



City of Arts & Innovation

Transportation Committee

TO: TRANSPORTATION COMMITTEE MEMBERS DATE: OCTOBER 11, 2018

FROM: PUBLIC WORKS DEPARTMENT WARDS: ALL

SUBJECT: NEW SAFETY IMPROVEMENT DEVICES - REVIEW OF INFORMATION - DIRECT SUBMITTAL

ISSUE:

Review of information regarding new safety enhancing traffic devices and current and potential future applications.

RECOMMENDATION:

That the Transportation Committee receive information regarding new safety enhancing traffic devices and current and potential future applications.

BACKGROUND:

On May 10, 2018, the Transportation Committee reviewed potential topics for future Committee review and discussion. Committee agenda items for the 3rd Quarter 2018 are devoted to topics related to updates on City pilot projects and new device deployment including this report which provides information regarding new traffic safety improvement devices.

DISCUSSION:

Advancements in innovation and technology continually lead to the development and availability of new and exciting traffic safety enhancement devices. The Public Works Department is steadfast in its ongoing efforts to examine and identify new and improved devices and measures aimed at improving traffic safety citywide. The new devices may provide enhancements in effectiveness, efficiencies, or offer new alternatives to existing equipment or methods. Exploration of the latest innovation and technology allows the Public Works Department to shape strategies for future projects, engage in pilot project trials on promising new devices to assess overall benefits and impacts, and continually strive to achieve notable improvements in traffic safety on our local roadways.

New safety improvement devices recently implemented by the Public Works Department at select locations include:

Accessible Pedestrian Signals

Accessible Pedestrian Signals offer upgraded pedestrian push button features at signalized intersections. This device features an ambient noise controlled locator tone, easily activated two inch American Disability Act (ADA) button with raised arrow, high quality digital audio messages, automatic volume adjustment to ambient noise levels, and a vibro-tactile walk phase indication. These devices are particularly beneficial to visually impaired pedestrians as they provide audible cues of when to safely enter a crosswalk. The systems create a safer walking environment for pedestrians and promote mobility. The Public Works Department has begun to utilize Accessible Pedestrian Systems at intersections where replacement of existing devices was required and will continue to upgrade the older push buttons citywide as maintenance necessitates and at new and modified signalized intersections and pedestrian crossings.

Additionally, in May of 2014, the Public Works Department submitted an ATP Cycle I Grant application and was later awarded grant funding to complete the project. One component of the project involves the upgrade of existing pedestrian push button devices to Accessible Pedestrian Signals at five select intersections. The ATP Cycle 1 Grant project was recently put out to bid and the project has been awarded to a contractor with construction anticipated to begin late summer 2018.

Intersections planned for upgrade to Accessible Pedestrian Signals under the ATP Cycle 1 Grant project include:

1. Magnolia Avenue at Beatty Drive;
2. Market Street at Fourteenth Street;
3. Market Street at Mission Inn Avenue;
4. Market Street at Tenth Street; and
5. Market Street at University Avenue

Blank-Out Signs

Blank-out signs serve as an excellent alternative to static regulatory and warning signs by conveying critical, clearly visible information to motorists. This type of sign offers the benefit of LED lighting to display text and/or symbol messages to drivers yielding enhanced visibility and recognition of the signs. The signs allow for a number of applications including traffic regulation, lane control, warnings, and guidance.

Blank-out Signs are Manual on Uniform Traffic Control Devices (MUTCD) compliant and can accommodate standard and/or custom traffic messages. The signs are versatile, allowing for hard wired or solar powered energy, are glare resistant, enable optional remote control or vehicle activation, can be set to engage during specific times of day such as peak traffic hours, and are cost effective, energy efficient devices.

The Public Works Department previously installed a No Right-Turn on Red Blank-out sign at westbound El Cerrito Drive at Canyon Crest Drive where the roadway alignment impacts sight distance and right-turn movements on red lights are restricted. More recently a No Right-Turn on Red Blank-out sign was installed at northbound Brockton Avenue at Magnolia Avenue which is set to display during restricted weekday a.m. and p.m. peak hours only and sits dark outside of restricted times. Additionally, a No Right-Turn Blank-out sign was installed on northbound Watkins Drive at Spruce Street in conjunction with the Perris Valley Line RRR upgrades. Initial observations indicate that the signs have been effective in gaining driver attention of the restrictions and reducing violations, ultimately improving both safety and traffic flow.

The Public Works Department is currently considering a future test project for No Left-Turn Active Railroad Crossing Blank-out signs at Indiana Avenue / Mary Street and/or Magnolia Avenue / Buchanan Street approaching the Burlington Northern Santa Fe (BNSF) Railroad crossings. The Blank-out signs would notify turning motorists of the train activity and prohibit turning movements when the crossings are active to reduce the potential for vehicles backing-up across the railroad tracks.

LED Lit Signs

Traffic signs containing embedded Light Emitting Diodes (LED's) are utilized to heighten driver awareness of traffic regulatory or warning signs by enhancing visibility and recognition of the signs with a goal of improving driver compliance. Sign variations are available with options including LED's placed to outline the edge, words, or symbols of a sign. LED's can be set to flash or operate in a sequential or steady mode and can function as pedestrian or vehicle activated or be illuminated 24 hours per day. LED signs offer the ability to use stand-alone solar panel units to power the signs due to the lower power requirements, allowing for flexibility in terms of project location.

