



# Potrero Hill Neighborhood Transportation Plan

## DRAFT FINAL REPORT



JUNE, 2015

## ACKNOWLEDGEMENTS

This final report and study are the result of the hard work, dedication, and enthusiasm of a number of people and organizations.

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**PHOTO CREDITS**

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Pedestrian improvements recommended in the plan will build upon the successful community gardening program.

## EXECUTIVE SUMMARY

The Potrero Hill Neighborhood Transportation Plan (NTP) is the result of a community-based planning effort in the southern Potrero Hill neighborhood of San Francisco. The technical team collaborated with community stakeholders to identify multimodal transportation priorities at the neighborhood scale, prioritizing near-term improvements to improve connectivity across the site and to the broader neighborhood, city, and region. The final recommendations focus on low-cost improvements that could be implemented before the site is redeveloped wholesale through the Rebuild Potrero project.

Due to the extensive planning processes preceding the current effort as well as the anticipated redevelopment of the Potrero Terrace and Annex housing sites through the Rebuild Potrero project, this NTP was focused on developing low-infrastructure transportation solutions that could bring benefit to residents in the very near term. Three priority projects emerged:

1. Building on the success of the neighborhood's walking school bus program, the team partnered with residents to design pedestrian safety improvements at five intersections throughout the project site. These improvements call for the use of materials that do not require infrastructure changes. Therefore, they are lower in cost and can be

reused in other parts of the city once development begins for Rebuild Potrero. They also will allow space for transit amenities such as shelters, allowing the city to test the use of non-infrastructure materials (e.g., improvements that don't require regrading streets, moving sewer catch-basins, etc.) for a concept such as a bus bulb.

2. Complementing the intersection design improvements, the team also proposed a lighting project behind the Potrero Hill Recreation Center to improve security for the walking school bus participants as well as other residents using this key link in the dark.

3. Finally, the project team developed a potential shuttle route to enhance access for residents across the site and to other goods and services.

The Potrero Hill NTP includes cost estimates and a funding and implementation strategy for each of the projects described above. The first two pedestrian safety projects anticipate full funding by the time of the study is adopted, and implementation could be as soon as the end of 2015. The shuttle project will require further refinement and identification of funding sources, and implementation is likely at least 1–2 years away.

# 1. INTRODUCTION

The Potrero Hill Neighborhood Transportation Plan (NTP) is the result of a community-based planning effort in the southern Potrero Hill neighborhood of San Francisco. The technical team collaborated with community stakeholders to identify multimodal transportation priorities at the neighborhood scale, prioritizing near-term improvements to improve connectivity across the site and to the broader neighborhood, city, and region. The final recommendations focus on low-cost improvements that could be implemented before the site is redeveloped wholesale through the Rebuild Potrero project, described below.

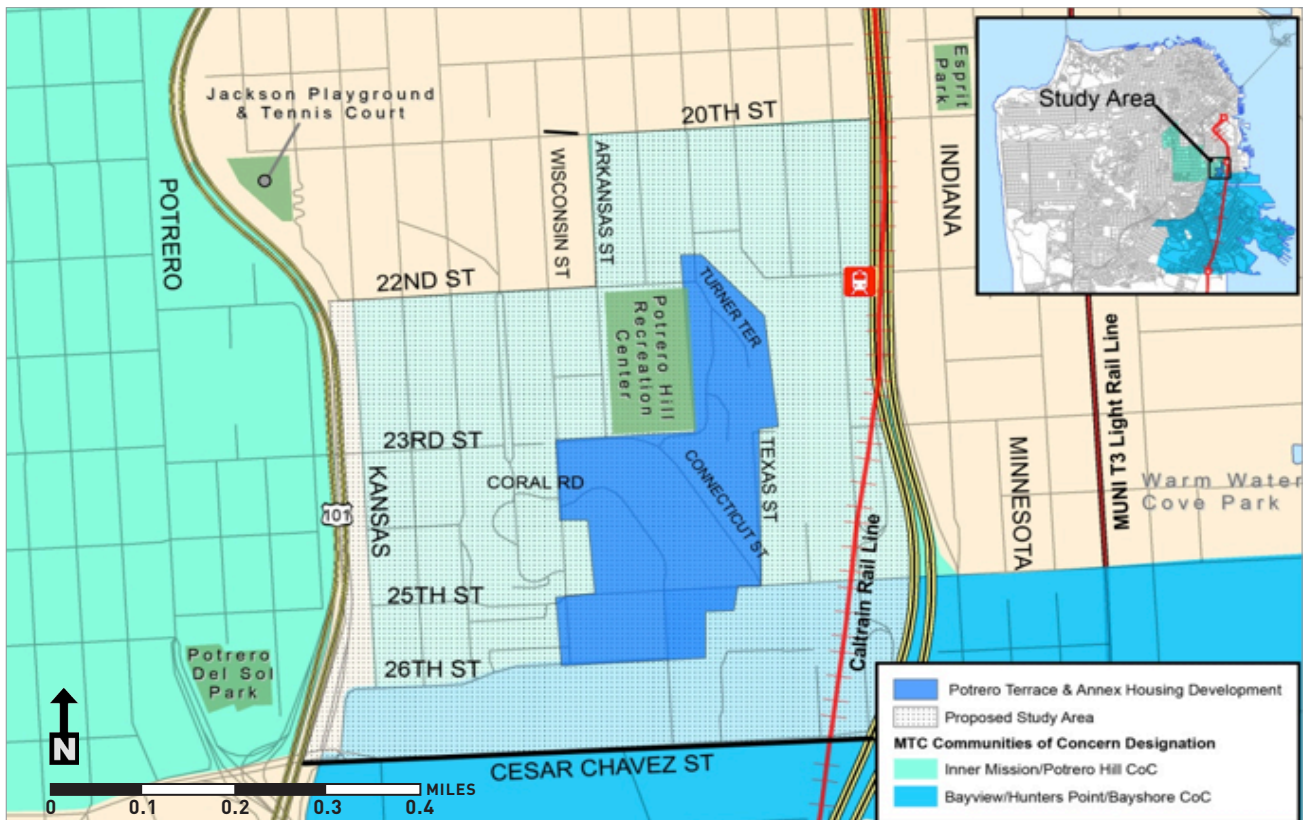
This introduction chapter provides an overview of existing conditions, goals and objectives, outreach, and prioritized transportation improvements. Chapters 2-5 of this final report provide more details on each of the transportation priorities, including the context and conditions that led to their prioritization.

## PROJECT SITE AND EXISTING CONDITIONS

The plan study area is bordered by US-101 to the west, I-280 to the east, Cesar Chavez Street to the south, and

22nd Street/20th Street to the north (see Figure 1-1), wholly encompassing the Potrero Annex and Potrero Terrace public housing sites, with approximately 1,200 people living in 606 homes on the steep, south-facing slope of the hill. The sites were developed in the middle of the 20th Century, during a period in which accommodating cars was the highest transportation priority. A product of its time, the Potrero Annex and Terrace are characterized by wide roads and narrow sidewalks interrupted by curb cuts that provide access to ample off-street parking. While traffic volumes through the site are relatively low, street widths encourage cars to travel at high speeds, and intersection design prioritizes efficient vehicle movement rather than safe and comfortable pedestrian crossings. The circuitous internal street grid and the area's steep topography further reduce pedestrian accessibility.

The public housing sites are also isolated from the rest of San Francisco with relatively few and challenging connections to the surrounding neighborhoods. A number of these connections require crossing the I-280 and US 101 freeways, which form major barriers just east and west of the site. While there are multiple transit lines that stop along or within the housing site, the lines do not connect residents from one end of the site to the other, forcing residents to undertake a steep walk or an untimed transfer to access many locations outside of the site.



Finally, there are few transit amenities on the site. Narrow sidewalks do not have the space to allow for Muni shelters. Stops are demarcated by painted lines on either the street or a light pole. This lack of amenities makes using transit a less desirable option.

Chapters 2 through 5 provide further context related to each of the recommended improvements.

### Rebuild Potrero Project

The Rebuild Potrero project will demolish and re-build the public housing sites in their entirety as a mixed-use, mixed-income neighborhood, replacing all of the public housing units and adding up to 1,000 moderate-income and market-rate units and building a new gridded street network. The effort is currently undergoing environmental review and seeking funding for implementation. The groundbreaking is expected by 2016, but the project is broken into multiple phases that will not be fully completed for at least 10 to 15 years.

BRIDGE Housing is the lead developer for Rebuild Potrero and also leads community building efforts such as the Healthy Generations Project, the sites’ walking club, community gardening program, and the walking school bus. Using their intimate knowledge and relationships with residents, BRIDGE served as the outreach consultant for the project. See outreach summary and Appendix A for more details.

### Previous Planning Efforts

Previous planning efforts led by community partners have identified important and urgent transportation needs before Rebuild Potrero can be completed; Potrero Hill NTP aimed to identify and prioritize projects to address those needs while advancing design, cost estimation, and funding and implementation strategies. The NTP built on the following studies: Baseline Conditions Assessment of HOPE SF Redevelopment: Potrero Terrace and Annex (SFDPH), Potrero Hope SF Master Plan EIR, and Potrero Hill Traffic Calming Project (SFMTA). These efforts included a full description of existing conditions, and a summary was documented in the Green Connections Potrero Terrace and Annex Needs Assessment Summary Memo and the Potrero Hill Neighborhood Transportation Plan Existing Conditions, Needs Assessment, and Prioritized Projects Memo (see Appendix B).

### GOALS AND OBJECTIVES

The Potrero Hill NTP effort aimed to respond to the needs and priorities of the community and build on past plan-

ning efforts in and around the study area. The team and community partner goals of the study were designed to align with the goals for the Rebuild Potrero and Healthy Generations Projects (see Figure 1-2).

**FIGURE 1-2. POTRERO HILL NTP GOALS AND OBJECTIVES**

GOALS	OBJECTIVES
1. Enhance connectivity to daily goods and services for Potrero Terrace and Annex residents.	1.1 Create new transportation options within site
	1.2 Improve access to transportation options outside of site
	1.3 Supplement existing transit options to/from site
2. Improve sense of safety and security in Potrero Terrace and Annex.	2.1 Seek solutions that calm traffic within site
	2.2 Make transit waiting areas safer and more comfortable
3. Provide short-term improvements that have independent utility before the implementation of rebuild of the site.	3.1 Develop solutions that have short lead times, low barriers to implementation, and minimal need for demolition/removal during the rebuild effort
4. Strengthen community capacity.	4.1 Complete strong community process
	4.2 Identify solutions that foster community involvement

Source: SFCTA, 2014.

### OUTREACH SUMMARY

The Potrero Hill NTP work, along with the prior efforts identified above, included extensive community outreach to identify concerns and priorities among community members. These community outreach efforts included:

- Participation in Unite Potrero: A Community Wide Get Together, at which Potrero residents and stakeholders gathered to identify trends, issues, and priorities and create a cohesive vision for the future, January 2011
- Public outreach by the SFMTA and participation in semi-monthly Community Building Group meeting to gather information that would help identify strategies to improve accessibility and mobility for Potrero residents, Fall and Winter 2011
- Focus group as part of the HOPE SF efforts, August 2013
- Participation in Rebuild Potrero’s Walking Club which included one-on-one discussions of community transportation issues, Spring 2013
- Participation in PARADISE Plan Community Needs Assessment, including a presentation to the community and assessment of education, economic sta-



bility, public safety, health and wellness, technology access, and transportation needs, October 2013

- Rebuild Potrero Community Meetings, Potrero Hill Neighborhood House, bi-monthly October 2013 through March 2015 (4 total meetings)
- Participation in Rebuild Potrero’s Walking Club by Potrero Hill NTP project team which included one-on-one discussions of community transportation issues, November 2013
- Participation in Rebuild Potrero’s Walking School Bus by Potrero Hill NTP project team and Fletcher Studio, which included one-on-one discussions of community transportation issues, particularly related to pedestrian safety along the walking school bus routes, March and September 2014
- Site visits to take measurements, verify conditions, and obtain background shots for renderings, September and October 2014
- NTP working group consisting largely of Community Health Leaders provided input on designs through a series of meetings during the fall of 2014; the series included a field trip to Persia Triangle in November 2014

A full summary of the NTP outreach efforts is included in Appendix A.

## OVERVIEW OF TRANSPORTATION IMPROVEMENTS AND EVALUATION

The team compiled the full list of all the potential projects and programmatic improvements that have been identified through review of past planning efforts and community outreach. This list is included as Appendix B. The principal themes that surfaced for desired transportation improvements were:

- Improve access to goods and services as well as destinations across the two housing sites, focusing on ways to mitigate the impact of the loss of the 53 Southern Heights Muni bus route—e.g. introduce a shuttle or resident-driver program
- Improve pedestrian amenities and safety especially at hot-spot intersections (based on safety concerns or pedestrian activity); fill missing sidewalks and enhance intersections and roadway crossings
- Improve transit stops and transit amenities

The team conducted an evaluation of the full project list to identify the highest priority improvements to further de-

velop as part of this project. The evaluation criteria used to select the priority projects were developed based on the Potrero Hill NTP goals and objectives and are shown in Figure 1-3. The results of the initial prioritization process are shown in Figure 1-4. Note that Figure 1-4 (next page) is slightly different than that included in Appendix B be-

FIGURE 1-3. EVALUATION CRITERIA

EVALUATION CRITERIA	DESCRIPTION	POTRERO HILL NTP GOAL ADDRESSED
Hot Spot (Safety)	High collision intersection, high pedestrian activity, pedestrian-vehicle conflicts found through field visits by project team	#2
Hot Spot (Transit)	Transit stops with highest boardings by community members	#2
Community Support	Association with school/park/health center-focused areas, identified by community through outreach results in current or previous efforts	#1, #2, #4
Time Frame	Ability to implement in the short or medium term, particularly if within Rebuild Potrero project area.	#3
Collaboration Potential	Higher potential for collaboration with parallel efforts to leverage funding and construction synergies	#3, #4

Source: Existing Conditions, Needs Assessment, and Prioritized Projects Memo, Fehr & Peers, 2014.

cause it reflects further refinement that occurred after the original memo was finalized.

The team then conducted additional feasibility analysis on this draft prioritized project list to determine if any projects or programmatic improvements were infeasible. The following projects were determined to be infeasible, unnecessary given the final NTP recommendations, or outside the scope of this project:

- Fill sidewalk gaps (with prioritization on gaps not inside Rebuild Potrero boundaries): Through collaboration with the SFMTA it was determined that filling sidewalk gaps outside the Potrero Annex and Terrace site was a lower priority than improving the pedestrian network on the site, given that most pedestrian trips are made to services and transit on or directly adjacent to the site.
- Resident driver program with professional development component: The team further investigated the potential for several ridesharing options, including partnership with a local carsharing company, a volunteer driver program, and a paid resident driver program. None of these options are feasible due to issues with safety, liability, and cost.
- Site transportation coordinator: The team de-

terminated that a transportation coordinator was unnecessary given the types of improvements that were being considered for immediate implementation. If a shuttle or resident driver program were to be implemented in the future, a coordinator could be reconsidered.

The final stage of the evaluation process was to group projects for the purposes of implementation. Groupings are shown in Figure 1-5 (next page). Subsequent chapters provide additional detail for each group as well as additional information on project funding and implementation.

## OVERVIEW OF FUNDING AND IMPLEMENTATION

Due to the extensive planning work undertaken before the start of the Potrero Hill NTP, the project was able to focus on creating strong funding and implementation plans. The project has been able to complete funding plans for two significant capital projects (see Chapters 2, 3, and 4). Both projects have lead implementing agencies with project managers assigned to them and anticipate completion of implementation by the end of 2015.

FIGURE 1-4. DRAFT PROJECT LIST

PROJECT NUMBER	DESCRIPTION	HOT SPOT (SAFETY)	HOT SPOT (TRANSIT USE)	COMMUNITY SUPPORT	TIME FRAME	COLLABORATION POTENTIAL
<b>CAPITAL IMPROVEMENTS</b>						
1	Transit stop improvements at 25th St./ Connecticut St. (e.g. signage, benches, lighting)		X	X	X	X
2	Transit stop improvements at 25th St./ Texas St./ Dakota St. (e.g. signage, benches, lighting)		X	X	X	X
3	Transit stop improvements at 25th St./ Wisconsin St. (e.g. signage, benches, lighting)		X	X	X	X
4	Intersection safety improvements - 25th St./ Connecticut St.	X	X	X	X	X
5	Intersection safety improvements - 25th St./ Texas St./ Dakota St.	X	X	X	X	X
6	Safe Routes to School (SR2S) project(s) along walking bus routes to schools (e.g. labeling/signing routes, safety improvements, etc.)	X		X	X	X
7	22nd St. stairs between Missouri St. and Texas St. (ensure complete connection)			X	X	X
8	Improvements to the "straight away" and the "cuts" - a pathway that goes around the side of the Rec Center to the Connecticut St. dead end (e.g. pedestrian facilities, add lighting, plantings)			X	X	X
9*	Fill sidewalk gaps (with prioritization on gaps not inside Rebuild Potrero boundaries)			X	X	X
<b>PROGRAMMATIC IMPROVEMENTS</b>						
10	Neighborhood shuttle program		X	X	X	X
11*	Resident driver program with professional development component			X		X
12*	Transportation Coordinator to support the community and transportation programs			X	X	X

Source: Existing Conditions, Needs Assessment, and Prioritized Projects Memo, Fehr & Peers, 2014.

\*Project screened and not included in Final Prioritized Project List

FIGURE 1-5. FINAL PRIORITIZED PROJECT LIST

PROJECT GROUPING	PROJECT NUMBER	DESCRIPTION
<b>CAPITAL IMPROVEMENTS</b>		
Traffic Calming and Transit Stop Amenities	1	Transit stop improvements at 25th St./ Connecticut St. (e.g. signage, benches, lighting)
	2	Transit stop improvements at 25th St./ Texas St./ Dakota St. (e.g. signage, benches, lighting)
	3	Transit stop improvements at 25th St./ Wisconsin St. (e.g. signage, benches, lighting)
	4	Intersection safety improvements - 25th St./ Connecticut St.
	5	Intersection safety improvements - 25th St./ Texas St./ Dakota St.
Safe Routes to Schools	6	Safe Routes to School (SR2S) project(s) along walking bus routes to schools (e.g. labeling/signing routes, safety improvements, etc.)
Pathway Improvements and Lighting	7	22nd St. stairs between Missouri St. and Texas St. (ensure complete connection)
	8	Improvements to the "straight away" and the "cuts" - a pathway that goes around the side of the Rec Center to the Connecticut St. dead end (e.g. pedestrian facilities, add lighting, plantings)
<b>PROGRAMMATIC IMPROVEMENTS</b>		
Community Shuttle	10	Neighborhood shuttle program

## 2. TRAFFIC CALMING

Improving pedestrian safety on the site and improving transit rider comfort were two of the key needs that were prioritized for further development as part of the Potrero Hill NTP. The site is auto-oriented in nature, characterized by wide roads which encourage high traffic speeds, incomplete and narrow sidewalks, and a lack of bus shelters, benches and other transit amenities that make waiting for a bus comfortable. Bus stops are often marked with little more than a worn yellow rectangle in the street or yellow paint on a stop sign or light pole.

The first stage of development was to evaluate a wide range of improvements that could help improve conditions on the site for non-motorized users. These included traffic calming, pedestrian safety interventions, and potential stop improvements to more clearly demarcate stop areas and improve ADA access.

After the initial survey of strategies, specific traffic calming and bus stop improvement concepts were developed for several high priority intersections. The team focused on the two intersections that were identified in the prioritized list of projects at key locations for both transit and safety improvements:

- 25th Street and Connecticut Street
- 25th Street, Texas Street, and Dakota Street

Three additional intersections were selected for improvements that complement the two priority intersections because they slow traffic before reaching those intersections and because these are key crossing points for the walking school bus routes:

- 23rd Street, Dakota Street, and Missouri Street
- 23rd Street and Arkansas Street
- Missouri Street and Watchman Way

### POTENTIAL TRAFFIC-CALMING STRATEGIES

The project team identified 14 potential traffic-calming and pedestrian safety strategies. Figure 2-1 (next page) shows nine shorter-term interventions that are characterized by lower costs and shorter installation timelines. All of these interventions are called "non-infrastructure" improvements, given that they do not require constructing permanent features like concrete curbs. Figure 2-2 (next page) shows five strategies requiring a larger commitment of resources to design and construction and longer installation timelines.

**FIGURE 2-1. SHORT-TERM TRAFFIC-CALMING AND PEDESTRIAN SAFETY STRATEGIES**

INTERVENTION	AVERAGE COST/RANGE (MEDIAN)	POTENTIAL BENEFITS	POTENTIAL DOWNSIDES
<b>SHORTER-TERM</b>			
Crosswalks	\$350-\$1,000 each (avg. \$8.51/linear foot, median \$5.87/linear foot)	Clearly marks common pedestrian crossing paths, increasing visibility for approaching drivers.	Research: No safety benefit to crosswalks without traffic controls.
Street Signage (including stop signs)	Standard Street Signs: avg. \$300 each, median \$220 Other signs: \$23 to \$130 each	Range in benefits; stop signs force drivers to stop, effectiveness of crosswalk alert signs and school signs not documented.	Visual clutter could make drivers less likely to pay attention to most critical signs.
Motion-Activated Beacons	Avg. \$10,010 per intersection, median \$5,170	Provide a special attention-grabbing flashing light that alerts drivers when pedestrians are crossing.	Less effective where pedestrian traffic is consistent throughout the day as beacon flashes almost continuously, reducing driver response.
Speed Bumps/Humps (plastic)	Bumps: \$1,550 each Humps: \$1,000 each	Lower-cost approach to speed bump/hump intervention that instinctively causes most drivers to slow down.	Potential concerns from Muni where applied on bus routes, and potentially less durable on streets with significant traffic from trucks and buses.
Rumble Strips	\$450-550 per set	Provide visual warning and audible feedback to drivers that gets louder when they drive faster; generally applied on freeway shoulders to keep drivers awake.	Emit significant noise in the surrounding area and may not slow drivers much, given low vertical profile.
Transverse Markings	Average \$10 per line, median \$10	Provide a novel visual signal on an approach to a sensitive roadway feature.	Easily ignored.
Safe-Hit Posts	\$50 each	Provide a physical barrier between the street and pedestrian/bike rights of way.	May require more frequent replacement.
Solid Pavement Paint	Average \$3.40/square foot, median \$1.21 median	Provide a visual cue to drivers that a portion of a roadway is to be used differently from the rest of it.	Without other strategies, may not provide enough of a visual cue to prevent drivers from using the space.
Advertising/Awareness	Free—cost of advertising	Provide general awareness.	Documentation of effectiveness limited for smaller application.

Source: ???

**FIGURE 2-2. LONG-TERM TRAFFIC-CALMING AND PEDESTRIAN SAFETY STRATEGIES**

INTERVENTION	AVERAGE COST/RANGE (MEDIAN)	POTENTIAL BENEFITS	POTENTIAL DOWNSIDES
<b>LONGER-TERM</b>			
Speed Humps (concrete)	Average \$2,640 each, median \$2,130	Intervention that instinctively causes most drivers to slow down.	Potential concerns from Muni where applied on bus routes.
Bollards	\$150-\$350 each	Provide a more permanent physical barrier between the street and pedestrian rights of way	Can create visual clutter
Raised Crosswalks	Average \$8,170 each, median \$7,110	Causes drivers to instinctively slow down at the point at which pedestrians will be crossing.	Can slow transit speeds, increase wear and tear on transit vehicles.
Roundabout/Traffic Circle	Average \$85,370 each, median \$27,190	Causes drivers to physically change course, for which most drivers instinctively slow down.	Potential concerns from Muni where applied on bus routes and SF Fire Department where roundabout narrows travel lanes significantly.
Curb Extensions	Average \$13,000 each, median \$10,150	Reduce crossing distances and, at corners, create tighter turning radii for drivers, slowing travel speeds.	Can create more difficult turns for transit vehicles and trucks.

Source: Appendix C, Traffic Calming Strategies

## TRAFFIC CALMING CONCEPTS

### Overview

The Rebuild Potrero project will completely reconstruct the Potrero Annex and Terrace in the next 10 to 15 years, including re-grading the site and reconstructing the street network. As such, the project team determined that lower-cost, non-permanent infrastructure interventions, which carry a shorter implementation timeline, would be most effective for quickly improving pedestrian safety and bus rider comfort in the Study Area.

Based on evaluation of the above strategies and community input on the places where traffic calming is most needed, the team created concepts to improve pedestrian safety at the five key intersections identified above in the near term. The concepts focused on narrowing the travelway and using the re-claimed portions of roadway to create inviting spaces that reflect the interests and culture of the community. They also incorporated efforts to improve transit waiting areas.

This chapter includes precedents for the concepts and an overview of the design team's approach. It then details existing conditions at each Study Area intersection identified for improvements and describes the conceptual designs developed for them. The intersection interventions have been funded and are scheduled to be implemented in 2015, more detail on the funding and future implementation steps are described at the end of the chapter.

### Precedents

Elements of each of the Potrero Hill traffic calming concepts have been implemented in cities across North America. The concepts create bulb outs, pedestrian passageways, and small plazas, and this section shares examples of similar projects in San Francisco and other cities.

The five intersections included in this project are a set of nodes along typical journeys from the Annex and Terrace to the two main schools in the area.

### NON-INFRASTRUCTURE BULB OUTS

Non-infrastructure bulb outs have typically been implemented to pilot longer-term infrastructure changes. Figure 2-3 shows small non-infrastructure bulb outs installed in SoMa, at 6th and Mission streets. The implementation included red paint reinforced by safe-hit posts and boulders, though the physical barriers did not extend past the stop lines to the actual corner. The lack of reinforcement of new corner radii allowed some cars to violate the marked pedestrian space. These painted bulb outs have been in place since November 2013.

Figures 2-4 (next page) and 2-5 (next page) show other similar implementations. Figure 2-5 shows temporary bulb-outs on a set of streets in downtown Phoenix with wide rights of way but relatively low traffic volumes. Painted areas were much larger than those seen in San Francisco and were reinforced by planters of different sizes. Phoenix also chose to use a more decorative color scheme. These temporary bulb outs were replaced by physical curb extensions shortly after this implementation. Figure 2-5 shows an implementation in another part of Phoenix and a simpler implementation in downtown Los Angeles.

### NON-INFRASTRUCTURE WALKWAYS/SIDEWALKS

Several cities have used non-infrastructure approaches to create longer sidewalk extensions or walkways. Figure 2-6 (next page) shows how Los Angeles (left) extended a sidewalk in its downtown using an attached gravel-like surface and safe-hit posts. New York City (right) created a whole new pedestrian passageway using a similar surface, safe-hit posts, and large planters.

FIGURE 2-3. NON-INFRASTRUCTURE BULB OUT AT 6TH AND MISSION STREETS IN SAN FRANCISCO.



FIGURE 2-4. NON-INFRASTRUCTURE BULB OUTS IN DOWNTOWN PHOENIX



FIGURE 2-5. NON-INFRASTRUCTURE BULB OUTS IN PHOENIX AND DOWNTOWN LOS ANGELES



FIGURE 2-6. NON-INFRASTRUCTURE PEDESTRIAN PASSAGEWAYS IN LOS ANGELES AND NEW YORK CITY



## PLAZAS

San Francisco, Los Angeles, and New York City have all used non-infrastructure interventions to create pedestrian plazas on what were formerly low-volume or low-utility portions of roadway space.

Figure 2-7 shows the most recent implementation of this type of approach in San Francisco. The Persia Triangle Pavement to Parks project used a variety of materials to extend sidewalks and create a gathering space at an Ocean Avenue intersection with particularly challenging geometry in the Excelsior district.

Figure 2-8 shows an implementation in Los Angeles' Silver Lake neighborhood that repurposed a portion of a wide but lightly used roadway that intersected Sunset Boulevard at an angle. The geometry of the intersection previously encouraged cars to turn onto the street at high speeds. Using green paint and planters, the city blocked off the area, which is now used in part for café seating.

The implementation effectively extended a small adjacent triangular park that had functioned as little more than a traffic island previously.

Finally, New York City has used a similar approach to create pedestrian plazas in a number of places where lower Manhattan's irregular street network created large, underused roadway areas with geometries that previously encouraged high travel speeds. Figure 2-9 shows two of these implementations.

## Elements

The intersection treatments all draw from a similar palette of materials, which are used to make the spaces pleasant and exciting, give them a cohesive identity, and make them safe and comfortable. This section gives an overview of a few of the main elements present in plans for most of the intersections and the element that could tie them all together.

FIGURE 2-7. PERSIA TRIANGLE PAVEMENT TO PARKS IMPLEMENTATION



FIGURE 2-8. NON-INFRASTRUCTURE PLAZA EXTENSION IN LOS ANGELES



FIGURE 2-9. NON-INFRASTRUCTURE PEDESTRIAN PLAZAS IN NEW YORK CITY



### PLANTERS

Concrete manhole reinforcement cylinders are envisioned as a customizable vehicle for plantings and informal seating. The cylinders come in different sizes, cost relatively little, and can be easily stacked and shaped to create compelling designs at each intersection. Figure 2-10 shows the assortment of shapes and sizes in which these cylinders are made, their scale, the ways in which they might be arranged to create an interesting planted area, and how they might be customized to reflect the look and feel of a given site.

