



## MEMORANDUM

To: Fred Dock and Bahman Janka

From: Paul Moore and Steve Boland

Date: December 27, 2017

Subject: City Funding Request to Metro (SR-710 Early Action Projects)

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This memorandum briefly describes the projects the City of Pasadena Department of Transportation is proposing to include in the City's SR-710 Early Action Projects funding request to Metro.

The projects were selected based on:

- review of the SR-710 North Environmental Impact Report/Statement (EIR/EIS);
- recommendations of the SR-710 Working Group;
- other existing City plans, including the Mobility Element of the General Plan;
- additional project development by City staff;
- Nelson\Nygaard evaluation;
- discussions with representatives of the Cities of South Pasadena and Alhambra; and
- discussions with the Transportation Advisory Commission in its October 26 meeting.

Consistent with Metro direction, many of the proposed projects are Transportation System Management/Transportation Demand Management (TSM/TDM) projects, while others are multimodal in nature. Many of the projects are in advanced stages of project development or are part of adopted policies, while others are newer concepts requiring further community discussion and project development (note that cost estimates for these projects are by necessity preliminary, based on professional judgment).

The projects are presented in no particular order. Given the scale of funding available, it is our hope that most if not all projects can be funded by Metro.

### **GOLD LINE GRADE-SEPARATION**

This project would consist of grade-separation of the existing at-grade Metro Rail Gold Line crossing at California Boulevard. This segment of the Gold Line intersects two arterial streets with relatively high traffic volumes – California and Del Mar Avenue – resulting in substantial delay and congestion. Moreover, because a number of other area streets terminate at the Gold Line, these at-grade crossings contribute to a lack of pedestrian and bicycle connectivity between neighborhoods east and west of the Gold Line. While providing regional connectivity and access for Pasadena residents, the Gold Line acts as a physical barrier in central Pasadena.

Grade-separation of the Del Mar intersection would be challenging due to the proximity of the existing at-grade Del Mar station and adjacent transit-oriented development spanning the Gold

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Line right-of-way. However, a very preliminary plan has been developed for grade-separation of the California intersection that would have far fewer impacts, including no interruption in Gold Line service (either space is available, or certain properties could be acquired for the purpose of providing for a shoofly on adjacent properties during the construction of the project).

This project has preliminary been estimated to have a capital cost of \$105 million. We understand that Metro may wish to evaluate this project in the context of other potential grade separations of existing at-grade Gold Line crossings, including intersections in South Pasadena and Los Angeles. Therefore, our initial request is for a broader study of Gold Line grade separations, with funding set aside for implementation of priority projects.

## **210 RAMP MODIFICATIONS**

This project would remove the existing I-210 "stub" on- and off-ramps north of California and make operational improvements to Del Mar and Fair Oaks to accommodate traffic shifted to those streets.

The I-210 stub, while less than one mile long, currently features two pairs of on- and off-ramps: north of California, and just north of Del Mar. The northbound on-ramps at Del Mar and north of California (between Bellevue and Waverly Drives) are less than 800 feet apart.

We understand that proposed projects may not interfere with eventual construction of an SR-710 North tunnel, if that is the direction Caltrans and Metro eventually decide to pursue. However, removal of the existing ramps at California should not interfere with that project, and would provide a number of benefits.

Most importantly, removal of the California ramps would effectively shift north-south regional traffic (particularly southbound traffic) away from the one-way couplet of St. John and Pasadena avenues, relatively narrow residential streets, to Del Mar, Fair Oaks and Arroyo Parkway, broad commercial arteries that are designed to accommodate such traffic. This would be consistent with the City of South Pasadena's accompanying effort to shift regional traffic from Fremont Avenue to Fair Oaks, and would enable traffic calming improvements to St. John and Pasadena (see following section).