The Federal Highway Administration (FHWA) cites prior study data related to the safety effects of LED embedded stop signs based on the results of a 2004 Texas Transportation Institute study which showed a 28.9% reduction in the number of vehicles not fully stopping and a 52.9% decrease in the number of vehicles moving through the intersection without significantly slowing. Also documented was a 2007 study conducted by the Virginia Transportation Research Council which showed a significant 7% decrease in vehicle approach speeds with the greatest benefits seen during the nighttime hours. Both studies show the considerable benefits which may be achieved through the use of LED lit stop signs.

The Public Works Department recently installed the first solar powered LED edge lit stop signs on California Avenue at Bolton Avenue. The signs are intended to elevate driver awareness of the stops and improve motorist compliance creating safer conditions at the intersection particularly during nighttime dark conditions. Thus far the signs have operated satisfactorily and have been well received by the neighboring communities. The Public Works Department is also currently considering utilization of the first LED lit chevron warning and combined speed limit and smaller speed feedback signs which also offer the ability to equip the signs with additional radar sensor gear and radios to allow create dynamic systems which can engage by sensing approaching vehicular traffic or based upon vehicular travel speeds.

Other high activity intersections being considered for LED edge lit stop sign upgrades include Lincoln Avenue at Maude Street adjacent to Gage Middle School, Washington Street at Marguerita Avenue, and Watkins Drive at Big Springs Road near University of California Riverside (UCR). Additionally, the Public Works Department is assessing possible LED lit chevron warning signs for use on street segments with characteristics such as curvilinear alignment and/or roadway slope to enhance driver awareness and navigation of roadway curves and aid in prevention of run off road type collisions. Locations currently under consideration include Alessandro Boulevard near Royal Hill Drive, Arlington Avenue near Hawarden Drive, Central Avenue near Fairview Avenue, and Riverwalk Parkway north of Collett Avenue.

Another new safety improvement device which the Public Works Department will test in an upcoming project is:

High Friction Surface Treatments (HFST)

High Friction Surface Treatments (HFST) are pavement treatments which include spot applications of a very high-quality aggregate using a polymer binder to restore and/or maintain pavement friction to aid drivers in sustaining control in both wet and dry conditions. HFST improvements are utilized at locations which have experienced or have the potential for high collision rates. A treatment originally used in the United States for sealing bridge decks, HFST use expanded in the early 2000's to include safety countermeasures particularly in locations where roadway geometrics and/or vehicle speeds create a high friction demand.

Roadways which undergo premature polishing of pavement surfaces due to sharp horizontal curves and/or excessive braking are excellent candidates for HFST's to restore appropriate friction levels and aid in reducing incidents with vehicles skidding or losing control when they speed, turn abruptly, or brake excessively. HFST are relatively low in cost at \$25 to \$50 per square yard and have excellent durability with an expected longevity of approximately ten years.

FHWA has identified horizontal curves as the location at which HFST have the greatest benefit and has developed a Surface Enhancements at Horizontal Curves (SEaHC) Program which serves as a national demonstration program for the treatments. In April 2015, the Public Works Department applied for and was awarded funding through the Highway Safety Improvement Program (HSIP) Cycle VII grant for a project which includes installation of HFST improvements at seven horizontal curves located on four arterial roadways which have experienced run-off-road type collisions. Improvements are anticipated to be installed by 4th quarter 2018 and are anticipated to result in a marked decrease in vehicular collisions involving vehicles leaving the roadway.

Upcoming HFST project locations include:

1. Alessandro Boulevard at Glenhaven Avenue;
2. Arlington Avenue east of Hawarden Drive;
3. Arlington Avenue at Chadbourne Avenue;
4. Arlington Avenue at Norwood Avenue;
5. Central Avenue at Fairview Avenue;
6. Riverwalk Parkway south of Waterstone Drive; and
7. Riverwalk Parkway at Raley Drive

The Public Works Department will monitor and compare collision activity at the improvement sites pre and post improvements to determine the achieved benefits of the pavement treatments and allow for an informed decision regarding potential future expansion of use of the HFST.

FISCAL IMPACT:

There is no cost associated with review of this report. Utilization of these devices has primarily been in conjunction with grant projects with funding largely provided through the various awarded grants. Potential funding for future multiple applications of devices may be sought through upcoming grant opportunities. Costs associated with potential individual treatments would be assessed to determine if funding is available in the existing Public Works Department budget, Signing Supplies account number 4110100-424143, to cover individual project costs.

Prepared by: Kris Martinez, Public Works Director
Certified as to

availability of funds: Adam Raymond, Chief Financial Officer/City Treasurer

Approved by: Rafael Guzman, Assistant City Manager

Approved as to form: Gary G. Geuss, City Attorney

Attachments:

1. High Friction Surface Treatment (HFST) Sample Design – Alessandro Boulevard at Glenhaven Avenue Exhibit 1
2. Presentation