

MTP2035 Issue Papers: System Retrofits

In this paper, “system retrofits” refers to improvements to the existing transportation system for one of several possible reasons – to improve the function of a facility such as a road or public transit with new technology, to meet federal or state laws for accessibility, to correct unsafe conditions, to create a better environment for walking and biking, or to meet the desires of a community. A retrofit, as opposed to simple maintenance, improves a facility. Some of the key policy questions in system retrofit are:

- Is it a priority compared to maintenance and operations, or compared to expansion of the transportation system to growing areas?
- Which are the highest priority types retrofits?
- Given the high costs of some kinds of retrofits, can they be phased in over time?
- What are the risks and tradeoffs of delay?
- How can retrofits enhance our Blueprint-based transportation plan?

The following is a discussion of system retrofits relevant to our region.

High-Tech Improvements

Intelligent Transportation Systems (or ITS) uses computers, communication and roadway technologies to improve traffic flow, transit operations, incident management, emergency response, pedestrian and bicycle movement, and traveler information. Some of the common applications are roadway cameras, automated message signs, traffic signal upgrades, transit signal preemption, queue jumping, and bus rapid transit improvements.

- High tech improvements that are feasible have been planned for the region, but funding for full-scale implementation still must be found.
- ▶ The 2005 ITS Strategic Deployment Plan includes improvements such as automated highway message signs, crosswalk signals with pedestrian countdown timers, real-time train or bus arrival time message signs (such as seen at BART stations), and intersection signal preemption for buses. The Plan identifies corridors, including Sunrise and Hazel Avenues in Sacramento, where near-term ITS strategies are planned by local agencies.
- ▶ The Plan also extends the control of traffic operations through a Traffic Operations Center over more of the arterial network and calls for the coordination of traffic information and operations between cities, counties, and Caltrans.

- ▶ Basic “smart corridor” improvements that are connected to the Traffic Operations Center (cameras, message signs, signal timing, and fiber optics) cost approximately \$600,000/mile. Smart corridors with transit-specific enhancements cost roughly \$1 million per mile. The additional technologies include transit signal preemption, queue jumping, and other bus rapid transit improvements.
- ▶ Corridors targeted for reinvestment could consider ITS to handle increases in traffic, transit service, pedestrian and bicycle mobility as envisioned in Blueprint, at less than a quarter the cost of adding new lanes.
- ▶ ITS features, particularly the timing of signals, can add 10% to 20% to road capacity at modest cost.
- ▶ ITS features can be installed to speed up buses and light rail, increase productivity, and improve finances for Regional Transit and other transit operators. A recent report by the San Francisco Planning and Urban Research Association (SPUR) recommends these ITS features – traffic signal timing to favor transit, traffic signal priority technology that extends green lights as transit approaches, prepaid fare vending, and real-time next bus arrival times at transit stops – as part of a package of improvements to make Muni more efficient, speed it up by 25%, attract more riders, and reverse its declining productivity trend.
- ▶ Although favored by local agencies, ITS has been criticized by some who believe ITS encourages driving and higher speed traffic, or can create unsafe walking and biking conditions.
- ▶ Other high-tech applications that can help travelers are the 511 phone number and website for real-time travel information available to the public, and the rapid dispatch of Freeway Service Patrol trucks to assist incapacitated vehicles on the freeway.

Soundwalls

- Residents adjacent to freeways, arterials, and railroads have frequently requested soundwalls to protect them from noise. Traditionally a low priority for regional funds, SACOG is developing a soundwall funding policy.
- ▶ Road noise is caused by engine noise, exhaust noise, and tire whine. More trucks lead to higher engine and exhaust noise. Tire whine increases with vehicle speed and pavement conditions.
- ▶ Soundwalls are the typical method used to mitigate road noise, and a high quality concrete block wall costs an average \$1.3 million per mile to construct.
- ▶ Quieter pavements can reduce tire whine but are expensive and hard to justify if the pavement is otherwise still serviceable.
- ▶ Soundwalls can also serve as a safety barrier or to screen residents from roadways.
- ▶ Caltrans is responsible for building soundwalls as environmental mitigation for building new freeways or adding capacity to older ones. Some soundwalls are built by developers or local governments, but not if there is not a road project on adjacent development is

being built, then there is not a present program to fund the increased building necessary to fund soundwalls to keep up with increased traffic noise.

