



2018 BOND DEVELOPMENT QUESTION

Response to Request for Information

BOND CATEGORY: Transportation Infrastructure

REQUEST NO.: 01

REQUESTED BY: Kitchen

DATE REQUESTED: 04/10/2018

DATE POSTED: 04/21/2018

REQUEST: Please provide a breakdown of the overlap, such as it exists, between the signal funding recommended by the Task Force for the 2018 Bond and the existing CAMPO plan.

RESPONSE:

Please see the table on page 4 and its accompanying Appendix of the attached April 16, 2018 memo “2018 Bond Program – Infrastructure Services’ Programs” that identifies the Intelligent Transportation System (ITS) Projects – *Traffic Signals/ATMS* funding overlaps between the Identified Need, the 2018 Bond Program Request, the 2016 Mobility Bond, and CAMPO Requests. As noted at the bottom of page 3 of the memo:

Some of the Intelligent Transportation System (ITS) Projects and the Active Transportation funding is included in both the CAMPO staff recommended grant funding and the 2018 funding request recommended by the Bond Election Advisory Task Force. In these cases, the 2018 Bond funding will be used for the Local Match required for the CAMPO grants. The program needs and funding scenarios are laid out in the Appendix. A summary table showing the CAMPO funding in relationship to the 2018 Bond Program is shown below.

As you can see by the table below, the needs for most programs are not being met by the 2016 Mobility Bond, the 2018 Bond, nor the CAMPO funding. The following information in the Appendix provides more detailed information for each program.





2018 Bond Request vs 2016 Mobility Bond and CAMPO Requests

(numbers in Millions)

Infrastructure	Identified Need	2018 Bond Program Request			2016 Mobility Bond*	CAMPO	
		2018 ATD/PW Request	2018 Staff Starting Point	BEATF		Local Match	Grant
Roadway (Mobility/new capacity)							
Regional	\$5,000	\$0	\$0	\$0	\$101	\$0	\$0
Local (includes 2016 Corridors)	\$2,500	\$108	\$0	\$0	\$482	\$40	\$58
Sidewalks New	\$1,600	\$0	\$0	\$0	\$37.5	\$0	\$0
Urban Trails	\$1,600	\$61	\$0	\$0	\$26	\$5.4	\$4.9
Bicycle Improvements	\$125	\$35	\$0	\$0	\$20	\$0	\$0
Safe Routes to School	Developing	\$0	\$0	\$0	\$27.5	\$0	\$0
Roadway (Capital Renewal)							
Bridges	\$160	\$131	\$54	\$54	\$1	\$0	\$0
Street Reconstruction	\$777	\$388	\$75	\$75	\$0	\$0	\$0
Sidewalk Rehab/Replacement	\$330	\$45	\$20	\$20	\$0	\$0	\$0
Studies/Prelim Engr Reports	NA	\$0	\$0	\$0	\$10	\$0.24	\$0.96
Neighboring Partnering Program	\$15	\$1	\$1	\$1	\$0	\$0	\$0
ITS Projects – Traffic Signals/ATMS	\$71	\$37	\$20	\$15	\$0	\$4.28	\$17.02
Vision Zero/Transportation Safety	\$160	\$35	\$20	\$15**	\$15	\$0.5	\$1.1
TOTALS	\$12,338	\$841	\$190	\$180	\$720	\$50	\$81

*The 2016 Mobility Bond funding may include construction for many Transportation Infrastructure elements if the project ultimately includes rehabilitation/replacement. For example, as we construct corridors we may install new sidewalks, traffic signals, etc. We may restore pavement and implement a major intersection safety project within these corridors too. None of these corridors have been designed and until that design is completed it is difficult to estimate quantities and funding. Nevertheless, the 2016 Mobility Bond funding is primarily focused on mobility improvements in most of the programs (other than the \$11 million dedicated to Capital Renewal as detailed above) and the work that will be accomplished in the other programs shown above (traffic signals, etc.) will be supportive of the mobility goals set via the 2016 Mobility Bond process.

**ATD's speed mitigation program, the Local Area Traffic Management Program (LATM) included in the 2018 Bond Program request for Vision Zero/Transportation Safety Program for \$500,000 is being reevaluated for speed management techniques and community participation ([memo](#)). Until such a time when the LATM program evaluation has been completed and standards to move forward have been identified, staff recommends not including speed mitigation funding in the 2018 Bond.





MEMORANDUM

TO: Mayor and Council

FROM: Robert Goode, P.E., Assistant City Manager

CC: Spencer Cronk, City Manager
Richard Mendoza, P.E., Director, Public Works Department
Rob Spillar, P.E., Director, Austin Transportation Department
Elaine Hart, CFO
Greg Canally, Deputy CFO
Carla Steffen, Deputy Director, Convention Center
Katy Zamesnik, Business Process Consultant

DATE: April 16, 2018

SUBJECT: **2018 Bond Program - Infrastructure Services' Programs**

During the recent presentation by staff and the Bond Election Advisory Task Force several questions arose regarding the “overlap” of Transportation Infrastructure funding in a potential 2018 Bond Program with the funding in both the 2016 Mobility Bond Program and the recent CAMPO call for projects. In a majority of the programs there really is no overlap since the funding from each source addresses different elements of our Transportation Infrastructure. Where there is an overlap with the CAMPO grants, the City’s money can be used to fund the required local match, thus leveraging outside funding opportunities per Council direction as outlined in the 2016 Mobility Bond resolutions. The funding sources are described in more detail below and the Program definitions and needs are laid out in the Appendix.

As mentioned during the April 10 Council Work Session, staff will update Council again on this topic in May. Specifically, any suggested changes to the Task Force recommendations will be provided across the entire 2018 program, including transportation.

