fraction of the cost of resurfacing or full reconstruction...**does not increase** condition ratings but prevents deterioration that would decrease ratings
  - **Major maintenance** including Rehabilitation, Restoration, and Partial Reconstruction, in general, **immediately** increases condition ratings

# Street Condition Ratings - 1995-2011



- 15 years to improve from low of 62% in FY95 to peak in FY09
- Citywide rating decreased from 86.7% to 83.2% in FY10 due to deferred maintenance and development of a more precise condition rating system

# Street Condition Ratings - Current and Projected (through September 30, 2012)





# Achieving and Maintaining the Goal

- Achieving and maintaining the goal of 87% satisfactory citywide and minimum 80% satisfactory in all council districts requires Bond Programs approximately every four years and the requisite street maintenance allocation
  - The capital and O&M funding needed to achieve 87% citywide and minimum 80% in all council districts is included in the proposed FY 2011-12 budget
    - FY 2011-12 Capital budget includes \$118M for street improvements
    - FY 2011-12 O&M budget includes \$28M for street maintenance
  - To maintain 87% citywide and minimum 80% in all council districts requires
    - Capital investment for street improvements of \$225M over a 4 year period beginning in the fall of 2012
    - O&M funding of \$28M per year for street maintenance

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# Questions / Discussion

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# Appendix A – Condition Rating Equipment and Method

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Additional Information

# Street Condition Assessment: Transition from pen/paper to high-tech

INSPECTION DATE: 06DEC05 PAGE: 2  
 2451504 ANORTH.HPH/DALLAS(STRMFIELD) STREET SERVICES - CITY OF DALLAS FIELD SHEETS MAINT. DIST: 1  
 INSPECTORS: 2006 PAVEMENT MANAGEMENT 20006 CENSUS TRACT: 02701

STREET INFORMATION										
CODE	BLK	DIV	NAME	TYPE	SUF	F	CND	SURFACE	TOTAL	USE
								TYPE	LNS	DIV
8050	46	BALDWIN	ST	2	U	2	2	8541 26	4	7
CURB AND GUTTER										
EVEN										
ODD										
EVEN										
ODD										
EVEN										
ODD										

CONSTRUCTED TRK DESIGN SECONDARY SURFACE VALLEY GUTTERS EVEN ODD EVEN ODD  
 155 1

CRACKS									
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
5	3	4							

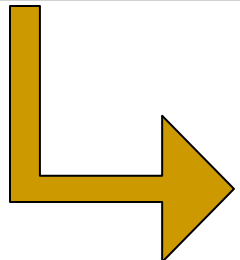
*Asphalt Repairs*

STREET INFORMATION										
CODE	BLK	DIV	NAME	TYPE	SUF	F	CND	SURFACE	TOTAL	USE
								TYPE	LNS	DIV
8050	47	BALDWIN	ST	2	U	2	2	8541 26	4	7
CURB AND GUTTER										
EVEN										
ODD										
EVEN										
ODD										
EVEN										
ODD										

CONSTRUCTED TRK DESIGN SECONDARY SURFACE VALLEY GUTTERS EVEN ODD EVEN ODD  
 141 1

CRACKS									
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
6	3	2							

*Concrete Asphalt Repairs*



Reduced annual operating costs from \$760k in FY05 to \$250k in FY11

# Data Analysis Continues to Evolve

- Technical rating of streets based on extent and severity of distress (roughness, cracking, etc.) = Pavement Condition Index (PCI)
- Weighting factors adjusted based on field quality control verification - roughness 35%, cracking 35%, other distress 30%
- PCI (ratings) expressed as letter grades: A (best) to E (worst) for decades
- Each “letter grade” had a very wide range prior to technology upgrade in 2007