- ▶ Caltrans has created a preliminary inventory of soundwall retrofit needs in this region, a list of 42 projects along 30 miles of freeways, local streets, and railroads. At an average cost of \$1.3 million/mile, building these soundwalls would cost approximately \$39.0 million.
- ▶ Since the passage of Senate Bill 45 in 1997, responsibility to fund retrofit soundwalls along state highways has devolved from the state to regional agencies such as SACOG. Soundwalls don't typically compete well for regional funding against other transportation priorities, and SACOG is considering the creation of a soundwall policy to allow at least some to be funded.

Americans with Disabilities Act (ADA) Compliance

- Compliance with the federal ADA, an act that affirms the civil right of disabled access to the transportation system, will be very costly and must be phased through time.
- ▶ The ADA requires public agencies to prepare transition plans that show how they intend to provide for disabled access to streets, roads, and walkways. The deadline for transition plans was 1995; in our region, plans have been completed by the Cities of Sacramento, Citrus Heights, Galt, and Rancho Cordova, and the Counties of Sacramento and El Dorado.
- ▶ These plans include a schedule for providing curb ramps at intersections and access improvements on public walkways; walkways serving public facilities receive priority for retrofit.
- ▶ Comprehensive pedestrian improvements to a major street intersection are expensive, averaging \$250,000/intersection, providing accessible pedestrian signals (APS), ramps, improved lighting and special paving material for the crosswalks.
- ▶ Public agencies partnered with utility companies are responsible for removal of barriers in sidewalks (such as utility poles).
- ▶ Although the total regional cost of ADA compliance is not known at this time, Sacramento County has estimated that it would cost \$67 million to bring curb ramps, accessible signals, and sidewalks up to ADA compliance in the unincorporated county.

Bike Lane and Sidewalk Connectivity

- The 2050 Blueprint preferred land use scenario for our region envisions a much larger and more complete bicycle and pedestrian network that will allow and encourage greater use of those travel modes.
- ▶ The bicycle/pedestrian share of trips in the Blueprint preferred scenario in 2050 is estimated at 13%, versus 6.9% today.
- ▶ There are currently approximately 500 miles of Class I (separated bike/pedestrian paths), 1,900 miles of Class II (on-street bike lanes), and 115 miles of Class III (bike routes) in the region.

- ▶ Other improvements supportive of bicycle travel include bike racks on buses, bicycle parking, and lockers and shower rooms provided by employers.
- ▶ The Metropolitan Transportation Plan 2025 included \$350 million over the next 20 years for bicycle and pedestrian facilities. SACOG has recently completed a Regional Bicycle, Pedestrian, and Trails Master Plan with a detailed and prioritized capital project list of almost 300 projects, of which 126 are considered high priority and ready to implement. Many of the projects do not yet have costs.
- ▶ The cost of bicycle and pedestrian projects depends on factors such as land costs, and pavement types. If a street is being rehabilitated or repaved, widening and striping for bicycles is much less expensive.
- ▶ Projects listed in the Master Plan are eligible for SACOG’s Bicycle and Pedestrian Funding Program. The program provides federal funding to local agencies on a biannual basis; the 2006 round of funding is estimated at \$4-8 million.
- ▶ SACOG’s Community Design Funding program is another source for bicycle and pedestrian facilities connected to land developments consistent with the Blueprint principles. This round of funding is estimated at \$15 million in 2006.
- ▶ Developers of new areas are expected to provide high quality bicycle and pedestrian facilities as part of the basic public infrastructure.

