TO: *Dennis Roybal***,** President, Duboce Triangle Neighborhood Association
Erik Honda, Vice-President, Duboce Triangle Neighborhood Association
Pat Tura, Treasurer, Duboce Triangle Neighborhood Association
Mark Scheuer, Recording Secretary, Duboce Triangle Neighborhood Association

FROM: *Patrick Golier,* Section Leader, Livable Streets Subdivision, SFTMA
Charlie Ream, Project Manager, Livable Street Subdivision, SFMTA

ATTACHMENTS: Proposed Circulation Changes on Upper Market Street
(SFMTA Circulation Study, April 29, 2016)
Upper Market Safety Improvement Feedback
(DTNA Letter, June 10, 2016)
Upper Market Street Pedestrian and Bicycle Safety Improvements
(DTNA Letter, April 29, 2015)

RE: Upper Market Street Safety Project Response to DTNA Feedback

Dear Duboce Triangle Neighborhood Association partners,

Thank you for your interest and collaboration in this important safety project. As residents and users of the intersections, sidewalks, bike lanes, and streets impacted by this plan, we greatly value your input. Ultimately, your input–as well as input from other community stakeholders–will lead to a stronger project for everyone.

The Upper Market Street corridor is a High Injury Corridor for people walking, biking, **and** driving. This unusual designation in San Francisco means there will be difficult trade-offs to make the street safer for all road users. SFMTA's goal is to to craft a proposal that has the greatest possible safety improvement with the fewest number of trade-offs . Our proposal to address safety on the corridor provides a balanced approach, combining street and sidewalk upgrades, potential circulation changes, and ideas for a safer, more efficient use of curb space.

We appreciate the time and effort put into the feedback you provided in your June 10, 2016 letter, which we have attached for reference (Attachment A). The goal of this response is to provide our professional perspective on the concerns you raised in your letter in the context of our work together throughout the outreach process. Below you will find our responses on the five topics that were covered in the June 10th letter: Circulation, Bulbouts, Congestion/Level of Service, Parking and Lighting.

Circulation

We began to explore potential circulation changes along the corridor in order to simplify the 6-legged intersections on Market Street at 17th/Castro, 16th/Noe, and 15th/Sanchez Streets in response to input from past outreach, community requests and surveys. We've attached an April 2015 letter from DTNA titled *Upper Market Street Pedestrian and Bicycle Safety Improvements* (Attachment B) to this effect.

Overall, something we have repeatedly heard from many in the community is that the many unusual turn movements at these intersections can make walking and driving along the corridor unpredictable and uncomfortable. Our analysis of collision data reinforces this observation, since we found high rates of collisions and injuries at these intersections. SFMTA's proposal is for changes that make the intersections more predictable and intuitive for drivers, pedestrians and cyclists. These changes include:

1. The installation of a left-turn lane and protected left-turn signal arrow where there is currently no permitted left-turning (eastbound Market Street at Castro Street), both arterial streets;
2. The installation of protected left-turn signalization (a green arrow for free left-turns) where high volumes of vehicles are currently making left-turns: westbound 16th Street at Market Street and westbound Market Street at Castro Street; and
3. A prohibition of left-turning movements where there are currently relatively low volumes of left-turning vehicles, (various movements at Noe/16th and Sanchez Streets)

These proposed changes facilitate safer and more predictable turn movements for vehicles on the arterial streets (Market, Castro, 16th) while restricting some of the lower volume turns from the side streets onto Market Street. We expect this to improve pedestrian and driver safety by significantly reducing the opportunity for conflicts between drivers and walkers, as well as among drivers. Though this could introduce some traffic delays in some locations, this trade-off in our opinion is worth the safety benefit of more predictable and intuitive intersections.

This means that for some drivers to access Market Street from side streets, they may have to shift their route choice to a different street or make an additional right or left turn to access Market Street. We feel that this can be a more desirible alternative, since it will move these turns away from the complex 6-legged intersections and distribute them among simpler four-way intersections along the wider street grid, resulting in fewer opportunities for collisions.

