

Memorandum



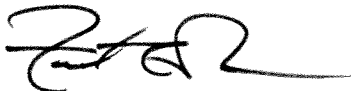
DATE January 20, 2012

TO Honorable Members of the Transportation & Environment Committee: Linda Koop (Chair), Sheffie Kadane (Vice Chair), Pauline Medrano, Vonciel Jones Hill, Sandy Greyson

SUBJECT Pavement Markings

On Monday, January 23, 2012, you will be briefed on Pavement Markings. The material is attached for your review.

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



Forest E. Turner
Assistant City Manager

Attachment

cc: Honorable Mayor and Members of the City Council
Mary K. Suhm, City Manager
Rosa A. Rios, Acting 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, Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Frank Libro, Public Information Office
Stephanie Pegues-Cooper, Assistant to the City Manager

Department of Street Services

Pavement Markings

Presented to: Transportation and Environment Committee

January 23, 2012

Briefing Purpose

- ❑ Provide information on the current street striping program and costs

Pavement Markings

Inventory

- ❑ Lane lines
 - 7.7 M linear feet of stripes over 1,011 miles of roadways
- ❑ 7,400 Crosswalks
 - Most are at traffic signals
 - 3,400 school related
- ❑ 5,500+ Stop bars
- ❑ 2,700+ pavement legends (left and right turn arrows)



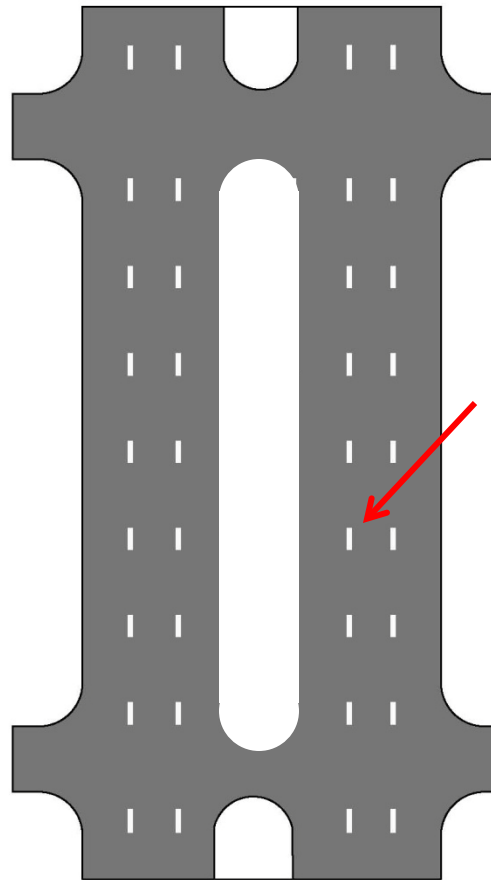
Street Striping Machine



Examples of Striping Quantities

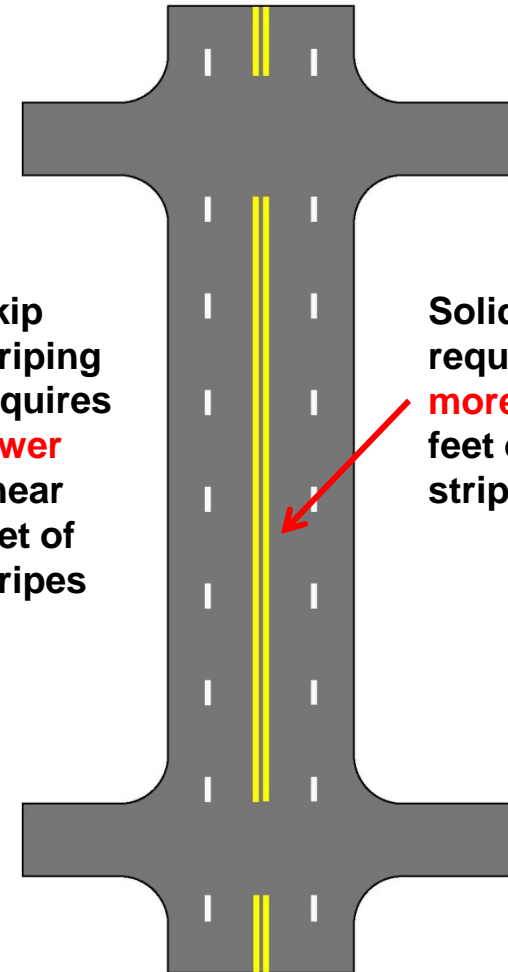
- ❑ Staff reports linear miles of stripes installed each year not lane miles
- ❑ Quantities per mile each street varies depending on street type
 - More lanes do not necessarily result in higher striping quantities per mile

