



# City of San Antonio

## Agenda Memorandum

**File Number:**17-4307

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**Agenda Item Number:** 2.

**Agenda Date:** 8/2/2017

**In Control:** Governance Committee

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**DEPARTMENT:** Transportation and Capital Improvements

**DEPARTMENT HEAD:** Mike Frisbie, P.E

**COUNCIL DISTRICTS IMPACTED:** Citywide

### SUBJECT:

Audit of 2007 and 2012 Road and Sidewalk Bond Projects

### SUMMARY:

On January 17, 2017, Councilmember Rey Saldana issued a Council Consideration Request requesting the Transportation and Capital Improvements Department provide City Council with an independent, comprehensive audit on road and sidewalk conditions of major bond projects completed as part of the 2007 and 2012 Bond Programs.

### BACKGROUND INFORMATION:

On January 17, 2017, Councilmember Rey Saldana submitted the “Audit on 2007 and 2012 Road and Sidewalk Bond Projects” Council Consideration Request (CCR) for Transportation and Capital Improvements Department (TCI) staff to provide a comprehensive, independent audit on road and sidewalk conditions of major bond projects completed as part of the 2007 and 2012 Bond Programs. The Projects requested to be reviewed included the following:

Bond Program	Project	Pavement Surface	Location
2007	Bulverde Road (Loop 1604 to Marshall Road)	Concrete	NE
2007	DeZavala Phase I (Babcock to Cogburn)	Asphalt	NW
2007	Hunt Lane (Ingram to Potranco)	Concrete	West
2007	Walters Street (E. Houston to Paso Hondo)	Asphalt	East

2012	Tezel Road (Culebra Road to Timber Path Road)	Asphalt	NW
2012	West Vestal Place (Commercial Avenue to Pleasanton Road)	Asphalt	South

Utilizing the data gathered from the audit, Councilmember Saldana, also requested a matrix outlining the predicted lifespan, estimated costs and projected maintenance costs associated with road and sidewalk reconstruction projects. The request also included an overview of sidewalk applications, their costs as well as advantages and disadvantages.

## **ISSUE:**

In response to the requested audit, TCI consulted with Terracon Consultants, Inc. on Thursday, February 9, 2017 and initiated a study on the types of pavement sections for the projects requested. TCI provided the pavement design and geotechnical reports to Terracon to use as part of their study. The study is complete, and following is a summary of the findings.

## **Sidewalk and Street Assessment Results**

Based on Terracon's report, pavement design procedures are in compliance with the City's Design Guidance Manual and all streets are performing well and as would be expected based on their age, traffic, and site specific conditions. The assessment identified very specific and small areas of pavement distress along Hunt Lane (concrete) and Walters (asphalt) which were built on expansive subsurface soils.

Terracon's recommendation for improvement on future projects includes the implementation of a standard requirement for design engineers to consider the utilization of concrete and asphalt for street projects and for the final decisions to be based on project specific site conditions. Terracon also recommended improved documentation of laboratory tests related to the characteristics of soils.

## **Maintenance Cost**

As of today, no maintenance has been performed on any of the above mentioned streets. Both concrete and asphalt streets have performed as designed, and no maintenance has been required.

## **Predicted Lifespan and Cost Matrix**

There are several factors that affect the lifespan of a roadway. The lifespan depends on how it was originally constructed, soil conditions, weather or climate changes, traffic, and the maintenance performed by the owner. The typical lifespan of an asphalt roadway is 20 to 30 years, and 20 to 40 years for a concrete roadway. It is worth noting that the majority of the maintenance performed on an asphalt roadway happens in the initial 14 to 16 years, while concrete roadways have minimum maintenance costs those same initial years.

## **Advantages and Disadvantages of Asphalt vs Concrete**

Both concrete and asphalt pavements are subject to movement due to the expansive soils in the San Antonio area. In general, asphalt pavements are more flexible and tend to move and bend to conform to this movement. There are a number of advantages and disadvantages for both.