### PAVEMENT PAINT TREATMENTS

Each bulbout would be demarcated with pavement paint to help create boundaries between safe pedestrian space and the street right of way. As Figure 2-11 shows, such

treatments can be used in a variety of ways to clearly mark pedestrian zones in areas that are otherwise used by automobiles, to give pedestrian areas distinct identities, and, in some cases, to make such areas playful and engaging.

### CONNECTIONS

Paint can also be used to make connections between the intersections. Figure 2-12 (next page) shows how lines can be used to engage passersby and cue pedestrians to use space in particular ways.

Figure 2-13 (next page) shows how this is done on the Freedom Trail in Boston. The pathway between the intersections would also act as a playful wayfinding device for children on the way to the two schools.

FIGURE 2-10. PLANTINGS IN MANHOLE REINFORCEMENT CYLINDERS





FIGURE 2-11. PAVEMENT PAINT TREATMENTS

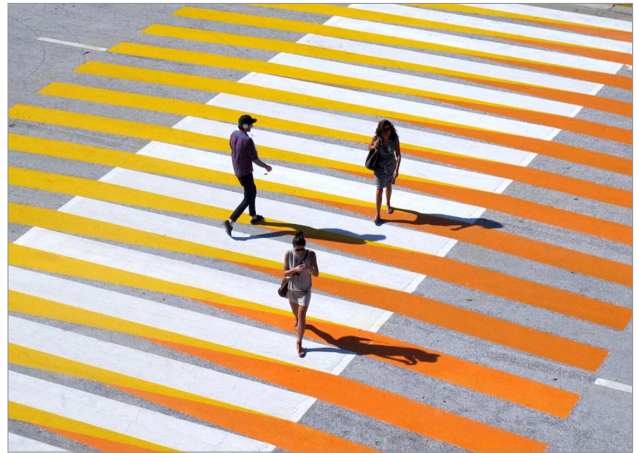
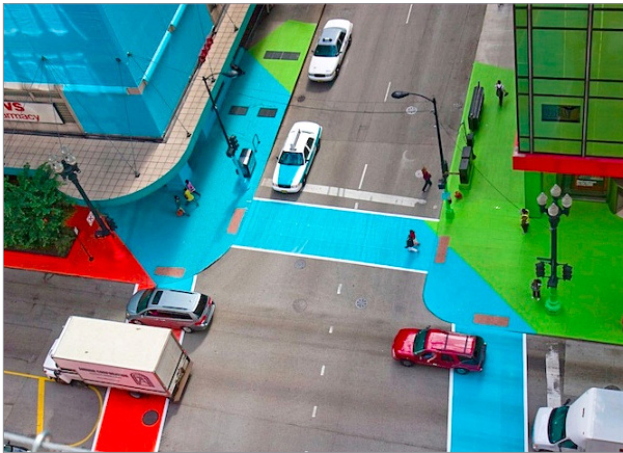


FIGURE 2-12. LINE TYPES

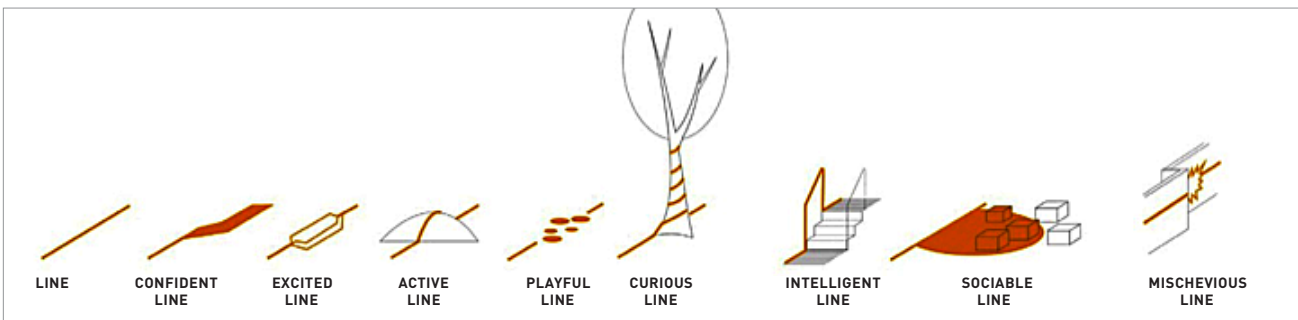
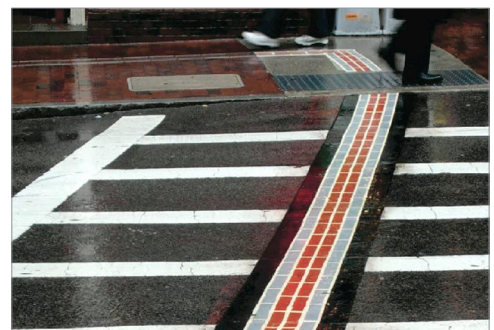


FIGURE 2-13. CONNECTING LINES CASE STUDY IN BOSTON



## Design Approach

The approach employed at all five intersections is consistent with guidance in the *NACTO Urban Street Design Guide* and the San Francisco *Better Streets Plan*.

With regard to intersection geometry, the NACTO guide recommends that complex intersections, like the one at 25th, Dakota, and Texas streets, be broken into “multiple compact ones,” with streets bent to meet “at as close to a right angle as possible.” The *Better Streets Plan* does not address intersection geometry in quite the same way, but like the NACTO guide, it recommends minimizing vehicle speeds using, among other strategies, tight curb radii. The *Better Streets Plan* notes that curb radii on streets serving transit should generally be designed to enable the turns of buses using the route.

Both guides endorse temporary designs as a way to improve pedestrian safety until costly changes to curbs and sidewalks are possible. The NACTO guide points to examples of this approach from New York City, Phoenix, and Los Angeles and says temporary designs should include “a strong edge... defined using a combination of striping, bollards, and larger fixed objects such as granite rocks or planters.” These designs can lower traffic speeds, activate public spaces, and energize surrounding streets. The NACTO guide notes that maintaining temporary plazas often requires a dedicated partner who wants to “take ownership of an underutilized road space and can maintain it throughout the year.”

The *Better Streets Plan* also includes guidelines for transit-

route lane widths, bulb-out lengths, transit-stop design, and other streetscape elements. The concepts are consistent with this guidance.

The interventions were designed with the Potrero Annex and Terrace’s distinctive culture in mind. The heavy reliance on plantings reflects the strength of the existing community gardening program, and each intersection will be given distinctive colors and elements based on themes identified by the community.

## Intersections: Existing Conditions and Concepts

### 25TH STREET, DAKOTA STREET, AND TEXAS STREET

Today, the confluence of 25th, Dakota, and Texas streets creates a wide expanse of roadway space on the northern side of the intersection. Much of this space is unused. Though southbound traffic is controlled by a stop sign, the combination of a downhill grade and wide turn angle from Dakota to 25th Street encourages high vehicle speeds approaching the intersection and may encourage vehicles to ignore the stop sign when cross-traffic does not appear to be present. East-west traffic is uncontrolled. Figure 2-14 (next page) shows this existing condition.

The large amount of roadway space creates the potential for a pedestrian plaza and more substantial bus stop at the intersection. Community members expressed interest in beautifying the space, significantly reducing crossing distances, and creating a more comfortable waiting area for bus passengers.



Figure 2-15 shows the improvement concept. It creates pedestrian areas with greenery and seating on both of the northern corners, with a painted and planter-reinforced walkway continuing on Dakota north of Texas Street to the point at which the sidewalk begins. The bus waiting area on the northeastern corner would be raised. Planters of different widths and heights would be placed strategically at the most sensitive edges of the pedestrian spaces, to discourage vehicle intrusion. A narrow pedestrian space would also be painted on the southern side of the intersection, to narrow 25th Street's travel lanes to 12 feet each, per Muni guidelines,<sup>1</sup> and to create room for an eastbound bus shelter.

The concept clarifies the interaction between the three streets by creating two separate intersections at angles close to 90 degrees, per guidance in the *NACTO Urban Street Design Guide*.<sup>2</sup> The perpendicular orientation of intersections is more legible to pedestrians and drivers alike, and forces drivers to slightly alter their paths of travel and, by instinct, slow down when nearing the intersection. Curb radii are drawn at 20 feet, and the designs allow for the turning sweep of a 40-foot bus, the Muni-route design vehicle called for in the *Better Streets Plan Plan* (see AutoTurn simulations for key intersections in Appendix D). The entryway to Texas Street is designed to be 10 feet wide because there are very low traffic volumes that would utilize this access to what is effectively a parking lot for just a few houses. The narrow "drive-way" makes the pedestrian crossing to the transit stop just to the north as short as possible.

The concept proposes that stop signs be installed on 25th

**FIGURE 2-14. EXISTING CONDITION AT INTERSECTION OF 25TH, DAKOTA, AND TEXAS STREETS**



**FIGURE 2-15. CONCEPT FOR 25TH, DAKOTA, AND TEXAS STREETS**



Street, which would require additional study, per city regulations. Stop bars should be set 8 feet behind crosswalks to allow for turns by vehicles with large turning radii, a strategy recommended in the *Urban Street Design Guide*.<sup>3</sup>

<sup>1</sup> SFMTA. Regulations for Working in San Francisco Streets. 8th Edition, January 2012. Page 10.

<sup>2</sup> National Association of City Transportation Officials. Urban Street Design Guide. 2013. Page 104.

<sup>3</sup> NACTO (2013), page 119.

### 25TH STREET AND CONNECTICUT STREET

The intersection of 25th and Connecticut streets is a transfer point between north-south and east-west transit lines and is the southern center of the Potrero Annex portion of the Study Area, with the property management office on the northwest corner of the intersection.

Figure 2-16 shows existing conditions at the intersection. Connecticut Street allows for one-way northbound traffic north of 25th Street, with parking and bus-stop areas marked by white lines. Two-way travel is allowed on Connecticut Street south of the intersection and in both directions on 25th Street. Crosswalks are currently marked by yellow Continental crosswalks, and the intersection is controlled by stop signs. There are no curb ramps at the intersection, and corners feature wide turning radii.

Community members envisioned an enhanced bus waiting area and gathering space around the northeast corner of the intersection. Figure 2-17 shows the improvement concept. Pedestrian spaces on the northern corners of the intersection would be widened using paint, enhanced by planters as a hard barrier. Travel-way widths would be narrowed to 12 feet per lane. The bus stop on the eastern side of Connecticut Street would be enhanced with a raised platform using non-infrastructure materials like those shown in Appendix C.

FIGURE 2-16. EXISTING CONDITION AT 25TH AND CONNECTICUT STREETS

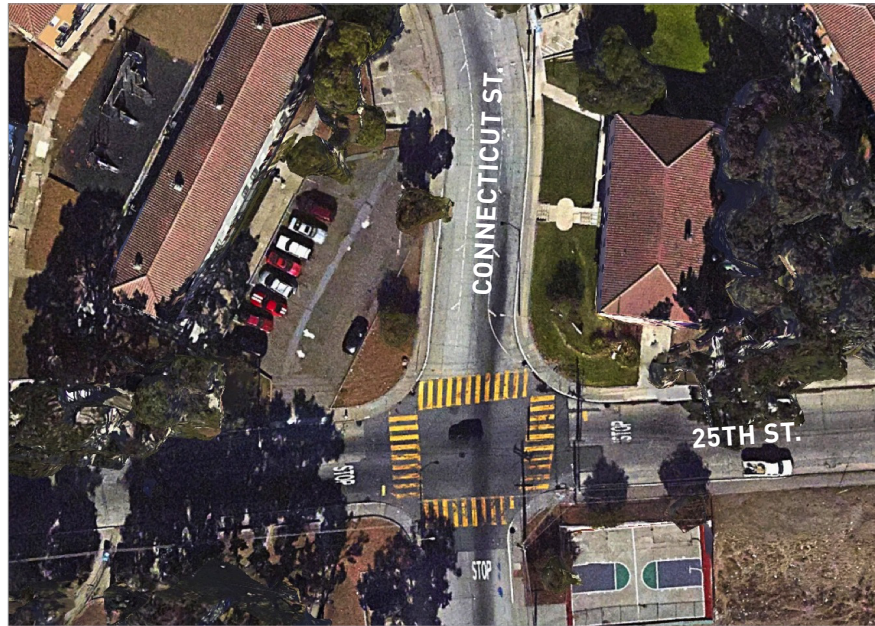


FIGURE 2-17. CONCEPT FOR 25TH AND CONNECTICUT STREETS



### 23RD STREET, DAKOTA STREET, AND MISSOURI STREET

The confluence of 23rd, Dakota, and Missouri streets creates a sweeping downhill curve between 23rd and Dakota Streets. Missouri meets the intersection at what is roughly a right angle after curving up a hill from the Terrace side of the development. Northbound traffic is controlled by a stop sign in the uphill direction, and there is a bus stop on the northeast corner. Figure 2-18 shows existing conditions at the intersection.

Community members suggested that this intersection have a design treatment connecting it with the surrounding intersections. It could have space to allow for kids' play and, given that there is a bus stop on one corner, could have seating.

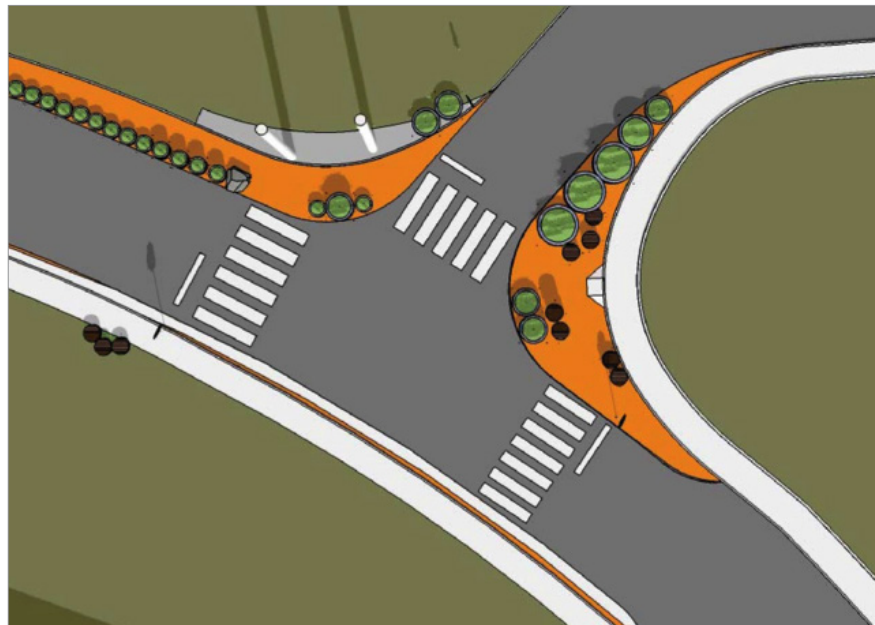
Figure 2-19 shows the proposed concept. Given that Missouri Street does not carry any transit lines, it would narrow the street's travel lanes at the intersections to 10 feet each, per Better Streets Plan guidance, through bulb outs. The curb extension on the northern corner would continue east to the beginning of a sidewalk on the north side of Missouri Street. Given the lack of sidewalk on the northern side of 23rd Street, the extension would continue west as a walkway all the way to another set of intersection improvements at Arkansas Street. Speed cushions would be added on 23rd Street, at the point at which the street reaches its apex before steadily descending into and past the intersection.

The concept repurposes approximately 390 linear feet of curb space, reducing theoretical parking supplies by 19 spaces. However, though parking is currently legal along these curbs, cars are rarely parked on them. The concept proposes stop signs on the northern and western legs of the intersection that would require additional study, per city regulations.

FIGURE 2-18. EXISTING CONDITION AT 23RD, DAKOTA, AND MISSOURI STREETS



FIGURE 2-19. CONCEPT FOR 23RD, DAKOTA, AND MISSOURI STREETS



### 23RD STREET AND ARKANSAS STREET

The intersection of 23rd and Arkansas streets creates an important connection between the Potrero Annex and Terrace and the entrance to the Potrero Hill Recreation Center, which is located just north of the intersection on Arkansas Street. Southbound traffic is currently controlled by a stop sign, but east-west traffic has no controls. The roadway is basically flat, though 23rd Street rises slightly to the east of the intersection before descending as Dakota Street to 25th Street. Figure 2-20 shows existing conditions.

Community members noted that the intersection is an important connection point, rather than a gathering place. As such, the improvement concept, shown in Figure 2-21, focuses on using painted bulbouts to create more comfortable pedestrian passageways and improve pedestrian connections where sidewalks are inadequate. The figure shows the continuation of the pedestrian passageway on the north side of 23rd Street from the intersection of 23rd, Missouri, and Dakota. The passageway is shown protected by a series of small planters. At the corner, bulbouts narrow the vehicle travelway to 12 feet per lane, creating enough room for transit vehicles.

FIGURE 2-20. EXISTING CONDITION AT 23RD AND ARKANSAS STREETS



FIGURE 2-21. CONCEPT FOR 23RD AND ARKANSAS STREETS



**MISSOURI STREET AND  
WATCHMAN WAY**

The intersection of Missouri Street and Watchman Way is in the center of the Potrero Terrace and operates as a gathering space for two walking school buses. Given the angle of the street, shown in Figure 2-22, and the nearby topography, vehicles tend to travel at high speeds through the intersection, and narrow sidewalks on the east side of the street create limited gathering spaces for pedestrians. The intersection is not controlled by any stop signs or lights.

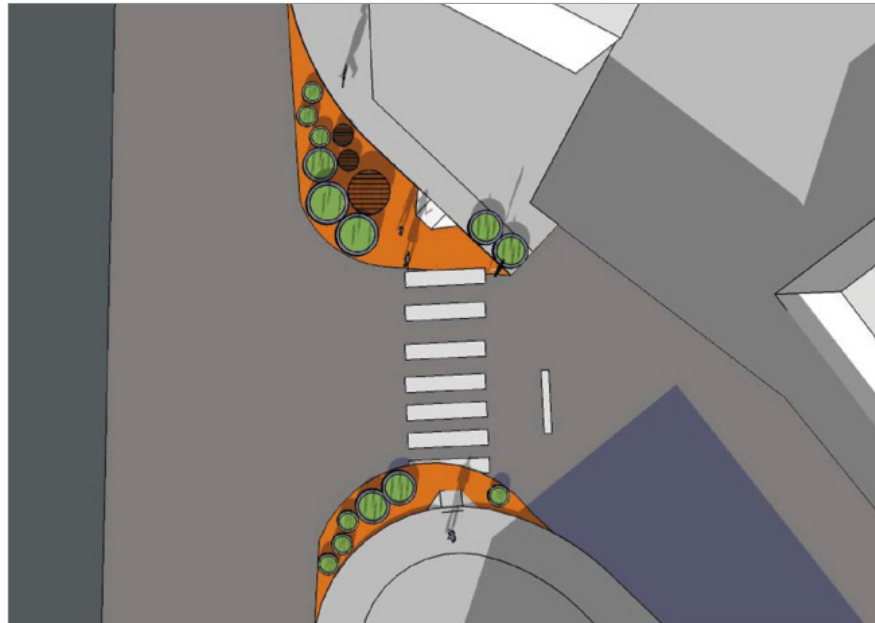
Community members highlighted the intersection as an important target for traffic calming and improved pedestrian comfort. Because the intersection is a meeting place for the walking school bus, they also noted that elements of the intervention should allow for pedestrian gathering and seating.

Figure 2-23 shows the concept for the intersection, which includes small bulbouts on the northeastern and southeastern corners and uses a combination of planters and seats to make the pedestrian experience more comfortable. The bulbouts square Watchman Way off with Missouri Street, which increases legibility for pedestrians and naturally forces cars entering the intersection from Watchman Way to slow down. The concept also proposes adding a stop sign on Watchman Way.

**FIGURE 2-20. EXISTING CONDITION AT 23RD AND ARKANSAS STREETS**



**FIGURE 2-21. CONCEPT FOR 23RD AND ARKANSAS STREETS**



## Parking Impacts

Figure 2-24 shows the potential parking impacts of the proposed interventions. Parking-space length is based on MTA guidelines for mid-block spaces. Note that Texas Street currently has perpendicular parking, requiring fewer feet of curb per space. While the table indicates parking losses noted for 23rd Street, few cars park in these spaces today.

## Other Concerns

### AMERICANS WITH DISABILITIES ACT (ADA)

The Americans with Disabilities Act (ADA) dictates that curb ramps must be installed at all pedestrian crossings. As such, new crosswalks cannot be added without installing ramps, which can require completely rebuilding sidewalks at corners. Doing so would make this project significantly more expensive, making moot the use of temporary materials to reduce cost.

There are two potential approaches that would help keep costs manageable. Each of these approaches will need to be fully vetted to ensure it complies with all relevant regulations.

- Install temporary curb ramps that stick out from existing curbs at key places (see examples in Figures 2-25 and 2-26). These can be made from plastic, metal, or concrete, and they can incorporate appropriate drainage features. The legality of such temporary ramps will need to be fully explored if this is the approach selected.
- Using a more flexible ADA standard called “program access,” it may be possible to direct people in wheelchairs to existing nearby curb cuts, though this may require eliminating several off-street parking spaces

FIGURE 2-25. TEMPORARY CURB RAMP



Source: <http://www.handiramp.com/curbcutramps.htm>

FIGURE 2-24. PROJECTED PARKING IMPACTS

STREET	SEGMENT	CURB LENGTH	FT. PER SPACE	SPACES
25th Street	South side, Connecticut-Mississippi	210	20	10*
23rd Street	South side, Arkansas to Missouri	160	20	8
23rd Street	North side, Arkansas to Missouri	230	20	11**
Arkansas Street	East Side	40	20	2
23rd Street	North side, west of Arkansas	30	20	1
Dakota Street	West side, at Missouri	120	20	6
Watchman Way	Corner	50	20	2
Texas Street	East side, at 25th [perpendicular]	50	9	5
<b>Total</b>				<b>45</b>

\* These spaces are unregulated, and used primarily for long-term parking by trucks not associated with the neighborhood.

\*\* Due to a lack of sidewalk and land uses on the north side of the 23rd street on this block, these parking spaces are seldom used.

to which the ramps currently provide access. From the U.S. Department of Justice’s guidelines: “For pre-ADA highways, streets, roads, and sidewalks that have not been altered, state and local governments may choose to construct curb ramps at every point where a pedestrian walkway intersects a curb. However, they are not necessarily required to do so. Under a more flexible standard called ‘program access,’ alternative routes to buildings may be acceptable where people with disabilities must travel only a marginally longer route than the general public.”<sup>4</sup>

<sup>4</sup> United States Department of Justice, Civil Rights Division. “Americans with Disabilities Act Toolkit for State and Local Governments.” Retrieved from <http://www.ada.gov/pcatoolkit/chap6toolkit.htm> on 5/13/14.

FIGURE 2-26. TEMPORARY RAMP WITH DRAINAGE SPACE



Source: <http://www.theworkplacedepot.co.uk/plastic-kerb-ramp>



## DRAINAGE

None of the proposed interventions would have an adverse impact on drainage. Elements like temporary curbs never extend all of the way to the curb line, leaving normal gutter space. Certain designs of potential additional interventions, like temporary bus platforms and the temporary curb ramps discussed in the previous section, could have an impact on water flow. Drainage would be an important factor to consider in selecting the right products.

## PROJECTED COSTS

Costs were estimated based on the conceptual designs. Figure 2-27 details estimated costs by phase. Detailed estimates of material costs can be found in Appendix E. The total estimated cost is approximately \$475,000 for the five intersections.

## FUNDING AND IMPLEMENTATION

In the fall of 2014, the Planning Department agreed to lead final design and implementation of the project through its Pavement to Parks Program, which focuses on near term, non-traditional projects. As the lead agency, the Planning Department will seek all necessary approvals and permits and oversee construction, anticipated in late 2015. The SFMTA will review drawings and assist in the creation of any new guidelines triggered by the project. The Planning Department may contract with the SFMTA and/or SF Public Works to construct the project. BRIDGE Housing will extend its community gardening program contract with the Parks Alliance in order to maintain the new infrastructure.

At its meeting on February 24, 2015, the Transportation Authority recommended this pedestrian improvement and traffic calming project for \$375,854 of Lifeline Transportation Program funds for final design and construction. The Metropolitan Transportation Commission (MTC) approved allocation of Lifeline Transportation Program funds for the project at its meeting in April, 2015. Combined with an in-kind match of staff time, the project would only seek \$60,000 to complete the funding plan. The SFMTA has identified Prop K as a potential source, and full funding is anticipated by the end of July 2015. At the same time, BRIDGE Housing anticipates operational funding to extend its community gardening contract with the Parks Alliance.

## CONCLUSIONS

The City can do a lot to mitigate for the auto-oriented nature of the original Potrero Annex and Terrace design through the temporary infrastructure interventions at five intersections shown in this chapter. These low-cost designs with short implementation timelines can help improve the safety and comfort of current residents of the project while they wait for the phased implementation of the Rebuild project, which will significantly improve pedestrian conditions through more pedestrian-oriented streets organized in a more regular grid. By creating gathering spaces and reflecting the activities that make the Potrero Hill community special, the interventions can also help build community. As with any implementation project, the project team will need to continue discussions with area residents, including neighbors who live outside of the Terrace and Annex sites. The design team plans further outreach to relevant stakeholders before, during, and after potential construction.

FIGURE 2-27. TRAFFIC CALMING CONCEPTS COST OVERVIEW

TASK	COST
1. Environmental Review	\$2,892
2. Design + Review	\$67,419
3. Construction Support *	\$26,512
CONTRACT: **	
4. Design services, Outreach, and Intern Support Through Parks Alliance	\$20,400
6. Construction Management	\$22,150
7. Construction Installation	\$257,370
Contract Contingency	\$80,565
<b>Total</b>	<b>\$477,308</b>

\* e.g. engineering labor during construction

\*\* e.g. consultant or construction contractor (construction installation may be undertaken by a City agency)

### 3. SAFE ROUTES TO SCHOOL

Children are some of the most vulnerable users of the southern Potrero Hill streets, and their journeys to school are both critical and challenging, including several hills and wide intersections. Creating safer routes to Starr King and Daniel Webster elementary schools was a key need that emerged from initial community outreach efforts.

Official Safe Routes to Schools (SRTS) efforts already exist in many San Francisco neighborhoods, and Potrero Hill is no exception with a thriving Walking School Bus program that helps more than a dozen children reach school safely each morning. SRTS programs generally aim to increase non-automobile mode share for trips to and from school, but they have secondary goals of encouraging active lifestyles and helping students get to school on-time.

The traffic calming concepts described in the prior chapter will notably improve the safety and quality of the walking school bus routes as the five prioritized intersections include the start-points for both routes where children gather to start the walk, and key crossing locations. All five intersections are on the walking school bus routes.

This chapter outlines some additional low-cost SRTS programs that could help increase safety and comfort for those walking to school in Potrero Hill. It highlights innovative strategies recently implemented in Marin County (safety) and the City of Santa Clara (visibility).

#### SAFETY ENHANCEMENTS

The lowest cost strategy for improving safety around schools and along major SRTS routes is to enhance signage and roadway markings. National experts recommend increasing the visibility of crossings and signage in the immediate vicinity of schools, and a community in Marin County has extended the idea into the neighborhoods surrounding schools.



FIGURE 3-1. SCHOOL BIKE ROUTE SIGN

The Town of Fairfax (Marin County) implemented a set of special signs and street mark-

ings along the main school bike route in October 2013. The route, called the Bike Spine, was selected as the safest and most direct bike connection between three schools and a residential area. School bike signs (see 3-1) and green-backed sharrows were installed along the route, which already had stop signs and lights at major intersections along the way. Fairfax officials see the enhanced signage and markings as a way to increase driver awareness of student commuters and to “teach people proper use of the routes determined to be the safest” through the community.<sup>5</sup>

FIGURE 3-2. HIGH-VISIBILITY CROSSWALK



The online Safe Routes to School Guide recommends increased use of signage and markings in the vicinity of schools and at key crossings, though it says “signs should be used judiciously, as overuse may lead to driver noncompliance and excessive signs may create visual clutter.”<sup>6</sup> Such signs can use a fluorescent yellow-green color that is brighter and more reflective than standard yellow signs, allowing drivers to see them earlier.<sup>7</sup> Reflective sleeves on sign posts labeled “school” can also increase the signs’ visibility.

Crossings are the parts of school routes with the highest safety risks, and national authorities recommend special signage enhancements for these locations. The American Traffic Safety Association recommends increasing the visibility of crosswalks by using fluorescent yellow-green paint under normal crosswalk markings (see Figure 3-2). Increasing the use of widely implemented strategies like mid-street signs and other standard crosswalk markings is also recommended. Attaching a smaller “school” label to

<sup>5</sup> Marin County Safe Routes to School. “Fairfax Bike Spine Launched on October 9th.” Retrieved from [http://www.saferoutestoschools.org/ross\\_valley.html](http://www.saferoutestoschools.org/ross_valley.html) on 11/20/13.

<sup>6</sup> Pedestrian and Bicycle Information Center. “Around the School.”