As part of this project, the City is requesting funding for a new traffic signal at Fair Oaks and Bellevue. The City has recently completed a number of throughput improvements to both Fair Oaks and Arroyo, including implementation of adaptive traffic control systems (ATCS) technology at signalized intersections.

As an alternative to this project, regional traffic could be shifted from St. John and Pasadena to Fair Oaks and Arroyo Parkway using modifications to the intersection of the I-210 southbound off-ramp and California including restriping (removal of one westbound lane on California) to accommodate dual left-turn lanes and signal timing adjustments. If this direction were pursued, the City would request funding for accompanying pedestrian improvements on California, including sidewalk widening.

However, the City's strong preference is for removal of the California ramps, as this would much more effectively divert regional traffic away from Pasadena and St. John while maintaining local and regional access to and from I-210.

Cost estimates have not been developed for this project, but costs for removal of two freeway ramps, along with attendant changes to roadway striping, signals and signage, could reasonably be expected to exceed \$10 million.



## **TRAFFIC CALMING/COMPLETE STREET PROGRAMS**

A number of “complete streets” projects are proposed to: improve safety for pedestrians and bicyclists by reducing auto speeds; reduce the impacts of regional traffic diverted to local residential streets from adjacent freeways; and work toward encouraging non-auto travel throughout the City and the northern segment of the 710 North corridor. Cost estimates have not been developed for these projects; however, the types of improvements under consideration should be relatively low-cost, amounting to less than \$1 million per mile.

### **St. John Avenue/Pasadena Avenue/Orange Grove Complete Street Program**

Removal of the I-210 on- and off-ramps north of California (see previous section) would enable traffic calming improvements to the residential streets of St. John and Pasadena Avenue. Residents along these streets must currently bear a disproportionate share of the burden of accommodating regional traffic in the 710 North corridor.

Specifically, the City proposes to restore both St. John and Pasadena to their previous configurations, before they were converted to a one-way couplet accommodating higher vehicular throughput. In addition to converting both streets to two-way traffic, this would result in restoration of removed sidewalks, and resulting narrower rights-of-way further improving pedestrian conditions by shortening street crossings.

As a corollary to this project, the City is also requesting funding for traffic calming improvements to Orange Grove Boulevard, which parallels St. John and Pasadena Avenue to the west. A community process to identify desired improvements is currently underway.

### **Allen Avenue Complete Street Program**

The City of Pasadena also wishes to enhance pedestrian walkability and bicyclist safety along the critical north-south Allen Avenue corridor, between Villa Street and Colorado Boulevard. A wide variety of travelers, including pedestrians, bicyclists, transit users and motorists, use the corridor due to its proximity to the I-210 Freeway, the Allen Gold Line Station, and Pasadena City College. Proposed improvements to improve safety and walkability may include narrowing of streets by widening sidewalks, raised landscaped medians, “road diet” lane reconfiguration, constructing curb extensions/bulb outs at some intersections, upgrading traffic signal equipment, and modifying roadway signing and striping.

### **Hill Avenue Complete Street Program**

Hill Avenue between Villa Street and the northern city limit at Topeka Street was evaluated for potential safety enhancements through a City-sponsored program in 2016- 2017. This program began with the development of a working group that included residents and other stakeholders, and culminated with a list of potential enhancements to reduce vehicular speed and enhance pedestrian, bicyclist and motorist safety. The list of potential enhancements includes bulb outs at twelve intersections and traffic circles at the intersections of Hill Avenue with Topeka Street and Elizabeth Street. The I-210 freeway has both eastbound and westbound on-ramps and off-ramps at Hill Avenue, making it a heavily traveled corridor. Design is currently underway for these enhancements, but construction funding has not yet been identified. Measure R funds would be

used to construct a shovel-ready project that has been developed through a community-based working group and has received neighborhood support.