Market Street will always be the main vehicle and transit corridor through this region of San Francisco. The SFMTA does not anticipate that drivers will use smaller streets to traverse this neighborhood in the same manner that drivers use Market Street today. A full analysis of intersection Level of Service, vehicle volumes, and associated circulation changes are documented in the attached *Upper Market Circulation Study* (Attachment C).

Bulbouts

The SFMTA installed Painted Safety Zones—khaki paint and plastic posts—at the intersections of Noe/16th, and Sanchez/15th in 2015 to create a buffer between cars and pedestrians at these busy intersections that encourages slower turns for cars. So far, we've heard great feedback from the community on how a little paint and some plastic posts have improved vehicle turning behavior and about how these zones reduce the exposure to motor vehicle traffic for people walking along Market Street.

Upgrading many of these Painted Safety Zones to concrete bulbs, consistent with multiple planning studies that have been developed for the corridor, will shorten crossing distances for pedestrians and increase the visibility of pedestrians to drivers. This is important for both pedestrian safety and comfort.

More specifically, bulbs that have been proposed at Market and 15th Streets would shorten the crossing distances (and also the time required to get across the street) significantly:

- Crossing Chase to Hecho – approximately 15 feet shorter
- Crossing Chase to the new development on Market/Sanchez – approximately 6 feet shorter
- Crossing Hecho to new development on Sanchez – approximately 9 feet shorter
- Crossing south side of Market across Sanchez (at Verizon) – approximately 16 feet shorter

Other less tangible benefits of sidewalk bulbs include an increase in pedestrian waiting space, and provision of space for landscaping and other amenities. This is also consistent with the goals of the community as outlined in the *Upper Market Community Vision and Recommendations* plan.

With that said, over the past year, SFMTA staff have evaluated and observed driver and pedestrian behavior surrounding these painted safety zones and have incorporated this information into our proposed design for concrete corner sidewalk extensions. For example, we have decided to eliminate plans for a concrete bulbout on the north side of 16th Street, just west of Market Street based on observed vehicle turning and through-movement behavior at 16th/Market Streets. The SFMTA will conduct conceptual design and procure cost estimates for the bulbout at the north corner of 15th/Sanchez Street in front of the Chase Bank Building and conduct a cost-benefit analysis to determine whether to move forward.

Other bulbouts, like the one proposed for the east side of Sanchez Street just south of Market Street, would be paired with paint improvements to improve safety for people riding bicycles. These paint improvements include a lead-in bike lane and northbound bike box, which will define the path of travel for bicycles and give bicycles a space to queue while waiting at a red light before continuing straight on Sanchez Street.

Congestion/Level of Service

A full analysis of existing and proposed Level of Service (LOS) for each of the study intersections can be found in the attached *Upper Market Circulation Study*. This study also lists the specific benefits of the proposals at each intersection and the effects on LOS and intersection delay.

The Market Street corridor is exceedingly complex as it carries high volumes of pedestrians, cyclists, drivers, Muni bus lines and the F-Line streetcar through intersections with very unusual 6-legged geometries. This creates a very constricted environment where a change to one signal phase or one turning movement has consequences that ripple throughout the corridor and beyond. Unfortunately, this limits our ability to make substantial signal timing adjustments along the corridor since many seemingly benign changes would take the entire network out of equilibrium.

Some of the changes proposed to improve pedestrian safety on the Upper Market Street corridor will impact vehicle flow and delay for vehicles on Market Street and adjacent side streets. It our goal to craft a final proposal that achieves the most positive impact for all modes of travel on Market Street with the comparatively least amount of impact to transit vehicles, commercial vehicles, and private automobiles.

When analyzing the impacts of proposed improvements, the SFMTA has taken into account the delay for east- and westbound Market Street and how this delay would potentially affect the F-Line light rail trains.

Minimizing the delay to Market Street is vital to maintain this heavily-used transit service as well as maintaining vehicular travel on Market Street as a through-corridor linking the east and west sides of the city.