2016 MOBILITY BOND

In 2016, staff developed several alternatives ranging from \$250 million to \$720 million for Council’s consideration for Bond funding. All of the alternatives included a mix of Capital Renewal projects/programs and Mobility projects/programs. The “Capital Renewal” projects/programs generally focused on renewing existing transportation infrastructure that is beyond the scope of repair and maintenance techniques and thus needs capital funding while the “Mobility” projects/programs generally focused on enhancing existing corridors or adding new infrastructure with the goal of improving mobility and providing congestion relief through capacity improvements for all transportation modes.

In preparation for the 2016 Bond program, staff identified \$4.8 Billion in the “universe of needs” for Transportation/Mobility *including \$500 million in “Capital Renewal” for Street Rehabilitation, Street Reconstruction, and Bridges.* Working within the financial constraints at that time, staff developed 2 alternatives for the \$720 million bonding level. The first was a “blended alternative” that would have dedicated \$100 million to “Regional Mobility”, \$344.5 million for “Corridor Mobility”, and \$275.5 million to “Local Mobility” (with \$180

million of the Local Mobility funding for Capital Renewal). Staff's "enhanced corridor alternative" would have dedicated \$93.5 million to "Regional Mobility", \$471.5 million for "Corridor Mobility", and \$155 million for "Local Mobility" (with \$67 million of the Local Mobility funding for Capital Renewal). The voters ultimately approved a version more focused on "Mobility" than "Capital Renewal" with \$101 million for Regional Mobility, \$482 million for Corridor Mobility, and \$137 for Local Mobility (with only \$11 million of the Local Mobility funding dedicated specifically for Capital Renewal). The table below summarizes the funding allocation described above.

2016 Bond Package Alternatives

Alternative	Regional Mobility	Corridor Mobility	Local Mobility
Staff "Blended"	\$100M	\$344.5M	\$275.5M (\$180M for Capital Renewal)
Staff "Enhanced Corridor"	\$93.5M	\$471.5M	\$155M (\$67M for Capital Renewal)
Voter Approved Bonds	\$101M	\$482M	\$137M (\$11M for Capital Renewal)

The 2016 Mobility Bond approved by the voters dedicates the \$11 million Capital Renewal funding for the preliminary engineering and design (no funding for construction) for two projects (Fallwell Lane and the William Cannon Drive Bridge over the Union Pacific Railroad) and 9 sub-standard street projects. So, the package that the Council ultimately chose to put forward for voter consideration in 2016 was primarily focused on mobility needs rather than capital renewal needs.

2018 Bond Overlap - Staff originally requested over \$100 million for additional Corridor Mobility projects, \$35 million for Bicycle Improvements, and \$35 million for Urban trails funding during the initial development phase for the 2018 Bond Program (see the following table). However, additional funding in 2018 for these Mobility programs did seem to be an "overlap" with the 2016 Mobility funds so those funding requests did not move forward in the process.

There are also components of the transportation infrastructure that may be rehabilitated via the 2016 Mobility Bond's Corridor Program (traffic signals, sidewalks, etc.) depending on the approved corridors final design. That being said, there is only 1 program in the 2016 Mobility Bond dedicated strictly to Capital Renewal...funded at \$11 million.

CAMPO FUNDING

In December 2017, the Capital Metropolitan Planning Organization (CAMPO) issued a project call to its member governments and regional transportation partners to submit applications to receive federal funding for transportation projects as part of the 2019-2022 Transportation Improvement Program (TIP). Staff developed a list of projects for City Council to consider that we believed could be competitive based on CAMPO's ranking criteria. City Council, at their December 14, 2017 meeting, authorized the City Manager to submit 27 applications for funding ([Resolution No. 20171214-056](#)). CAMPO staff evaluated the applications (they received 139 submittals) and have recommended funding allocations. CAMPO is now in the public review process for their recommended funding list and are seeking comments prior to consideration by their Transportation Policy Board in May 2018. In summary, the City of Austin projects that CAMPO staff have recommended for funding fall into 4 categories: Studies, Roadway Projects, Active Transportation Projects, and Intelligent Transportation System (ITS) Projects ([see previous memo to Mayor and Council here](#)).

The “Roadway Projects” CAMPO staff recommends includes \$58 million of grant funds for Austin to add new roadway capacity. Two of these projects, William Cannon Drive and Slaughter Lane, are part of the 2016 Mobility Bond Corridor Program. This segment of William Cannon Drive (Running Water Drive to McKinney Falls Pkwy) was part of the staff recommendation for the Corridor Construction Program in the “initiate design and potential construction” funding category. The CAMPO grant will allow us to not only design, but also construct the improvements for this segment. This segment of Slaughter Lane was also part of the staff recommendation for the Corridor Construction Program in the “seek other funding” category. The CAMPO grant will allow us to design and construct the improvements for this segment. Using the City’s required matching funds of \$19.9 million (2016 Mobility Bonds) for these projects, we leverage an additional \$24.3 million of Federal funds to apply toward our Corridor Mobility Program.

There are no “studies” or “Preliminary Engineering” Transportation projects included in the 2018 funding request, so there is no overlap with the CAMPO funds in this category.

The \$4.95 million of the CAMPO grant funding for “Active Transportation” projects is devoted to new trail capacity...mobility focused. As stated above, there are no new trail capacity projects included in the 2018 Bond Program at this point.

Some of the Intelligent Transportation System (ITS) Projects and the Active Transportation funding is included in both the CAMPO staff recommended grant funding and the 2018 funding request recommended by the Bond Election Advisory Task Force. In these cases, the 2018 Bond funding will be used for the Local Match required for the CAMPO grants. The program needs and funding scenarios are laid out in the Appendix. A summary table showing the CAMPO funding in relationship to the 2018 Bond Program is shown below.