<sup>7</sup> American Traffic Safety Services Association. “Putting Safety in the Safe Routes to School Program.” Washington, D.C.: 2006. Page 8.

such signs can help emphasize the vulnerability of pedestrians and bikers in the area. Signs with LED flashers (see Figure 3-3) that activate when people are in crosswalks can also increase visibility, albeit at a slightly higher cost.<sup>8</sup>

## PROGRAM VISIBILITY

Increasing marketing and publicity for Safe Routes to School can serve the dual purpose of increasing the number of students taking non-auto modes and increasing awareness of walk and bike commuting among drivers in the school community. San Francisco's Safe Routes to School program already recommends that schools implement a number of national best practices, including bike and walk to school days, walking school buses and bike trains (as already occur in Potrero Hill), and competitions between classes. However, there may be ways to expand promotional activities.

The City of Santa Clara's Safe Routes to School program held a contest in the spring of 2013 that had students create promotional posters about "making it safer, easier, and more fun to walk, bike, or take transit to and from school" using a set of themes identified by program organizers.<sup>9</sup> Contest winners' posters were put on buses and light-rail vehicles in the area, and winners also received a selection of Safe Routes to School merchandise and official commendation from the city. Program organizers created the contest to raise the profile of Safe Routes to

<sup>8</sup> Ibid. Pages 9-18.

<sup>9</sup> Santa Clara Safe Routes to School. "Santa Clara Safe Routes to School Poster Contest." Retrieved from <http://santaclarasr2s.org/get-involved/santa-clara-safe-routes-to-school-poster-contest/> on 11/20/13.

School among students during mid-school-year months that tend to be slower for the program, as most of the district's SRTS activities take place in October and May.<sup>10</sup> They also aimed to use the contest and winning posters to increase media attention and publicity and strengthen the program's relationship with the local transit service provider, the Valley Transportation Agency.

The National Center for Safe Routes to School and California Walk to School each have additional marketing and publicity recommendations and materials. The National Center's website includes template posters and flyers for use with local programs,<sup>11</sup> and the California program's site includes detailed recommendations on enhancing program visibility and working with teachers to execute poster and publicity contests.<sup>12</sup>

## FUNDING AND IMPLEMENTATION

The pedestrian improvement and traffic calming project described in Chapter 2 would include some Safe Routes to School marketing and visibility features (project anticipates full funding in Spring 2015). In particular, a painted line will be designed to connect each of the plazas along the routes of the walking school buses. This line is envisioned

<sup>10</sup> Kidd, Christopher and Lauren Ledbetter, Alta Planning. "Santa Clara SR2S Poster Contest." Memo to the Santa Clara Unified School District and the Valley Transportation Agency. Retrieved from <http://santaclaraca.gov/modules/ShowDocument.aspx?documentid=8478> on 11/20/13.

<sup>11</sup> National Center for Safe Routes to School. "Every Step Counts Marketing Materials." View at <http://www.saferoutesinfo.org/program-tools/every-step-counts-marketing-materials>.

<sup>12</sup> California Walk to School. "October Walk to School Month: Making Banners, Posters, and Signs with Students." View at <http://www.caactivecommunities.org/wp-content/uploads/2011/09/Making-Banners-Posters-and-Signs-with-Students.pdf>.

FIGURE 3-3. FLASHING SIGNS



FIGURE 3-4. POTENTIAL CHINESE NEW YEAR THEMED INTERSECTION AT 25TH AND CONNECTICUT



to have varying widths, patterns, and other characteristics that will raise the profile of the routes and hopefully draw attention to the great program already underway in the housing sites. In addition, design details from the intersection improvements (e.g., bike reflectors, themes such as Chinese New Year—see Figure 3-4, previous page). are anticipated to include input from school children to enhance their association with the walking school bus and will serve to draw attention to the key nodes along the routes. Once implementation is complete (anticipated in late 2015), further programmatic improvements could be made to the routes, and community health leaders who “drive” the walking school buses have discussed potential funding sources for these improvements with the SFDPH Safe Routes to School coordinator.

## CONCLUSION

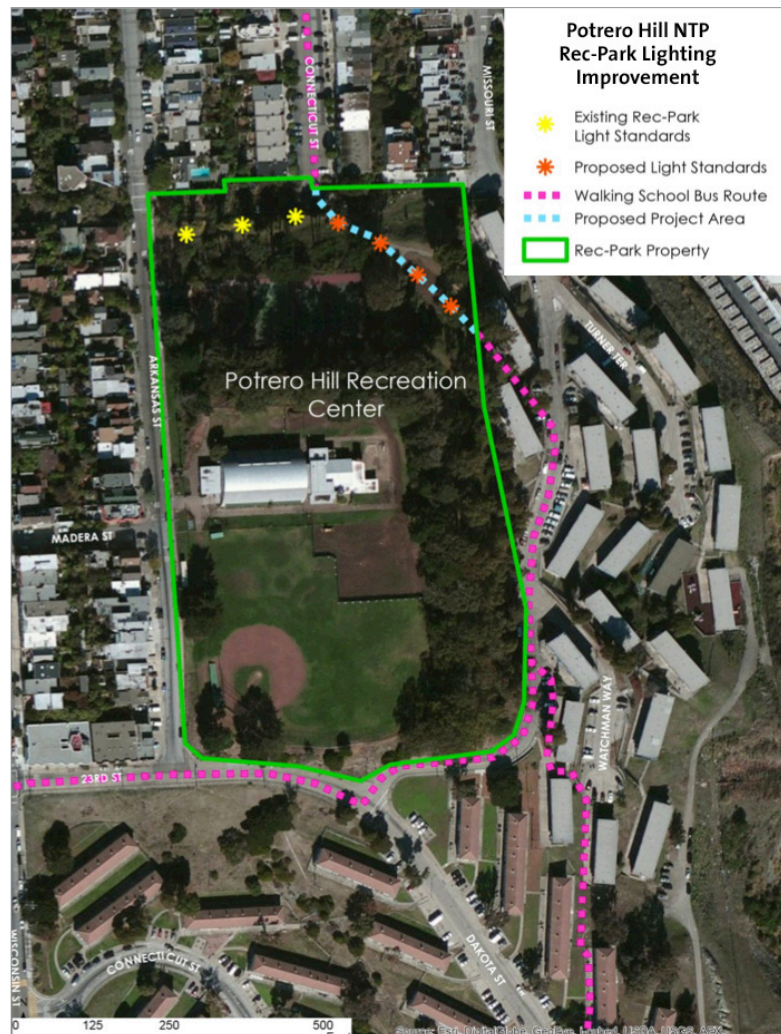
With a thriving Walking School Bus, the Potrero Hill community has already implemented some important Safe Routes to Schools programs. A combination of strategies that improve the visibility of the program could take it to the next level.

Bay Area Safe Routes to Schools programs have recently implemented new strategies to increase safety and program visibility, and both could be useful and low-cost additions to programs in the Potrero Hill neighborhood. The Fairfax bike spine improvements in particular could be a useful model for extending school safety zones along key non-motorized access routes without making major infrastructure investments like changing curb lines or creating bike- or pedestrian-only facilities. Promotional activities like Santa Clara’s poster contest could also increase program participation and visibility overall.

## 4. PATHWAY IMPROVEMENTS AND LIGHTING

Southern Potrero Hill has relatively weak connections to surrounding neighborhoods, but a set of walking paths provide some pedestrian connectivity where roads do not, both through the site and to areas north and east. Lighting along these pathways is limited, and as such, they are only useful during the day, particularly for more vulner-

FIGURE 4-1. PATHWAYS CREATING IMPORTANT CONNECTIONS



able community members. The Potrero Hill NTP aimed to increase visibility and safety on these pathways to make these connections more useful during early morning and evening hours.

## CONTEXT

Figure 4-1 shows where these pedestrian pathways, called the “cuts” and the “straightaway,” are located. One pathway runs just to the northeast of the Potrero Hill Recreation Center, beginning behind Potrero Terrace buildings on the west side of Missouri Street. The pathway splits to the north of the recreation center, making connections with Connecticut Street to the north and Arkansas Street to the west. Only parts of the pathway are paved.

Community members noted that the pathway creates an important connection to the Recreation Center. It is also a much-used route to Daniel Webster School, which is lo-

cated at the corner of 20th and Missouri streets. While Missouri Street is a more direct route, its topography—descending into a small valley before rising to the apex of Potrero Hill—makes the slightly longer route via the “cuts” and Connecticut Street a more attractive option. Figure 4-2 (next page) shows the Walking School Bus using this route.

While there are light fixtures on the western portion of the path, closest to Arkansas Street (shown in Figure 4-3), it is mostly unlit. Community members indicated that additional light fixtures would make this important connection feel safer. The pathway is on land owned by the San Francisco Recreation and Parks Department.

FIGURE 4-2. WALKING SCHOOL BUS ON PATHWAY



FIGURE 4-3. PORTION OF THE “CUTS” WITH LIGHT FIXTURES



A dirt pathway up from 22nd and Missouri Streets also connects to the “cuts,” and strengthening this connection could further improve east-west connectivity on this northern portion of the Study Area. Initial drawings for a development at 1395 22nd Street include a paved and landscaped stairway down to the intersection of Texas and 22nd streets, near the 22nd Street Caltrain station, which could further improve connectivity in this area.

## FUNDING AND IMPLEMENTATION PLAN

At its September 2014 meeting, the Eastern Neighborhoods CAC voted to recommend the allocation of \$150,000 in developer impact fees to the project, thereby fully funding it. Since the project is on San Francisco Recreation and Parks Department Property, they would lead final design and implementation, which is anticipated in 2015.

FIGURE 4-4. “CUTS” LIGHTING PROJECT COST OVERVIEW

TASK	COST
1. Poles	\$ 40,000
2. New Service	\$ 5,000
3 Conduit	\$28,000
4. Pull Box	\$6,000
5. Overhead	\$19,750
6. Construction Contingency	\$11,850
7. Soft Cost	\$26,070
8. Overall Contingency	\$13,380
<b>Total</b>	<b>\$150,000</b>

## CONCLUSION

The “cuts” create an important connection between the Study Area and important community resources to the north and west. Community members expressed an interest in installing more lighting to make those connections feel more comfortable, and the NTP was able to secure funding to fill this need.

## 5. COMMUNITY SHUTTLE

The Potrero Annex and Terrace community identified improvements in circulation around the project site and between the site and neighboring areas as a critical need. With its hilly topography and limited number of entry and exit points, it can be difficult to get around the site, and non-auto connections to commercial and employment centers can be arduous.

The Study Area is served directly by several Muni lines today, and residents cited the 22 as an important connector to the Mission and BART. However, Muni Forward will eliminate one of the lines that provides direct service, and it will move the 22 route several blocks north of its current path through northern Potrero Hill to the 22nd Street Caltrain station, making it much less convenient for residents. Muni also recently eliminated a community route, the 53, which provided residents a valued connection to the central Mission.

With this context in mind, the Potrero Hill NTP explored the possibility of creating a shuttle service that could en-

hance circulation through the site and improve connections to the surrounding area and high-capacity regional transit systems.

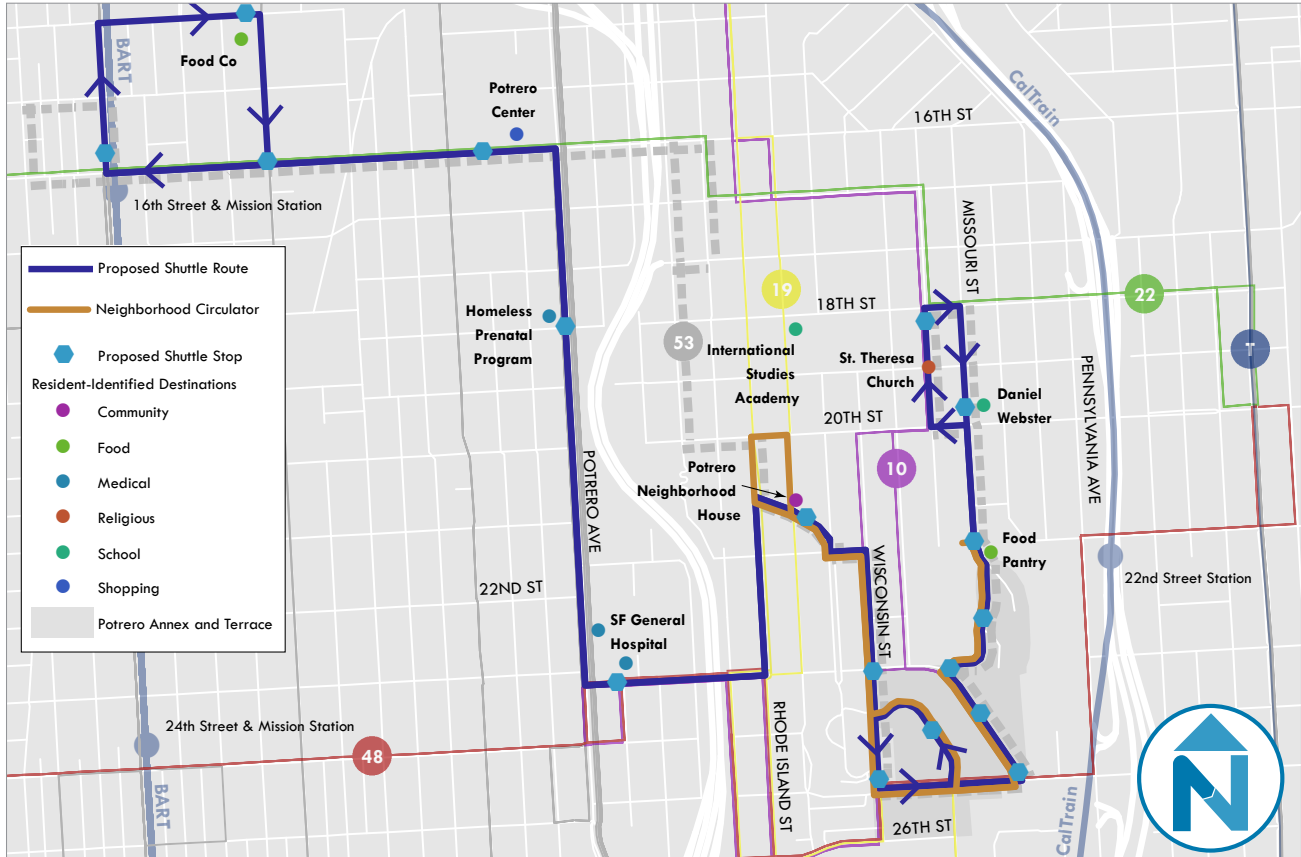
### SHUTTLE ROUTES

The project team created two shuttle alternatives. One would provide regular circulation through the site and the other would extend the service up Potrero Avenue and west along 16th Street to the BART station at Mission Street. Figure 5-1 shows the alternatives, and the following sections describe them. The figure also indicates important trip destinations outside the Potrero development site.

#### Circulator

The circulator (in orange in Figure 5-1) would provide service between the Food Pantry on the east side of Potrero Hill to the Neighborhood House, with a route serving all major streets through the site. The route is envisioned making nine stops along its course. The route is long enough to provide circulation through the site while being

FIGURE 5-1. POTENTIAL SHUTTLE WITH EXISTING MUNI NETWORK



short enough to allow one vehicle to serve the route every 30 minutes with 10 minutes of driver break time per hour.

### Full Shuttle Route

The full shuttle route is designed to give residents a one-seat ride to many of the important destinations identified by neighborhood residents within a reasonable radius of the site. It was largely modeled after the 53 bus route.

The proposed shuttle route roughly follows the route of the former Muni line 53 with two exceptions. Stakeholders identified additional important destinations along Potrero Avenue, in particular SF General, and the FoodsCo grocery store at 14th and Folsom Streets; the route diverges from the old 53 to serve these destinations.

The shuttle route is as follows:

- The westbound run would start at the corner of 18th and Connecticut streets, go through the development site via Connecticut Street (turning right at Wisconsin Street), travel along Wisconsin, 22nd Street, Southern Heights Street, Rhode Island Street, 23rd Street, Potrero Avenue, and 16th Street, completing its run at the corner of 16th and Mission streets.
- The eastbound run would start by traveling northbound along Mission to 14th Street, eastbound on 14th to Folsom Street, and southbound on Folsom back to 16th, mirror the westbound route back to the project site, follow Wisconsin and 25th streets through the project site, and complete its run back at 18th and Connecticut streets.

## SHUTTLE SERVICE PLANS AND OPERATING COSTS

The project team also estimated the travel times and costs of each of these alternatives and created a cost-projection tool, included in Appendix E, to help local staff estimate capital and annual operating costs of different route alternatives.

The circulator route would require an estimated 15 minutes of drive time and six minutes of dwell time. With the return trip and layover, the full cycle time would be 52 minutes. Like the full shuttle service, the circulator would still require two vehicles to provide service every 30 minutes. Circulator service might provide more reliable scheduled service given the shorter route length and the exclusion of streets with higher levels of congestion, including northern Potrero Avenue and 16th Street.

Based on a driving and timing exercise conducted on the morning of March 4, 2014, the full route is estimated to take 25 minutes each way (including 18 minutes of travel time and 30 seconds of dwell time for each of the 14 stops in each direction). The shuttle also has to allow for 10 minutes of layover for driver breaks during each cycle. This conveniently creates a 60-minute cycle time which allows for predictable scheduling throughout the day that would enable riders to count on a bus arriving at a certain time each hour or half hour, pending service plan details. This was further validated by comparison to the 53 scheduling, which was very similar.

### Sample Service Plan

The project team developed several sample service plans and estimated the costs of providing different levels of service. The cost-projection tool also allows staff to compare the cost of contracting out the service to the cost of purchasing vehicles and administering the service in-house.

Cost estimates for contracted service are based on the *SamTrans Community Transit Guide*, inflated to 2014 values. The guide’s adjusted costs range from \$70 to \$96 per hour, including vehicles, drivers, insurance, maintenance, a storage and maintenance facility, and fuel. Cost estimates for in-house service are based on a combination of the *Community Transit Guide* and used-vehicle capital cost estimates from the Alliance Bus Group, a national bus dealer.

Figure 5-2 summarizes the estimated costs of several scenarios. Full shuttle service would be more expensive to

**FIGURE 5-2. ANNUAL OPERATING AND CAPITAL COSTS, FULL SHUTTLE/CIRCULATOR SERVICE ALTERNATIVES**

ROUTE TYPE	SERVICE SPAN	HEADWAY	CONTRACTED COST	IN-HOUSE COST
Full Shuttle	9 am–6 pm daily	1 hour	\$230,000–\$320,000	\$150,000 + \$25,000 Capital
	7:30 am–7:30 pm, Monday-Saturday	1 hour	\$260,000–\$350,000	\$170,000 + \$25,000 Capital
	9 am–6 pm daily	30 minutes	\$460,000–\$630,000	\$310,000 + \$50,000 Capital
	7:30 am–7:30 pm, Monday-Saturday	30 minutes	\$510,000–\$710,000	\$350,000 + \$50,000 Capital
Circulator	9 am–6 pm daily	30 minutes	\$230,000–\$320,000	\$160,000 + \$25,000 Capital
	7:30 am–7:30 pm, Monday-Saturday	30 minutes	\$260,000–\$350,000	\$180,000 + \$25,000 Capital

provide given the longer route (3.8 miles each way for the full shuttle versus 1.27 miles each way for the circulator service). For in-house service, 30-minute headways would require twice the up-front capital cost given the need for two vehicles to provide that frequency of service.

## FUNDING AND IMPLEMENTATION PLAN

Given the high levels of ongoing funding needed to run either shuttle or circulator service, site-specific transit services are unlikely to be implemented in the immediate term. However, BRIDGE Housing will continually monitor potential funding sources and continue ongoing conversations with the SFMTA on how such a service might be implemented. Non-traditional transportation funding sources, such as private foundations, should be considered in addition to those programmed by local, regional, state, and federal agencies.

## CONCLUSION

A new private transit service is unlikely to be implemented in the immediate term, but the Potrero Hill NTP sets up local organizations to move forward quickly on such a service should ongoing funding become available. The route and service plans outlined in this chapter reflect community members' expressed needs and present a range of options for enhancing connectivity within the site and to important destinations in the surrounding area.

## 6. CONCLUSION

The Potrero Hill NTP took a unique approach. The Study Area encompassed a public housing development that is slated to be rebuilt from the ground up starting in just a few years, making large-scale transportation infrastructure investments unwise in the short term. The area's transportation conditions have been extensively studied in recent years, making the detailed examination of existing conditions that usually comes with a study like

this unnecessary. Based on these two factors, the NTP set out to quickly identify low-cost, short-term projects that could improve the lives of those living on the site right now as they wait for the larger-scale changes that will happen through the Rebuild Potrero effort.

Two key ideas developed as part of the NTP have received or been recommended for implementation funding:

- Lighting for an important pedestrian connection between the site and the school and recreation center to its north and east.
- Temporary infrastructure traffic calming, pedestrian safety, and bus stop improvements at five intersections that will slow traffic through the site and make students' journeys to school safer and more comfortable.

In addition, the stairwell between Texas and Missouri streets has been incorporated into the project design for the proposed 1395 Pennsylvania Avenue. The study readied other ideas for implementation when funding comes available. These concepts include a shuttle that would make traversing the hilly project site and accessing retail and employment opportunities in the surrounding area easier and enhancing the neighborhood's already robust Safe Routes to School program.

Over the next 10 to 20 years, Rebuild Potrero will make the site a denser, less isolated site that is easier to traverse. The NTP can help ensure that, in the meantime, getting around is a bit easier and safer for Potrero Annex and Terrace residents. Materials from the temporary treatments (e.g., decorated manholes, plantings, etc.) can be moved to other sites around the City and reused for other projects. Finally, treatments such as the temporary bus bulbs could be replicated by the SFMTA as a way to deliver low-cost transit improvements. In these ways, the treatments implemented in the near term will have long-lasting utility for San Francisco as a whole even after Rebuild Potrero is complete.





# Potrero Hill Neighborhood Transportation Plan

## DRAFT FINAL REPORT APPENDICES



JUNE, 2015

## **APPENDIX A: BRIDGE OUTREACH SUMMARY**

Potrero Hill Transportation Plan  
Community Outreach and Engagement Summary  
BRIDGE Housing Corporation

**Overview**

The purpose of the Potrero Hill Neighborhood Transportation Plan (NTP) is to develop a community-based transportation plan for the Potrero Hill neighborhood of San Francisco, identifying community multimodal transportation priorities at the neighborhood scale, and working with stakeholders to prioritize near and mid-term improvements. The transportation improvements will be integrated into a long term plan to redevelop a public housing site, Potrero Terrace and Annex, located on the south slope of Potrero Hill. “Rebuild Potrero” is a holistic effort to transform the now isolated public housing site into a thriving mixed income, mixed use community and to improve long term social outcomes for existing and future south Potrero families. Transportation access plays a crucial role in the Rebuild Potrero efforts. The boundaries for the Potrero NTP follow the boundaries of the Potrero Terrace and Annex public housing site and the surrounding neighborhood. A more detailed description of the Potrero neighborhood is below.

**Current Socio Economic Conditions**

Potrero Annex and Terrace is perched along a steep ridge at the southern edge of Potrero Hill. The 33 acre site is highly visible, particularly from the 280 freeway, driving north into San Francisco. Strewn about in what seems like a haphazard pattern are buildings containing 606 homes. The large sodium lights, stark absence of trees, and utilitarian paint colors, leave no doubt: this is public housing. Of the approximately 1,200 people living at Potrero, virtually all are living in financial distress.



The portion of adults with earned income (as opposed to income from government sources) is approximately 30%; a low percentage even compared to other public housing in San Francisco. Approximately 44% of Potrero Annex and 62% of Potrero Terrace residents receive public assistance and approximately 60% to 70% receive food stamps. The median income is \$14,600, reflecting an extremely high concentration of poverty. Less than 50% of Potrero residents have graduated from high school, compared to 86% in San Francisco. Another important indicator of the social and educational conditions of Potrero Terrace and Annex is the low level of enrollment in Preschool and high chronic absentee levels in elementary and high school. Of the 78 three and four year olds living in Potrero Terrace and Annex, only 30% attend Pre-School. The Chronic Absence Rate (missing more than 10% of school days with unexcused absences) for Potrero Terrace and Annex students in K-12 grade is 53%. At the elementary school level, approximately 35% of PTA students are chronically absent.

Additionally, the health of the residents living in PTA is dire. As the Department of Public Health’s baseline assessment indicates, in 2003-2005, residents of zip code 94107, which includes Potrero Terrace and Annex, had far higher rates of acute care hospitalizations for adult and pediatric asthma, diabetes, lung disease and heart failure when compared to San Francisco. These four chronic diseases are considered ambulatory care sensitive (ACS) conditions: conditions for which hospitalization can usually be prevented when they have been effectively managed in outpatient settings. High rates of ACS conditions indicate poor access to or use of outpatient health care.

Hospitalization Rates, age-adjusted per 1,000 (2003-2005)

	San Francisco	Zip Code 94107
Adult and pediatric asthma	6.9	19.3
Diabetes	8.4	20.3
Chronic obstructive pulmonary disease	4.9	9.5
Heart Failure	14.4	38.3

### Neighborhood Context

The Potrero Terrace lies on a south-facing slope, with unobstructed solar access, creating a warm microclimate. The Terrace is bounded by 26th, Wisconsin, Texas, and 23rd Streets. The Annex is east facing, receiving direct sun in the morning, but is shaded and cooler in the afternoon. All Terrace buildings are 3 story concrete structures with tiled hipped roofs. The buildings in the Annex are wood construction with flat roofs. The resultant open space between buildings is often steep and ambiguous, without a sense of stewardship or purpose.

There are a variety of adjacency conditions. The western edge of Potrero Terrace and the northern tip of the Annex abut residential uses. At the top of the hill, directly adjacent to the site, but 20 feet above it, lies the Potrero Hill Recreation Center, a 9-acre park including a baseball diamond, tennis courts, playgrounds, and an indoor gymnasium with full size basketball court. West of the intersection of Wisconsin and Connecticut is Starr King Elementary School and Starr King Open Space. A steep cliff along the eastern edge, from 22nd to the small existing southern portion of Texas Street and then along the southern edge, separate Potrero from the Dogpatch neighborhood and light industry below.

The site was designed with the streets following the ridge up Dakota Street and the valley along Connecticut Street, with buildings located along the contours, stepping with the topography. The developments are isolated from the rest of the community with relatively few connections to the surrounding neighborhood: Missouri connects to the north side of Potrero, 25th connects east to Dogpatch and 280 freeway access, Connecticut to Cesar Chavez to the south and Coral Rd. to the west, and 26th connects to Potrero and on to the Mission in the southwest corner of the site. The steep topography and lack of clear paths make the site difficult to traverse for a pedestrian. A stair connects Connecticut and Dakota, and an informal path at the top of the hill connects 23rd to the north side of the park.

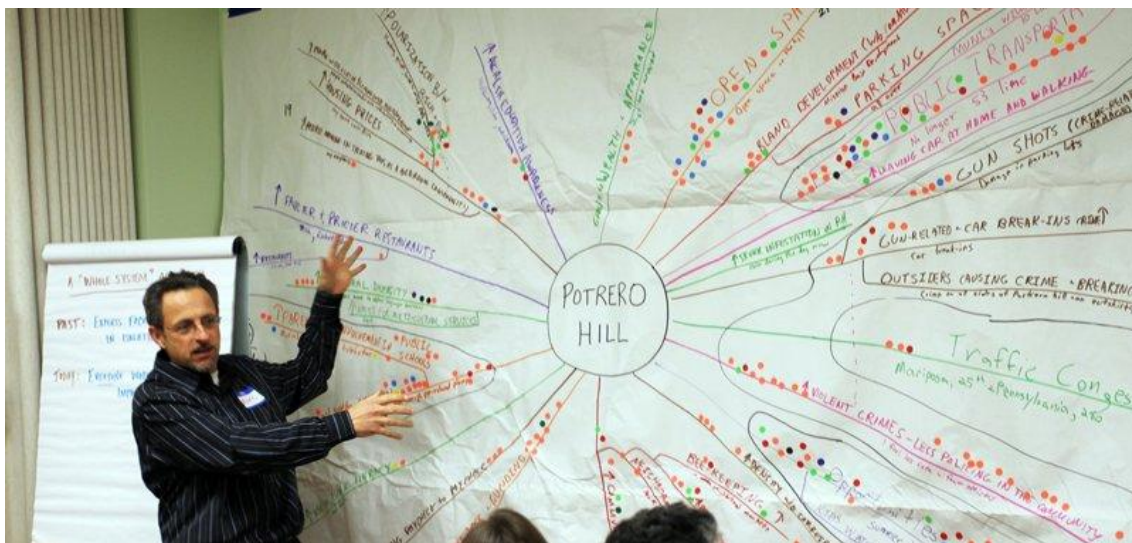
**Community Outreach and Engagement Efforts**

An essential element of Rebuild Potrero is a Community Building Initiative to ensure ongoing resident involvement in all aspects of the change process. The Rebuild Potrero Community Building Initiative has been underway since 2009 with the goal of building the capacity of residents to improve their quality of life and effect positive change in the South Potrero community. The implementation of the Community Building Initiative has involved residents at every step.

The Potrero Neighborhood Transportation Planning process leverages the authentic engagement efforts that are already underway and provides additional opportunities for community involvement in the development of specific transportation recommendations. Below is an overview of the community engagement efforts that have informed the Neighborhood Transportation Plan to date and the takeaways of each engagement effort. Additionally, a summary matrix of each engagement effort including the date, number of participants and outreach methodology is also included.