Street Improvements

- A number of techniques, costing between \$60,000 and \$1 million per mile, can be used to improve street safety and aesthetics; and landscaping makes biking and walking more enjoyable. Paying for the ongoing maintenance of landscaping is a perennial problem, though.
- ▶ Major street safety enhancements include “no turn” lanes at intersections, improved lighting and signage, special paving, and median strips.
- ▶ Traffic calming is typically installed when neighborhood streets experience unsafe cut-through or high-speed traffic. Methods include street narrowing or changes in alignment, installation of barriers, speed bumps, roundabouts, sidewalk bulbouts and refuge islands at intersections, pavement treatments and other street changes. According to a study by Reid Ewing of Fehr & Peers Associates¹, while the impacts are case-specific, traffic calming measures generally have the desired effect of reducing speeds, volumes, and collisions.
- ▶ Traffic calming is often controversial, since vehicles may simply divert to nearby streets or drivers may resent being forced to slow down.
- ▶ Pedestrians and bicyclists can benefit from traffic calming if it’s designed correctly.
- ▶ Average traffic calming costs are \$60,000 per application for the most common elements, including speed bumps, crosswalks and signage.

¹ Ewing, Reid, “Impacts of Traffic Calming,” Transportation Research Board Circular E-C019: Urban Street Symposium.

- ▶ Streetscaping includes landscaped buffers between streets and sidewalks, landscaped median islands, lighting, signage, and street furniture.
- ▶ Streetscaping is usually considered an amenity to neighborhoods and business areas since it provides shade for walking and biking and improves street aesthetics.
- ▶ Average costs for major streetscaping run as high as \$3 million per mile for improved lighting, landscaping, signage and street furniture.
- ▶ Landscaping maintenance costs are ongoing and usually the responsibility of cities and counties. The City of Sacramento uses a cost of 2-14 cents per square foot for these maintenance costs.

Local Bridges and Rail System Upgrades

- Many local bridges and railroad/road intersections in our region are old and need to be replaced, reconstructed, or widened for safety reasons. Rail station updates that improve the functionality of the system are also envisioned.
- ▶ Caltrans maintains a list of 218 local bridges in the SACOG region in need of retrofit. The roughly \$130 million cost of this work (based on an assumption of \$2,000 per square meter) can be only partially covered by the federal highway bridge replacement program, and match funding is a challenge for many local agencies. Regional funds are used on very high priority local bridges.
- ▶ Caltrans also maintains a list of unprotected railroad/road intersections. But very little federal or state money has been available to fund these types improvements, falling to the region to fund. Federal reauthorization legislation funds a new Safety Program starting in 2007, with rail grade crossings as an eligible category of project.
- ▶ Renovating and reconfiguring the Sacramento Amtrak station (also called the Sacramento Valley Station or the Sacramento Intermodal Transportation Facility) has been planned for years and is moving forward. The cost of this project, which will involve new track alignments, moving and renovation of the old SP depot, sidewalks, a parking garage, new freeway ramps, and bus and light rail connections, is estimated to be at least \$350 million. As of now, there is no identified funding except for a small federal earmark.

Storm Drainage

- Based on Caltrans reports, there is an approximately \$15 million unmet need in this region for drainage system improvements and water treatment facilities on state highways, to satisfy water quality board permits. These upgrades would ensure that state highway storm drains comply with federal and state water quality standards in rural areas. The cost in urban areas remains undefined.
- Local agencies would need to spend a much larger sum for local street and road storm water runoff, probably greater than \$50 million, if water quality boards decide to emphasize water pollution from street runoff. Runoff from nearby properties, such as from roofs, parking areas, and landscaping, that ends up in street drains, complicates the problem for urban areas.

Other types of retrofits not covered in this paper, which could also have significant costs to the region, are:

- freeway landscaping and lighting
- paving shoulders on rural highways and urban freeways
- cul-de-sac passthroughs
- pedestrian-bicycle crossings of barriers such as freeways, rivers, creeks, and railroads

In conclusion, very few of these types of retrofits have any dedicated sources of funding available to them, probably because they don't fit neatly into the categories of "new system" or "maintenance." To fund them, the region will have to consider some or all of these a priority for use of regional discretionary funding.