As you can see by the table below, the needs for most programs are not being met by the 2016 Mobility Bond, the 2018 Bond, nor the CAMPO funding. The following information in the Appendix provides more detailed information for each program.

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(numbers in Millions)

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APPENDIX - PROGRAM NEEDS

Traffic Signals and Technology

One of the most visible transportation infrastructure elements is the City's signal infrastructure, which is comprised of traffic signals, pedestrian hybrid beacons (PHBs), reduced speed school zone flashers, and flashing beacons. Less visible are the technology elements needed to ensure the infrastructure is delivering the best possible service (e.g., optimized signal timings, transit signal priority, and emergency vehicle preemption) to the traveling public. Together, these elements and services form the Signal System Program.

The 2018 Bond Election Advisory Task Force recommendation of \$15,000,000 supports the on-going Signal System Program by recommending funding for the categories listed below and described further below in this memorandum.

• Traffic Signals and Signal System	\$9,100,000
• Signal Safety Improvements	\$4,300,000
• Mobility Improvements	<u>\$1,600,000</u>
	\$15,000,000

It is important to mention that any quantities listed in the following sections are approximates. The quantities are derived from historical costs and the field conditions at the specific locations where the respective infrastructure was deployed. Future contracts (i.e., equipment, construction services) and field conditions at candidate deployment sites will dictate the actual quantities deployed under this funding recommendation. For example, over the past year and a half, contractor costs to build signals increased approximately 30 percent based on responses to City procurements. The ability to deliver on any referenced quantities will be reduced if this trend continues.

Traffic Signals and Signal System - (\$9,100,000)

Funding in this category is needed to deliver signal infrastructure aimed at addressing Austin's continued growth, responding to citizen requests, and harnessing efficiencies that result from technology advancements. Austin grew by about 70 people a day between 2015 and 2016 (City of Austin Demographics Data Library). This growth results in changing travel patterns that require expanding the signal infrastructure to provide safe access mobility throughout the transportation network (e.g., traffic signals for all modes of travel to enter and cross the roadway, PHBs to facilitate pedestrian crossings). ATD also receives nearly 70 3-1-1 requests each week from citizens asking for signal timing changes. Infrastructure, like the signal communications system, enables signal engineers to respond to these requests more quickly without traveling to the signal in certain instances. In addition, some signal technology used in Austin is nearly 20 years old. Updating to the latest technology allows us to implement more advanced strategies that have evolved and emerged over the past 20 years to improve safety and mobility.

Brief descriptions of the proposed signal infrastructure and funding levels in this category are provided in the following sections.

New Signal Installations

Funding in the amount of \$2,500,000 is recommended for new signals, PHBs, flashing beacons, and reduced speed school zone flashers. At the time that the TIWG's recommendation was prepared, ATD had requests for 168 traffic signals and 158 PHBs. Traffic signals and PHB costs vary based on location and current contractor and equipment costs. Signals can cost \$250,000 to construct while PHBs average around \$100,000. Flashing beacons and school zones are usually studied shortly after receiving the request since the volume of requests is much lower - usually less than 10 each year. Since the volume and costs are relatively low, those that are recommended are constructed as funding permits. The cost for a beacon varies and can usually range between \$1,000 and \$3,000. School zone flashers are roughly \$15,000 each. To fund all recommended signals, PHBs, and school zone flashers, we estimate that approximately \$20,000,000 in funding is needed.

The number of requests continues to grow. ATD ranks each request to ensure funds are spent on the higher ranking locations with the greatest need. Factors used to rank request can be found on the City's web site:

- [Signal Ranking Criteria](#)
- [PHB Ranking Criteria](#)

The highest ranked requests are studied. Signals and PHBs are then constructed based on the studies' recommendations and available funding.

Please note there is an error in the [TIWG's Recommendation](#) related to New Signal Installations (refer to page 7 of the online recommendation). The error is related to this statement:

- *77 percent coverage of overall current need for 168 new traffic signals and 158 PHB's*

The proposed \$2,500,000 for new signal installations **does not cover 77 percent of the need**. The bullet was erroneously crafted at some point in the process. The 77 percent reflects the recommended funding level (\$2,500,000) relative to the highest funding level (\$3,250,000) proposed in the 5 funding scenarios consider in the bond development process. *To fund all recommended signals, PHBs, and school zone flashers, we would need about \$20,000,000.* **The City did not submit a New Signal Installation project for the CAMPO Call for Projects.**

Communications System

The communications network provides the conduit for two-way communication to field equipment (e.g., signals, traffic management cameras, maintenance monitoring). It enables staff to change signal timing from the Transportation Management Center (TMC). Communications is also needed to coordinate signals, provide adaptive signal control, deploy transit signal priority, and deploy other technologies needed to enhance mobility for all modes. Funding in the amount of \$2,000,000 is recommended. Funds would be used to increase redundant communications, upgrade aging equipment, and expand communications to the remainder of the signals and PHBs not currently on the network. A cybersecurity assessment is included to assess and implement security enhancements. *The estimated cost of meeting the full need for communications system improvements is about \$6,000,000.*

Regarding the CAMPO Call for Projects, the City submitted a project that covers the communication systems upgrades discussed above as well as additional improvements for reliability. **CAMPO staff recommended this project. If CAMPO funding is awarded, then the 2018 Bond funding would be used**

to provide the required local match. If additional funding remains after providing the local match, ATD staff recommends allocating these funds to the New Signal Installations, Cabinets, and/or Aerial Detection projects.

Modifications and Upgrades

Modifications and upgrades include signal enhancements that lead to safety (e.g., adding protected left turns) and mobility (e.g., removing split phase operations reduces delay by ~7 percent) improvements. Funding for modifications and upgrades is also used to respond to citizen requests. This subcategory is recommended to be funded at \$1,500,000 which provides \$300,000 per year on average over 5 years. *The estimated need for modifications and upgrades is estimated at \$3,300,000.*

The City did not request funding for this project through the CAMPO Call for Projects.