Community Wide Get Together

On January 29, 2011 “Unite Potrero: A Community-Wide Get Together” was held to bring together residents from all over Potrero Hill in a fun, constructive and interactive dialogue about their community. The event was a huge success and included over 175 participants representing Potrero Terrace and Annex, the North side of the hill, CBO stakeholders, government agencies and political leaders. Together, they identified the trends and issues impacting Potrero Hill.



The issue areas that received top focus included:

- Public transportation (34)
- Crime (33)
- Youth opportunities (27)
- Families with young children (26)
- Open spaces (21)
- Community engagement, parks and gardening (20)
- Economic polarization and housing costs (19)
- Development planning (12)
- Social services (11)
- Cultural diversity (8)

The issue of transportation was further highlighted by the various stakeholder groups, particularly youth and young adults, community residents and community based organizations.

Community Residents:

- Crime (19)
- Public transportation (17)
- Families with young children (13)
- Open spaces (10)
- Social services (9)
- Opportunities for young adults (9)
- Housing prices (6)

Community-Based Organizations:

- Public transportation (6)
- Opportunities for young adults (5)
- Open space (4)
- Influx of affluent residents not interacting in the community (4)

Government Officials:

- Opportunities for young adults (8)
- Public transportation (4)
- Crime (3)

Schools/Education:

- Development planning (2)
- Polarization between rich and poor (3)

Business Owners:

- Open spaces (5)
- Public transportation (2)
- Families with young children (2)
- Community engagement (2)

Youth and Young Adults:

- Public transportation (3)
- Opportunities for young adults (3)

### Community Building Group Meeting #1

An important function of the Rebuild Potrero Community Building Initiative is to bring together community members from various parts of Potrero Hill who would not come together on their own. The Community Building Group has been meeting every other month since 2009 at the Potrero Hill Neighborhood House (NABE). This meeting serves as an opportunity for members to interact, build relationships, learn about and provide feedback on the Rebuild Potrero process, and organize and execute large scale community-wide events. The Community Building Group includes approximately 60 people and averages 30 people per meeting. The Group is composed of public housing residents, surrounding community members, CBO representatives and other South Potrero stakeholders.

In Winter 2011, SFMTA participated in the semi-monthly Community Building Group meeting and asked a series of questions to gather information that would help them identify strategies to improve accessibility and mobility for Potrero residents.

### **Key Takeaways:**

- Potrero residents rely more on buses than any other mode for their travel needs.
- There are many reasons people listed for not taking buses or trains more frequently. The most frequently cited ones were: buses don't go where people need to go; buses are expensive; bus service is not predictable/reliable/frequent enough (i.e. people have to wait too long); people have other options; and people can't reach their destinations without transferring.
- There are many reasons people listed for not bicycling or walking more, including: they don't feel safe biking/walking due to crime; they don't have anyone to bike/walk with; they don't feel safe walking and crossing streets (for lack of crosswalks or sidewalks); they don't know how to reach their destinations by biking or walking.
- When asked what transportation improvements would most benefit their family, there were 21 comments related to buses, one comment related to bicycling, and one comment related to sidewalks. There were no comments related to driving.. The most cited strategies related to adding or improving bus service; in particular, residents wish they could have the 53-Southern Heights bus service restored.

### Walking Club and Discussions with Residents

As part of the Rebuild Potrero Community Building Initiative, BRIDGE supports a regularly-scheduled walking group for Potrero residents led by Jr Community Builder and resident Uzuri Pease-Greene. Transportation consultants Fehr & Peers joined the walking group on 3/15/2013 and 4/1/2013 with the purpose of reviewing site conditions and discussing transportation issues with residents.



### **Key Takeaways:**

- Based on discussions with residents, Fehr and Peers concluded that the residents rely more on buses than the commute mode split suggests.
- No issues were raised related to driving despite the relatively high car ownership rate reported for Potrero; rather, residents had much more feedback about access to buses and destinations not accessible by bus, as well as difficulties negotiating the steep hills at the site in order to reach bus stops.
- The Potrero residents described the discontinuation of the 53-Southern Heights bus route in 2009 as the most significant barrier to their travel. They explained that the community relied heavily on the 53, and that it used to provide access to several common destinations as illustrated in Figure 6, including:
  - Safeway, Ross, and other retail at the Potrero Center, Potrero Avenue at 16th Street
  - Food Co. at Folsom Street and 14th Street
  - St. Theresa’s Church at Connecticut Street and 19th Street
  - Potrero’s food pantry at Missouri Street and 22nd Street
  - The Potrero Hill Neighborhood House (NABE) at De Haro Street and Southern Heights Avenue

### PARADISE Plan Needs Assessment and PARADISE Plan Community Meeting

In October 2012, Rebuild Potrero was awarded a HUD Choice Neighborhood Planning Grant. BRIDGE, The San Francisco’s Mayor’s Office of Housing, and SFHA identified the need to complement the Rebuild Potrero physical Master Plan with a second, but equally important, plan to provide a comprehensive program and service strategy for meeting the needs of Potrero families and improving a range of social outcomes. The Choice Neighborhood Planning Grant funded the creation of the “PARADISE Plan”—a visionary blueprint for addressing identified child, family, and community needs in South Potrero. Named by residents, PARADISE stands for **Practical And Realistic And Desirable Ideas for Social Enrichment**.

The PARADISE Plan process began with a Community Needs Assessment Household Survey, an interview survey that was administered by teams composed of Potrero Terrace and Annex residents and Masters in Public Health (MPH) students from San Francisco State University (SFSU). The assessment included questions related to education, economic stability, public safety, health and wellness, technology access and transportation needs.

The transportation data collected as part of the PARADISE Plan Needs Assessment was presented to the community at a large-scale PARADISE plan Community Meeting in which Potrero residents and community based organizations had the opportunity to learn and interact with the needs assessment data and provide their reactions to the results. The results were provided to the SFCTA as part of the Potrero Neighborhood Transportation Plan.





**Key Takeaways:**

- 71% of respondents utilize the bus for their everyday needs
- 21% of respondents drive a vehicle for their daily transport (another 5% carpool)
- 47% of respondents have access to a car (52% do not have access at all)
- Respondents would use public transportation more if:
  - The wait at the bus stop were shorter
  - It went closer to places they want to go
  - You reach the final destinations with fewer transfers
  - It were cheaper
  - It were cleaner
  - It were safer
- The barriers to walking or biking in PTA include:
  - Narrow sidewalks
  - Lack of benches or other pedestrian amenities
  - Traffic volume on the some streets
  - Absence of destinations within walking distance for residents to access jobs of meet daily needs

**Community Building Group Meeting #2**

On December 5, 2013 SFCTA staff and consultants from Nelson Nygaard participated in the semi-monthly Rebuild Potrero Community Building Group meeting. At the meeting participants were provided the opportunity to meet the staff and learn about the transportation needs assessment and recommendations that Fehr and Peers summarized in their memo as part of the Green Connections

grant. Participants also learned about the Neighborhood Transportation Plan planning process and the role they would play moving forward.



**Key Takeaways:**

- Residents were engaged and excited about the Neighborhood Transportation Plan process.
- The possibility of getting a shuttle to replace the loss of the 53 is a key motivation for resident's involvement with the process.

Walking Club and Walking School Buses

As part of the Rebuild Potrero Community Building Initiative, BRIDGE supports a regularly-scheduled walking group for Potrero residents led by Jr Community Builder and resident Uzuri Pease-Greene. Additionally, as a way to increase elementary school attendance, two walking school buses are conducted on a daily basis to Starr King and Daniel Webster. The Walking School Buses are led by Potrero residents that are employed through the Healthy Generations Project as Community Health Leaders.

Staff from the SFCTA and transportation consultant, Nelson Nygaard participated in the walking group on 11/07/2013 and on the Walking School Buses (WSB) on 3/4/2014. The landscape architecture firm, Fletcher Studio also participated in the WSB in Fall 2014. The purpose of these visits were to review site conditions and safety concerns related to "safe routes to schools" and discuss transportation issues with residents.



**Key Takeaways:**

- Confirmed pedestrian safety and access challenges noted in previous study, including prioritized intersection locations.
- Confirmed other pedestrian and access challenges:
  - high design speed of roadways
  - lack of stop or signal control at intersections
  - unmarked crossings
- Strength of community gardening program as a potential asset
- Significant grades are hard to understand unless experienced through site visits

- Community capacity building efforts underway of various walking programs, including the walking club and the walking school bus
- Significant space in parking lanes creates opportunities for bus stop amenities by reallocating street right of way.

### Community Building Group Meeting #3

On April 3, 2014 SFCTA staff and consultants from Nelson Nygaard participated in the semi-monthly Rebuild Potrero Community Building Group meeting. At the meeting, an update was provided on the Potrero Neighborhood Transportation Plan and a brief summary was distributed to assess usage patterns and priorities for the proposed shuttle. Here is a brief, informal summary of the survey results from the April 3, 2014 Potrero community workshop.

#### **Key Takeaways:**

- Twice as many people said they want a stop close to them vs. fewer/no transfers. This is surprising given the comments during the meeting, so we likely should not put too much authority in this, however it does indicate some potential appetite for a local circulator that would make transit stops more accessible.
- Secondly weekday and morning/evening service were most important to this group (over weekend), which indicates that eliminating weekend service could be a viable way to lower cost.
- Car is the mode people cited using most in their “travel diaries,” followed by bus. I assume this is because many destinations are not accessible by bus. We did not ask whether this was their own car or a borrowed car.
- Departure times are fairly evenly distributed between 9 a.m. and 8 p.m.
- Top destinations attendees indicated that they would go to more often if easier to get to: Safeway, SF General, BART, the Mission, the NABE, and FoodsCo (followed by several more local destinations with fewer votes).





#### Community Building Group Meeting #4

On August 7, 2014 BRIDGE staff provided an overview of the Potrero Neighborhood Transportation Plan and recruited volunteers to participate in a focus group to identify short-term strategies to increase pedestrian safety and improve transit access.

#### ***Key Takeaway:***

- Based on the volunteer sign-up sheet, there is a lot of interest in improving walkability and transit access in Potrero Terrace and Annex.

#### Design Charrettes/Focus Groups

After the August 2014 CBG, a series of four design meetings were held on 9/16/14, 11/6/14, 11/13/14, and 12/16/14. The purpose of these meetings was to solicit resident input on the design for the five intersections identified in the Potrero NTP, which align with the routes for the Walking School Bus (WSB) to Daniel Webster and Starr King Elementary Schools. The working group consisted of residents who signed up at the August 2014 CBG meeting as well as staff from the Healthy Generations Project who operate the WSB and staff from the Potrero Terrace and Annex Community Garden who would provide maintenance for the small-scale planting proposed in the new design. The design charrettes included a field trip to Persia Triangle in the Excelsior neighborhood of San Francisco, so working group members could tour a recent pedestrian improvement/traffic calming project (see photos on next page).

#### ***Key Takeaways:***

- Residents are excited about the prospect of redesigning the spaces to make them:
  - safer for pedestrians
  - more convenient and comfortable for bus riders
  - fun and playful areas for children and families

- bright and beautiful locations for everyone to gather
- There are relatively inexpensive materials and ways to bring about the temporary pedestrian improvements and traffic calming measures.
- It will be key to have community events to engage residents in the installation and celebration of the improvements to foster community ownership and stewardship of the redesigned spaces.



#### Community Building Group Meeting #5

On February 5, 2015 SFCTA staff and consultants from Fletcher Studio participated in the Rebuild Potrero Community Building Group meeting. Meeting attendees heard an overview of and update on the Potrero Neighborhood Transportation Plan. Fletcher Studio, the landscape architect, also presented the preliminary design for the pedestrian improvements and traffic calming measures component of the NTP. SFCTA, Nelson Nygaard, Fletcher Studio, and BRIDGE all assisted in soliciting community feedback on the draft design.

#### **Key Takeaways:**

- Residents are very concerned about pedestrian safety in the neighborhood and want to slow down the cars.
- Overall, residents like the idea of having safe and fun spaces for children and families to walk, and they like how the new design will beautify the community.
- Resident feedback on the draft design was primarily focused on ensuring the new layout is functional and practical for all users of the space. These comments included:
  - Minimize loss of parking
  - Texas Street needs to remain accessible for trucks, deliveries and emergency vehicles
  - Minimize width and length of bulb outs
    - In the words of one resident, “They stick out too far into intersection. Cars speed up and down streets. Intersections will be sharp.”



### San Francisco Housing Authority (SFHA)

On February 25, 2015 BRIDGE Housing staff and Fletcher Studio presented to and solicited feedback from the SFHA on the preliminary design for the pedestrian improvements and traffic calming measures component of the NTP. SFHA Project Managers Toni Autry and Aaron Goodman and Property Manager Brenda Morales attended.

#### ***Key Takeaways:***

- SFHA representatives echoed resident sentiments almost word for word with their overall support of the project and the functional and practical nature of their feedback.

### Summary

Below is a matrix of the engagement efforts to date including participation numbers and outreach methodologies. All participation numbers are collected from sign in sheets and recorded and tracked on a monthly basis by the Jr Community Builder. In an effort to ensure authentic engagement and encourage greater community building and social cohesion between resident populations, BRIDGE Housing Corporation does not record data regarding the race and ethnicity of participants. However, Spanish translation is available at every community meeting and based on the observations of the Jr Community Builder on site and the Director of Potrero Community and Housing Development, participation in Rebuild Potrero activities reflects the demographics of the Potrero Terrace and Annex housing development (60% African American, 20% Latino, 8% Asian, 12% White).

Engagement Effort	Date	Purpose of Engagement Effort	Number of Community Participants	Outreach Methodology
Community Wide Get Together	1/29/2011	Bring Potrero residents and stakeholders together to identify trends, issues and priorities and create a cohesive vision for the future.	175	<ul style="list-style-type: none"> <li>• Event Planning Committee of 20 diverse stakeholders met for 4 months to plan event.</li> <li>• Two postcard mailings and drop off to public housing residents' homes.</li> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>• E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600 people)</li> <li>• Spanish and Cantonese translation provided.</li> </ul>
Community Meeting #1	11/03/11	Assess transportation and travel patterns of residents and community members of Potrero Hill.	51	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>• E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600 people)</li> <li>• Spanish translation provided.</li> </ul>
Walking Club	3/15/13 and 4/1/13	Review of Site Conditions and provide opportunity for in depth discussions with residents	12 and 18	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Walking Club included in Monthly Potrero Healthy Living calendar distributed to all public housing residents, community members and</li> </ul>



Engagement Effort	Date	Purpose of Engagement Effort	Number of Community Participants	Outreach Methodology
				community based organizations (over 800 households)
PARADISE Plan Meeting	10/27/13	Presentation of transportation topics based on community needs assessment conducted as part of the Choice Neighborhood Planning Process.	67	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• One postcard mailing and drop off to public housing residents' homes.</li> <li>• Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>• E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600 people)</li> <li>• Spanish translation provided.</li> </ul>
Walking Club	11/07/13	Met residents on site and assessed current conditions as experienced by community members participating in the Rebuild Potrero Walking Club. Conducted one-on-one discussions with residents regarding transportation access and current conditions.	16	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Walking Club included in Monthly Potrero Healthy Living calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> </ul>
Community Meeting #2	12/5/13	Introduced SFCTA NTP project staff and consultants. Presented NTP process and scope of work and solicited community feedback. Reviewed current condition findings.	53	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>• E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600 people)</li> </ul>

Engagement Effort	Date	Purpose of Engagement Effort	Number of Community Participants	Outreach Methodology
				<ul style="list-style-type: none"> <li>• Spanish translation provided.</li> </ul>
Stakeholder Meeting	1/29/14	Met with Resident Community Builder and Director of Community Development to review shuttle route data and verify its validity based on community understanding.	2	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Walking School Bus to Starr King and Daniel Webster Elementary School	3/4/14 and Fall 2014	Attended Walking School Buses to collect current data and conducted one-on-one discussions regarding pedestrian safety and school bus routes based on community participation.	27 Children 3 Adults	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> </ul>
Community Meeting #3	4/3/14	Conducted survey to assess shuttle route prioritization and current transportation patterns. Presented potential improvement recommendations and solicited community feedback.	36	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>• E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600 people)</li> <li>• Spanish translation provided.</li> </ul>
Community Meeting #4	8/7/14	Provided NTP overview and recruited community members to participate in design charrettes	39	<ul style="list-style-type: none"> <li>• Full Time Community Builder conducted outreach to ensure high participation.</li> <li>• Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>• E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600</li> </ul>

Engagement Effort	Date	Purpose of Engagement Effort	Number of Community Participants	Outreach Methodology
				people) <ul style="list-style-type: none"> <li>Spanish and Cantonese translation provided.</li> </ul>
Design Charrettes	9/16/14 11/6/14 11/13/14 12/16/14	Learned about best practices and other examples of pedestrian improvements and traffic calming measures, including field trip to Persia Triangle. Provided feedback on initial designs.	13	<ul style="list-style-type: none"> <li>Recruited volunteers from 8/7/14 Community Meeting</li> <li>Made additional solicitations to ensure diverse and comprehensive representation including: Healthy Generations staff, Community Garden staff, other public housing residents, other community members, and elementary school staff</li> </ul>
Community Meeting #5	2/5/15	SFCTA provided NTP overview and update. Fletcher Studio (Landscape Architect) presented draft pedestrian improvements and traffic calming design. SFCTA, Fletcher Studio, Nelson Nygaard (Transportation consultant), and BRIDGE solicited community feedback.	51	<ul style="list-style-type: none"> <li>Full Time Community Builder conducted outreach to ensure high participation.</li> <li>Meeting included in Monthly Community Building calendar distributed to all public housing residents, community members and community based organizations (over 800 households)</li> <li>E-mail blast regarding meeting sent out to Rebuild Potrero listserv (approximately 600 people)</li> <li>Spanish and Cantonese translation provided.</li> <li>Rebuild Potrero Program Director went door-to-door at one of the identified intersections, Texas and 25th Streets, to inform residents of the potential improvements and invite them to the meeting.</li> </ul>
Stakeholder Meeting	2/25/15	BRIDGE staff and Fletcher Studio presented and solicited feedback on draft pedestrian improvements and traffic calming design to San Francisco Housing Authority.	3	<ul style="list-style-type: none"> <li>N/A</li> </ul>

**APPENDIX B: POTRERO HILL NEIGHBORHOOD  
TRANSPORTATION PLAN EXISTING CONDITIONS, NEEDS  
ASSESSMENT, AND PRIORITIZED PROJECTS MEMO**



## MEMORANDUM

Date: April 4, 2014  
To: Michael Schwartz (SFCTA) and Cathleen Sullivan (Nelson\Nygaard)  
From: Tien-Tien Chan  
**Subject: Potrero Hill Neighborhood Transportation Plan – Existing Conditions, Needs Assessment, and Prioritized Projects Memo**

*SF13-0714*

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This memorandum provides a summary of the existing conditions, goals and objectives, and overall needs documented in prior efforts, along with a draft list of the prioritized projects for the Potrero Hill Neighborhood Transportation Plan (“Potrero Hill NTP”).

### INTRODUCTION/ EXISTING CONDITIONS

The Potrero Hill NTP will develop a community-based transportation plan for the southern Potrero Hill neighborhood of San Francisco, identifying multimodal transportation priorities at the neighborhood scale and working with stakeholders to prioritize near- and mid-term improvements. The study area for the Potrero Hill NTP (“study area”) is bordered by US-101 to the west, I-280 to the east, Cesar Chavez Street to the south, and 22<sup>nd</sup> Street/20<sup>th</sup> Street to the north.

The study area includes the Potrero Annex and Potrero Terrace public housing sites, with approximately 1,200 people living in 606 homes on the steep, south-facing slope of the hill. The public housing sites are isolated, with an internal circuitous street grid and relatively few and challenging connections to the surrounding neighborhoods; including the I-280 and US 101 freeways, which form major barriers just east and west of the sites.

The Rebuild Potrero project (“Rebuild Potrero”) will demolish and re-build the public housing sites in their entirety as a mixed-use, mixed-income neighborhood, replacing all 606 public housing units, while adding up to 1000 moderate and market-rate units and building a new grid street



network. The effort is currently undergoing environmental review and seeking funding for implementation. Groundbreaking is expected by 2016.

## GOALS AND OBJECTIVES

The Potrero Hill NTP was designed to respond to the needs and priorities of the community. The goals for this project were created keeping in mind that there has been significant transportation planning done in the Potrero Hill study area and there are other projects going on in the larger community. In particular, the goals were aligned with the Rebuild Potrero Project (see **Table 1**).

**TABLE 1 POTRERO HILL NTP GOALS & OBJECTIVES**

Goals	Objectives
1. Enhance connectivity to daily goods and services for Potrero Terrace and Annex residents.	1.1 Create new transportation options within site
	1.2 Improve access to transportation options outside of site
	1.3 Supplement existing transit options to/from site
	1.4 Develop strategies to deal with challenging terrain within Annex
2. Improve sense of safety and security in Potrero Terrace and Annex.	2.1 Seek solutions that calm traffic within site
	2.2 Make transit waiting areas safer and more comfortable
3. Provide short-term improvements that have independent utility before the implementation of rebuild of the site.	3.1 Develop solutions that have short lead times, low barriers to implementation, and minimal need for demolition/removal during the rebuild effort
4. Strengthen community capacity.	4.1 Complete strong community process
	4.2 Identify solutions that foster community involvement

Source: SFCTA, 2014.

## RECOMMENDED IMPROVEMENTS / OVERALL NEEDS

The work for the Potrero Hill NTP builds upon past efforts, including: HOPE SF, Green Connections, and Potrero Hill Traffic Calming. A complete list of identified needs and project recommendations from these prior efforts are documented in the June 7, 2013 *Potrero Terrace and Annex Needs Assessment Summary* Report and organized in a table in the **Appendix**. The Potrero Hill NTP work, along with the prior efforts identified above, included extensive community



outreach to identify concerns and priorities amongst the community members. These community outreach efforts included:

- Public outreach by SFMTA which included a mapping exercise of key destinations identified by community members, 11/3/2011
- Focus group as part of the HOPE SF efforts, 8/23/2013
- Participation in Rebuild Potrero's Walking Club which included one-on-one discussions of community transportation issues, Spring 2013
- Rebuild Potrero Community Meeting (presentation of transportation topics by Rebuild Potrero staff to community members), Potrero Hill Neighborhood House, 10/27/13
- Participation in Rebuild Potrero's Walking Club by Potrero Hill NTP project team which included one-on-one discussions of community transportation issues, 11/07/2013
- Participation in Rebuild Potrero's Walking School Bus by Potrero Hill NTP project team which included one-on-one discussions of community transportation issues, particularly related to pedestrian safety along the walking school bus routes, 3/4/2014

The principal themes that surfaced as desired improvements for the Potrero Hill NTP area include:

- Improve access to goods and services as well as destinations across the two housing site, focusing on ways to mitigate the impact of the loss of the 53 Southern Heights Muni bus route – e.g. introduce a shuttle or resident-driver program
- Improve pedestrian amenities and safety especially at hot-spot intersections (based on safety concerns or pedestrian activity); fill missing sidewalks and enhance intersections and roadway crossings
- Improve transit stops add transit amenities

## PRIORITIZED PROJECTS

The full list of potential projects (**Appendix**) was prioritized based on a set of evaluation criteria, which link to the Potrero Hill NTP's goals and objectives. The evaluation criteria used to identify the priority projects is shown in **Table 2**.



**TABLE 2 EVALUATION CRITERIA**

Evaluation Criteria	Description	Potrero Hill NTP Goal Addressed
Hot Spot (Safety)	High collision intersection, high pedestrian activity, pedestrian-vehicle conflicts found through field visits by project team	#2
Hot Spot (Transit)	Transit stops with highest boardings by community members	#2
Community Support	Association with school/park/health center-focused areas, identified by community through outreach results in current or previous efforts	#1, #2, #4
Time Frame	Ability to implement in the short or medium term, particularly if within Rebuild Potrero project area.	#3
Collaboration Potential	Higher potential for collaboration with parallel efforts to leverage funding and construction synergies	#3, #4

Source: Fehr & Peers.

**Table 3** provides a summary matrix of the draft prioritized projects that will be carried forward for further evaluation.





**TABLE 3 PRIORITIZED PROJECTS**

Project #	Prioritized Projects	Hot Spot - Safety	Hot Spot - Transit Use	Community Support	Time Frame	Collaboration Potential
Capital Improvements						
1	Transit stop improvements at 25 <sup>th</sup> St./ Connecticut St. (e.g. signage, benches, lighting)		X	X	X	X
2	Transit stop improvements at 25 <sup>th</sup> St./ Texas St./ Dakota St. (e.g. signage, benches, lighting)		X	X	X	X
3	Transit stop improvements at 25 <sup>th</sup> St./ Wisconsin St. (e.g. signage, benches, lighting)		X	X	X	X
4	Intersection safety improvements - 25 <sup>th</sup> St./ Connecticut St.	X	X	X	X	X
5	Intersection safety improvements - 25 <sup>th</sup> St./ Texas St./ Dakota St.	X	X	X	X	X
6	Safe Routes to School (SR2S) project(s) along walking bus routes to schools (e.g. labeling/signing routes, safety improvements, etc.)	X		X	X	X
7	22nd St. stairs between Missouri St. and Texas St. (ensure complete connection)			X	X	X
8	Improvements to the "straight away" and the "cuts" - a pathway that goes around the side of the Rec Center to the Connecticut St. dead end (e.g. pedestrian facilities, add lighting, plantings)			X	X	X
9	Fill sidewalk gaps (with prioritization on gaps not inside Rebuild Potrero boundaries)			X	X	X



**TABLE 3 PRIORITIZED PROJECTS**

Project #	Prioritized Projects	Hot Spot - Safety	Hot Spot - Transit Use	Community Support	Time Frame	Collaboration Potential
Programmatic Improvements						
10	Neighborhood shuttle program		X	X	X	X
11	Resident driver program with professional development component			X		X
12	Transportation Coordinator to support the community and transportation programs			X	X	X

Source: Fehr & Peers, 2014



## APPENDIX

The appendix includes:

- Detailed descriptions of prioritized projects, along with maps illustrating additional supporting information
- The complete list of recommended projects from prior efforts

### **Projects #1 – 3: Transit Stop Improvements**

The high priority transit stop improvements are for the following intersections:

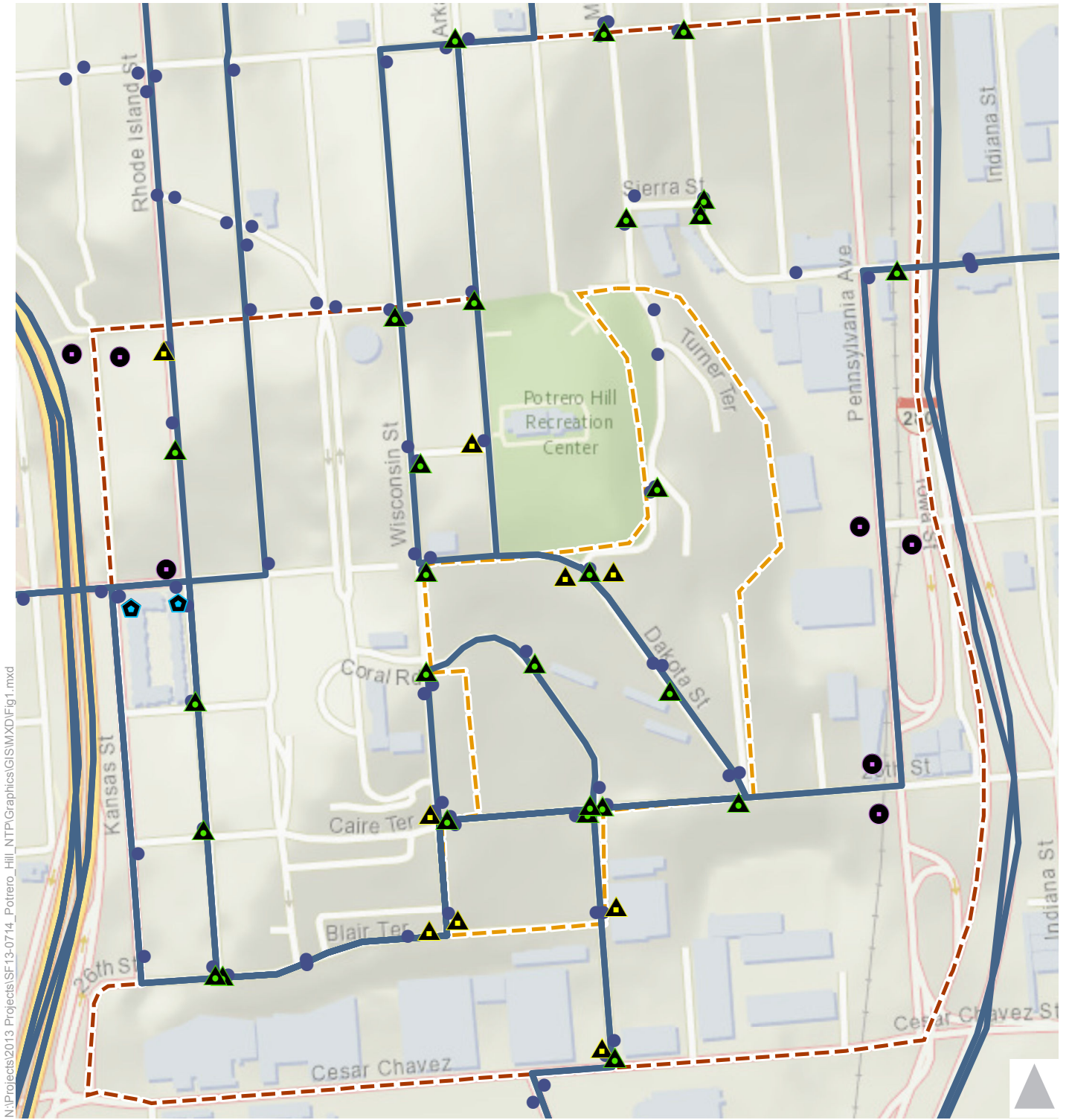
- Project #1 – 25<sup>th</sup> St./ Connecticut St.
- Project #2 – 25<sup>th</sup> St./ Texas St./ Dakota St.
- Project #3 – 25<sup>th</sup> St./ Wisconsin St.