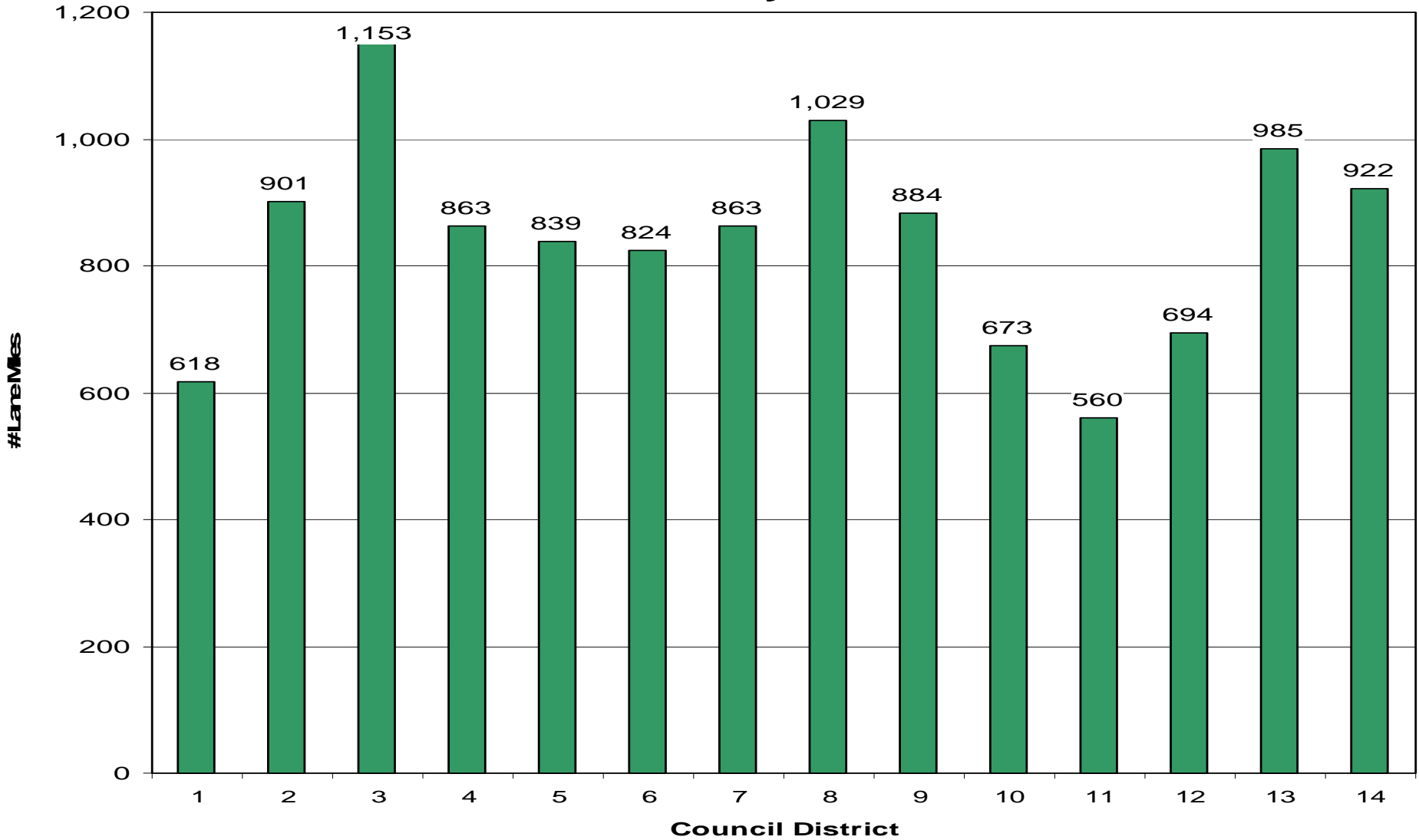
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# Appendix B – Street System and Needs