Controllers

Traffic signal controllers (i.e., computers) run software (also known as firmware) that translates (1) detector information and (2) timing parameters programmed by the Signal Engineer into commands that then turn on and off signal displays (e.g., green ball, flashing yellow arrow, WALK). The controller also controls dynamic lane control signs like those on westbound Cesar Chavez at Congress. During the PM peak period, the Cesar Chavez sign changes to allow left turns from two lanes while only allowing left turns from one lane during other times of the day. The controller is housed in a cabinet (typically a large silver metal box) at the intersection. Upgrading existing controllers to a modern platform, in combination with the firmware described in the next section, enables us to take our signal timing program to the next level with next generation emergency vehicle preemption, expanded transit signal priority features, and signal timing optimization. Funding in the amount of \$1,000,000 is recommended to continue upgrading our 20-year old controllers to a modern platform. *At this funding level and current prices, we expect to upgrade most, if not all of our signals.* **The City did not request funding for this project through the CAMPO Call for Projects.**

Firmware

Firmware is the software that runs on the controller and controls the signal at the intersection. The current firmware was rolled out in 1999 (last century technology - think flip phone compared to an iPhone with apps) and limits the ability to implement more advanced strategies (e.g., more robust transit signal priority features, next generation emergency vehicle preemption, advanced pedestrian safety timing plans). Funding in the amount of \$800,000 is recommended to continue expanding the rollout of new firmware procured in 2017. *At this funding level and current prices, we expect to upgrade most, if not all of our signals.* **The City did not request funding for this project through the CAMPO Call for Projects.**

Conflict Monitors

Roughly 2,000 times per year signals unexpectedly go into flash mode (i.e., flashing red in all directions) with many due to power surges (e.g., lightning strikes). Although design steps are being taken to reduce this impact, conflict monitors allow staff to reset the signal to normal operations without traveling to the field in cases where equipment is not damaged. The ultimate benefit is reduced delays to travelers and improved safety with having the signal return to normal operations sooner. *Funding is recommended at \$700,000 which enables us to expand next generation conflict monitors to all signals.* **The City did not request funding for this project through the CAMPO Call for Projects.**

Battery Backup Systems & Signal Cabinets

Battery backup systems (BBSs) can provide power to signals for several hours until traditional power from powerlines is restored. BBSs increase safety by keeping the signal running and avoiding the confusion that occurs when signal heads are dark when power is lost. After installing BBSs at half of the signals in 2011, “all out” signal 3-1-1 calls dropped by more than 50 percent to 450 calls/year in 2013. Funding in the amount of \$600,000 is recommended for this subcategory of which \$500,000 would be used to install BBSs at 50 signals that do not have a BBS today and replace 15 existing BBSs that are nearing the end of their life. The remaining \$100,000 would be used to replace older cabinets (e.g., 30 years old) with modern, larger cabinets that can accommodate equipment needed to implement newer safety and mobility strategies. In order to provide BBS at all signals and PHBs operated by the City of Austin, approximately 575 BBS systems are required to be installed at an approximate cost of \$2,600,000. In addition the signal cabinets at 200 intersection will need to be replaced for a BBS system to be mounted to the cabinet. *In order to provide BBS at all signals and PHBs operated by the City of Austin, and upgrade signal cabinets to allow for a BBS system to be mounted to the cabinet, the total need is roughly \$4,800,000.* **The City did not request to fund this project through the CAMPO Call for Projects.**

Signal Safety Improvements - (\$4,300,000)

Safety is ATD’s top priority. It is the foundation of ATD’s mission and a focus of the department through our Vision Zero Program. As such, safety is the primary consideration in the Signal Program. The TIWG recommended \$4,300,000 in funding for this category. Specific improvements and related funding levels follow.

Emergency Vehicle Preemption

Emergency Vehicle Preemption (EVP) interrupts (preempts) the normal signal operation to turn the signal green for an approaching emergency vehicle. The National Cooperative Highway Research Program shows that EVP can reduce response times between 14 percent and 50 percent and reduce emergency vehicle crashes (e.g., 70 percent reduction in Minneapolis, MN). The TIWG recommended \$3,000,000 in funding for ATD to deploy a Next Generation EVP System to all City signals. ATD currently has traditional line-of-sight equipment deployed at nearly 140 signals to provide EVP in one or more directions. Using traditional line-of-sight EVP equipment would cost approximately \$5,400,000 to deploy to every signal before including costs for maintaining field equipment. The proposed Next Generation EVP System project eliminates traditional EVP equipment and would therefore decrease capital costs by about \$2.4 million. *The proposed bond funding would meet the need for EVP at all City signalized intersections.* **CAMPO staff is recommending that this project is funded through the recent Call for Projects. If CAMPO funding is awarded, the 2018 bond funding is needed to provide the local match. If additional funding remains after providing the local match, staff recommends allocating these funds to the New Signal Installations, Cabinets, and/or Aerial Detection subcategories.**

Power Source Modernization

The TIWG recommended \$550,000 in funding to upgrade signal connections to Austin Energy power to meet current safety standards. More than half of the traffic signals in the City of Austin are over 30 years old. The power source for most of the signals in Austin are directly connected to Austin Energy transformers and are not easily located, particularly in emergency situations. As part of the power source modernization project, Austin Energy and ATD will begin mapping existing power source connection points and installing power disconnects to bring the traffic signal power source connection

points up to current Austin Energy standards and National Electrical code. *The estimated need for funding to identify and implement all needed upgrades is about \$2,000,000. **Power source modernization is not included in the CAMPO Call for Projects.***