6 Lane Divided Street
5,280 Linear Feet
of Stripes per Mile



Skip striping requires **fewer** linear feet of stripes

4 Lane Undivided Street
15,840 Linear Feet
of Stripes per Mile



Solid lines require **more** linear feet of stripes

Installation and Materials

- All street striping is installed by contractors
 - Seasonal work
 - Markings should be applied to dry surfaces with temperatures greater than 50 degrees to allow markings to properly adhere
 - Majority of maintenance striping is completed between March and October

- Materials Used
 - City uses specifications developed by TxDOT based on research and statewide committee input
 - Materials available:
 - Thermoplastic (2 to 4 years)
 - Water based (six months to 1 year)
 - Pre-formed Tape (4 to 6 years)
 - Epoxy (under test by TxDOT)

Cost Comparison of Striping Materials

- ❑ City uses mostly thermoplastic material since it is the most cost effective over time
- ❑ Problem spots with high traffic volumes or constant weaving may warrant use of pre-formed tape

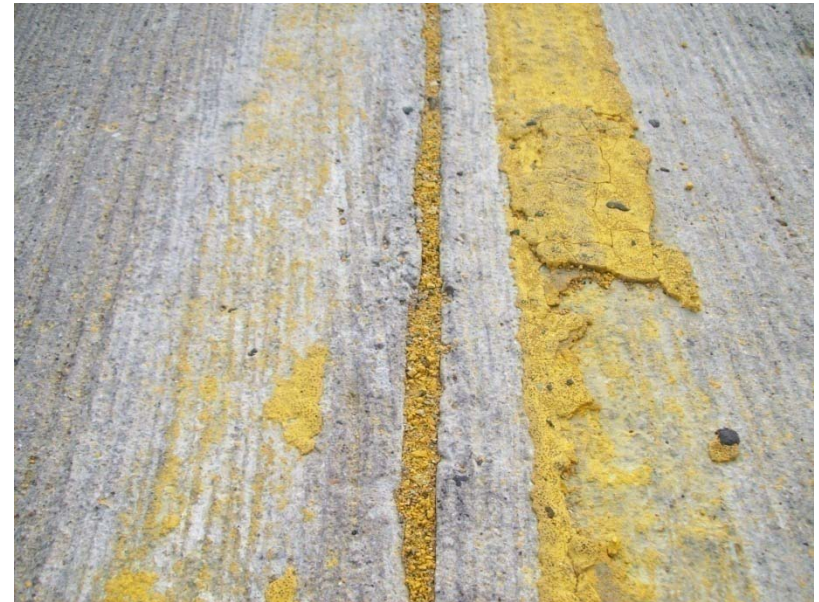
Example

for Major Street with **30,000** Vehicles per Day

Marking Material	Life (1) Street with 30,000 vehicles per day	4 Inch Lane Line Cost	Average Cost over 10 years
Thermoplastic	3 years ⁽¹⁾	\$0.33 LF	\$1.09 LF
Water-based	1 year ⁽¹⁾	\$0.22 LF	\$2.20 LF
Pre-formed Tape	5 years ⁽¹⁾	\$2.60 LF	\$5.20 LF

(1) Life of markings vary based on traffic volume, pavement surface and weather conditions. Higher traffic volumes will result in shorter life and higher average cost over 10 years.