**Figure 1** maps the existing bus amenities in the study area, highlighting the fact that bus amenities are minimal. **Figure 2** shows the transit boarding and alighting activity and highlights the intersections for Projects #1 – 3 as having the highest transit ridership activity in the study area.

Transit improvements for these projects should be focused on short-term improvements. It is our understanding that benches may not be feasible on the sidewalk due to space constraints. The team is exploring the possibility of creating temporary bus stops near the intersections that would serve as sitting and waiting areas near the bus stops.

Transit stop improvements will also be considered for the following intersections with bus amenities limited to signage painted on poles or on the ground, or no amenities at all. These include:

- Rhode Island St. at 22<sup>nd</sup> St., 23<sup>rd</sup> St., 24<sup>th</sup> St., 25<sup>th</sup> St., 26<sup>th</sup> St.
- Wisconsin St. at 22<sup>nd</sup> St., Madera St., 23<sup>rd</sup> St., Connecticut St., 26<sup>th</sup> St.
- Connecticut at 26<sup>th</sup> St., Cesar Chavez St.
- Dakota St./ 23<sup>rd</sup> St.
- Pennsylvania Ave. at 22<sup>nd</sup> St., 23<sup>rd</sup> St., 25<sup>th</sup> St.



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**Bus Amenities**









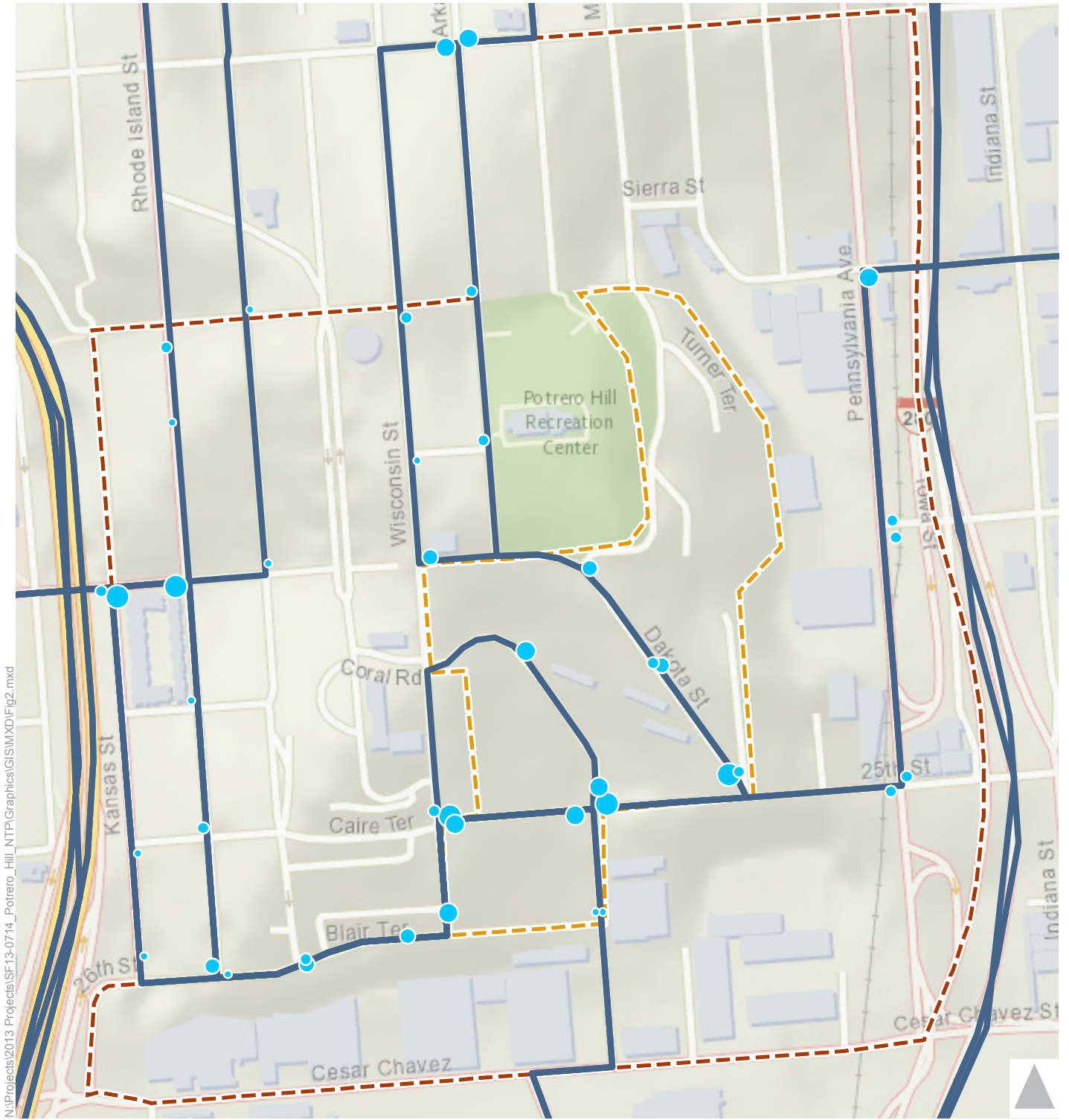
-  Bus Shelters
-  Bus Stops - Painted On Poles
-  Bus Stops - Painted on Ground
-  Bus Stops - Unmarked
-  Transit Stops
-  Transit Routes
-  Potrero Annex/Terrace
-  Potrero NTP



Figure 1  
Bus Stop Amenities



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**Transit Boardings and Alightings**

- 0 - 25
- 101 - 200
- 📐 Potrero Annex/Terrace
- 26 - 50
- 200 +
- 📐 Potrero NTP
- 51 - 100
- Transit Routes



Figure 2  
Transit Activity



### **Projects #4 and 5: Intersection Improvements**

Intersection improvements are recommended for:

- Project #4 – 25<sup>th</sup> St./ Connecticut St.
- Project #5 – 25<sup>th</sup> St./ Texas St./ Dakota St.
- Project #6 – 23<sup>rd</sup> St./Missouri St./Dakota St. (as part of walking school bus)

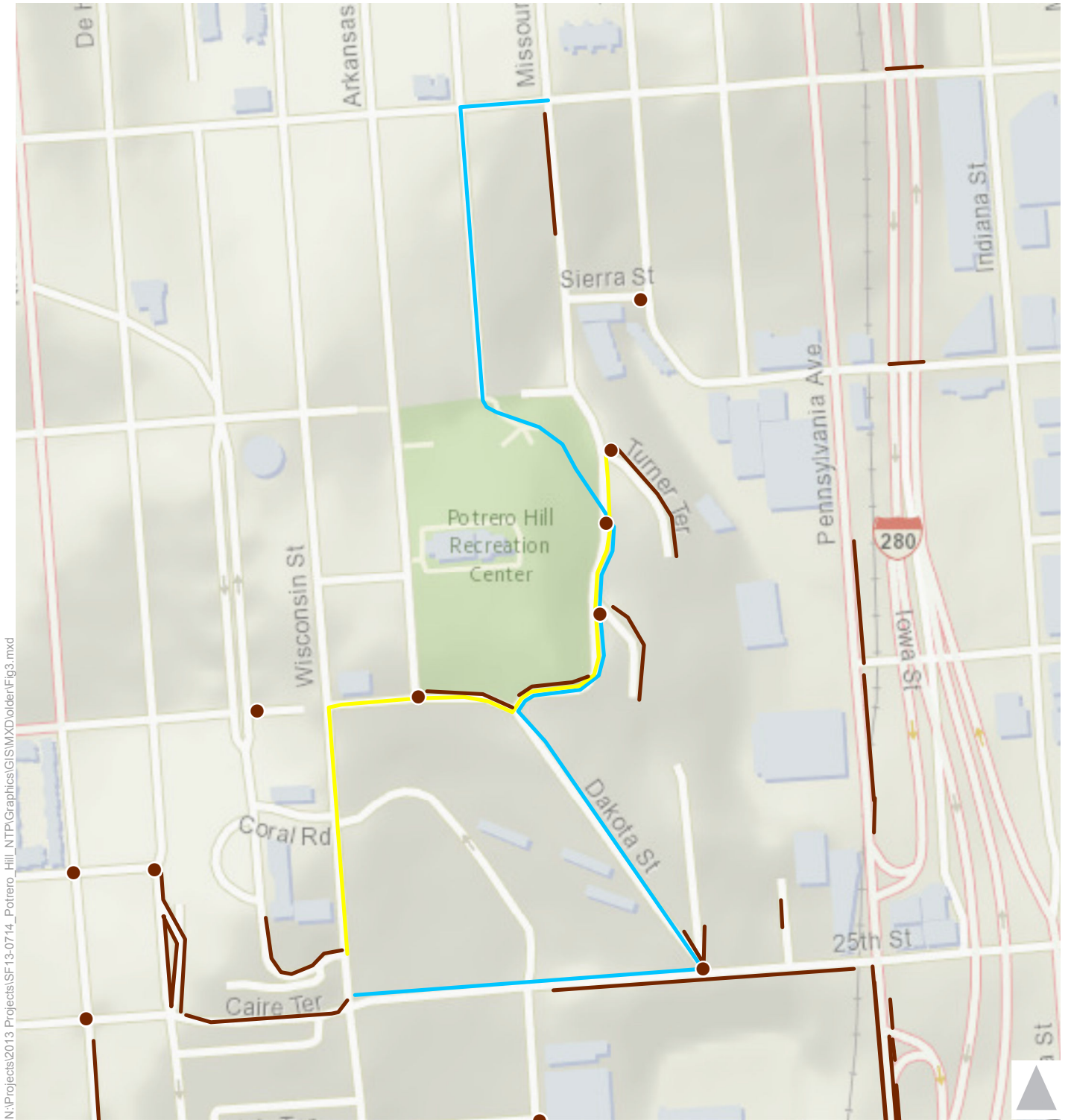
**Figure 2** shows the transit boarding and alighting activity and highlights the intersections for Projects #4 – 5 as having high pedestrian activity. The intersection of 25<sup>th</sup> St./ Connecticut St. is also the hub of the community: location of the only playground in the Potrero Terrace / Annex, the Housing Authority building, and the meeting spot for the walking club and one walking school bus. 25<sup>th</sup> St. at Texas St./ Dakota St. is largely uncontrolled and speeding has been observed by community members. 25<sup>th</sup> St. at this intersection has a crest, so visibility is poor. Transit riders alighting on the south side of 25<sup>th</sup> St. must cross the street where the intersection is unprotected, no crosswalks exist, and visibility is poor due to the crest. The Potrero Hill Traffic Calming Report (2009) identified the intersection of 25<sup>th</sup> St./ Texas St./ Dakota St. as a location with observed exhibition driving. At Connecticut Street and Dakota Street near 25<sup>th</sup> Street vehicle speeding has also been observed. These intersections are also part of Phase II for Rebuild Potrero, and thus there will be an anticipated increase in pedestrian activity due to Phase I implementation.

Intersection improvements should be focused on improving safety and reducing vehicle speeding. These improvements should be relatively low cost and may include addition of crosswalks and stop signs.

### **Project #6: Safe Routes to School Improvements**

**Figure 3** shows the current walking school bus routes highlighting the pedestrian deficiencies, while **Figure 4** highlights the pedestrian amenities. The deficiencies include sidewalk gaps, unmarked crossings, and uncontrolled intersections. The pedestrian amenities are mainly concentrated near the schools.

Improvements along the walking school bus routes may include: rumble strips, painted crosswalks, signage, and speed humps. Other temporary traffic calming measures may also be considered.



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**Walking School Bus Routes**

— To Daniel Webster

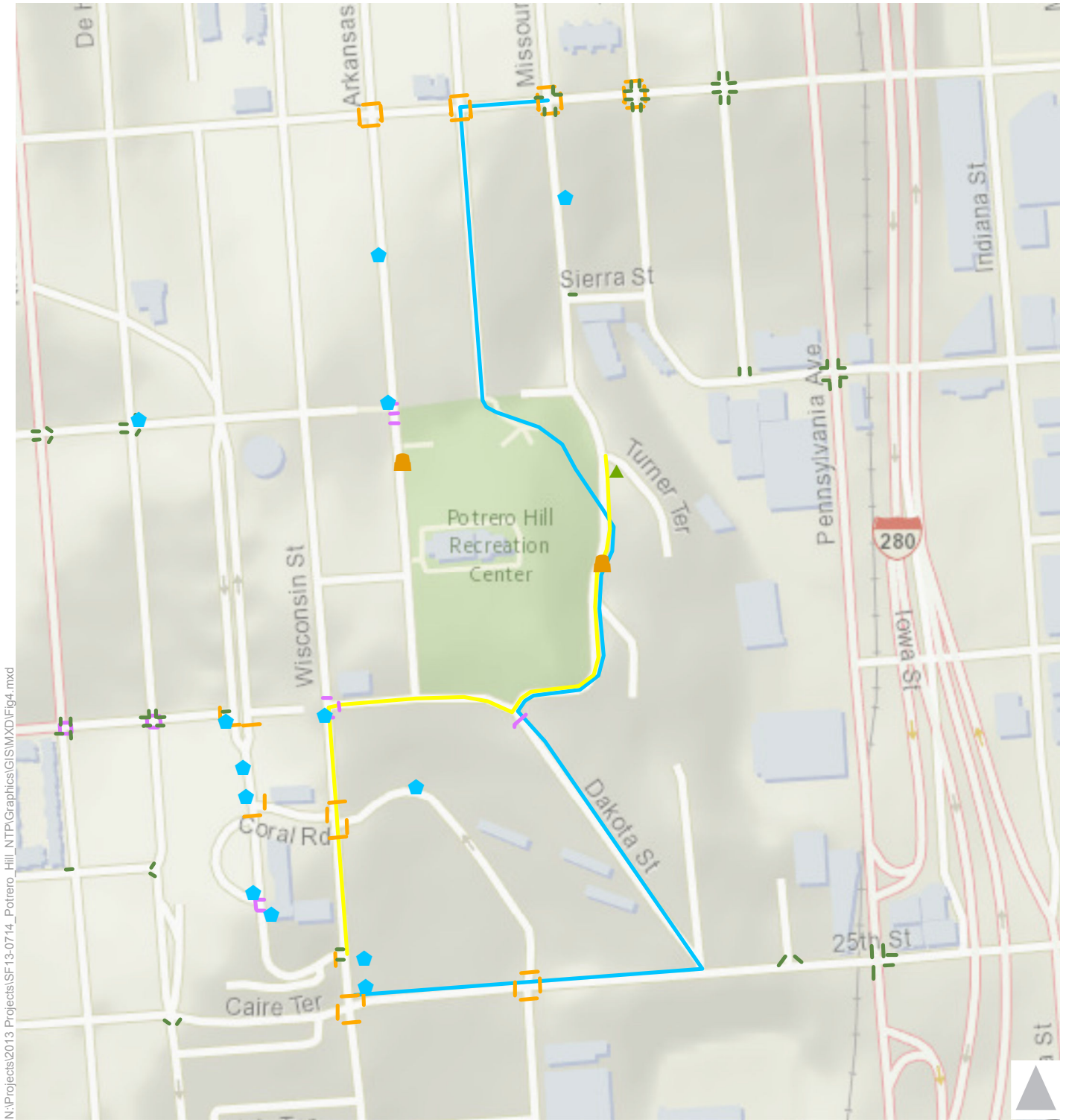
— to Starr King

● Intersection without Control

— Missing Sidewalk



Figure 3  
Walking School Bus with Pedestrian Deficiencies



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**Pedestrian Amenities**

— Curb Ramps Showing Direction

— Simple Crosswalks

— Zebra Crosswalks

◆ Pedestrian Signs

**Traffic Calming**

▲ Small Medians

▲ Speed Bumps

**Walking School Bus Routes**

— To Daniel Webster

— to Starr King



Figure 4

Walking School Bus with Pedestrian Amenities





### Project #7: 22<sup>nd</sup> Street Stairs

A private development project east of Rebuild Potrero is currently planning a staircase along 22<sup>nd</sup> Street connecting Texas St. to Missouri St. This staircase will provide an important connection to the Caltrain Station, T Third station, and 22nd St. mixed use district. A portion of the proposed 22<sup>nd</sup> St. path near Missouri St. is part of SF Housing Authority land (see **Figure 5**).

It is a priority of the Potrero Hill NTP to ensure there are no gaps in this staircase. Project #7 will mainly require continued conversations with the SF Planning Department to ensure all portions of the 22<sup>nd</sup> St. staircase between Missouri St. and Texas St. are developed.

**Figure 5 Parcel Boundary Map**





### Project #8: The "Straight Away" and the "Cuts"

The path highlighted for Project #8 runs north/south along the northeast side of the Potrero Hill Rec. Center. The northern portion terminates at the Connecticut St. dead-end. The "straight away" is the paved section, the "cuts" is the unpaved section (see **Figure 6**). This path is a relatively flat connection to the street grid north of Potrero Annex and is also part of the walking school bus route.

Improvements to this path should be focused on short-term, low cost strategies. This may include low cost lighting and plantings.

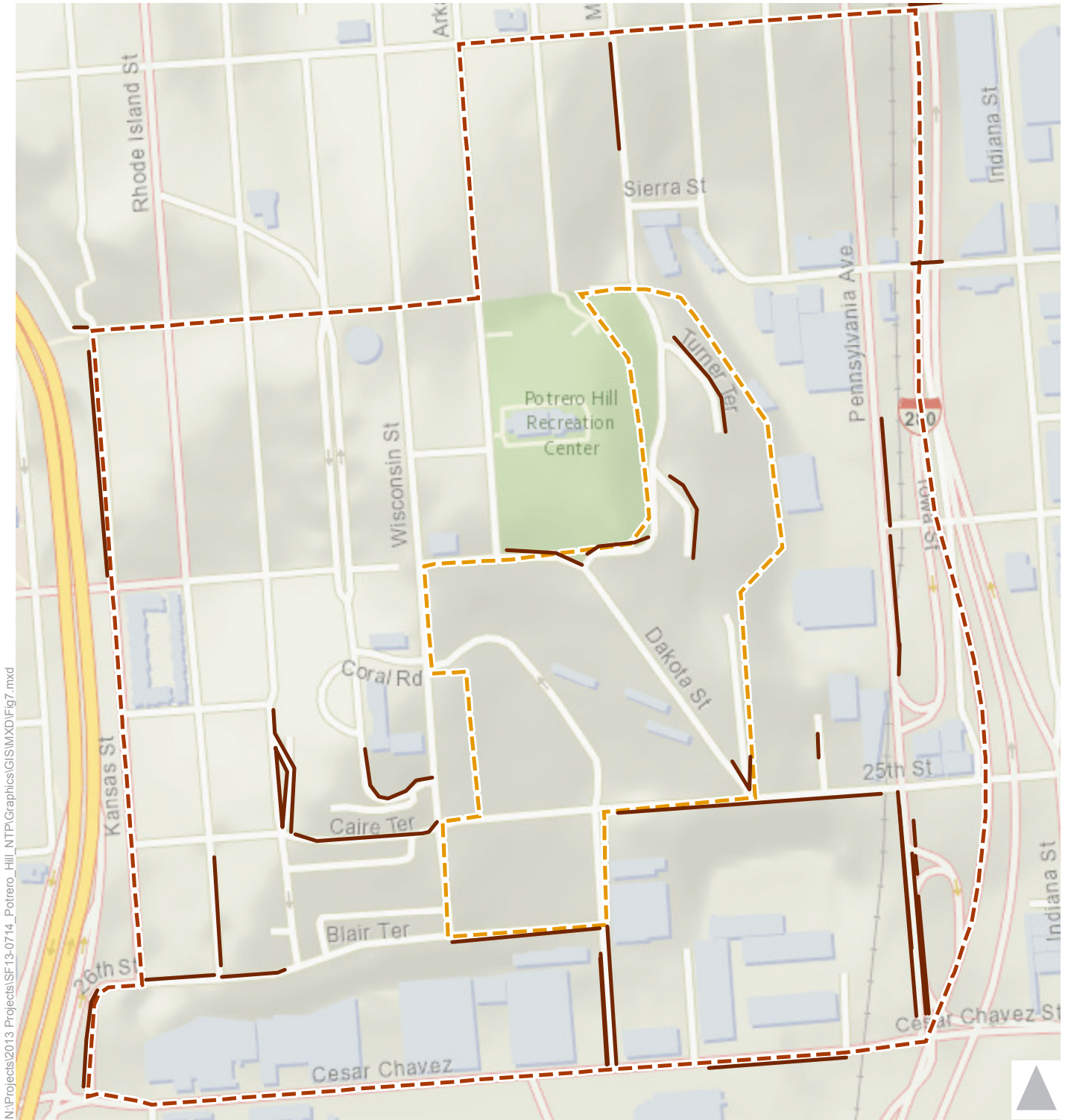
**Figure 6** The "Straight Away" and the "Cuts"





### **Project #9: Fill Sidewalk Gaps**

**Figure 7** shows the locations of the missing sidewalks in the study area. New sidewalks should complement ReBuild Potrero improvements, focus on gaps close to the housing sites, and should be coordinated with the Rebuild Potrero construction. Sidewalk gaps within the ReBuild boundaries will not be addressed as they will be completed as part of ReBuild Potrero.



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- Potrero Annex/Terrace
- Potrero NTP
- Missing Sidewalk



Figure 7  
Sidewalk Gaps



### **Project #10: Neighborhood Shuttle Program**

Access to basic goods and services is limited due to the challenging topography and low density of goods and services. A half mile radius around the housing sites does not include grocery stores, banks or credit unions, barbers and salons, dry cleaners, gyms, hardware stores, pharmacies, post offices, movie theaters, and farmer's markets. While there are multiple bus lines that serve the housing sites, they do not adequately provide access for the residents, and each line only serves one side of the site or the other. This is a particular issue due to the hilly terrain, which makes crossing the site challenging. Residents used to rely heavily on the 53-Southern Heights bus route, which was discontinued in 2009 and used to provide cross-site accessibility in addition to connections to other Muni routes and nearby goods and services. SFMTA has not implemented similar service to replace the 53, and changes envisioned as part of the Transit Effectiveness Project (TEP) will not address this issue.

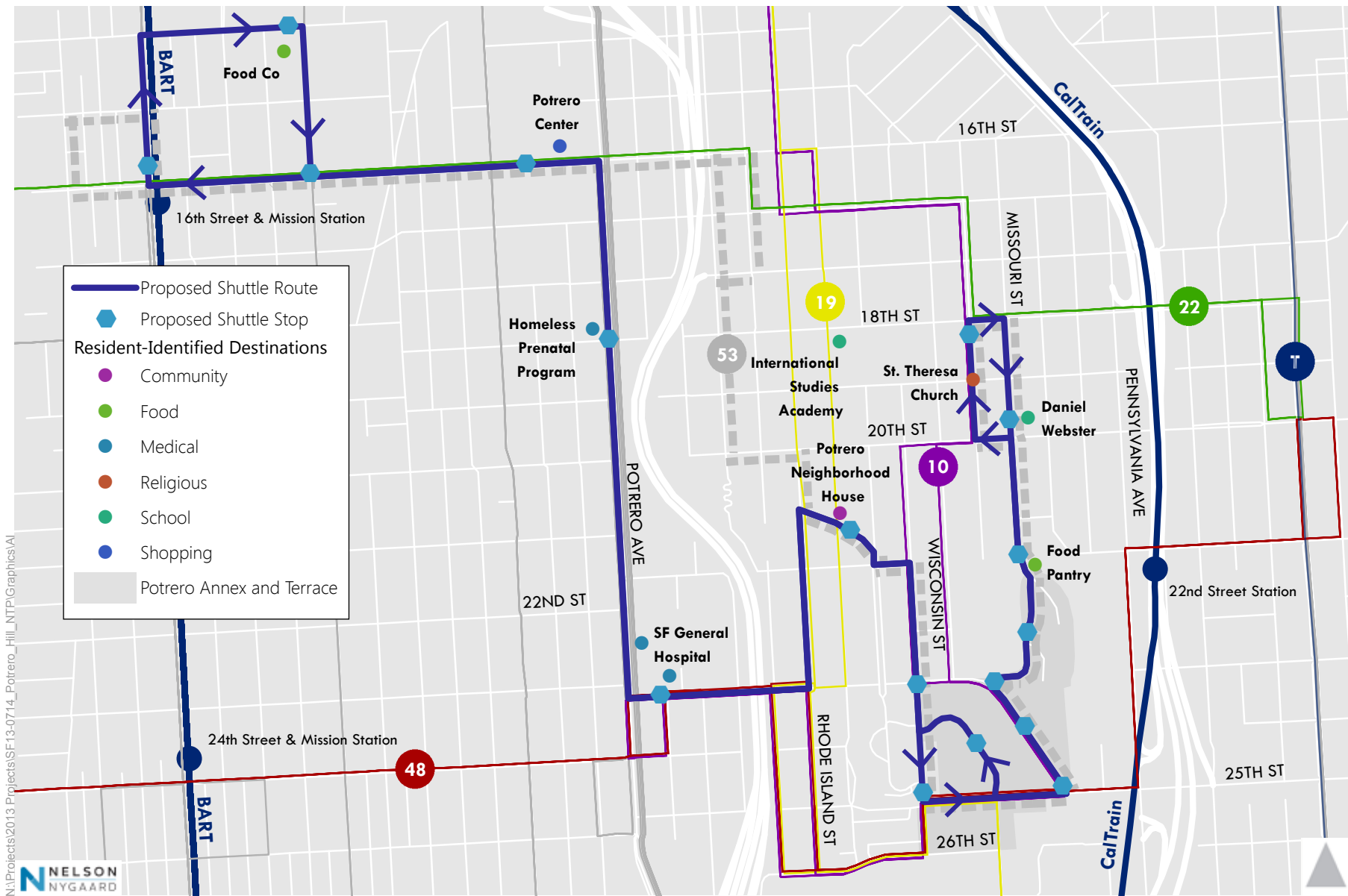
The broader Potrero Hill neighborhood has been studying the possibility of implementing a shuttle service to serve its residents. The Potrero NTP will continue to look for coordination opportunities between the broader Potrero Hill neighborhood shuttle and one focused on serving the needs of the housing site residents.