Accessible Pedestrian Signals

Accessible pedestrian signals (APSS) provide an audible message to inform pedestrians when the WALK signal is active to cross the roadway and when the FLASHING DON'T WALK will expire. APSS also assist visually impaired individuals by increasing awareness of when to cross especially at low traffic volume signals that do not produce the vehicular noise necessary to serve as a cue. Funding is recommended at \$500,000 which would provide APS equipment at approximately 56 signals (based on current equipment costs). Many times, installing APSS also requires sidewalk, ramp and signal pole modifications. Although the recommended funding does not cover these costs, ATD partners with the Sidewalk Program in the Public Works Department to identify opportunities where these improvements can be implemented at the same time APSS are installed. The installation of APS systems has historically been driven on a request basis. *The recommended funding level is expected to meet the needs for APS installations over the next 5 years. **The City did not request to fund this project through the CAMPO Call for Projects.***

Retroreflective Backplates

Backplates added to a traffic signal indication improve the visibility of the illuminated face of the signal by introducing a controlled-contrast background. The improved visibility of a signal head with a backplate is made even more conspicuous by framing it with a retroreflective border. Signal heads that have backplates equipped with retroreflective borders are more visible and conspicuous in both daytime and nighttime conditions. Backplates can result in up to a 15 percent reduction in crashes (Federal Highway Administration). The TIWG recommends funding in the amount of \$250,000. *This level of funding would install retroreflective backplates at approximately 75 signals based on current prices. To install retroreflective backplates system-wide, the anticipated funding need is approximately \$3,000,000. **The City did not request to fund this project through the CAMPO Call for Projects.***

Mobility Improvements - (\$1,600,000)

The following TIWG recommendations are categorized as Mobility Improvements. While many of the previous recommendations also provide mobility benefit to travelers, the recommendations below have improved mobility as a primary outcome. The TIWG recommended \$2,500,000 in funding for this category. Specific improvements and related funding levels follow.

Aerial Detection

Detectors sense the presence of roadway users (e.g., vehicles, pedestrians, bikes, transit, and emergency vehicles). This information is sent to the signal controller (discussed earlier) that determines whether a particular movement needs to be served. ATD primarily uses two forms of detection to sense the presence of roadway users: (1) inductive loops placed in the pavement and (2) aerial detection mounted above the roadway. The pavement is a harsh environment. Loops are routinely broken by roadway construction, resurfacing projects, and pavement shifting under traffic loads and heat. Broken detection increases delays by 5 percent to 10 percent (Transportation Research Board's Highway Capacity Manual). Due to these factors, ATD is upgrading loop detectors in many locations to aerial detection (e.g., video, radar). Aerial detection also facilitates adaptive signal control by providing the necessary flexibility to setup additional detection zones required to optimize the related detection design. Funding in the amount of \$1,000,000 was recommended for aerial detection.

Based on current pricing, this funding level would replace loop detection at up to 40 signals. *To implement aerial detection system-wide would require approximately \$23,000,000.* **CAMPO staff is recommending funding City detection improvements at 400 intersections through its recent Call for Projects – a much bigger project than requested in the 2018 bond. The required local match is \$2,240,000. If this funding is approved by the Transportation Policy Board (TPB), the 2018 bond funding of \$1,000,000 would be used to provide local match.**

Closed Circuit Television Cameras

ATD uses closed circuit television (CCTV) cameras to provide situational awareness and in turn actively manage traffic by adjusting signal timing during recurring congestion, modifying timings due to construction lane closures, incidents, special events, and disseminating accurate traveler information (e.g., after crashes). The TIWG recommends \$500,000 in funding to deploy cameras to roughly 100 signals resulting in a camera at approximately half of the 1,000 signals. Funding is also included to upgrade 10 and rehabilitate 19 locations. *The estimated funding need to have traffic monitoring capabilities at every signalized intersection is roughly \$1,900,000.* **CAMPO staff is recommending funding City CCTV cameras at 275 intersections, as well as funding a video management system that will allow video data-sharing with our regional partners. If this funding is approved by the TPB, the 2018 bond funding would provide the local match. Staff recommends applying any remaining funds to install cameras at signal and additional locations throughout the city. Combining the 2018 bond and CAMPO funds with current funding will provide traffic monitoring capabilities at approximately 80 percent of the City's signals.**

Transit Signal Priority Reporting

ATD continually collaborates with Capital Metro to enhance transit performance in the region. One such collaboration is the MetroRapid bus lines. Specifically, ATD enabled the buses to “talk” to the signals and extend the green signal a few seconds to allow the bus to make it through the green light. This form of transit signal priority (TSP) is implemented at more than 150 signals to support the two MetroRapid lines that began service in 2014. TSP typically results in an 8 percent to 12 percent reduction in transit travel times (USDOT). ATD and Capital Metro are currently coordinating to expand TSP. Experience has shown that each signal is different (volumes, bus frequencies, pedestrians) necessitating individually customized timing parameters to optimize TSP. To facilitate optimizing TSP, ATD requires real-time reports to assess the benefits and impacts of making incremental TSP adjustments. *The BEATF recommendation funds \$100,000 towards developing these initial reports. The estimated funding level required to create comprehensive transit signal priority reporting is \$250,000. A basic level of reporting will be created for \$100,000.* **CAMPO staff is recommending funding this project. If this funding is approved by the TPB, the 2018 bond funding would provide the required local match for this project. If additional funding remains after providing the local match, staff recommends allocating these funds to the New Signal Installations, Cabinets, and Aerial Detection.**

Vision Zero/Transportation Safety

The Vision Zero/Transportation Safety program proposes to provide \$15,000,000 for critical transportation infrastructure needed to continue progress in addressing system-wide traffic safety and achieving Austin's goal of zero traffic fatalities.