Factors Affecting Visibility and Life of Markings

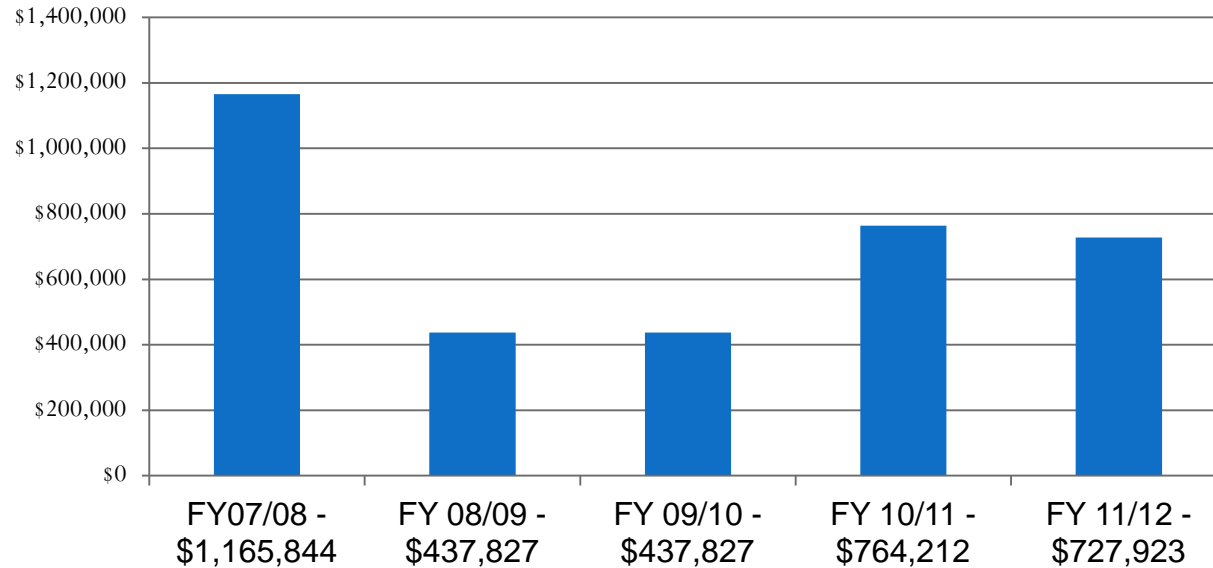


- ❑ Average daily traffic volume
- ❑ Type of pavement surface (concrete or asphalt)
- ❑ Weather conditions
- ❑ Application methods and thickness of stripe

Vehicle Striping Costs

- ❑ The typical cost for standard striping for lanes lines ranges from \$871 to \$5,227 per mile depending on the street type.
- ❑ Based on the current inventory of street types and footages, this averages to \$1,690 per mile.

Budget History



- ❑ Budget determines number of miles striped per year
- ❑ Staff implemented cost efficiencies to allow more streets to be striped with lane lines:
 - Reduced lane line width from 6 inches to 4 inches
 - No surface preparation
 - Installation or maintenance of raised reflective buttons not funded
 - Installation or maintenance of edge lines not funded
 - Maintenance of crosswalks at traffic signals not funded

Annual Inspection for Visibility

- ❑ 1,011 miles of roadway segments inspected and rated each year for lane line visibility
- ❑ Lane Line Ratings (A, B or C)
 - A - 467 miles (visible)
 - B - 337 miles (visible but worn)
 - C - 207 miles (little to no visibility)
- ❑ FY11/12 budget funds striping on worst condition streets
 - All 207 miles of “C” rated streets funded and 115 miles of “B” rated streets funded
- ❑ \$510,000 required to stripe remaining 222 miles of “B” rated streets
 - Striping “B” rated streets allows striping to be installed before visibility is lost

Annual Inspection for Visibility

- ❑ Crosswalks = 7,388 total
 - 2,807 (38%) rated A – Visible
 - 1,405 (19%) rated B - Visible but worn
 - 3,176 (43%) rated C - Little to no visibility
- ❑ Currently budgeted to repaint 100 crosswalks per year
- ❑ Staff only approves restriping of crosswalks that are school related or safety-related sites; all other requests put on hold
- ❑ Additional **\$2.3 M** required to repaint all crosswalks rated “C” = little to no visibility