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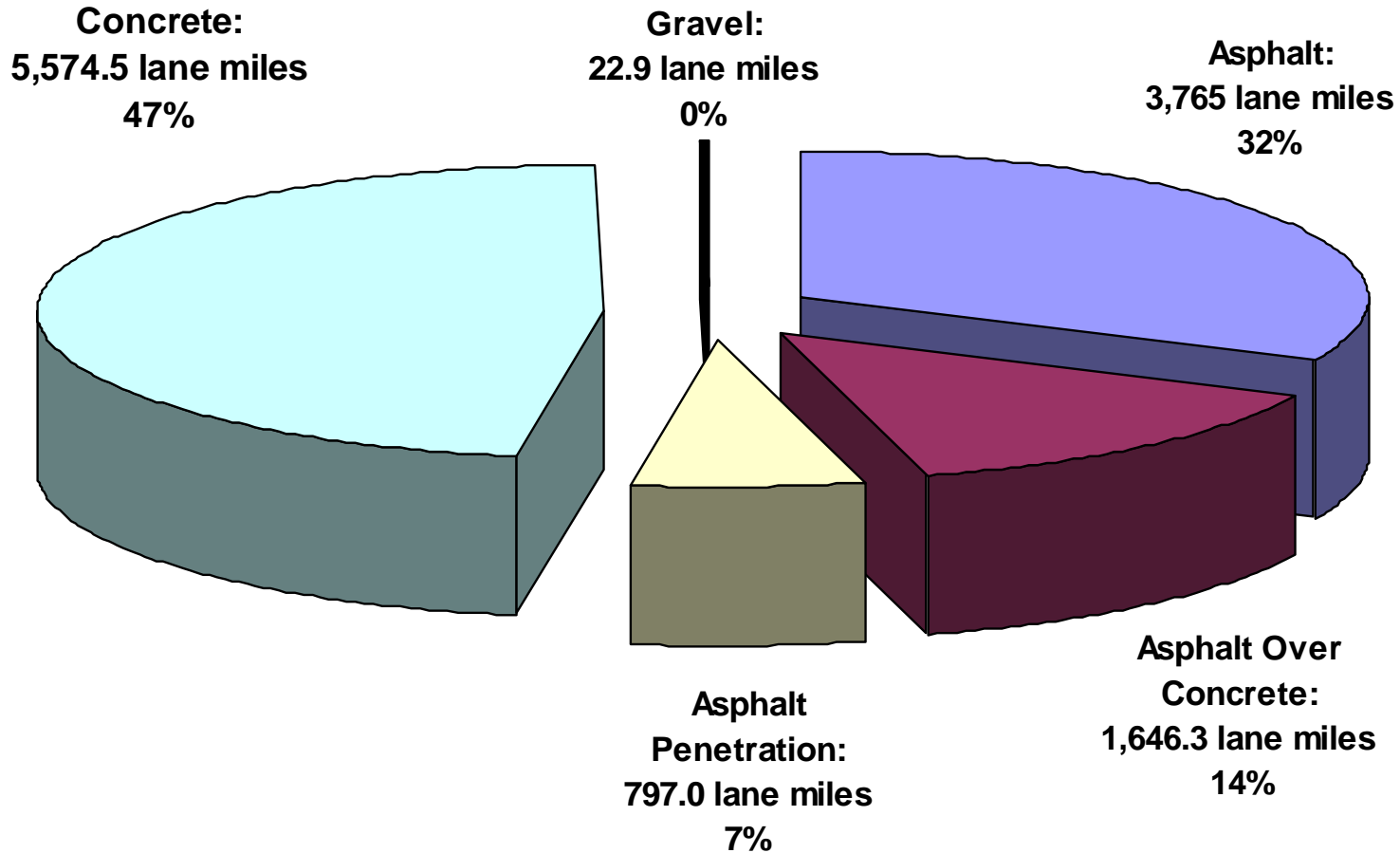
Additional Information

## Lane Miles of Streets by Council District



# Total City Street Inventory by Surface Type

11,805.8 Lane Miles





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# Diversity of Districts

- No two districts have the same size street network - varies from 559.5 to 1,153.3 lane miles
- No two districts have the same composition of street types – all have different combinations of concrete and asphalt with and without curbs and gutters
- Unit costs of cost-effective treatments vary by surface type

## Estimated Value of Total Maintenance and Capital Street Needs

Treatment	Current Universe (Lane Miles)	Approx Cost (\$)	Typically Performed By
Partial Reconstruction	678.5	78,366,750	Street Services
Restoration	231.3	37,008,000	Street Services
Rehabilitation	165.8	24,870,000	Street Services
Full Depth - Asphalt	690.1	30,019,350	Street Services
Microsurfacing	377.4	9,057,600	Street Services
Slurry Seal	1,256.1	16,329,300	Street Services
Full Depth - Concrete	3,034.5	62,207,250	Street Services
Regravel / Blade and Grade	15.2	2,871,398	Street Services
Crack Filling	1,464.5	3,092,975	Street Services
<b>O&amp;M Totals</b>	<b>7,913.4</b>	<b>\$263.8M</b>	
Reconstruction	789.5	808,059,234	Public Works
Resurfacing	765.1	143,639,314	Public Works
<b>Capital Totals</b>	<b>1,554.6</b>	<b>\$951.7M</b>	
No Treatment	2,216.7	--	
<b>Citywide Totals</b>	<b>11,684.7</b>	<b>\$1.2 billion</b>	

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# Appendix C – Maintenance and Construction Methods

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Additional Information

# Slurry Seal (Street Services)



Candidate streets are predominately residential asphalt surfaced streets with curb and gutter.



Slurry seal consists of a 1/4" thick layer of sand and finely crushed stone mixed with asphalt emulsion. In addition to sealing, it provides an aesthetically smooth and uniform surface that conceals scars from previous repairs. The mix contains less stone and is a less expensive asphalt based product than micro surfacing, but takes longer to cure. Slurry seal is outsourced to a private contractor with specialized equipment. Preparation work is performed by the Department of Street Services and includes minor base repair and crack sealing.

# Micro Surfacing (Street Services)



Candidate streets are predominately higher traffic volume asphalt surfaced streets with curb and gutter.