The following figures provide an illustration of a potential shuttle that could provide service to the Potrero Hill neighborhood:

- **Figure 8** – Potential Shuttle (with Existing Muni Network)
- **Figure 9** – Potential Shuttle (with TEP Muni Network)
- **Figure 10** – Potential Shuttle Through Site

### **Project #11: Resident Driver Program**

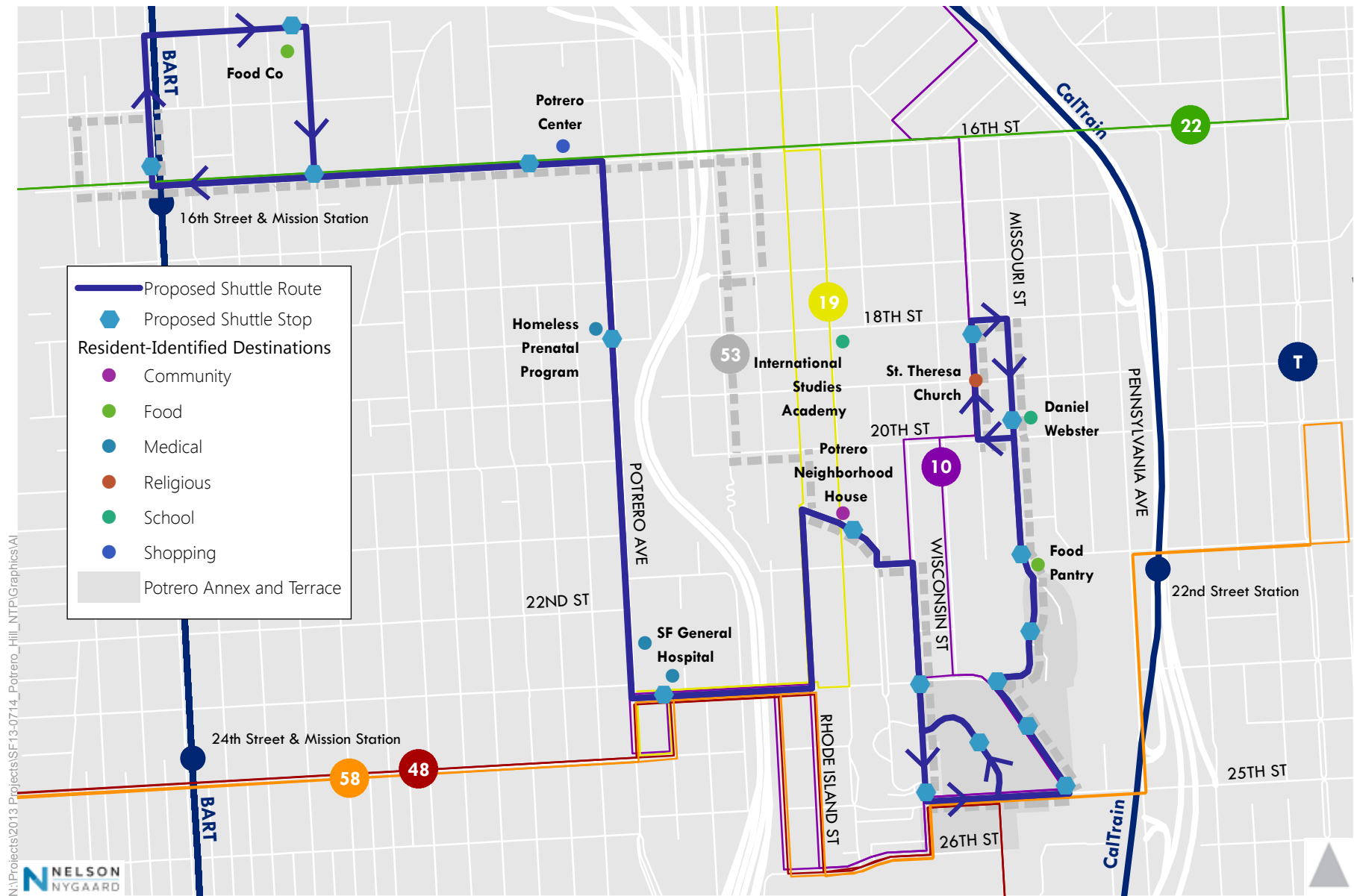
One of the findings of the HOPE SF efforts was that residents overcome barriers to transportation by informally giving each other rides. Those who currently offer rides are either family members or neighbors; however, not everyone has access to a family member or a neighbor with a vehicle who can provide a ride. Rides are not free; rather, those who provide the rides are frequently compensated for their time and expense (i.e. cost of gas) at about \$10/ride. Formalizing the ride sharing scheme with hired drivers would allow the entire community to benefit from it by pooling resources (i.e. vehicles and drivers) and extending access to everyone. The program can also serve as professional development for residents of Potrero.



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Figure 8  
Potential Shuttle with Existing Muni Network



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Figure 9  
Potential Shuttle with TEP Muni Network

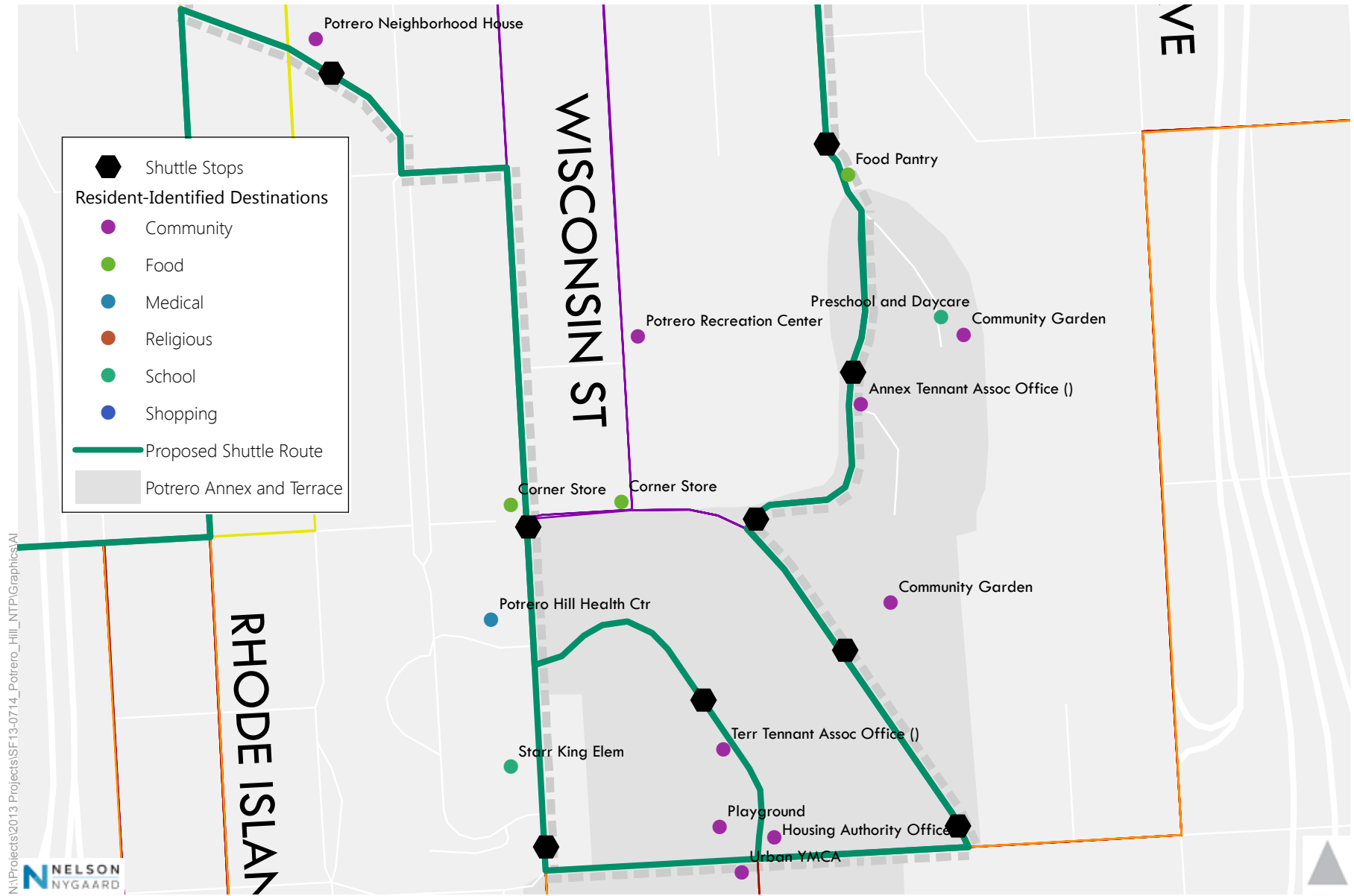


Figure 10  
Potential Shuttle Through Site







### **Project #12: Transportation Coordinator**

A Transportation Coordinator may be hired to support the study area community with a broad range of transportation needs. Having a dedicated Coordinator will improve residents' access to jobs, goods, and services; improve residents' access to existing transportation services; and improve residents' access to transportation-related information.

The Transportation Coordinator would have four primary roles:

- 1) Implement and manage the recommended projects in this memo (e.g. resident driver program).
- 2) Educate the community regarding their transportation options through significant outreach and events.
- 3) Facilitate trip-making and accessing goods and services for members of the community.
- 4) Serve as point-of-contact and advocate for transportation-related requests to city agencies, non-profit organizations, elected officials and other relevant organizations.

The Transportation Coordinator could also be responsible for fund-raising to support his or her own role and transportation-related events and programs.

Ranking <sup>1</sup>	Grouping <sup>2</sup>	Project	Detail	Type <sup>3</sup>	Category	Project will be impacted by Redevelopment?	Document Source	Hot Spot - Safety	Hot Spot - Transit Use	Community Support	Time Frame	Collaboration Potential
	1	Prioritize implementation of TEP changes to provide improved transit access to Potrero.	specifically the 48 and 58 would provide improved service	Programmatic	access to transit / transit improvements	No	Needs Assessment Summary, F&P 2013.					SFMTA funded
	1	Review proposed TEP implementation of 19-Polk changes.	--	Programmatic	access to transit / transit improvements	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					SFMTA funded
	1	Consolidate bus routes and stops	Alternative 1: re-route 10 Townsend within project site, outbound from Dakota to Arkansas, inbound from Dakota to Wisconsin. New planned Muni line - 58 24th Street, would traverse through the project site along Wisconsin, 25th, Missouri. Relocate/consolidate existing bus stops. 12 bus stops provided, pole type stops, potential bus bulbs, potential shelters.	Programmatic	access to transit / transit improvements	yes	Potrero HOPE Transportation Study, 2012					SFMTA funded
	2	Improve transfer connection on Potrero Avenue and 25th Street.	--	Programmatic	access to transit / transit improvements	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	3	Developer agreement to mitigate transit demand	Developer agreement should include contribution to mitigate additional demand on transit (project anticipates generating 381 new weekday peak hour transit trips, the equivalent of more than seven coaches of demand added to a system that is already at capacity)	Programmatic	access to transit / transit improvements	yes	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012.					developer funded
x	4	Transit stop improvements at 25th St./ Connecticut St. (e.g. signage, benches, lighting)	for benches, we are considering temporary sitting spaces (like a parklet)	Capital	access to transit / transit improvements	Yes	MP email - 10/22/13; Short-Term Street Improvements. F&P, 2013. Short-term improvement report concepts, Green Connections deliverable, 2012.		high boarding location	priority in HOPE SF analysis	short-term	SFMTA funded
x	4	Transit stop improvements at 25th St./ Texas St./ Dakota St. (e.g. signage, benches, lighting)	for benches, we are considering temporary sitting spaces (like a parklet)	Capital	access to transit / transit improvements	Yes	MP email - 10/22/13; Short-Term Street Improvements. F&P, 2013. Short-term improvement report concepts, Green Connections deliverable, 2012.		high boarding location	priority in HOPE SF analysis	short-term	SFMTA funded
x	4	Transit stop improvements at 25th St./ Wisconsin St. (e.g. signage, benches, lighting)	for benches, we are considering temporary sitting spaces (like a parklet)	Capital	access to transit / transit improvements	Yes	MP email - 10/22/13; Short-Term Street Improvements. F&P, 2013. Short-term improvement report concepts, Green Connections deliverable, 2012.		high boarding location	priority in HOPE SF analysis	short-term	SFMTA funded
	4	Implement pedestrian improvements at bus stops for safety and comfort, such as bus shelters, electronic messaging, benches, lighting.	--	Capital	access to transit / transit improvements	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.				short-term	SFMTA funded

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Ranking <sup>1</sup>	Grouping <sup>2</sup>	Project	Detail	Type <sup>3</sup>	Category	Project will be impacted by Redevelopment?	Document Source	Hot Spot - Safety	Hot Spot - Transit Use	Community Support	Time Frame	Collaboration Potential
	4	Install strategic lighting, improve visibility, and implement low-cost pedestrian treatments at bus stops.	--	Capital	access to transit / transit improvements	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.				short-term	SFMTA funded
	4	Install new Muni shelters with NextMuni technology at key locations.	--	Capital	access to transit / transit improvements	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					SFMTA funded
	4	Provide adequate light, shelter and space to sit at all transit stops interior and adjacent to the site.	--	Capital	access to transit / transit improvements	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.				short-term	SFMTA funded
	4	Transit improvements such as benches, not by SFMTA. Continue to try to get signage at the stops.	--	Capital	access to transit / transit improvements	Yes	MP email - 10/22/13					
	4	Deploy NextMuni	Prior to completion of build-out at both sites, adequate utilities should be included for NextMuni at those locations that have been identified by the SFMTA to receive bus shelters.	Capital	access to transit / transit improvements	yes	Short-term improvement report concepts, Green Connections deliverable, 2012. Transportation Planning for Changing Communities: Case Study of Two HOPE-SF Sites (UC Berkeley Client Report, Fall 2011).					SFMTA funded
	4	Improve access to buses and amenities at bus stops	Provide signage, seating, and shelters at bus stops; provide transportation information to residents	Both	access to transit / transit improvements	yes and no	Overall recommendation from Needs Assessment Summary, F&P 2013.					
	5	Design transit-serving streets to optimize transit operations: minimize stop signs for transit flow, include flat areas for boarding/alighting, provide sufficient turning radii.	--	Capital	access to transit / transit improvements	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	5	Make pedestrian access to transit safer by improving walking conditions to and around public transit stops (e.g., pedestrian scale lighting, wider sidewalks, and visible, safe pedestrian crosswalks that are signalized when crossing arterials and streets with heavier traffic volumes). This is particularly an important issue for pedestrian connections to transit near or under freeways.	--	Capital	access to transit / transit improvements	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	5	Ensure safe and convenient connections to Caltrain, BART, and the Muni T-Third.	--	Both	access to transit / transit improvements	yes and no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	6	reduce grade	If Missouri Street could be designed with a less steep grade, the Muni 48 bus could run on it and operate optimally; 10 Townsend should run N-S on Wisconsin; Design transit-serving streets to optimize transit operations: minimize stop signs for transit flow; include flat areas for transit boarding/alighting; provide sufficient turning radii for transit	Both	access to transit / transit improvements	yes	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012.					

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x	7	Resident driver program with professional development component	--	Programmatic	access to amenities	No	MP email - 10/22/13; Short- to Mid-Term Transportation Recommendations. F&P 2013. Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013. Short-term improvement report concepts, Green Connections deliverable, 2012.			priority in HOPE SF analysis; access to goods and services for community		has potential w/ existing carshare program, Rebuild, and others?
	7	Carsharing	Develop plan for implementing carsharing (6). Project Sponsor considering providing discount carshare membership, especially for affordable housing residents. Potential strategy: promote carpool or vanpool programs for commuters, provide subsidy (9).	Programmatic	access to amenities	no	Short-term improvement report concepts, Green Connections deliverable, 2012. Potrero HOPE Transportation Study, 2012					has potential w/ existing carshare program, Rebuild, and others?
	7	Establish car sharing program for residents and employees.	--	Programmatic	access to amenities	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					has potential w/ existing carshare program, Rebuild, and others?
	7	Formalize ridesharing in the community.	--	Programmatic	access to amenities	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					has potential w/ existing carshare program, Rebuild, and others?
	7	Ridesharing	Formalize Ridesharing in the Community	Programmatic	access to amenities	no	Short-term improvement report concepts, Green Connections deliverable, 2012.					has potential w/ existing carshare program, Rebuild, and others?
x	8	Neighborhood shuttle program	--	Programmatic	access to amenities	No	MP email - 10/22/13; Potrero Boosters;		addresses transit need	access to goods and services for community	short to mid-term	collaborative w/ other stakeholders
	8	Alternative to bus service elimination of 53-Southern Heights	--	Programmatic	access to amenities	no	Needs Assessment Summary, F&P 2013.				short to mid-term	collaborative w/ other stakeholders

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	9	Consider connecting the development to existing retail food stores in Potrero via improvements to public transit routes, bike routes, and pedestrian amenities.	--	Both	access to amenities	yes and no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	9	Design and build clear, well-lighted, and well-maintained path to existing RPD recreation center and park.	--	Capital	access to amenities	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.			pedestrian connections to park		
	9	Improve connection to existing off-site retail food stores and markets.	--	Both	access to amenities	yes and no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.			access to goods and services for community		
	9	Provide direct connection to local amenities; e.g. recreational facilities and libraries.	--	Both	access to amenities	yes and no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.			pedestrian connections to park		
	9	Improve access to goods and services	assist in purchase of muni passes and clipper cards; coordinate ride shares or shopping trips; help residents order groceries online; organize site visits by service providers	Programmatic	access to amenities	no	Overall recommendation from Needs Assessment Summary, F&P 2013.					
	9	Improve transit connections to supermarkets	Work with SFMTA and the community to identify important transfer points that facilitate access to grocery stores. Improve top transfer points physically and/or through scheduling adjustments.	Both	Access to Amenities	yes and no	Short-term improvement report concepts, Green Connections deliverable, 2012.					
	10	Create accessible zones	Proposed alternative 1 plans <8.33% grades along Texas, 24th, 23rd, creating 3 accessible zones. Two new access points, along 24th and Texas - improve connectivity. Accessible paths to neighborhood core and Starr King Elementary. Project Sponsor working with SF Mayor's Office of Disability (MOD) and SFDPW to prepare accessibility circulation plan.	Capital	Access to Amenities	yes and no	Potrero HOPE Transportation Study, 2012					
	10	Prepare accessibility circulation plan	Steepness of streets/sidewalks makes access for disabled residents and visitors a major concern/ SFMTA recommends preparation of an accessibility circulation plan	Capital	Access to Amenities	yes	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012.					
	10	Reduce grade in certain areas of the project site to create accessible zones.		Capital	access to amenities	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	11	Create safe pedestrian routes	Design and build clear, well-lighted and maintained path to existing RPD recreation center and park. Consider contributing funding to RPD for recreation center and park improvements. Program community-desired rec activities (classes, activity days) into new park/community center, coordinate activities with RPD rec center and Potrero Hill Neighborhood House. Safe ped routes, crosswalks, sidewalks, street lights, traffic calming.	Capital	Access to Amenities	yes	Potrero.Draft SFDPH Recs.2.26.10					
	11	Create safe, continuous, and functional pedestrian routes to on-site park and community center through the use of well-defined crosswalks, sidewalks, street lights, and traffic calming measures.	--	Capital	access to amenities	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	12	focus density in accessible areas	focus higher building densities in areas with less steep slopes and near transit stations	Capital	Access to Amenities	yes	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012.					

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	13	Facilitate construction of on-site non-profit food cooperative.	--	Capital	access to amenities	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	13	Mix of uses on site	Project Sponsor to provide small neighborhood outlets within project site, pre-school, daycare, gym, sports facilities, community center. Consider provision of non-profit food cooperative (9). Provide subsidized on-site childcare (10). On-site retail food outlet, weekly shuttle to existing retail food store or farmer's market, improve transit/bike/ped connections to retail food stores, multi-use flexible space on site to store CSA boxes during delivery day (10). Mix housing stock/size, LEED, Section 8 vouchers for relocation alternative of current residents, construction/noise mitigation (10).	Capital	access to Amenities	yes	Potrero HOPE Transportation Study, 2012					
	14	Healthcare	Health fair with local health center	Programmatic	access to Amenities	no	Potrero.Draft SFDPH Recs.2.26.10					
x	15	22nd St. stairs between Missouri St. and Texas St. (ensure complete connection)	Add stairways to connect steep streets. Stairway along 22nd between Missouri and Texas, pending agreement with private land owner, connecting to Caltrain Station, T Third station, and 22nd St mixed use district. Need to ensure there are no gaps in the path.**This will likely be completed as part of Phase I for Potrero ReBuild. The gap portion is part of Housing Authority land.	Capital	pedestrian	no	Emily - from kick-off meeting; Needs Assessment Summary, F&P 2013. Potrero HOPE Transportation Study, 2012.			priority in HOPE SF analysis	mid-term	potentially fully developer funded.
	15	22nd Street - Green Connections	22nd st is part of Green Connections draft network	Capital	pedestrian	no	Needs Assessment Summary, F&P 2013.					
	16	Create safe walking routes to neighborhood schools.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					x
	16	SR2S project along walking bus routes to schools.	--	Capital	pedestrian	Possibly	MP email - 10/22/13					x
x	16	Safe Routes to School (SR2S) project (s) along walking bus routes to schools. (e.g. labeling/signing routes, safety improvements, etc.)	two existing routes	Capital	pedestrian	Possibly	MP email - 10/22/13; Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013. Potrero.Draft SFDPH Recs.2.26.10	Routes have missing sidewalks, uncontrolled crossings, informal paths		school focus	short-term	SR2S funding opps
	16	Safe routes to school	Safe routes to school	Programmatic	pedestrian	yes and no	Potrero.Draft SFDPH Recs.2.26.10					
x	17	Fill sidewalk gaps (with prioritization on gaps not inside Rebuild Potrero boundaries)	Webmap shows missing sidewalks throughout project site, including Connecticut, Pennsylvania, 26th, Missouri, etc. If this is a phased approach, should focus on filling gaps closest to ReBuild phasing.	Capital	pedestrian	no	--			access and safety	mid-term	SFMTA funded

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	18	22nd St. pathway between Connecticut St. and Missouri St. - improve pedestrian facilities, add lighting, plantings.	The pathway runs east/west (north of the rec center). The paved pathway has no lighting. It will be a key connection to the new 22nd St. stairs.  *This does not need to be a project as it will be covered under Rebuild Potrero	Capital	pedestrian	no	--					
x	19	Improvements to the "straight away" and the "cuts" a pathway that goes around the side of the Rec Center to the Connecticut St. dead end (e.g. pedestrian facilities, add lighting, plantings)	The path runs north/south along the northeast side of the rec center. The northern end hits the southern Connecticut St. dead-end. The "straightway" is the paved section, the "cuts" is the unpaved section.	Capital	pedestrian	no	Emily - from kick-off meeting			part of walking school bus route	short to mid-term	collaboration/funding with Rec&Park
	20	Texas Street Improvements	it is currently not much more than an informal path, and now has a community garden and other attractors.	Capital	pedestrian	Yes	MP email - 10/22/13; Emily - at kick-off meeting					
	21	Path from the Texas Street garden to the FRC garden on the back side of 85 Turner Terrace.	no formal path - ppl are walking on planks	Capital	pedestrian	Yes	Emily - from kick-off meeting					
	22	Add stairways to connect steep streets.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	22	provide stairways as paths	Add stairways to connect steep streets. Propose project alternative 1 plans stairways on Connecticut between 24 1/2 St and 23rd St, linking residents to Potrero Hill Recreation Center. New stairway on 23rd between Missouri and Texas ending at platform or plaza with grove of trees. Stairway along 22nd between Missouri and Texas, pending agreement with private land owner, connecting to Caltrain Station, T Third station, and 22nd St mixed use district.	Capital	pedestrian	yes and no	Potrero HOPE Transportation Study, 2012					
	23	Focus ped improvements at bus stops	Focus pedestrian improvements at transit stops - bus shelters, bus bulbs, curb ramps, electronic messaging, benches	Capital	pedestrian	yes	Short-term improvement report concepts, Green Connections deliverable, 2012.					
	24	Improve pedestrian visibility at intersections by providing bulb-outs, crosswalks, yield lines, and prohibiting street trees on the last 25 feet of an intersection approach.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	25	Modify the existing street network; create a grid street network that matches the surrounding neighborhood, to improve connections and provide a continuous connection for through travel.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	25	Create grid street network	Alternative 1: modify existing street layout - create grid street pattern, match surrounding neighborhood, to improve connections to surrounding neighborhood and provide continuous route for through traffic, especially in n-s direction. (bulb outs for traffic calming)	Capital	pedestrian	yes	Potrero HOPE Transportation Study, 2012					
	26	Ensure there are complete and safe pedestrian networks, including sidewalks or other designated pedestrian pathways through the site and to key community resources and destinations.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					

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	27	Incorporate at least 5 of the following traffic calming interventions on streets interior and adjacent to the site: bollards; channelization islands; chicanes; chokers; curb extensions, planters, or centerline traffic islands; gateway treatments; horizontal shifts; median islands; parking restrictions for on-street parking such as residential permit parking; perceptual design features on roads; reductions in the number and width of traffic lanes; roundabouts; rumble or warning strips; semi-diverters, partial closures; signal timing; speed humps; automated speed limit enforcement; speed limit signs; speed tables, raised crosswalks; street closures; street trees; tighter corner radii; traffic circles; truck restrictions; turn restrictions; woonerfs.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	27	Traffic calming	Design streets for 20-25mph (7). Bollards, channelization islands, chicanes, chokers, bulb outs, planters, ped islands, gateway treatments, horizontal shifts, parking restrictions, road diets, traffic circles, rumble/warning strips, partial closures, speed humps, speed limit signs, speed tables, raised crosswalks, street closures, street trees, turn restrictions, woonerfs (10).	Capital	pedestrian	yes	Potrero.Draft SFDPH Recs.2.26.10					
	28	Incorporate at least 6 of the following pedestrian safety treatments on streets interior and adjacent to the site: limit/yield lines at marked crosswalks, corner bulb-outs, signalized/marked crosswalks, < 4 driveway cuts per street segment, median refuge islands, pedestrian-oriented building access, pedestrian scale design on building frontages, pedestrian scale lighting, public art in streetscape, public seating in streetscape, intersection/street crossing sidewalk curb cuts for pedestrians, sidewalks with a continuous curb with appropriately placed curb cuts for people with disabilities, street trees, planters, and gardens included in streetscape.	--	Capital	pedestrian	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	29	Incorporate wayfinding and signage to help locate people around the site, create site identity and awareness of walking and biking paths, and educate re: onsite services.	--	Capital	pedestrian	Possibly	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	30	short-term street improvements	improvements to street crossings, sidewalks, and bus stops identified for 15 intersections w/in and surrounding the project site	Capital	pedestrian	yes	Short-Term Street Improvements. F&P, 2013.					
	31	Widen sidewalks	Proposed project alternative 1 plans to provide sidewalks with a width of 5-14 feet in residential areas and 9.5-14 in retail areas.	Capital	pedestrian	yes	Potrero HOPE Transportation Study, 2012					

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x	32	Intersection safety improvements - 25th St./ Connecticut St.	this is a sort of "hub" for the community; the walking club meets here, for example; will be part of Phase II for Rebuild Potrero and thus there will be increased pedestrian activity due to Phase I - high priority.	Capital	safety / security	Yes	MP email - 10/22/13; Short-Term Street Improvements. F&P, 2013.	hub/meeting location for the Annex/Terrace community	high boarding location	priority in HOPE SF analysis	short-term	SFMTA funded
x	33	Intersection safety improvements - 25 <sup>th</sup> St./ Texas St./ Dakota St.	It's wide open; 25th Street is uncontrolled, Dakota slopes steeply down to it while 25th has a crest, so visibility is poor. Note bus stop yellow marker on pole in the foreground, but unpaved island, no shelter, no bench, no curb ramps; will be part of Phase II for Rebuild Potrero and thus there will be increased pedestrian activity due to Phase I - high priority.	Capital	safety / security	Yes	MP email - 10/22/13; Overall recommendation from Needs Assessment Summary, F&P 2013. Short-Term Street Improvements. F&P, 2013.	hub/meeting location for the Annex/Terrace community	high boarding location	priority in HOPE SF analysis	short-term	SFMTA funded
	34	Ensure safe transit waiting facilities and safe routes to transit, with improved lighting and video surveillance.	--	Capital	safety / security	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	34	Improve safety at bus stops	Install strategic lighting, improve visibility, and implement low-cost pedestrian treatments at bus stops. Video surveillance systems at hot spot crime locations (23rd/Wisconsin, Wisconsin/Connecticut)	Capital	Safety / security	yes	Short-term improvement report concepts, Green Connections deliverable, 2012.					
	35	Improve pedestrian visibility	To ensure visibility, prohibit street trees on last 25 feet of intersection approach. Streets designed according to Planning Department's Better Streets Plan. Ped bulb-outs and 6-ft crosswalks at most intersections. Bus bulbs recommended. (9) Yield lines, bulb outs, limit driveway curb cuts (10).	Capital	Safety / security	yes	Potrero HOPE Transportation Study, 2012 Potrero.Draft SFDPH Recs.2.26.10					
	36	Increase "Eyes on the street"	Selectively place entrances and exits, fencing, lighting and landscape to limit access or control flow; use a single, clearly identifiable, point of entry (8). Safe ped entrances - ped-specific building entrances, ped-scale design, ped-scale lighting, street trees, planters, signage, street cleaning, sidewalks free of impediments. Consider funding community outreach worker to support ongoing engagement of new residents in Potrero community. Public toilets. Site design to minimize wind and maximize sun (10).	Capital	Safety / security	yes	Potrero.Draft SFDPH Recs.2.26.10					
	37	Improve security	install lighting at bus stops; coordination of police presence on streets; walking buses or walking escorts;	Both	safety / security	yes and no	Overall recommendation from Needs Assessment Summary, F&P 2013.					