### **Avenue 64 Complete Street Program**

Similarly to Hill Avenue, improvements to Avenue 64 have been identified based on feedback obtained through a community process. This project would provide for the installation of bulb outs and median islands at the intersections of Avenue 64 with Church Street, Melrose Avenue, Nithsdale Road and other locations, as well as a traffic signal at Avenue 64 and Nithsdale Road and small median islands south of Burleigh Drive.

### **GOLD LINE AT-GRADE CROSSING ENHANCEMENTS**

This project would provide for enhanced performance monitoring, data collection and analytics at intersections adjacent to the at-grade Gold Line crossings of Glenarm Street, California Boulevard and Del Mar Boulevard. Currently, the Gold line operates at six-minute headways in peak periods, resulting in a train crossing these intersections every three minutes during the time of day with the highest vehicular and pedestrian volumes. The City of Pasadena has been actively working on enhancements to reduce delay, including the ongoing implementation of Adaptive Traffic Control System (ATCS) along the corridors adjacent to the Metro Gold line alignment (see below).

This project would allow for greater reduction in delay through the implementation of a performance monitoring system that collects vehicular, bicyclist and pedestrian data and uses advanced analytics to report on performance measures and provide an analysis tool for making informed decisions. The project would provide for the installation of hardware at up to 25 signalized intersections and central system hardware and software to implement a performance monitoring system. This project also provides for redundant communications infrastructure to handle the higher volumes of data and provide reliable reporting. This project has preliminary been estimated to have a capital cost of \$950,000.

### **INTELLIGENT TRANSPORTATION SYSTEMS PROJECTS**

The City has implemented ATCS signal technology on Fair Oaks Avenue and is in the process of expanding ATCS to other major corridors including Arroyo Parkway, Raymond Avenue, Marengo Avenue, California Boulevard and Del Mar Boulevard. As a complement to this, the City is requesting funding for Intelligent Transportation System (ITS) projects including a redundant communication path, data analytics capability, controller upgrades to provide high-resolution data, and pedestrian and bicycle video detection installations. In order to prepare for accommodation of autonomous vehicles on city streets, the City is also requesting funding for Dedicated Short Range Communication (DSRC) and signal preemption technology.

### **Pedestrian and Bicyclist Automated Data Collection**

As the City of Pasadena continues to pursue the complete streets policies identified in the Mobility Element of its General Plan, the ability to collect, analyze and process pedestrian and bicyclist data takes on a more important role. This project provides for the installation of multimodal count stations that would collect motorist, pedestrian and bicyclist counts at 36 locations within a half-mile of the six Gold Line stations in Pasadena. The project would create an extensive database of multimodal traveler information, and would provide the analysis tools to



report out on performance measures and make informed decisions based on advanced analytics. This project has preliminary been estimated to have a capital cost of \$1.4 million.

## High-Resolution Traffic Signal Data

While the City is currently updating some corridors to ATCS, the vast majority of the signalized intersections in the City continue to be controlled by hardware and software unable to collect high-resolution vehicle arrival data. This project would allow the City to upgrade traffic signal controllers citywide to collect such high-resolution data. The ability to collect and analyze high-resolution data would allow for the development of improved coordination plans, reducing delay for roadway users while simultaneously providing the ability to manage traffic speeds. In addition, high-resolution data would provide a foundation for arterial performance monitoring and reporting.

This project would also include the installation of DSRC infrastructure, providing the ability to share traffic signal phase and timing data with vehicles equipped to receive the information.

This project would provide for traffic signal controller upgrades at up to 300 intersections, the upgrade of up to 100 traffic signal cabinets and the installation of fiber optic communication infrastructure to provide a redundant high bandwidth network. In addition, this project provides for the use of cost-effective network communication hardware to allow for IP communication over existing copper infrastructure where the cost to install fiber optic communication cable would be prohibitive. This project has preliminary been estimated to have a capital cost of \$8.5 million.