In summary, asphalt and concrete streets have similar lifespans and equivalent lifecycle costs. The decision to design one surface or the other needs to take into account the advantages and disadvantages of asphalt and concrete along with the specific site characteristics.

<b>Pavement Type</b>	<b>Concrete</b>	<b>Asphalt</b>
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<b>Advantages</b>	<ul style="list-style-type: none"> <li>• Historically less maintenance (in the initial years)</li> <li>• Limited repairs</li> <li>• Higher recycling/salvage value</li> <li>• Material naturally more reflective (cooler)</li> </ul>	<ul style="list-style-type: none"> <li>• More flexible pavement (bends easier with movement of expansive soils)</li> <li>• Lower initial costs</li> <li>• Initial installation faster</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>• Expensive costs due to economy &amp; availability of materials</li> <li>• Initial installation more disruptive</li> <li>• High costs of repairs (in later years)</li> <li>• High cost of joint maintenance &amp; crack sealing</li> <li>• High cost for utility spot repairs</li> <li>• Poor ride quality (as it ages)</li> <li>• More road noise than asphalt</li> </ul>	<ul style="list-style-type: none"> <li>• Historically more maintenance (in the initial years)</li> <li>• Material darker (absorbs more heat)</li> </ul>

### Lessons Learned from PreCast Sidewalk Pilot

TCI initiated a pilot sidewalk project using precast panels. The project was along La Manda Street. Half of the length was built with traditional cast-in-place concrete and the other half with precast panels. The City's Office of Innovation performed an independent analysis on the benefits of the precast sidewalks. The final report is attached.

The report recommends evaluating the La Manda sidewalks on an annual basis to evaluate the longevity of the sidewalks and conduct a second pilot project that would follow a bidding process that would evaluate if precast construction is a viable alternative method to cast-in-place, and re-evaluate the cost-effectiveness of precast construction based on the results of the second pilot project.

### Additional Information:

- 1. Pavement Infrastructure Improvements** - TCI currently considers the underlying soil type, environmental conditions and roadway functionality in making the decision on the material utilized for constructing/reconstructing roadways. The challenge continues to be the performance of roadways built in high expansive soil environments.

Last year, TCI staff in conjunction with industry experts (Geotechnical Engineers, Pavement Engineers and Contractors) and other stakeholder agencies formed a Pavement Evaluation Committee and over a one year period evaluated various factors impacting the performance of roadways built in San Antonio. Through that effort, the committee made several recommendations to enhance the design, construction and maintenance of the City's roadway network. Some of these include the piloting of deeper curbs built with asphalt pavements, installation of moisture barriers, increased utilization of contiguous curbs and sidewalks. Staff is working to integrate these recommendations as part of the FY 2017 Bond Program as well as other capital projects.

- 2. Sidewalk Infrastructure Improvements** - Concurrent with the evaluation of precast sidewalks, TCI staff also evaluated the current design guidelines and construction specifications for the construction of sidewalks and has developed additional refinements to enhance the performance of the sidewalks particularly in expansive soil environments. Some of these include the modification of the underlying base layer material, as well as the strengthening of the reinforcements and greater oversight on contractor's concrete placement and finishing.

In summary, TCI plans to make the appropriate refinements as outlined in Terracon's Pavement Engineering and Management services report to further enhance the performance of the pavement and sidewalks currently being built through the various infrastructure programs funded by the City.

#### **ALTERNATIVES:**

There are no alternatives associated with this item.

#### **FISCAL IMPACT:**

There is no fiscal impact associated with this item.

#### **RECOMMENDATION:**

Transportation and Capital Improvements Department recommends refining the City's Design Guidance Manual to incorporate Terracon's Pavement Engineering and Management Services report recommendations and findings that include:

- The pavement material selection made during the design process needs to be site specific - based on specific site characteristics.
- Asphalt and concrete pavement should be considered for every street. There is no "one size fits all" solution.
- Asphalt and concrete pavement have similar lifespans and lifecycle costs.