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	38	Provide plentiful bike parking.	--	Capital	bicycle	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	38	Provide safe, secure, and convenient bicycle parking on streets and in parking garages.	--	Capital	bicycle	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	38	Provide bicycle parking	Ensure that Class I bicycle parking is located in safe-to-access, well-lit locations throughout the site	Capital	bicycle	yes	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012. Potrero HOPE Transportation Study, 2012 Potrero.Draft SFDPH Recs.2.26.10					
	39	Construct new bicycle road facilities that connect to the existing bicycle network.	--	Capital	bicycle	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	39	Develop key connections to greater bicycle network.	--	Capital	bicycle	Possibly	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	39	Incorporate at least 4 of the following bicycle safety treatments on streets interior and adjacent to the site: bicycle lanes at least 5 feet wide, bicycle lane signs, dashed intersection bicycle lanes, double-striped bicycle lanes, < 4 driveway cuts per street segment, left-turn bicycle lanes, shared traffic lanes with sharrows, smooth roadway pavement surface, street lighting adequate for bicyclists, street trees.	--	Capital	bicycle	Possibly	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	39	Develop bicycle access network	Develop bicycle access network identifying circulation within the site and from the site to surrounding bicycle routes (4). Bike lanes, sharrows (10)	Capital	bicycle	yes	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012. Potrero.Draft SFDPH Recs.2.26.10					
	39	Connections to bicycle network	Develop key connections to greater bicycle network	Capital	bicycle	yes	Short-term improvement report concepts, Green Connections deliverable, 2012.					
	40	Provide showers and lockers for bicyclists.	--	Capital	bicycle	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	41	Install bicycle way-finding signage.	--	Capital	bicycle	Possibly	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	42	Offer official bicycle safety classes.	--	Programmatic	bicycle	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	43	Provide bicycle maintenance tools.	--	Programmatic	bicycle	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	44	Paid parking	On-street parking should be paid parking	Programmatic	parking	no	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012.					
	44	Price on-street parking.	--	Programmatic	parking	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					

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	45	Consider a structured residential parking permitting program that would help discourage "cruising" for parking around the site which creates hazards for people walking and biking, including children at play.	--	Programmatic	parking	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	45	Residential parking permit program	Implement residential parking permit zone program	Programmatic	parking	no	Potrero.Draft SFDPH Recs.2.26.10					
	46	Unbundle parking	Parking should be unbundled from housing, commercial uses	Programmatic	parking	no	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012. Potrero HOPE Transportation Study, 2012 Potrero.Draft SFDPH Recs.2.26.10					
	46	Unbundle parking from housing and commercial uses.	--	Programmatic	parking	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	47	Limit off-street parking	On-site parking ratio 3 spaces/4 units.	Programmatic	parking	yes	Potrero.Draft SFDPH Recs.2.26.10					
	47	Reduce on-site parking ratio to 3 parking spaces for every 4 units.	--	Programmatic	parking	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	47	Utilize joint-use parking agreements to reduce parking requirements.	--	Programmatic	parking	yes	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	48	Preferential HOV parking	Include vanpool parking in preferential HOV parking	Programmatic	parking	no	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012. Potrero HOPE Transportation Study, 2012					
	49	Include designated passenger loading zones for the elderly.	--	Programmatic	parking	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	50	TDM coordinator	Include TDM coordinator services at on-site neighborhood/recreation center; on-site coordinator could provide trip-planning resources, conduct mobility training, administer transit passes, conduct outreach to new residents promoting sustainable options before move-in, coordinate ridesharing/vanpooling	Programmatic	other	no	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012. Potrero HOPE Transportation Study, 2012 Potrero.Draft SFDPH Recs.2.26.10			priority in HOPE SF analysis	short to mid-term	
x	50	Transportation Coordinator to support the community and transportation programs	--	Programmatic	other	No	Overall recommendation from Needs Assessment Summary, F&P 2013. Short- to Mid-Term Transportation Recommendations. F&P 2013. MP email - 10/22/13			priority in HOPE SF analysis	short to mid-term	multiple funding sources?
	51	Establish a residential transit pass program funded by monthly or annual homeowners' fees.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	51	Provide Muni FastPass to residents.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					

Notes:  
 1. Ranking = "x" indicates a prioritized project.  
 2. Grouping= projects are grouped by similarity/overlap.  
 3. Type is categorized by either "Capital" (physical improvements) or "Programmatic" (non-physical)

Ranking <sup>1</sup>	Grouping <sup>2</sup>	Project	Detail	Type <sup>3</sup>	Category	Project will be impacted by Redevelopment?	Document Source	Hot Spot - Safety	Hot Spot - Transit Use	Community Support	Time Frame	Collaboration Potential
	51	Transit passes	Provide at least one Muni FastPass per residential unit as part of rent/HOA fees (4). Project sponsor will consider providing subsidized transit pass (muni fast pass) to low income households - find funding source or coordinate agreement with SFMTA (9).	Programmatic	other	no	Summary of SFMTA input into HOPE SF plans for Sunnydale/Potrero, 2012. Potrero HOPE Transportation Study, 2012 Potrero.Draft SFDPH Recs.2.26.10					
	52	Develop strategies with Community Building Organization to integrate youth-oriented alternative transport programs.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	52	Youth-oriented alternative transport programs	Develop strategies with Community Building Organizations (CBO) to integrate youth-oriented alternative transport programs	Programmatic	other	no	Short-term improvement report concepts, Green Connections deliverable, 2012.					
	53	Conduct a transportation training and information fair.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.				short-term	
	53	Transportation training and information fair	Conduct a Transportation Training and Information Fair	Programmatic	other	no	Short-term improvement report concepts, Green Connections deliverable, 2012.				short-term	
	54	Distribute transit info	Master Homeowners Association will regularly distribute transit info - timetables, schedules, info on transit stations and stops, info on local/regional transit operators to residents. Transit info on bulletin board in community center.	Programmatic	other	no	Potrero HOPE Transportation Study, 2012				short-term	
	54	Provide a dedicated central space to display information about public transit and other alternative transportation options (e.g., bike lanes, car-sharing, carpooling) in the neighborhood, residential or, employee facilities.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	54	Provide information about alternative transportation choices and signage indicating best routes.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	55	Implement additional programs such as carpool matching, preferential carpool parking, shuttle service to transit, access to Muni Lifeline.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	55	Incorporate a Transportation Demand Management (TDM) program. Billboards/other information could be located in community space; could also be managed on a website. Could include: carpool matching program; dedicated resident/employee transportation coordinator; shuttle service to BART, Caltrain or T-line and/or other key community resources not proximate to the project site including supermarkets or other key retail services; free or reduced cost transit passes (e.g., built into rent or HOA fees); preferential carpool/vanpool parking; provision of bus/train schedules, bike maps, and other transportation alternative resources.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					
	56	Public art	Public art, include artists to design elements of the development, work with library/schools to create mural, sculpture or other public art, wayfinding signs, post library hours and community center programs.	Capital	Other	yes	Potrero.Draft SFDPH Recs.2.26.10					

## Notes:

1. Ranking = "x" indicates a prioritized project.

2. Grouping= projects are grouped by similarity/overlap.

3. Type is categorized by either "Capital" (physical improvements) or "Programmatic" (non-physical)

Ranking <sup>1</sup>	Grouping <sup>2</sup>	Project	Detail	Type <sup>3</sup>	Category	Project will be impacted by Redevelopment?	Document Source	Hot Spot - Safety	Hot Spot - Transit Use	Community Support	Time Frame	Collaboration Potential
	57	Sponsor residents' association and utilize strategic environmental design to promote collective engagement over public spaces.	--	Programmatic	other	no	Recommendations aggregated from documents review. Needs Assessment Summary, F&P 2013.					

Notes:

1. Ranking = "x" indicates a prioritized project.
2. Grouping= projects are grouped by similarity/overlap.
3. Type is categorized by either "Capital" (physical improvements) or "Programmatic" (non-physical)

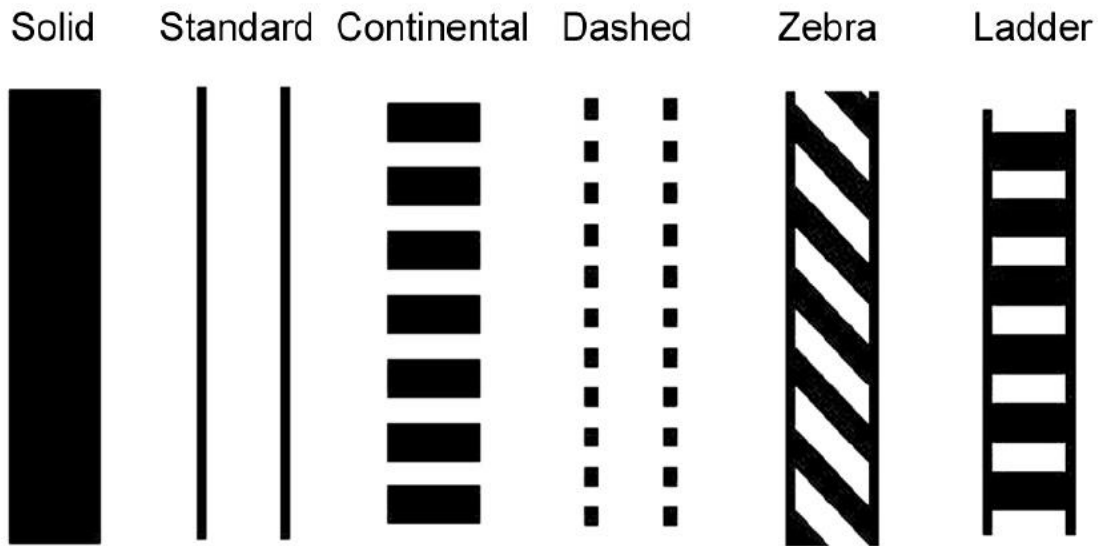
## APPENDIX C: TRAFFIC CALMING STRATEGIES

### Shorter-Term Interventions

#### Crosswalks

Crosswalks are the most basic type of pedestrian-friendly infrastructure, but some designs allow for higher visibility than others. Figure 4-3 shows most widely used crosswalk designs. The designs that provide the best visibility are the Continental, Zebra, and Ladder. Most crosswalks in the project area are Standard crosswalks, though the ones at Connecticut and Wisconsin streets, next to Starr King Elementary, use the Continental design.

Figure A3-1 Crosswalk Designs



Source: Federal Highway Administration. Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Intersections: Final Report and Recommended Guidelines. September 2005. Page 15.

Cost: \$8.51 per linear foot (\$5.87 median), or about \$350 to \$1,000 each, depending on the width of the street.<sup>15</sup>

**Advantages:** Crosswalks can increase driver awareness of pedestrian activity and can make pedestrians feel safer crossing streets. Though many drivers ignore state law's requirement that they yield to pedestrians in crosswalks, drivers are more likely to do so than they are in an area with unmarked crossings.

**Disadvantages:** A Federal Highway Administration study found that, when implemented alone, crosswalks do not provide a measurable safety improvement at uncontrolled intersections. Looking at 914 crossing sites on two-lane roads with fewer than 10,000 cars per day, the rate of crashes involving pedestrians at marked crossings was equal to that of unmarked crossings (.25

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<sup>15</sup> Bushell, Max, Bryan Poole, Charles Zegeer, and Daniel Rodriguez. "Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public." UNC Highway Safety Research Center. October 2013. Page 24.

crashes per million crossings).<sup>16</sup> Another study focusing on pedestrians 65 years or older found that crash risk actually increased by 2.1 times at marked crossings, likely because crosswalks can give pedestrians a false sense of security.<sup>17</sup>

### Street Signage (Including Stop Signs)

Street signs can increase the visibility of crossings and otherwise alert drivers to the presence of vulnerable pedestrians, including children on the way to school. The Manual of Uniform Traffic Control Devices allows certain types of signs, including those alerting drivers to crosswalks and school-related pedestrian traffic, to use a high visibility fluorescent yellow, as shown in Figure 4-4. The single-leg crosswalk at 23<sup>rd</sup>, Dakota, and Missouri streets currently employs such a sign. Portable signs can alert drivers to the presence of school children at times of high traffic. Such signs can be foldable, attached to cones, or use other distinctive designs, as shown in Figure 4-5.

Figure A3-2 High Visibility Signs



Figure A3-3 Portable School-Specific Signs



Figure 3 source: Wikimedia Commons. Figure 4 source: Amazon.com.

**Cost:** Standard street signs average \$300 each (median \$220).<sup>18</sup> Portable signs reviewed for this memo ranged from \$28 to \$130 each.<sup>19</sup>

<sup>16</sup> Zegeer, Charles, J. Richard Stewart, Herman H. Huang, Peter A. Lagerwey, John Feaganes, and B.J. Campbell. *Safety Effects of Marked versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines*. Federal Highway Administration, 2005. Page 36.

<sup>17</sup> Retting, Richard, Susan Ferguson, and Anne McCarrrt. "A Review of Evidence-Based Traffic Engineering Measures Designed to Reduce Pedestrian-Motor Vehicle Crashes." *American Journal of Public Health*. September 2003, 93 (9). Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447993/> on 3/21/14.

<sup>18</sup> Bushell et al (2013), page 28.

**Advantages:** Low cost relative to other interventions. Drivers particularly recognize and follow stop signs, so adding stop signs can be a low cost and effective way to calm traffic at key intersections. In fact, one study showed that pedestrian-vehicle crashes decreased by 25% after four-way stop signs replaced traffic signals at low-traffic intersections.<sup>20</sup> None of the intersections in question in this study are controlled by signals, but it is expected that the effect would be the same or possibly larger when stop signs are implemented at otherwise uncontrolled or partially controlled intersections. Other types of signs only slightly increase driver awareness of crosswalks and vulnerable pedestrian populations.

**Disadvantages:** MUTCD explicitly recommends that stop signs “not be used for speed control,” though some engineers “view the MUTCD’s warrants as too stringent for residential streets.”<sup>21</sup> A synthesis of studies of the impacts of stop signs showed “no midblock speed reduction,” though noted that “cut-through traffic appears to be discouraged by stop signs, and collisions may be less frequent and severe.” No literature documented notable changes in driver behavior around crosswalks or schools as a result of increased signage. In certain areas with significant signage already in place, additional signs can add to visual clutter, which actually decreases driver attention to individual warnings.

### **Motion-Activated Beacons**

Motion-activated beacons are flashing lights, embedded in roadway pavement or added to signs, that activate either when pedestrians enter a roadway at a marked crossing location or when pedestrians manually activate them. Figure 4-6 shows an example of sign-embedded beacons. Lights typically use LEDs and are colored red or amber. Engineers note that beacons are most effective when drivers are traveling 35 miles per hour or less because they can see the flashing lights from at least 400 feet away and have sufficient time to slow down.<sup>22</sup>

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<sup>19</sup>Prices retrieved from [http://www.schoolmasters.com/categories/schoolmasters\\_categories.cfm?category=Snap260764&bc2=2&div=sf](http://www.schoolmasters.com/categories/schoolmasters_categories.cfm?category=Snap260764&bc2=2&div=sf), , and [http://www.schoolmasters.com/categories/productdetails.cfm?product\\_ID=SS083D&div=sf&category&bc3&details](http://www.schoolmasters.com/categories/productdetails.cfm?product_ID=SS083D&div=sf&category&bc3&details) on March 20, 2014.

<sup>20</sup> Retting et al (2003), Table 1.

<sup>21</sup> Ewing, Reid. *Traffic Calming, State of the Practice*. Report no. FHWA-RD-135. Washington, DC: ITE under contract with US DOT, FHWA, 1999. Page 119.

<sup>22</sup> Katz, Okitsu & Associates. “Illuminated Crosswalks: An Evaluation Study and Policy Recommendations.” Prepared for the City of Fountain Valley, CA. October 2000. Page 27.



Figure A3-4 Beacons Embedded in Signs



**Cost:** \$10,010 (median \$5,170)<sup>23</sup> to \$15,000<sup>24</sup> per intersection.

**Advantages:** Draw extra driver attention to signs or pavement markings. A study in Kirkland, Wash. showed that drivers started braking further from crosswalks after flashing beacons were installed (day: 218 feet before implementation and 262 feet after; night: 191 feet before and 266 feet after).<sup>25</sup> Other studies have found that vehicle approach speeds decreased by 25% after implementation and the percentage of drivers stopping or slowing for pedestrians doubled, while the percentage of drivers failing to yield declined by two thirds.<sup>26</sup>

**Disadvantages:** Less effective in areas with steady pedestrian traffic throughout the day, as flashing lights are consistently activated, potentially decreasing driver response. Beacons can also be less effective if curves in the roadway prevent drivers' from being able to see the beacons from sufficient distance away to respond.

### Plastic Speed Bumps and Humps

Plastic speed bumps and humps that aim to slow approaching drivers. Made of durable plastic and securely attached to the roadway surface, as shown in Figure 4-7. Bumps and humps reviewed for this memo come in segments that can be laid next to each other to cover the full width of a roadway.

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<sup>23</sup> Bushell et al (2013), page 26.

<sup>24</sup> Godfrey, David and Tony Mazzella. "Kirkland's Experience with In-Pavement Flashing Lights at Crosswalks." ITE/IMSA Annual Meeting, February 1999.

<sup>25</sup> Godfrey et al (1999).

<sup>26</sup> Retting, et al (2003), Table 2.

Figure A3-5 Plastic Speed Bumps and Humps



Source: [http://www.schoolmasters.com/categories/schoolmasters\\_products.cfm?category=Port922673&bc2=2&div=sf](http://www.schoolmasters.com/categories/schoolmasters_products.cfm?category=Port922673&bc2=2&div=sf).

**Cost:** Bumps \$1,550 each, humps \$1,000 each.<sup>27</sup>

**Advantages:** One study of patients at Oakland Children’s Hospital showed that having speed humps present in a child’s neighborhood decreased the odds that the child was in the hospital as a result of an auto collision by 47%.<sup>28</sup>

**Disadvantages:** Speed bumps and humps slow transit vehicles, as well as general traffic, and abrupt changes in a street’s vertical plane can slightly increase wear and tear on transit vehicles. The plastic version of this intervention generally also requires significantly earlier replacement than the concrete version, noted below.

### Rumble Strips

Rumble strips are several-inch-thick plastic strips that provide a slight rise in the street plane, creating audio and some physical feedback for drivers. They are most widely implemented on freeway shoulders to alert drivers when they are about to leave a roadway. Figure 4-8 shows rumble strips implemented on a neighborhood street.

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<sup>27</sup> [http://www.schoolmasters.com/categories/schoolmasters\\_products.cfm?category=Port922673&bc2=2&div=sf](http://www.schoolmasters.com/categories/schoolmasters_products.cfm?category=Port922673&bc2=2&div=sf), assumes 360-inch-wide roadway, based on width of 23<sup>rd</sup> Street. Speed humps: 18.5-inch-wide end pieces: \$29 each; 18.5-inch-wide middle pieces: \$55 each. Speed bumps: 14-inch end pieces: \$29 each; 14-inch middle pieces: \$65 each. Installation kits: \$3.95 each for heavy duty installation.

<sup>28</sup> Tester, June, George Rutherford, Zachary Wald, and Mary Rutherford. “A Matched Case-Control Study Evaluating the Effectiveness of Speed Humps in Reducing Child Pedestrian Injuries.” *American Journal of Public Health*. April 2004, 94(4).

Figure A3-6 Rumble Strips



Source: <http://www.speedbumpsandhumps.com/speed-bumps/rumble-strips.html>.

**Cost:** \$450 to \$550 per set.<sup>29</sup>

**Advantages:** Affordable intervention that creates driver feedback that can cause slightly reduced speeds.

**Disadvantages:** Research is mixed on the effect of rumble strips on driver behavior. The City of Phoenix experimented with using rumble strips “at various patterns and spacings” to calm traffic and found that “advance rumble strips are not a helpful safety device based on speed data and pedestrian accident experience.”<sup>30</sup> A study of driver response to rumble strips on rural roads in China found that while they reduced average speeds on high-speed roads, “the speed reduction impacts were not found to be statistically significant” on a road with a 40 kilometer-per-hour speed limit.<sup>31</sup> Rumble strips also produce a great deal of noise that may be disruptive to the surrounding neighborhood.

### Transverse Markings

Transverse markings are tightly spaced horizontal lines across a travel line on the approach to a crosswalk or traffic-calming feature (i.e. a speed hump), as shown in Figure 4-9. The lines create the “illusion of increasing speed, thus inducing drivers to slow down.”<sup>32</sup>

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<sup>29</sup> <http://www.speedbumpsandhumps.com/speed-bumps/rumble-strips.html>, requires permanent primer to install.

<sup>30</sup> Cynecki, M, J Sparks, and J Grote. “Rumble Strips and Pedestrian Safety.” *ITE Journal*. 1993, 63 (8). Abstract.

<sup>31</sup> Liu, Pan, Jia Huang, Wei Wang, and Chengcheng Xu. “Effects of transverse rumble strips on safety of pedestrian crosswalks on rural roads in China.” *Accident Analysis and Prevention*. November 2011, 43 (6). Abstract.

<sup>32</sup> Ewing (1999), page 122.

Figure A3-7 Transverse Marking



Source: Ewing (1999), page 122.

**Cost:** \$10 per line average (median \$10).<sup>33</sup>

**Advantages:** Very cheap to implement, and no negative byproducts like noise. Some evidence of effectiveness in slowing drivers down, at least initially.<sup>34</sup>

**Disadvantages:** Research on this strategy is thin, and long-term impact, once “the novelty wears off,” is not proven.

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<sup>33</sup> Bushell, et al (2013), page 29.

<sup>34</sup> Ewing (1999), page 122.

## Safe-Hit Posts

Safe-hit posts are short plastic posts that provide a physical barrier that can keep cars out of pedestrian rights of way. The devices can bend if collided with, but they provide a very solid fence-like visual that deters drivers from hitting them. Figure 4-10 shows safe-hit posts being installed in downtown San Francisco.

Figure A3-8 Safe-Hit Posts



Source: San Francisco Bicycle Coalition, via Flickr.

**Cost:** \$50 each.<sup>35</sup>

**Advantages:** A cheap way to clearly delineate where cars are allowed to travel and/or park that does not reduce pedestrian mobility.

**Disadvantages:** Require regular replacement and maintenance.

## Solid Pavement Paint

These painted portions of pavement are used to divide roadway space among users. The approach is used most commonly in San Francisco to mark bike lanes (green) and transit lanes (red).

**Cost:** \$3.40 per square foot (median \$1.21).<sup>36</sup>

**Advantages:** Gives a clear signal to drivers that a portion of the roadway is to be used differently from the rest of it.

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<sup>35</sup> <http://www.speedbumpsandhumps.com/traffic-control-and-safety/traffic-cones-and-posts.html>

<sup>36</sup> Bushell et al (2013), page 29.

**Disadvantages:** Requires periodic repainting and, when not coupled with physical barriers and/or significant enforcement, drivers may intrude on the space.

### Advertising/Awareness

Posters or advertisements in local newsletters or newspapers can be used to remind community members to slow down and watch out for children walking to school.

**Cost:** Varies, but generally very low-cost relative to major investments in infrastructure.

**Advantages:** Can increase general awareness of Safe Routes to School programs and to directly engage participants, through poster- or advertisement-design contests and other such approaches.

**Disadvantages:** No documented effect on pedestrian safety.

## Longer-Term Interventions

### Concrete Speed Humps

Figure 4-11 shows a concrete version of the plastic speed humps noted above.

Figure A3-9 Concrete Speed Humps



Source: Wikimedia Commons.

**Cost:** \$2,640 each (median \$2,130).<sup>37</sup>

**Advantages:** Significantly more durable than plastic speed humps. See research on the effect of speed humps/bumps above.

**Disadvantages:** Significantly more costly than plastic speed humps. See general disadvantages above.

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<sup>37</sup> Bushell et al (2013), page 17.

## Bollards

Bollards are plastic or metal waist-high posts that are permanently attached to the ground and are generally thicker than safe-hit posts. Like safe-hit posts, they provide a visual barrier to drivers, as shown in Figure 4-12. Unlike safe-hit posts, they also function as a physical barrier.

Figure A3-10 Bollards



Source: <http://www.speedbumpsandhumps.com/>

**Cost:** \$150-\$350 each.<sup>38</sup>

**Advantages:** More permanent than safe-hit posts and require less maintenance.

**Disadvantages:** Can add visual clutter to a streetscape.

## Raised Crosswalks

This is a strategy that places crosswalks at the level of surrounding sidewalks, with sides that slope to the roadway plane. Effectively, these are speed humps placed at crosswalks themselves, rather than in a roadway's crosswalk approach, as Figure 4-13 shows.

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<sup>38</sup> <http://www.speedbumpsandhumps.com/traffic-control-and-safety/bollards.html>.

Figure A3-11 Raised Crosswalks



Source: Wikimedia Commons.

**Cost:** \$8,170 each (median \$7,110).<sup>39</sup>

**Advantages:** Similar effects as speed humps. One study of a combination of traffic calming measures in Cambridge, Mass., including raised crosswalks, found that raised crosswalks reduced the 85<sup>th</sup> percentile approach speed from 31 to 26 miles per hour and reduced the percent of vehicles exceeding 25 miles per hour from 57 to 17. The study found that raised crosswalks in particular quintupled the number of drivers yielding to pedestrians in crosswalks.<sup>40</sup>

**Disadvantages:** Similar disadvantages to those of speed humps.

### Roundabouts/Traffic Circles

Roundabouts are circles in the middle of intersections that force drivers to either slightly alter their paths, and thus slow down, or travel around a roundabout roadway in a particular direction. Figure 4-14 shows this concept implemented on a small residential street. Such a traffic-calming treatment could be implemented using cheaper, temporary materials like bollards, planters, and pavement paint, as the city tried on Page Street in the early 2000s.<sup>41</sup>

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<sup>39</sup> Bushell et al (2013), page 16.

<sup>40</sup> Watkins, Katherine. "Cambridge's Traffic Calming Program: Pedestrians are the Focus." Institute for Transportation Engineers. Retrieved from <http://www.ite.org/traffic/documents/AB00H3702.pdf> on March 20, 2014.

<sup>41</sup> Cabanatuan, Michael. "Traffic circle experiment draws mixed reviews/Some SF motorists confused by devices." *San Francisco Chronicle*. September 8, 2003. Retrieved from <http://www.sfgate.com/bayarea/article/Traffic-circle-experiment-draws-mixed-reviews-2590646.php#photo-2080483> on March 21, 2014.



Figure A3-12 Roundabout using Temporary Materials



Source: *San Francisco Chronicle*, September 8, 2003.

**Cost:** \$85,370 each (median \$27,190).<sup>42</sup> Significantly cheaper when implemented using temporary materials (see the cost of components under short-term interventions above).

**Advantages:** Force drivers to change course, which requires reducing speeds. Several studies have shown positive effects on pedestrian safety. One saw a 75% decrease in pedestrian-involved crashes, a second found a 73% decrease, and a third found that the “observed number of pedestrian crashes was three to four times lower than predicted for comparable intersections with signals.”<sup>43</sup>

**Disadvantages:** Transit agencies and local fire and waste-disposal departments may be concerned about narrowed travel lanes and the turning radii required to get around a traffic circle.

### Curb Extensions

Curb extensions extend sidewalk space so the curb is closer to the edge of travel lanes, as shown in Figure 4-15. This narrows the width of roadway pedestrians must cross and increases the visibility of pedestrians at corners, where they might otherwise be blocked by parked cars. When placed at bus stops, extensions can reduce transit dwell times by eliminating vehicles’ need to get out of a roadway to safely pick up passengers.

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<sup>42</sup> Bushell et al (2013), page 17.

<sup>43</sup> Retting, et al (2003), Table 1.

Figure A3-13 Curb Extension using Temporary Materials



Source: Wikimedia Commons.

**Cost:** \$13,000 each (median \$10,150).<sup>44</sup> Significantly cheaper when implemented using temporary materials (see the cost of components under short-term interventions above).

**Advantages:** Increases pedestrian visibility and reduces the amount of time vulnerable pedestrians are in the roadway. Where extensions adjust the course of travel lanes, or where they narrow travel lanes significantly, they can also reduce speeds.

**Disadvantages:** Potential concerns from fire departments because of reduced lane widths and tighter turning radii.

## Potential Bus Stop Improvement Strategies

Many San Francisco bus stops include Clear Channel-sponsored transit shelters to help protect passengers from the elements and provide seating. None of the Study Area bus stops include shelters, in part because sidewalks are too narrow to accommodate them. The project team explored alternative low-cost bus-stop improvements that could more clearly demarcate bus waiting areas, improve bus access for people with physical limitations, and, potentially, make room for bus shelters.

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<sup>44</sup> Bushell et al (2013), page 14.

The project team found two companies, both based abroad, that make temporary bus bulbs or similar products. While both products have been implemented, at least in part, to improve accessibility rather than to beautify stops or make them more prominent, they could help make bus waiting areas more prominent.

**Zicla Bus Boarder** (Figure 4-16): This platform comes to curb height and can either be placed adjacent to the curb or away from it, with ramps connecting the platform to the surrounding surface. As shown in the left image, the boarder can be attached to an existing curb via short connecting ramps, allowing the platform itself to sit several inches from the curb to allow for drainage. The boarder is black with yellow warning strips designed into the edges, and it is made of recycled PVC. The standard unit is approximately 9 feet 10 inches long and 5 feet 6 inches wide, though it can be made wider or longer and configured to fit between angled parking spaces and other local contexts. The boarder is shipped in pieces and assembled on site, and it is bolted into the ground.

Figure A3-14 Zicla Bus Boarder – Curb Extension



**Rediweld's BusPad** (Figures 4-17): This product has a slimmer profile and is intended to help raise curbs closer to bus level, to allow for level boarding. The pad rises to 2.5 inches and can be assembled to different lengths and widths, depending on the application. The pad is made of rubber and is bolted to the sidewalk. It is specifically marketed as an accessibility enhancement.