Bike Striping



Shared Lane



Bike Lane (No Buffer)

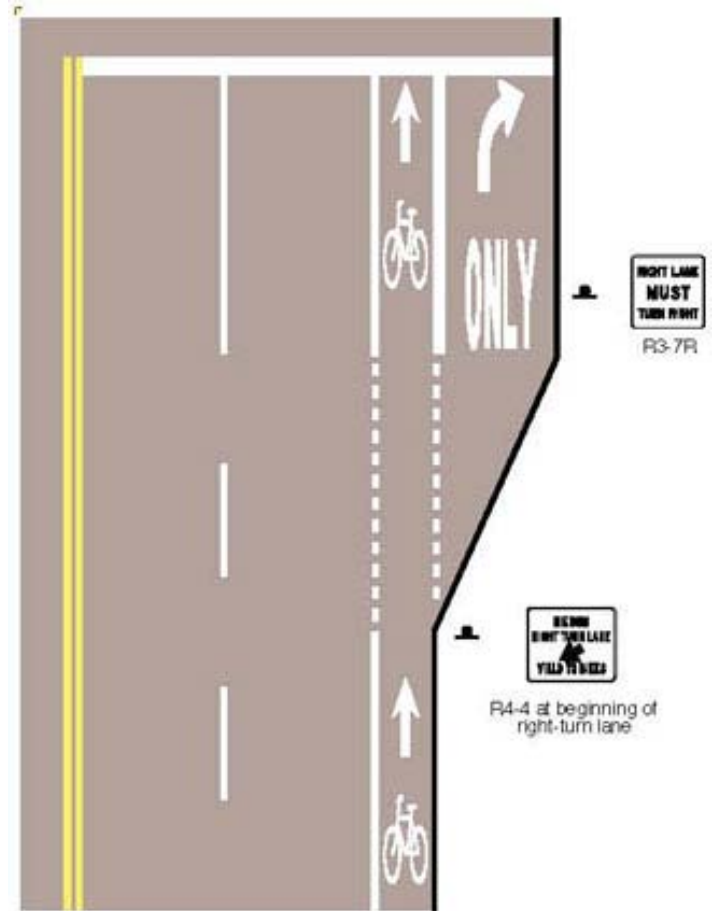


Buffered Bike Lane

Facility Type	Estimated Miles
Shared Lanes	206
Bike Lanes (No Buffer)	123
Bike Lanes Buffered	132
Paved Shoulders	19
To be determined	360
Total	840

- Painted bike symbols and signs recommended every 250 feet
- Some streets may require “No Parking” signs every 250 feet
- Thoroughfare Amendment required for many routes prior to implementation

Typical Bike Markings



❑ Dotted Extensions

- Used to reduce conflicts between bikes and turning vehicles
- Used at intersections where bike lane passes through intersection
- Creates awareness and designates space for bikes



City of Dallas

Bike Marking Enhancements



30 foot by 4 foot
Color Conflict Zone
Cost = \$600



Colored Lanes (\$4 cost per square foot)

- Enhancement to dotted extensions at right turn lanes
- Color creates awareness and designates space
- Used in problem areas (not a standard installation)

Bike Striping Costs

- ❑ The per mile cost to add bike markings can range from \$17,400 to \$24,500.
- ❑ This cost range depends on the bike route type (shared lane, bike lane, buffered lanes).

Summary

- ❑ The current budget, both operating and capital, provides funding for vehicle lane lines and pedestrian crosswalks.
- ❑ The capital budget, provides funds for bike striping tied to bond projects. Some private donations are also available.
- ❑ The operating budget, does not currently include funds for bike striping – only funds for vehicle lane lines and pedestrian crosswalks.
- ❑ On average, every 1 mile of bike routes striped equates to 10-14 miles of standard lane line striping.

Department of Street Services

Questions / Comments?