The 2018 Bond Election Advisory Task Force recommendation of \$15,000,000 supports the Vision Zero/Transportation Safety efforts by recommending funding for the categories listed below and described further below in this memorandum.

The program is comprised of three components:

• Major Intersection Safety Projects	\$11,000,000
• Pedestrian Safety Improvements	\$3,500,000
• Speed Management	<u>\$500,000</u>
	\$15,000,000

Major Intersection Safety Projects – (\$11,000,000)

The Major Intersection Safety Projects component proposes to use 2018 Bond funding to implement safety improvements at approximately ten of the highest crash intersections in Austin. This funding would continue progress in systematically addressing high crash intersections, building upon past funding received in 2015 for the Top 5 Intersections (\$3.3 million) and through the 2016 Mobility Bond (\$15 million). Typical safety improvements may include intersection reconfiguration and reconstruction, construction of new or modification of existing median, improvements to pedestrian and bicycle facilities, and/or construction of traffic and pedestrian signals. Early data from the constructed four intersections from the Top 5 list show a 22 percent to 61 percent reduction in crashes after improvements were made. Currently staff is actively reviewing a Top 100 High Crash Intersections List based on historical crash data for a 5 year period. Funding in the amount of \$11,000,000 is recommended to implement critical safety improvements at up to 11 high crash locations in City at an average estimated cost of \$1.1 million per intersection. *Understanding that costs among intersections vary quite a bit, we project that our total funding need is approximately \$110,000,000 for a total of 100 high crash locations.* **The City did not submit any Major Intersection Safety Projects for the CAMPO Call for Projects.**

Pedestrian Safety Improvements – (\$3,500,000)

The Pedestrian Safety Improvements component proposes to use 2018 Bond funding to implement high-impact, cost-effective pedestrian safety treatments at an anticipated 80-120 locations across the city. Currently ATD does not have a dedicated funding source to implement system-wide pedestrian safety treatments such as concrete refuge islands, rapid flashing beacons, raised crosswalks or curb extensions. A reliable funding source would help improve pedestrian safety by installing large numbers of safe crossings across the City, which is a key recommendation of Austin's Pedestrian Safety Action Plan. Funding would also be used for special event safety and security infrastructure, such as security bollards. Locations that will receive high-impact, cost-effective pedestrian safety treatments will be identified and prioritized by using the Pedestrian Safety Priority Network, as developed through the Pedestrian Safety Action Plan. This network identifies locations where treatments will have the biggest impact on improving pedestrian safety based on a combination of historical crash data, pedestrian

demand, and risk characteristics of the street. Looking just at crash scores, there are approximately 1,200 locations in Austin that would be high priority locations for pedestrian safety treatments. Based on this need, ATD staff estimates that implementing high-impact, cost-effective pedestrian safety treatments at every high crash location on the Pedestrian Safety Priority Network would cost between \$40 million and \$50 million. **CAMPO staff recommended the “Pedestrian Safety & Transit Connections Project”. If CAMPO funding is awarded, that funding can only be used to construct a limited number of pedestrian hybrid beacons.**

Speed Mitigation – (\$500,000)

ATD’s speed mitigation program, the Local Area Traffic Management Program (LATM), is currently being reevaluated to ensure compliance with best practices for speed management techniques and community participation ([memo](#)). **The original staff request for funding in the 2018 Bond included \$500,000 for speed mitigation, the same as the BEATF recommendation. Until such a time when the LATM program evaluation has been completed and standards to move forward have been identified, staff recommends not including speed mitigation funding in the 2018 Bond.**

Street Reconstruction & Rehabilitation Program

Background

Street conditions are assessed every two years, and are based on roughness and pavement degradation due to weather, heavy traffic, pavement structure, subgrade/shifting soils, and aging oxidation. Street conditions include: excellent (“A”), good (“B”), satisfactory (“C”), poor (“D”), and failed (“F”).

We have a goal established to maintain the existing street network at 80% satisfactory (“C”) or better. To accomplish this goal, staff relies on two distinct functions: the Street Preventative Maintenance Program and the Capital Improvement Program.

Street Preventative Maintenance activities focus on overlays and surface treatments for A, B, and C roadways. Other repair activities include fixing potholes, re-leveling streets, and edge milling. These activities are funded by the annual Operations & Maintenance Budget.

Capital Improvement projects address street conditions that are beyond maintenance and repair needs. Currently, the only source of funding for street CIP projects are G.O. Bonds. The bonds are typically expended on streets in poor (“D”) and failed (“F”) conditions.

Currently, the streets in Austin have a satisfactory rate of 75%, meaning that 25% of streets are in “D” and “F” conditions. In order to **maintain** the current satisfactory rate, funding for both Operations & Maintenance as well as CIP needs is needed.

Proposal

The currently proposed \$75M for street reconstruction and rehabilitation would be used towards the following types of street renewal projects: 1) reconstruction, 2) rehabilitation, 3) utility participation projects, 4) citywide curb and gutter replacement, and 5) various bus lane and intersection conversions from asphalt to concrete. The “named projects” category is to complete street reconstruction projects that have been designed with previous G.O. Bond programs and have related community expectations. The budget estimates for street renewal/CIP projects vary by the functional class of the street (residential, collector, minor arterial, or major arterial) and required program elements (e.g. Great Streets).

Based on current needs, should the proposed \$75M to address capital renewal needs be added to current funding levels, staff still anticipates streets with a satisfactory condition or better to reduce to 71% of our network. The following sections provide additional background on the proposed uses for these funds.