For drivers crossing Market Street, several streets will see a decrease in congestion and delay due to the prohibition of left-turning movements that cause intersection friction or due to the addition of protected left-turn arrows as a separate signal phase. For example, the addition of a left-turn arrow for westbound 16th Street substantially decreases the delay on this congested approach.

While there are trade-offs to every proposed improvement, the SFMTA has made tactical decisions to improve the safety for users of the corridor while minimizing impacts to the heaviest movements at the Noe/16th and Sanchez/15th intersections as well as to the 20,000 people who use the F-Line every day.

Parking

Through this project, the SFMTA has also conducted a full census of the existing curb regulations (e.g., general and accessible parking, loading, and short-term use) along Market Street and adjacent side streets. Based on this assessment, the SFMTA has come up with an initial proposal to facilitate further discussion with the community on how to more efficiently manage parking, loading, and pick-up/drop-off along the Upper Market Street Corridor. We look forward to additional resident and merchant input to consider holistic, rather than piecemeal, changes to the curb managment along the corridor that reflect current usage and demand.

The 5 basic tenets of this proposal are:

1. Increasing easily accessible commercial loading spaces: Commercial loading spaces are often in short supply or difficult for large vehicles to access, which leads to double-parking in the bicycle and travel lanes on Market Street. By adding spaces where necessary and making them more accessible for large vehicles, this proposal could reduce double-parking on Market Street
2. Provide Accessible Parking spaces where people need them and meet City standards: City standards call for one accessible blue parking zone for each commercial block face. The proposal intends to provide a sufficient supply of on-street accessible parking spaces.
3. Increase passenger loading spaces where pickups and drop-offs are occurring: Identify where demand for passenger pickup and drop-off is highest and provide loading zones to decrease occurance of double-parking.
4. Increase the supply of managed commercial parking: The Upper Market Street commercial corridor extends onto side-streets in many locations and merchants rely on a managed parking supply to ensure turnover during business hours. While commercial metering currently exists on some side-streets such as Noe Street and 14th Street, there are several locations on side streets that are not directly in front of single-family residential homes where metered commercial parking spaces could be added to increase commercial parking availability.
5. Increase the supply of short-term parking spaces for shorter errands: Increasing short-term loading will support the goal of reducing double parking by allowing pickups and drop-offs to occur in the parking lane rather than the bike lane or travel lane.

Lighting

We understand that side street lighting is a priority for the neighborhood. The San Francisco Public Utilities Commission (SFPUC) is responsible for maintaining and installing new street lighting in San Francisco. The SFMTA will forward the community concerns over street lighting to the correct representative at the SFPUC. The funding for the Upper Market Street Safety Project is dedicated to improving safety for all roadway users on the Market Street corridor in order to support the City's Vision Zero goals. We are making safety improvements to streets, sidewalks, and signals in order to meet these goals. Unforunately, lighting is outside of the Upper Market Street Safety Project's scope.

Next Steps:

Each of the three main components to this project can be designed and implemented independent of each other. It is our intent to complete conceptual design and legislation on the Streets and Sidewalk component in the second half of 2016 so that we are able to hand the work off to San Francisco Public Works for detail design and construction, which would take place in 2017 and 2018.

The Curb Management and Circulation portions of the project are moving forward on a separate timeframe. The SFMTA will begin further outreach on these elements in Summer/Fall 2016.

We commit to working with DTNA and the other stakeholder groups as we finalize our scope of work and move towards legislation on this important safety project. Thank you again for your time and interest in this work.

Please feel free to contact Charlie Ream, the Project Manager for the Upper Market Street Safety Project, with any questions or comments. Also, please visit https://www.sfmta.com/uppermarket and sign up for email updates related to this project under the "Receive Updates" tab at the top of the home page.

Charlie Ream
Project Manager
charlie.ream@sfmta.com
415-701-4695

Duboce Triangle Neighborhood Association

6/10/16

UPPER MARKET SAFETY IMPROVEMENTS FEEDBACK

DTNA is excited for the opportunity to work with SFMTA on neighborhood safety improvements. DTNA initiated the first Upper Market design charrette fifteen years ago suggesting at the time progressive improvements. We now welcome the opportunity to refine a plan that leverages our neighborhood experience and SFMTA traffic expertise. We look forward to expanding the conversation with deeper participation now that SFMTA has a preliminary proposal, which will enable community engagement in the process.