## Walnut Street Corridor Upgrades

Walnut Street is a major east-west corridor south of the I-210 freeway serving as a connector between the major north-south corridors of Orange Grove Boulevard and Fair Oaks Avenue and the I-210 on- and off-ramps at Lake Avenue, Hill Avenue, Allen Avenue and Sierra Madre Boulevard. This project would replace the decades-old traffic signal controller infrastructure and communications equipment along Walnut Street and allow for bicycle detection and differentiation, collection of high-resolution data, the ability to reduce delay through updated signal coordination, and the ability to manage traffic speeds.

The project provides for the installation of up to 15 new traffic signal cabinets, traffic signal controllers, video detection equipment, two CCTV cameras and three miles of fiber optic communication, associated hardware and software, as well as curb ramp accessibility improvements at fifteen intersections. This project has preliminary been estimated to have a capital cost of \$4.1 million.

## I-210 CONNECTED CORRIDORS EXPANSION

A pilot for the California Department of Transportation's Connected Corridors program of integrated corridor management (ICM) measures is already underway in the I-210 corridor east of SR-134. This program includes measures such as:

- Integration of freeway ramp meters and arterial signal systems
- Arterial signal coordination
- Traffic re-routing due to incidents or events

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- Traveler communication (via changeable message signs, 511, radio, social networks, mobile app) of traffic conditions, transit services, parking, alternate route/trip/mode options
- System coordination/communication between Caltrans (freeway operator) and local jurisdictions (arterial operators)

The I-210/SR-134 interchange has experienced a number of long-term closures resulting from collisions on the connector ramps. Additional funding would allow this innovative program to be expanded to the I-210 segment north of SR-134, facilitating the management of traffic resulting from the closure of the connector ramps at this interchange. The estimated cost of providing these improvements is approximately \$5 million.

## **RAPID BUS IMPROVEMENTS**

The Sr-710 North EIR/EIS included a Bus Rapid Transit Alternative featuring a BRT line running north-south from Pasadena to East Los Angeles, in the Fair Oaks/Atlantic Boulevard corridor currently served by Metro Rapid Route 762. While the City's position is that Fair Oaks cannot accommodate bus-only lanes, the City wishes to join South Pasadena in expressing support for Metro study of "rapid" or "enhanced" bus service and capital improvements in the Route 762 corridor. Consistent with recommendations of the SR-710 Working Group, the City also requests similar study of Rosemead Boulevard south of the Sierra Madre Villa Gold Line Station.

## **ROSE BOWL SHUTTLES**

Transit access to the Rose Bowl, a major regional destination, is somewhat limited. The nearest bus stop is one mile from the stadium, and the Gold Line Memorial Park Station is 2.4 miles away. However, during events at the Rose Bowl shuttle service is provided from the parking lot of Parsons Corporation, roughly a quarter-mile walk from Memorial Park. Depending on the event, this service may be free or may charge a fare.

The City would like to improve the utility, attractiveness and effectiveness of Rose Bowl shuttle service by: providing subsidies to make all service free, regardless of event; expanding marketing and awareness efforts in collaboration with Metro; providing additional wayfinding signage on the platforms and at exits to Memorial Park Station, as well as on the pedestrian path between the station and Parsons parking lots (Holly Street); and potentially providing additional service at events with relatively higher demand for transit, in order to reduce wait times. The first three improvements should have a total, combined cost of less than \$1 million per year. Operating costs for increased service would vary depending on the extent of the increase. Prior analyses indicate that adding service for the multi-day Arroyo Seco Music and Arts Festival (ASMAF) would require approximately \$150,000 annually. For now, the City is requesting funding for two years of ASMAF service and funding to conduct data collection and analysis on patterns of demand, in order to better determine the need for increased service.

## **COLLEGE AND UNIVERSITY TRANSIT PASSES**

The City currently provides subsidies for transit pass programs at Caltech (where passes good on Metro are available to students for \$85 per semester, and Pasadena Transit passes are free) and Pasadena City College (\$95 for both Metro and Pasadena Transit). Making all transit passes free for students at those campuses would cost approximately \$5 million per year; expanding the program to include Pasadena ArtCenter College of Design and Fuller Seminary (which have a



combined enrollment of approximately 6,000) would incur additional costs. The City is requesting funding for a one-year pilot program including all four institutions and extensive data collection to determine the cost-benefit of a permanent program expansion.