Figure A3-15 Rediweld BusPad – Formal Stop



## APPENDIX D: DETAILED MATERIALS COST ESTIMATES FOR PEDESTRIAN IMPROVEMENTS

Item	Unit	Quantity	Unit Price	Cost
BOULDERS	QTY	14	\$650.00	\$9,100
MANHOLE BARREL PLANTER 72"x12" riser section	QTY	48	\$725.00	\$34,800
MANHOLE BARREL PLANTER 60"x12" riser section	QTY	44	\$550.00	\$24,200
MANHOLE BARREL PLANTER 48"x24" riser section	QTY	68	\$375.00	\$25,500
MANHOLE BARREL PLANTER 36"x18" riser section	QTY	134	\$250.00	\$33,500
WOOD TOP FOR MANHOLE BARREL SEATS 72"x12" riser section	QTY	5	\$850.00	\$4,250
WOOD TOP FOR MANHOLE BARREL SEATS 60"x12" riser section	QTY	15	\$650.00	\$9,750
WOOD TOP FOR MANHOLE BARREL SEATS 36"x18" riser section	QTY	13	\$450.00	\$5,850
PLANTS - SUCCULENTS	SF	3290	\$7.50	\$24,675
PAINT AT CROSSWALKS	LF	379	\$14.00	\$5,306
PAINT AT BULBOUTS	SF	12598	\$2.50	\$31,495
BUS SHELTER (Assume ClearChannel Installation)	QTY	3	\$0.00	\$0
6" PLATFORM AT BUS SHELTER	SF	1018	\$6.00	\$6,108
SOIL	CY	138	\$35.00	\$4,830
BIKE REFLECTORS	QTY	1100	\$0.86	\$946
6" TEMPORARY CURB-ASPHALT-ASPHALT	LF	205	\$12.00	\$2,460
STOP SIGN	QTY	6	\$725.00	\$4,350
SPEED CUSHIONS	QTY	2	\$1,500.00	\$3,000
CURB RAMP	QTY	3	\$750.00	\$2,250
FURNITURE ALLOWANCE	LS	1	\$2,000.00	\$2,000
ART ALLOWANCE	LS	1	\$9,000.00	\$9,000
CONTINUOUS PAINT BETWEEN NODES	LS	1	\$12,000.00	\$12,000
STEAMCLEANING	LS	1	\$2,000.00	\$2,000
<b>Sub-total</b>				<b>\$257,370</b>
<b>Contingency (25%)</b>				<b>\$64,343</b>
<b>Construction Hard Costs Total</b>				<b>\$321,713</b>

## **APPENDIX E: BUS TURN SWEEPS FOR KEY INTERSECTIONS**



**B-40 Bus Turn Simulation**  
Design vehicle noted in  
Better Streets Plan

**Bus-40**  
AASHTO 2011 (US)

**Stop Bar**  
Moved to allow room for full sweep  
of 40-foot bus turning movement  
around 20-foot curb radius





**Stop Bar**  
Moved to allow room for full sweep  
of 40-foot bus turning movement  
around east-side curb radius of 30 feet

**B-40 Bus Turn Simulation**  
Design vehicle noted in  
Better Streets Plan

**Bus-40**  
AASHTO 2011 (US)



0 50 Feet

## **APPENDIX F: SHUTTLE COST MODEL**



# Shuttle: Contracted, 1-Hour Headways, 9-6 a.m. Daily

**ONLY CHANGE CELLS IN RED**

Summary	Low	High
Overall Costs (Annual)	\$ 230,000	\$ 320,000

## Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + 10 min layover)	60 min
One-way Route Distance	3.81 miles
Round Trip Route Distance	7.62 miles

## Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	9:00 AM	6:00 PM	60	5	9.00	60	1	9	45
Saturday	9:00 AM	6:00 PM	60	1	9.00	60	1	9	9
Sunday	9:00 AM	6:00 PM	60	1	9.00	60	1	9	9
<b>Total</b>				<b>7</b>	<b>27</b>			<b>27</b>	<b>63</b>

## Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,285</b>

\* Source: NN Transit Service Costing Worksheet

## Cost Estimate

	Low	High
Cost/Rev Vehicle Hour (2009\$)	\$60	\$75 for reference only
Cost/Rev Vehicle Hour (2014\$)	\$70	\$96
<b>Annual Cost (2014\$)</b>	<b>\$230,000</b>	<b>\$320,000</b>

Source: SamTrans Community Transit Guide, 2009, page 45; based on the cost of contracted Caltrain shuttles in San Mateo (including vehicles, drivers, insurance, a facility, maintenance, and fuel)

## Shuttle: Contracted, 1-Hour Headways, 7:30 a.m. - 7:30 p.m. Mon-Sat

**ONLY CHANGE CELLS IN RED**

Summary	Low	High
Overall Costs (Annual)	\$ 260,000	\$ 350,000

### Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + 10 min layover)	60 min
One-way Route Distance	3.81 miles
Round Trip Route Distance	7.62 miles

### Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	7:30 AM	7:30 PM	60	5	12.00	60	1	12	60
Saturday	7:30 AM	7:30 PM	60	1	12.00	60	1	12	12
Sunday			60	1	0.00	60	1	0	0
<b>Total</b>				<b>7</b>	<b>24</b>			<b>24</b>	<b>72</b>

### Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,684</b>

\* Source: NN Transit Service Costing Worksheet

### Cost Estimate

	Low	High
Cost/Rev Vehicle Hour (2009\$)	\$60	\$75 for reference only
Cost/Rev Vehicle Hour (2014\$)	\$70	\$96
<b>Annual Cost (2014\$)</b>	<b>\$260,000</b>	<b>\$350,000</b>

Source: SamTrans Community Transit Guide, 2009, page 45; based on the cost of contracted Caltrain shuttles in San Mateo (including vehicles, drivers, insurance, a facility, maintenance, and fuel)

## Shuttle: In-House, 1-Hour Headways, 9-6 a.m. Daily

**ONLY CHANGE CELLS IN RED**

### Summary

Costs vary based on inputs in spreadsheet below

Operating Costs (Annual)	\$ 153,984
Capital Costs (Total)	\$ 25,000

### Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + layover)	60 min
One-way Route	
Distance	3.81 miles
Round Trip Route	
Distance	7.62 miles

### Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Daily Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	9:00 AM	6:00 PM	60	5	9.00	60	1	9	45
Saturday	9:00 AM	6:00 PM	60	1	9.00	60	1	9	18
Sunday	9:00 AM	6:00 PM	60	1	9.00	60	1	9	18
<b>Total per week</b>				<b>7</b>	<b>27</b>			<b>27</b>	<b>81</b>

### Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,285</b>

\* Source: NN Transit Service Costing Worksheet

### COST ESTIMATE

#### Hourly Salary

Position	Hourly Salary	Annual Hours	Annual Cost
Driver*	\$20.00	3,614	\$72,270
Program Manager**	\$35.00	723	\$25,295
Benefits***			50%
<b>Total Staff cost</b>			<b>\$146,347</b>

\*Driver annual cost = annual rev hours + 10%

\*\*Program Manager hours = 20% of assumed driver hours

\*\*\*Benefits - adds 50% to total labor costs to account for health care, etc.,  
per <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>.

#### Vehicle Type Assumptions

New or Used	Used	<--- Choose from dropdown
Buy or Lease	Buy	<--- Choose from dropdown
Vehicle Type	Cutaway	<--- Choose from dropdown
Selection Notes	Selections OK	<--- If this box says anything but "Selections OK," please choose different options.

#### Mileage Cost

Vehicle Type	Cost per Mile*	Route Miles	Weekday Miles	Saturday Miles	Sunday Miles	Annual Miles	Annual Cost
Modified Van	\$ 0.62	3.32	29.9	29.9	29.9	10,910.2	\$ 6,721
Cutaway	\$ 0.70	3.32	29.9	29.9	29.9	10,910.2	\$ 7,637

\*Mileage costs based on IRS standard, plus 10% for van, 25% for cutaway

#### Vehicle Cost (Used)

Vehicle Type	Passengers	Estimated Cost	Model Quoted
Modified Van	11	\$ 12,900	2008 Ford E350 Gas Passenger Van
Cutaway	13	\$ 25,000	2008 Eldorado National AeroLite Ford E350

Source: Alliance Bus Group; note -- leases are typically not possible on used vehicles, but financing is an option  
(quoted a 36-month term for the 2008 vehicle)

#### Vehicle Cost (New)

Vehicle Type	Low	High	Low 2014\$	High 2014\$	Lease (monthly)
Modified Van*	\$40,000	\$50,000	\$ 50,000	\$ 60,000	
Cutaway**	\$60,000	\$115,000	\$ 70,000	\$ 130,000	\$899

\*SamTrans Community Transit Guide, 2009, page 27

\*\*SamTrans Community Transit Guide, 2009, page 28; Lease quote -- Alliance Bus Group

Shuttle: In-House, 1-Hour Headways, 7:30 a.m. - 7:30 p.m. Mon-Sat

ONLY CHANGE CELLS IN RED

Summary

Costs vary based on inputs in spreadsheet below

Operating Costs (Annual)	\$ 172,687
Capital Costs (Total)	\$ 25,000

Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + layover)	60 min
One-way Route Distance	3.81 miles
Round Trip Route Distance	7.62 miles

Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Daily Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	7:30 AM	7:30 PM	60	5	12.00	60	1	12	60
Saturday	7:30 AM	7:30 PM	60	1	12.00	60	1	12	24
Sunday			60	1	0.00	60	1	0	0
<b>Total per week</b>				<b>7</b>	<b>24</b>			<b>24</b>	<b>84</b>

Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,684</b>

\* Source: NN Transit Service Costing Worksheet

COST ESTIMATE

Hourly Salary

Position	Hourly Salary	Annual Hours	Annual Cost
Driver*	\$20.00	4,052	\$81,048
Program Manager**	\$35.00	810	\$28,367
Benefits***			50%
<b>Total Staff cost</b>			<b>\$164,122</b>

\*Driver annual cost = annual rev hours + 10%

\*\*Program Manager hours = 20% of assumed driver hours

\*\*\*Benefits - adds 50% to total labor costs to account for health care, etc., per <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>.

Vehicle Type Assumptions

New or Used	Used	<--- Choose from dropdown
Buy or Lease	Buy	<--- Choose from dropdown
Vehicle Type	Cutaway	<--- Choose from dropdown
Selection Notes	OK	<--- If this box says anything but "Selections OK," please choose different options.

Mileage Cost

Vehicle Type	Cost per Mile*	Route Miles	Weekday Miles	Saturday Miles	Sunday Miles	Annual Miles	Annual Cost
Modified Van	\$ 0.62	3.32	39.9	39.9	0.0	12,235.3	\$ 7,537
Cutaway	\$ 0.70	3.32	39.9	39.9	0.0	12,235.3	\$ 8,565

\*Mileage costs based on IRS standard, plus 10% for van, 25% for cutaway

Vehicle Cost (Used)

Vehicle Type	Passengers	Estimated Cost	Model Quoted
Modified Van	11	\$ 12,900	2008 Ford E350 Gas Passenger Van
Cutaway	13	\$ 25,000	2008 Eldorado National AeroLite Ford E350

Source: Alliance Bus Group; note -- leases are typically not possible on used vehicles, but financing is an option (quoted a 36-month term for the 2008 vehicle)

Vehicle Cost (New)

Vehicle Type	Low	High	Low 2014\$	High 2014\$	Lease (monthly)
Modified Van*	\$40,000	\$50,000	\$ 50,000	\$ 60,000	
Cutaway**	\$60,000	\$115,000	\$ 70,000	\$ 130,000	\$899

\*SamTrans Community Transit Guide, 2009, page 27

\*\*SamTrans Community Transit Guide, 2009, page 28; Lease quote -- Alliance Bus Group

## Shuttle: Contracted, 30-Minute Headways, 9-6 a.m. Daily

**ONLY CHANGE CELLS IN RED**

Summary	Low	High
Overall Costs (Annual)	\$460,000	\$ 630,000

### Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + 10 min layover)	60 min
One-way Route Distance	3.81 miles
Round Trip Route Distance	7.62 miles

### Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	9:00 AM	6:00 PM	30	5	9.00	60	2	18	90
Saturday	9:00 AM	6:00 PM	30	1	9.00	60	2	18	18
Sunday	9:00 AM	6:00 PM	30	1	9.00	60	2	18	18
<b>Total</b>				<b>7</b>	<b>27</b>			<b>54</b>	<b>126</b>

### Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>6,570</b>

\* Source: NN Transit Service Costing Worksheet

### Cost Estimate

	Low	High
Cost/Rev Vehicle Hour (2009\$)	\$60	\$75 for reference only
Cost/Rev Vehicle Hour (2014\$)	\$70	\$96
<b>Annual Cost (2014\$)</b>	<b>\$460,000</b>	<b>\$630,000</b>

Source: SamTrans Community Transit Guide, 2009, page 45; based on the cost of contracted Caltrain shuttles in San Mateo (including vehicles, drivers, insurance, a facility, maintenance, and fuel)

## Shuttle: Contracted, 30-Minute Headways, 7:30 a.m. - 7:30 p.m. Mon-Sat

**ONLY CHANGE CELLS IN RED**

Summary	Low	High
Overall Costs (Annual)	\$ 510,000	\$ 710,000

### Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + 10 min layover)	60 min
One-way Route Distance	3.81 miles
Round Trip Route Distance	7.62 miles

### Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	7:30 AM	7:30 PM	30	5	12.00	60	2	24	120
Saturday	7:30 AM	7:30 PM	30	1	12.00	60	2	24	24
Sunday			30	1	0.00	60	2	0	0
<b>Total</b>				<b>7</b>	<b>24</b>			<b>48</b>	<b>144</b>

### Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>7,368</b>

\* Source: NN Transit Service Costing Worksheet

### Cost Estimate

	Low	High
Cost/Rev Vehicle Hour (2009\$)	\$60	\$75 for reference only
Cost/Rev Vehicle Hour (2014\$)	\$70	\$96
<b>Annual Cost (2014\$)</b>	<b>\$510,000</b>	<b>\$710,000</b>

Source: SamTrans Community Transit Guide, 2009, page 45; based on the cost of contracted Caltrain shuttles in San Mateo (including vehicles, drivers, insurance, a facility, maintenance, and fuel)

## Shuttle: In-House, 30-Minute Headways, 9-6 a.m. Daily

**ONLY CHANGE CELLS IN RED**

### Summary

Costs vary based on inputs in spreadsheet below

Operating Costs (Annual)	\$ 307,968
Capital Costs (Total)	\$ 50,000

### Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + layover)	60 min
One-way Route	
Distance	3.81 miles
Round Trip Route	
Distance	7.62 miles

### Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Daily Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	9:00 AM	6:00 PM	30	5	9.00	60	2	18	90
Saturday	9:00 AM	6:00 PM	30	1	9.00	60	2	18	36
Sunday	9:00 AM	6:00 PM	30	1	9.00	60	2	18	36
<b>Total per week</b>				<b>7</b>	<b>27</b>			<b>54</b>	<b>162</b>

### Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>6,570</b>

\* Source: NN Transit Service Costing Worksheet

### COST ESTIMATE

#### Hourly Salary

Position	Hourly Salary	Annual Hours	Annual Cost
Driver*	\$20.00	7,227	\$144,540
Program Manager**	\$35.00	1,445	\$50,589
Benefits***			50%
<b>Total Staff cost</b>			<b>\$292,694</b>

\*Driver annual cost = annual rev hours + 10%

\*\*Program Manager hours = 20% of assumed driver hours

\*\*\*Benefits - adds 50% to total labor costs to account for health care, etc.,

per <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>.

#### Vehicle Type Assumptions

New or Used	Used	<--- Choose from dropdown
Buy or Lease	Buy	<--- Choose from dropdown
Vehicle Type	Cutaway	<--- Choose from dropdown
Selection Notes	OK	<--- If this box says anything but "Selections OK," please choose different options.

#### Mileage Cost

Vehicle Type	Cost per Mile*	Route Miles	Weekday Miles	Saturday Miles	Sunday Miles	Annual Miles	Annual Cost
Modified Van	\$ 0.62	3.32	59.8	59.8	59.8	21,820.4	\$ 13,441
Cutaway	\$ 0.70	3.32	59.8	59.8	59.8	21,820.4	\$ 15,274

\*Mileage costs based on IRS standard, plus 10% for van, 25% for cutaway

#### Vehicle Cost (Used)

Vehicle Type	Passengers	Estimated Cost	Model Quoted
Modified Van	11	\$ 12,900	2008 Ford E350 Gas Passenger Van
Cutaway	13	\$ 25,000	2008 Eldorado National AeroLite Ford E350

Source: Alliance Bus Group; note -- leases are typically not possible on used vehicles, but financing is an option (quoted a 36-month term for the 2008 vehicle)

#### Vehicle Cost (New)

Vehicle Type	Low	High	Low 2014\$	High 2014\$	Lease (monthly)
Modified Van*	\$40,000	\$50,000	\$ 50,000	\$ 60,000	
Cutaway**	\$60,000	\$115,000	\$ 70,000	\$ 130,000	\$899

\*SamTrans Community Transit Guide, 2009, page 27

\*\*SamTrans Community Transit Guide, 2009, page 28; Lease quote -- Alliance Bus Group

Shuttle: In-House, 30-Minute Headways, 7:30 a.m. - 7:30 p.m. Mon-Sat

ONLY CHANGE CELLS IN RED

Summary

Costs vary based on inputs in spreadsheet below

Operating Costs (Annual)	\$ 345,374
Capital Costs (Total)	\$ 50,000

Round Trip Cycle Time Calculation

Drive time	18 min
# stops	14 stops
Time per stop	0.5 min
One-way Time	25 min
Roundtrip Tim	50 min
Layover time	10 min
Cycle Time (x2 + layover)	60 min
One-way Route Distance	3.81 miles
Round Trip Route Distance	7.62 miles

Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Daily Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	7:30 AM	7:30 PM	30	5	12.00	60	2	24	120
Saturday	7:30 AM	7:30 PM	30	1	12.00	60	2	24	48
Sunday			30	1	0.00	60	2	0	0
<b>Total per week</b>				<b>7</b>	<b>24</b>			<b>48</b>	<b>168</b>

Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>7,368</b>

\* Source: NN Transit Service Costing Worksheet

COST ESTIMATE

Hourly Salary

Position	Hourly Salary	Annual Hours	Annual Cost
Driver*	\$20.00	8,105	\$162,096
Program Manager**	\$35.00	1,621	\$56,734
Benefits***			50%
<b>Total Staff cost</b>			<b>\$328,244</b>

\*Driver annual cost = annual rev hours + 10%

\*\*Program Manager hours = 20% of assumed driver hours

\*\*\*Benefits - adds 50% to total labor costs to account for health care, etc., per <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>.

Vehicle Type Assumptions

New or Used	Used	<--- Choose from dropdown
Buy or Lease	Buy	<--- Choose from dropdown
Vehicle Type	Cutaway	<--- Choose from dropdown
Selection Notes	OK	<--- If this box says anything but "Selections OK," please choose different options.

Mileage Cost

Vehicle Type	Cost per Mile*	Route Miles	Weekday Miles	Saturday Miles	Sunday Miles	Annual Miles	Annual Cost
Modified Van	\$ 0.62	3.32	79.7	79.7	0.0	24,470.7	\$ 15,074
Cutaway	\$ 0.70	3.32	79.7	79.7	0.0	24,470.7	\$ 17,129

\*Mileage costs based on IRS standard, plus 10% for van, 25% for cutaway

Vehicle Cost (Used)

Vehicle Type	Passengers	Estimated Cost	Model Quoted
Modified Van	11	\$ 12,900	2008 Ford E350 Gas Passenger Van
Cutaway	13	\$ 25,000	2008 Eldorado National AeroLite Ford E350

Source: Alliance Bus Group; note -- leases are typically not possible on used vehicles, but financing is an option (quoted a 36-month term for the 2008 vehicle)

Vehicle Cost (New)

Vehicle Type	Low	High	Low 2014\$	High 2014\$	Lease (monthly)
Modified Van*	\$40,000	\$50,000	\$ 50,000	\$ 60,000	
Cutaway**	\$60,000	\$115,000	\$ 70,000	\$ 130,000	\$899

\*SamTrans Community Transit Guide, 2009, page 27

\*\*SamTrans Community Transit Guide, 2009, page 28; Lease quote -- Alliance Bus Group



## Circulator: Contracted, 30-minute Headways, 9-6 a.m. Daily

**ONLY CHANGE CELLS IN RED**

Summary	Low	High
Overall Costs (Annual)	\$ 230,000	\$ 320,000

### Round Trip Cycle Time Calculation

Drive time	8 min
# stops	9 stops
Time per stop	0.5 min
One-way Time	12 min
Roundtrip Tim	24 min
Layover time	5 min
Cycle Time (x2 + 10 min layover)	29 min
One-way Route Distance	1.27 miles
Round Trip Route Distance	2.54 miles

### Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	9:00 AM	6:00 PM	30	5	9.00	29	1	9	45
Saturday	9:00 AM	6:00 PM	30	1	9.00	29	1	9	9
Sunday	9:00 AM	6:00 PM	30	1	9.00	29	1	9	9
<b>Total</b>				<b>7</b>	<b>27</b>			<b>27</b>	<b>63</b>

### Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,285</b>

\* Source: NN Transit Service Costing Worksheet

### Cost Estimate

	Low	High
Cost/Rev Vehicle Hour (2009\$)	\$60	\$75
Cost/Rev Vehicle Hour (2014\$)	\$70	\$96
<b>Annual Cost (2014\$)</b>	<b>\$230,000</b>	<b>\$320,000</b>

*for reference only*

Source: SamTrans Community Transit Guide, 2009, page 45; based on the cost of contracted Caltrain shuttles in San Mateo (including vehicles, drivers, insurance, a facility, maintenance, and fuel)

# Circulator: Contracted, 30-Minute Headways, 7:30 a.m. - 7:30 p.m. Mon-Sat

**ONLY CHANGE CELLS IN RED**

Summary	Low	High
Overall Costs (Annual)	\$ 260,000	\$ 350,000

## Round Trip Cycle Time Calculation

Drive time	8 min
# stops	9 stops
Time per stop	0.5 min
One-way Time	12 min
Roundtrip Tim	24 min
Layover time	5 min
Cycle Time (x2 + 10 min layover)	29 min
One-way Route Distance	1.27 miles
Round Trip Route Distance	2.54 miles

## Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	7:30 AM	7:30 PM	30	5	12.00	29	1	12	60
Saturday	7:30 AM	7:30 PM	30	1	12.00	29	1	12	12
Sunday			30	1	0.00	29	1	0	0
<b>Total</b>				<b>7</b>	<b>24</b>			<b>24</b>	<b>72</b>

## Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,684</b>

\* Source: NN Transit Service Costing Worksheet

## Cost Estimate

	Low	High
Cost/Rev Vehicle Hour (2009\$)	\$60	\$75
Cost/Rev Vehicle Hour (2014\$)	\$70	\$96
<b>Annual Cost (2014\$)</b>	<b>\$260,000</b>	<b>\$350,000</b>

*for reference only*

Source: SamTrans Community Transit Guide, 2009, page 45; based on the cost of contracted Caltrain shuttles in San Mateo (including vehicles, drivers, insurance, a facility, maintenance, and fuel)

# Circulator: In-House, 30-Minute Headways, 9-6 a.m. Daily

**ONLY CHANGE CELLS IN RED**

## Summary

Costs vary based on inputs in spreadsheet below

Operating Costs (Annual)	\$ 161,621
Capital Costs (Total)	\$ 25,000

## Round Trip Cycle Time Calculation

Drive time	8 min
# stops	9 stops
Time per stop	0.5 min
One-way Time	12.12 min
Roundtrip Tim	24.24 min
Layover time	5 min
Cycle Time (x2 + layover)	29.24 min
One-way Route Distance	1.27 miles
Round Trip Route Distance	2.54 miles

## Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Daily Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	9:00 AM	6:00 PM	30	5	9.00	29.24	1	9	45
Saturday	9:00 AM	6:00 PM	30	1	9.00	29.24	1	9	18
Sunday	9:00 AM	6:00 PM	30	1	9.00	29.24	1	9	18
<b>Total per week</b>				<b>7</b>	<b>27</b>			<b>27</b>	<b>81</b>

## Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,285</b>

\* Source: NN Transit Service Costing Worksheet

## COST ESTIMATE

### Hourly Salary

Position	Hourly Salary	Annual Hours	Annual Cost
Driver*	\$20.00	3,614	\$72,270
Program Manager**	\$35.00	723	\$25,295
Benefits***			50%
<b>Total Staff cost</b>			<b>\$146,347</b>

\*Driver annual cost = annual rev hours + 10%

\*\*Program Manager hours = 20% of assumed driver hours

\*\*\*Benefits - adds 50% to total labor costs to account for health care, etc.,

per <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>.

### Vehicle Type Assumptions

New or Used	Used	<--- Choose from dropdown
Buy or Lease	Buy	<--- Choose from dropdown
Vehicle Type	Cutaway	<--- Choose from dropdown
Selection Notes	OK	<--- If this box says anything but "Selections OK," please choose different options.

### Mileage Cost

Vehicle Type	Cost per Mile*	Route Miles	Weekday Miles	Saturday Miles	Sunday Miles	Annual Miles	Annual Cost
Modified Van	\$ 0.62	3.32	59.8	59.8	59.8	21,820.4	\$ 13,441
Cutaway	\$ 0.70	3.32	59.8	59.8	59.8	21,820.4	\$ 15,274

\*Mileage costs based on IRS standard, plus 10% for van, 25% for cutaway

### Vehicle Cost (Used)

Vehicle Type	Passengers	Estimated Cost	Model Quoted
Modified Van	11	\$ 12,900	2008 Ford E350 Gas Passenger Van
Cutaway	13	\$ 25,000	2008 Eldorado National AeroLite Ford E350

Source: Alliance Bus Group; note -- leases are typically not possible on used vehicles, but financing is an option (quoted a 36-month term for the 2008 vehicle)

### Vehicle Cost (New)

Vehicle Type	Low	High	Low 2014\$	High 2014\$	Lease (monthly)
Modified Van*	\$40,000	\$50,000	\$ 50,000	\$ 60,000	
Cutaway**	\$60,000	\$115,000	\$ 70,000	\$ 130,000	\$899

\*SamTrans Community Transit Guide, 2009, page 27

\*\*SamTrans Community Transit Guide, 2009, page 28; Lease quote -- Alliance Bus Group

Circulator: In-House, 30-Minute Headways, 7:30 a.m. - 7:30 p.m. Mon-Sat

ONLY CHANGE CELLS IN RED

Summary

Costs vary based on inputs in spreadsheet below

Operating Costs (Annual)	\$ 181,252
Capital Costs (Total)	\$ 25,000

Round Trip Cycle Time Calculation

Drive time	8 min
# stops	9 stops
Time per stop	0.5 min
One-way Time	12.12 min
Roundtrip Tim	24.24 min
Layover time	5 min
Cycle Time (x2 + layover)	29.24 min
One-way Route	
Distance	1.27 miles
Round Trip Route	
Distance	2.54 miles

Revenue Hours

	Start Time	End Time	Frequency (in min)	Number of days in operation	Operating Hours	Cycle Time	Buses Req'd	Daily Revenue Hours	Revenue Hours per Week (M-F)
Weekdays	7:30 AM	7:30 PM	30	5	12.00	29.24	1	12	60
Saturday	7:30 AM	7:30 PM	30	1	12.00	29.24	1	12	24
Sunday			30	1	0.00	29.24	1	0	0
<b>Total per week</b>				<b>7</b>	<b>24</b>			<b>24</b>	<b>84</b>

Annual Revenue Hours\*

Workdays	255
Saturdays	52
Sundays/Holidays	58
<b>Annual Rev Hours</b>	<b>3,684</b>

\* Source: NN Transit Service Costing Worksheet

COST ESTIMATE

Hourly Salary

Position	Hourly Salary	Annual Hours	Annual Cost
Driver*	\$20.00	4,052	\$81,048
Program Manager**	\$35.00	810	\$28,367
Benefits***			50%
<b>Total Staff cost</b>			<b>\$164,122</b>

\*Driver annual cost = annual rev hours + 10%

\*\*Program Manager hours = 20% of assumed driver hours

\*\*\*Benefits - adds 50% to total labor costs to account for health care, etc., per <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>.

Vehicle Type Assumptions

New or Used	Used	<--- Choose from dropdown
Buy or Lease	Buy	<--- Choose from dropdown
Vehicle Type	Cutaway	<--- Choose from dropdown
Selection Notes	Selections OK	<--- If this box says anything but "Selections OK," please choose different options.

Mileage Cost

Vehicle Type	Cost per Mile*	Route Miles	Weekday Miles	Saturday Miles	Sunday Miles	Annual Miles	Annual Cost
Modified Van	\$ 0.62	3.32	79.7	79.7	0.0	24,470.7	\$ 15,074
Cutaway	\$ 0.70	3.32	79.7	79.7	0.0	24,470.7	\$ 17,129

\*Mileage costs based on IRS standard, plus 10% for van, 25% for cutaway

Vehicle Cost (Used)

Vehicle Type	Passengers	Estimated Cost	Model Quoted
Modified Van	11	\$ 12,900	2008 Ford E350 Gas Passenger Van
Cutaway	13	\$ 25,000	2008 Eldorado National AeroLite Ford E350

Source: Alliance Bus Group; note -- leases are typically not possible on used vehicles, but financing is an option (quoted a 36-month term for the 2008 vehicle)

Vehicle Cost (New)

Vehicle Type	Low	High	Low 2014\$	High 2014\$	Lease (monthly)
Modified Van*	\$40,000	\$50,000	\$ 50,000	\$ 60,000	
Cutaway**	\$60,000	\$115,000	\$ 70,000	\$ 130,000	\$899

\*SamTrans Community Transit Guide, 2009, page 27

\*\*SamTrans Community Transit Guide, 2009, page 28; Lease quote -- Alliance Bus Group