Street reconstruction

Streets have a typical life cycle of 80 years, meaning that they need to be reconstructed approximately once every 80 years. Reconstruction projects typically address failed (“F”) conditions and consist of replacing the complete pavement section including the curb and gutter as necessary. Reconstruction projects may involve adjustments to the street profile, cross section and width; drainage improvements; water distribution and wastewater collection improvements; sidewalks and curb ramps; and bicycle facilities. The current street network is approximately 7,850 lane miles, meaning

that approximately 100 lane miles per year need to be reconstructed according to the street lifecycle. Previous G.O. Bonds funding for reconstruction projects has been at approximately 25 lane miles per year, which means the City is on a schedule of reconstructing roadways once every 300 years. The named reconstruction projects are those with investments from previous bond programs. These projects have significant completed design. The Public Works Department has \$75M of named reconstruction projects. The response for this subprogram will be determined based on infrastructure need and funding availability.

Street rehabilitation

Street rehabilitation projects typically address streets with poor (“D”) conditions that do not have any utility alignment or replacement needs. Street rehabilitation projects consist of 40% or less of full depth repairs, with structural overlays and repairs for the remainder of the project limits, as well as spot drainage and curb & gutter repairs. Sidewalk repairs and ADA curb ramp requirements (additions or repairs) are also addressed in street rehabilitation projects.

Utility participation projects

Utility participation projects are opportunities to maximize “dig once” coordination opportunities. These projects are initiated by partnering utility departments to address their priority infrastructure needs, such as water and wastewater main replacements. Cost participation is determined by the utility project at hand as well as if the corresponding street condition is fair, poor, or failed. Coordinating work between departments is cost efficient and minimizes disturbances to our community.

Citywide curb and gutter replacement

The proposed citywide curb and gutter replacement category is to rehabilitate and replace deteriorated curb and gutter on City streets. Curb and gutters preserve pavement conditions by conveying water away from the pavement and into storm drain infrastructure. We do not currently have a funding source for addressing curb and gutter rehabilitation and replacement needs. This is a “low cost-high impact” investment in protecting the pavement quality on City streets and resolving drainage ponding concerns for citizens.

Bus lane and intersection conversions

These projects will upgrade asphalt bus lanes and intersections to concrete. Candidates include arterials with weak to marginal subgrade that have poor (D) and failed (F) conditions. Bus lanes and intersections experience accelerated deterioration due to heavy traffic. The cost of maintaining these lanes is significant and is required more regularly than lanes subject to normal traffic. Upgrading asphalt bus lanes would increase service life and minimize disruptions to traffic due to maintenance operations.

Bridges and Structures Program

Background

Bridges and structures are critical locations in the roadway system which cannot be structurally unsound, deficient in safety, or have damage that is left unaddressed for any substantial length of time. These structures form critical links within the roadway system with limited or no alternative routes.

Additionally, safety barriers such as railings and other protection systems may be obsolete or may not meet current engineering standards, thus needing capital investments to construct new assets. Staff takes a proactive approach for funding bridge and structure needs to avoid any issues related to safety and mobility if we let bridges fall into lesser condition ratings. Therefore, criticality and risks are other factors considered in addition to condition ratings when selecting named projects. All but the Slaughter Ln Railroad Overpass have been identified in the City's Long Range CIP Strategic Plan, which has been approved by Council every two years since the inception of the document in FY 2014.

Proposal

There is currently \$54M recommended for Bridges and Structures. To address current needs, PWD has identified five bridges requiring immediate major rehabilitation or replacement. Staff takes a proactive approach for funding bridge and structure needs to avoid any issues related to safety and mobility if we let bridges fall into lesser condition ratings. Therefore, criticality and risks are other factors considered in addition to condition ratings when selecting named projects. Four of the five named bridge and structure projects have been identified in the City's Long Range CIP Strategic Plan, which has been approved by Council every two years since the inception of the document in FY 2014.

Recommendation for Bridge Repair/Rehabilitation/Replacement

Public Works has identified five bridges requiring immediate major rehabilitation or replacement.

1. Redbud Trail/Emmett Shelton bridge over Lady Bird Lake
2. Barton Springs Road bridge over Barton Creek
3. Delwau Lane bridge over Boggy Creek
4. William Cannon Drive Railroad Overpass
5. Slaughter Lane Railroad Overpass

The Redbud Trail, Barton Springs, and William Cannon Road bridges are all currently in preliminary engineering and will require additional funding for design and construction. The Delwau bridge and Slaughter Ln Railroad Overpass are the only bridges on this list not currently in the preliminary engineering phase and without funding identified for that effort. You can find a detailed report for each of these bridges in the memo from Richard Mendoza.

CAMPO Grant Impacts on Proposal

While a total of \$54M has been recommended, funding will be applied to projects depending on grant opportunities.

In January 2018, PWD applied for CAMPO Grants for all but the Delwau Lane bridge over Boggy Creek (due to application guidelines related to regional mobility needs, and Delwau is a residential road).

In March 2018, PWD was notified that none of the grant applications were recommended by CAMPO staff due to readiness and capital renewal needs.

The CAMPO grants yield a higher cost-benefit analysis for projects that include mobility capacity improvements (such as added lanes) as opposed to capital renewal projects that propose to replace existing structures and provide the same number of vehicular lanes. CAMPO staff did, however,

encourage PWD to re-apply for these grant opportunities in 2019 and work with CAMPO on updating the cost-benefit analysis so that capital renewal needs are better addressed in calculations.

If the 2018 G.O. Bond passes with recommended funding levels for Bridges and Structures, funding will first go towards Redbud Trail/Emmett Shelton bridge over Lady Bird Lake as well as other highlighted needs. The estimate for Redbud Trail/Emmett Shelton bridge over Lady Bird Lake is ~\$50M, so the amount of the proposed 2018 bond that will be dedicated to this project will depend on the 2019 CAMPO grant application status.