Micro surfacing consists of a 1/4" layer of crushed stone mixed with asphalt emulsion. In addition to sealing, it provides an aesthetically smooth and uniform surface that conceals scars from previous repairs. The mix contains more stone and is more expensive than slurry seal, but cures quicker. Micro surfacing is outsourced to a private contractor with specialized equipment. Preparation work is performed by the Department of Street Services and includes minor base repair and crack sealing (and curb & gutter repair where necessary).



# Full Depth - Asphalt (Street Services)



This repairs surface and base failure on an asphalt street. Repairs are typically larger than a pothole, but smaller than an area that would necessitate a street resurfacing or street rehabilitation project. After the failed area is cut square and excavated, a new base and asphalt surface is placed and compacted.

# Partial Reconstruction (Street Services)



Residential and thoroughfare streets with less than 25% failed areas are candidates for partial reconstruction.



Partial reconstruction is the removal and replacement of large, failed sections of concrete streets. The process includes breakout and removal of the old pavement section, repair of any existing base failures and the placement of new concrete in the failed areas.



# Rehabilitation (Street Services)



Candidate streets are predominately residential asphalt surfaced streets without curb and gutter.



Street rehabilitation is a treatment performed on an asphalt street where a large portion of the surface and base have deteriorated to an unsatisfactory level. It includes the full-depth repair of base failures, followed by a chip seal and a new two-inch layer of hot mix asphalt placed over the entire treated segment.



# Restoration (Street Services)



Candidate streets are predominately residential asphalt surfaced streets without curb and gutter.



Street restoration is a treatment performed on an asphalt street where the entire surface and base have deteriorated to an unsatisfactory level. It includes rebuilding the entire base by recycling the old base and surface materials into the new base, followed by a chip seal and new two-inch layer of hot mix asphalt placed over the entire treated segment.

# Resurface (Public Works)



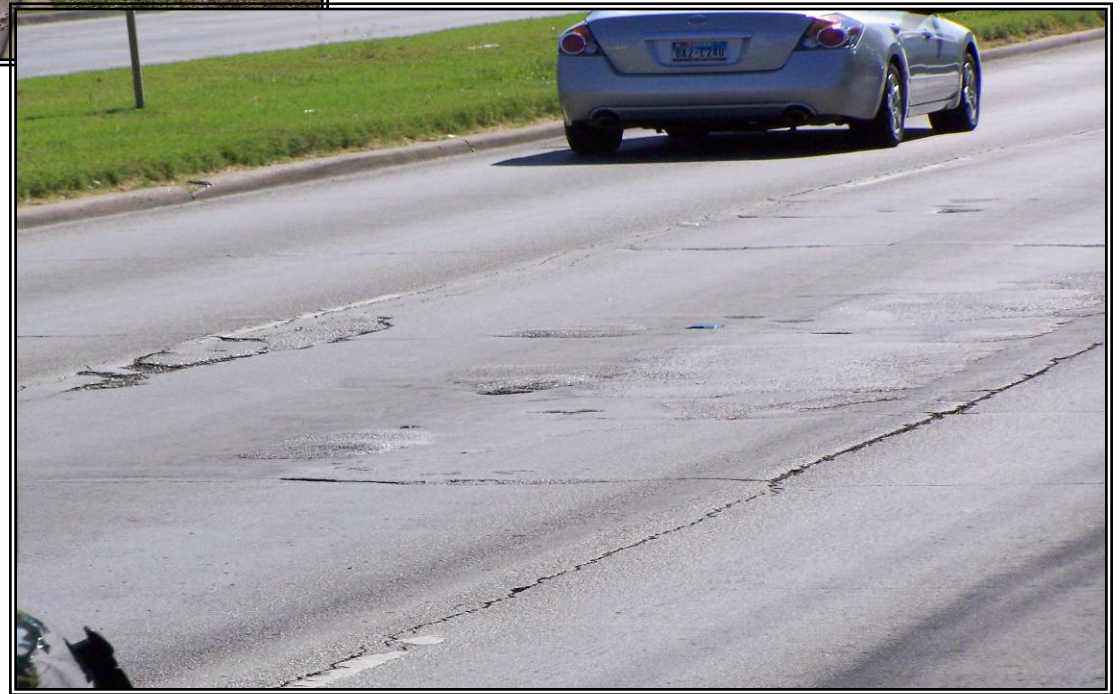
Candidate streets are usually in good condition asphalt or concrete streets with curb and gutter.

Resurfacing consists of two inches of asphalt placed over a prepared surface. It includes base repair, a chip seal, and replacement of curb and gutter where necessary.





# Reconstruction (Public Works)



Street reconstruction involves the entire removal and replacement of paved streets that are primarily in E condition and which cannot cost effectively be repaired or resurfaced to a satisfactory condition