

## ATTACHMENT E

### T2050 and Street Pavement Maintenance Program Background Information

On Aug. 25, 2015, City of Phoenix voters approved the passage of Proposition 104 (T2050), which provides a 0.3 percent increase in the transaction privilege and use tax rate to fund citywide transportation projects, including the construction and maintenance of City streets. Collection of T2050 sales tax began on Jan. 1, 2016.

Over the 35-year T2050 program, the Street Transportation Department (Streets) will receive 13.8% of collected revenues, which are estimated at \$2.3 billion. Streets has allocated 50% of its T2050 program revenues to its pavement maintenance program, with a specific focus of T2050 revenues towards the City's arterial and major streets.

On Oct. 3, 2018, City Council directed staff to expend an additional \$200 million over the next five years to accelerate pavement maintenance on arterial and major collector streets, and to implement the increased maintenance through financing against future T2050 Streets revenues. In response, staff has developed a plan to accelerate and increase asphalt pavement mill and overlay projects.

#### Phoenix's Street Network

Phoenix has a comprehensive roadway network of more than 4,860 miles of public streets. Phoenix's roadway network is made up of arterial, collector, and local streets. Arterials are major streets, which are typically the major north/south and east/west transportation corridors spaced at each mile. Collectors are important mid-level transportation corridors, which are generally on the ½-mile north/south and east/west streets between the arterial streets. Local streets are typically in residential areas and provide connectivity between the collectors and arterials for local traffic.

The arterial and major collector streets pavement maintenance program is funded by T2050, while the minor collector and local streets pavement maintenance program is funded by Highway User Revenue Fund (HURF) revenues.

The City's public transit system primarily utilizes the arterial and major collector streets for its bus and rail lines, and T2050 funds allocated to Streets are an essential part of proper pavement maintenance along these transit corridors.

**Table E-1** below shows the citywide distribution of the miles of various street classifications and the distribution of the street classification types across the City's eight council districts.

**Table E-1: Street Classification Centerline Miles by Council District**

| <b>Council District</b> |            |            |            |            |            |            |            |            |              |
|-------------------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|
|                         | <b>1</b>   | <b>2</b>   | <b>3</b>   | <b>4</b>   | <b>5</b>   | <b>6</b>   | <b>7</b>   | <b>8</b>   | <b>Total</b> |
| Arterial                | 94         | 130        | 64         | 61         | 54         | 87         | 121        | 118        | <b>729</b>   |
| Major Collector         | 18         | 20         | 12         | 18         | 6          | 24         | 16         | 29         | <b>143</b>   |
| Minor Collector         | 75         | 67         | 70         | 35         | 51         | 55         | 64         | 72         | <b>489</b>   |
| Local                   | 502        | 488        | 439        | 363        | 352        | 471        | 428        | 459        | <b>3,502</b> |
| <b>Total</b>            | <b>689</b> | <b>705</b> | <b>585</b> | <b>477</b> | <b>463</b> | <b>637</b> | <b>629</b> | <b>678</b> | <b>4,863</b> |

#### Pavement Management System and Pavement Condition Index

Streets is tasked with planning, programming and executing the City's pavement maintenance program. The department developed and implemented the Pavement Management System (PMS) to determine the condition of roadways in order to establish priorities of streets to receive maintenance treatments and pavement overlays. The foundation of PMS is field data obtained using a high-tech pavement management vehicle, which measures and records the condition of roads, evaluating them on surface roughness, environmental stresses, and structural condition. Based on the resulting pavement condition index (PCI) rating, which is tracked and mapped in the department's PCI database, staff uses these objective measurements of roadway conditions to develop an initial list of roads to receive asphalt overlay. Using the most recently recorded PCI data, only 30 percent of City streets are classified in good or excellent condition, while 68 percent are in fair condition and 2 percent are in poor or very poor condition. Once the pavement maintenance list is developed, the initial list of roads is put through a rigorous coordination review and includes evaluating the following:

- Americans with Disabilities Act compliance.
- Conflicts with other city projects.
- Right of way concerns.
- Environmental issues.
- Utility issues or conflicts.
- Field visual inspections.
- Pavement age.
- Roadway traffic volumes.
- Alternate pavement treatments.

Staff may also consider adjacent or related economic development opportunities in developing the recommended pavement maintenance project list in addition to the standard evaluation criteria.

#### Pavement Treatment Types

Based on the final pavement treatment location list and the respective PCI data for each street, the appropriate pavement treatments are then determined. **Table E-2** outlines and describes the four main types of pavement maintenance treatments, including whether roadway striping activities are included.

**Table E-2: Types of Maintenance Treatments**

| Name  | Description  | Are Roadway Striping Activities Included? |
|---|--|---|
| Overlay   | Milling the existing pavement surface in fair to poor condition and installing a layer of hot polymer modified asphalt rubber mix over the existing base layer to provide a new wearing surface. | Yes                                       |
| Microsurfacing  | Application of coarse sand aggregate and a polymer modified emulsion mixture, on arterial and collector streets that are in fair to good conditions to provide a new wearing surface.            | Yes                                       |
| Crack Seal  | Filling cracks in the pavement with modified asphalt rubber on streets in relatively good condition.   | No  |
| Fog Seal - Tire Rubber Modified Surface Sealant (TRMSS) | Thin spray of emulsified asphalt that is used to rejuvenate pavement that is starting to oxidize. Adds a small amount of binder to the top of the asphalt to help hold pavement together.        | No  |

#### Comprehensive Pavement Preservation Program

Since 2016 Streets has implemented a comprehensive pavement preservation program consisting of various types of treatment in order to maximize the effectiveness and reach of the pavement maintenance program.

Voter approval of increased resources through T2050 enabled expanded pavement maintenance treatment options in addition to asphalt overlays, including crack seal, fog seals, and microsurfacing. The use of these additional treatments provides multiple benefits to the pavement preservation program, including:

1. Lower cost of treatment per mile initially, and over the pavement life cycle.
2. Increased quantity of roadways that receive treatments annually.

3. Higher number of roadway miles maintained in fair to very good condition.
4. Increased number of roadway miles maintained appropriately, extending pavement life cycle.

The treatment types vary in their use, purpose, and cost and are summarized below in **Table E-3**.

**Table E-3: Characteristics of City of Phoenix Arterial Streets Pavement Treatment**

| <b>Treatment Name</b> | <b>Approx. Cost per Mile</b> | <b>Average Life of Treatment (years)</b> | <b>Approx. % Cost per Mile of Treatment, Compared to Overlay</b> | <b>Approx. Miles Treated Per Cost of One Mile of Overlay</b> | <b>Ideal Applicability</b>   |
|-----------------------|------------------------------|--|--|--|--|
| Overlay               | \$900,000-\$1 million        | 11                                       | 100%   | 1  | For Pavement in Fair to Poor Condition   |
| Microsurfacing        | \$350,000-\$450,000          | 7.5                                      | 35-50%   | 2.2  | For Pavement in Good to Fair Condition to extend life cycle of street                  |
| Fog Seal - TRMSS      | \$70,000-\$100,000           | 5  | 7-11%  | 11.1   | For Pavement in Good Condition to extend life cycle of street                          |
| Crack Seal            | \$30,000-\$50,000            | 4  | 3-6%   | 20.9   | For Pavement in Good to Very Good Condition to extend life cycle of street with cracks |

The current comprehensive pavement preservation program allows T2050-funded arterials and major collectors to be treated approximately every 10 years, while the Highway User Revenue Fund (HURF)-funded minor collectors and local streets are treated approximately every 10-12 years based on current revenue projections.