## **BICYCLE TRANSPORTATION ACTION PLAN PROJECTS**

The City completed an updated bicycle master plan in 2015. While a few of its recommended projects are in development, most remain unfunded. The estimated cost to complete all projects in the plan – including facilities along bike routes (lanes, bicycle boulevards, etc.) as well as bike parking and other amenities – is about \$5 million, a relatively small figure for a program that would result in comprehensive improvements citywide. (Note that most projects would require additional community discussion and project refinement.)

### **The Arroyo Link**

The Arroyo Link would be a combination of Class III and Class I paths connecting the in-progress bike facilities on Union Street (a protected cycle track) to the existing Arroyo Seco Path. Upon future completion of the Arroyo Seco Path to the Los Angeles River path, the Link could provide a key connection in the regional bicycle network to Old Pasadena, Pasadena Civic Center and Pasadena City College.

This project has not yet been designed, and cost estimates have not yet been developed. However, most of the project would utilize city streets, and only about 1,000 feet of new, off-street path would be required. This segment – between Orange Grove Boulevard and the Arroyo Seco Path – presents design challenges including topography and existing infrastructural constraints (primarily the Colorado Boulevard access to the Colorado Street Bridge). New bridges and/or tunnels would likely be required. Nonetheless, we believe the project cost should not exceed \$1-2 million, including costs for an initial feasibility study.

## **BIKESHARE EXPANSION**

As currently configured, Metro funds up to 35 percent of operating and maintenance costs for the Metro Bike Share program. We believe that setting aside a small portion of the 710 TSM/TDM funding to fully subsidize five additional bike stations, increasing the total in Pasadena from 32 to 37, and funding these stations for a minimum of three years would be a worthwhile use of the funding. Combined capital and O&M costs for each station are currently \$80,000 per year.

## **MOBILITY HUBS**

Consistent with recommendations of the SR-710 Working Group (recommendations that were based in turn on previous concepts developed by the City of Pasadena), the City is requesting funding for “mobility hub” first/last mile access improvements at Gold Line stations. Because Metro Rail station sites in Pasadena are generally constrained, analysis would need to be conducted of space requirements for different potential elements, as well as other factors including costs and benefits.

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**SR-710 EARLY ACTION PROJECTS FUNDING ESTIMATES**

<b>Project</b>	<b>Preliminary Cost Estimate</b>
Gold Line Grade Separation at California Boulevard	\$105M
I-210 Stub Ramp Modifications	\$10-\$50M
Traffic Calming Programs	<\$1M/mi.
Pasadena Avenue/St. Johns Avenue Complete Streets	\$15M
Allen Avenue Complete Streets	\$1.5M
Hill Street Corridor Complete Streets	\$1.5M
Avenue 64 Complete Streets	\$2M
Gold Line At-Grade Crossing Enhancements	\$950k
Pedestrian and Bicyclist Automated Data Collection	\$1.4M
High-Resolution Traffic Signal Data	\$8.5M
Walnut Street Corridor Upgrades	\$4.1M
I-210 Connected Corridors Expansion	\$5M
Rapid Bus Improvements	\$1-\$10M/mi.
Rose Bowl Shuttles (non-service)	<\$1M
Rose Bowl Shuttles (ASMAF service and analytics)	\$200k/yr.
College and University Transit Passes (Caltech/PCC)	~\$5M/yr.
College and University Transit Passes (other)	<\$1M
Bicycle Transportation Action Plan Projects	\$5M
Arroyo Link	\$1-2M
Bike Share Expansion	\$400k/yr.
Mobility Hubs	\$10M