The Redbud Trail Bridge connects Austin to West Lake Hills over Lady Bird Lake just downstream of the Tom Miller Dam. The existing bridge consists of two structures built in 1948 that are now 70 years old. The primary structure has experienced substructure degradation and been repaired several times due to flood flows from high volume dam releases by the Lower Colorado River Authority (LCRA).

Redbud Trail/Emmett Shelton bridge is the only approved trucking route stipulated in an Interlocal Agreement between the City of West Lake Hills and the City of Austin for Ullrich Water Treatment Plant (WTP) vehicles. If the bridge is not replaced, a load capacity study will need to be conducted due to structural concerns. This may negatively impact services at the Ullrich Water Treatment Plant, around 16,000 daily commuters, and visitors to the Redbud Isle Park.

This project also includes addressing concerns related to falling rocks at the southern end of the bridge, intersection safety improvements at Redbud Trail and Lake Austin Boulevard, and multi-modal capacity improvements and connections to existing networks. Additional information on this project, including a Fact Sheet, are provided on the project's website (<http://www.austintexas.gov/departments/redbud-trail-bridge-project>). The 2012 G.O. Bond provided approximately \$3.4M to this project for preliminary engineering and 30% design efforts. Additional funds are needed to complete the design and construct the project. If the project is awarded a CAMPO Grant, administrative fees will increase the cost estimate of this project.

Sidewalk Rehabilitation and Replacement Program

Background

The existing sidewalk network is about 2,500 miles. The absent sidewalk network is slightly less. The sidewalk network is comprised of existing and absent sidewalks within the full purpose jurisdiction.

As identified in the City's 2016 Sidewalk Master Plan, the Sidewalk Rehabilitation & Replacement Program replaces existing failed and/or non-ADA compliant sidewalks and curb ramps to maintain conformance with Department of Justice guidance and ADA requirements (the ADA Transition Plan).

We use annual Operations and Maintenance funding to temporarily address trip hazards and vegetation obstructions as well as address a limited amount of sidewalk rehabilitation, but supplemental Capital funding is needed to address the gap identified in the City's ADA Transition Plan (estimated annual need is \$15 million) to rehabilitate and replace non-ADA compliant sidewalks.

Existing sidewalk rehabilitation funding is estimated to be approximately \$4 to \$5 million annually, leaving a funding gap of over \$10 million annually (\$100 million shortfall for near-term 10 year target at current funding level). *Of the existing sidewalk network, approximately 80% of the network is functionally deficient, representing an approximate total need of \$330 million.*

Proposal

The current recommendation provides for \$20M for sidewalk rehabilitation. While the 2016 Mobility Bond funding is primarily used towards constructing new sidewalks, this \$20M within the 2018 Bond recommendation is intended to address non-ADA compliant existing sidewalks.

The goals of both programs are to create ADA-compliant, functional pedestrian routes, meaning that new sidewalk projects may build new and rehabilitate small segments of deficient sidewalks whereas rehabilitating existing sidewalks may include construction of new small segments of absent sidewalks.

The 2018 Bond proposed 10% of the overall funding to go towards each Council District, and the remaining funds applied according to needs identified via the methodology outlined in the Sidewalk Master Plan.

Note that even if a sidewalk is considered “high priority”, it does not necessarily mean it needs to be rehabilitated. Therefore, to provide a more systematic approach to project prioritization and selection, the City has developed a Condition Assessment Methodology for evaluating and rating existing sidewalks (Sidewalk assessment for the entire network is currently ongoing and expected to be complete around mid-2019).

Overall, project selection for sidewalk rehabilitation includes a combination of the locational priority (i.e., prioritization tool described above) and the condition rating. Using the prioritization ranking, candidate streets or areas can be identified (e.g., very high and high priority). Repair priority will then be given to sidewalks that have a large majority of D- and F-rated sidewalks to address the most significant ADA barriers in the most critical areas. Final repair scopes will likely also address C-rated sidewalks within the project limits to create functionally acceptable pedestrian routes.

Because 80% of the sidewalk network is in a functionally deficient state (based on the pilot condition assessment), there will often be competing projects that fall within these criteria. Further project refinement will include additional priorities and coordination opportunities, e.g., private development and departmental project coordination, ADA access requests, and opportunities to leverage funding.

Neighborhood Partnering Program

Background

The Neighborhood Partnering Program (NPP) allows citizens to partner with the City to propose small to medium scale projects on City-owned property to improve the places in which they live, work and play.

Projects applications are collected twice annually from community members and neighborhood groups. Examples of projects include: bicycle and pedestrian projects, green streets, pocket parks,

pedestrian projects, community gardens, landscaping and median adoption, and neighborhood park improvements. Program applications are reviewed by PWD staff and projects are prioritized through a scoring matrix based on community participation, cost share proposal, quality of life enhancement, geographic equity, and incorporation of city initiatives. Project applications are approved based on available funding. From our historical data from the last 4 years we estimate we will receive about \$570,000 in application requests per year.

The 2012 G.O. Bond provided the first capital funding for NPP, and the program has been provided additional Operations & Maintenance funds to continue funding projects for communities throughout Austin. To date, the value of community contributions for NPP equals \$1.4M and has resulted in 55 projects citywide.

We currently receive \$441,000 per year for NPP from a transfer out of the Transportation Fund operating budget (5120 6200 9999) into the Public Works CIP Budget (8400 6207 3070).

With funding from both sources, we have been able to approve every project (except one VERY high dollar project) that has gone before the Board for approval in the last 4 years.

Without additional funding it is likely we will not be able to approve as all projects in the future and the program will become more competitive.

Proposal

The recommended \$1M for the 2018 Bond would supplement existing program funding to execute additional projects as part of the City's contribution towards these community-lead projects.