Upper Market is a livable neighborhood that supports a sustainable urban living environment with multiple modes of transportation. Sidewalks, bike lanes and approaches to the major intersections are critical elements of the public domain. In order to maintain the quality residential character, the residents of Upper Market seek to ensure safety and livability of the streets and intersections. We travel through the chaos of the six point intersections every day and we seek solutions. We appreciate the technical evaluation and recommendations by SFMTA.

For the past several years, Duboce Triangle Neighborhood Association, DTNA, has worked with the contributing developers for this project. We appreciate the money that has been earmarked for an Upper Market Safety Project and want to ensure that every penny spent will add value and have a high return on investment for the residents and visitors to our neighborhood. We are sensitive to any proposal that endangers the residential character of our livable neighborhood. While we border a commercial district, we are a residential neighborhood, and we will do everything to protect the character of our streets and property.

We have discussed the SFMTA proposal with multiple members of our community and have responded by categories to the multiple factors of this project. Since this is a complex project we want to work with SFMTA to make sure the final plan is right for our neighborhood and for the people traveling through our neighborhood on their way to other parts of the city.

From neighborhood stakeholders, there is a general consensus that the trade-offs SFMTA is suggesting will work with some modifications. Overall, we do not support a diversion of increased traffic volumes and turn movement to adjacent residential streets and intersections. Duboce Triangle is a quiet, highly pedestrian friendly

neighborhood (Walk Score: 97) with multiple parks, schools and similar facilities. We do not want to turn our tree-lined streets with high-valued real estate into vehicle thoroughfares. The inner streets of the Duboce Triangle neighborhood were not built to manage high-density traffic and should not serve as alternatives to Octavia Street, 19th Avenue and other corridors designed for multi-lane high-density traffic. For example, 15th Street and Henry were designed for residential traffic and are now being proposed as thoroughfares. 15th Street currently functions in the range of LOS E and F. We also feel that SFMTA has missed some critical safety concerns Noe and Sanchez intersections that are critical and need solution.

Circulation:

DTNA has several thoughts regarding the many aspects to the proposed circulation plan. Questions regarding results and quality are major concerns. Currently, Market Street serves as a thoroughfare that allows people from points North and South to access in order to travel East to West. The neighborhood stakeholders are having a difficult time envisioning how the suggested routes changes will streamline the traffic flow. For example, neighbors want to know what types of data are available in order to understand how traffic will flow west off Market Street towards Twin Peaks? How will traffic flow North from the Noe Valley neighborhood to travel West on Market.

The neighborhood has considerable concern regarding the proposal for left turns off Market Street. We understand that eliminating left turns from Market Street is a citywide initiative of SFMTA; however, the proposal's creation of a left turn lane at the corner of Castro Street and Market Street degrades the intersection's letter of service from A to D. In all the traffic studies DTNA has been involved in, LOS D has never been considered acceptable. Castro Street recently went through a complete redesign and we do not want the commercial traffic problems of Castro Street extended to the Duboce Triangle residential street. Castro Street has already seen a disproportionate impact from the high volume of double decker, diesel buses not designed for city service, but instead designed for long distance. These loud, high impact vehicles serving companies outside the City have overwhelmed a street historically served by zero emissions, low impact electrified busses. But of particular concern with respect to the traffic changes, these buses stopping on the side of Pottery Barn, which is Castro Street and already create vehicle hazards on a street designed for one lane of traffic See photo of a typical day at the corner of Castro and Market.

The distance of the stopped vehicles on east bound Market coming down the Twin Peaks hill, from the cross walk due to the parallel 17th Street approach creates a particular hazard in this cross walk that is completely unnecessary. This intersection is difficult enough to pass heading west on Market without the addition turn of traveling north on Castro.

At 16th/Noe/Market there are three critical safety issues for pedestrians and cars that have not been addressed:

1. Traveling south on Noe and turning right from Noe to Market. There is a collision of automobile and pedestrians at this juncture.
2. Traveling north on Noe and turning right from Noe to Market. Pedestrian are in the middle of the crosswalk traveling west to east on Market where to two meet. Because it's a long travel distance for the cars traveling onto Market Street the cars pick up speed and meet the pedestrians at significant speed for an intersection.
3. Traveling east on Market Street and making a left turn onto 16th Street. While there is a protected left turn lane there needs to be a left turn signal because cars meet head on in both directions on Market.

Level of Service (LOS)

The SFMTA plan significantly reduces the current level of service of the three intersections. If the general consensus is that traffic is not acceptable now, then how does the decreases the quality of travel address the current congestion? We find this to be unacceptable.

The residents of Duboce Triangle perceive Market Street and 16th Street as the main arteries for through traffic. When people leave the neighborhood, they use 16th Street and Market Street to get downtown and to the access the freeway. The proposed plan traps cars onto the small neighborhood-scale street without access onto Market and limits travels on 16th Street. The plan diverts traffic off Market into the residential neighborhood streets, which were not meant for high-density traffic or to be thoroughfares. Residents do not want to change our tree lined two lane streets into car-dominated thoroughfares.

16th/Noe/Market and 15th/Sanchez/Market currently function at LOS F. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely thorough a major street traffic stream This LOS is particularly evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches.

In past studies Castro St/15th St. was reported to function at LOS E. The current study does not even take into account the cumulative negative contribution to an already unacceptable LOS.

Neighbors have asked why installing left turn signals at strategic points, particularly for Market Street traffic, is not an option, such as turns onto Noe from Market St.

Proposed Changes- 17th/Castro/Market St

Average existing AM C (27.3)
Proposed AM C (34.1)
Decrease in service -6.8
Market St both WB and EB would see significantly higher volumes

Average existing PM D (35.2)
Proposed PM D (44.1)
Decrease in service -8.9

Proposed Changes 16th St/Noe St./Market St

Average existing AM C (28.6)
Proposed AM C (33.4)
Decrease in service -4.8
Market St both WB and EB as well as 16th EB would all see significantly higher volumes

Average existing PM C (31.0)
Proposed PM C (30.7)
Increase in service +0.3
Noe NB, 16th St WB and Noe SB would see slightly lower volumes and fewer delays, while Market WB, 16th EB and Market EB would all see higher volumes and more delays.

The three critical issues addressed on page 2 & 3 in this feedback need to be addressed by SFMTA for pedestrian safety at this intersection.

Proposed Changes 15th St/Sanchez St./Market St

Average existing AM C (33.7)
Proposed AM C (31.1)
Increase in service +2.6
Market St. east bound will improve while 15th Street east bound will experience higher volumes and more delays.

Average existing PM C (29.9)
Proposed PM C (31.5)
Increase in service -1.6
15th Street will experience higher volumes and more delays

Parking

Market Street is a "Protected Pedestrian and Transit-Oriented Street". To better assess the impact offloading activities on traffic and pedestrian flow, the Market Street loading should be restricted to morning business hours and available for general parking for the remaining hours of the day after 1:00pm.

1. Castro, on the side of Pottery Barn- narrow passage with Commuter buses
2. Castro, on the side of RC station- 2 spaces should be metered
3. Market- North side (between Castro Street & Noe Street) –
    a. Red meter should have extremely short hours, as red- the rest of the time should be regular metered parking.
    b. Eliminate new white zone in front of (former) Check Cashing on Market, just west of 16th north side.
4. Market- South side (between Castro Street & Noe Street) eliminate all or most of 8 motorcycle spaces, they are not used or have never been used.
    a. Green zone in front of Coldwell Banker not necessary- it's a real estate office, not a bank.
    b. Eliminate white zone in front of the Café, not necessary
    c. 5 yellow-metered zones are too many. Flower shop ordered one many years ago, which should stay along with one other. Drive by during the day and you will see the delivery trucks never use the empty parking spots.
5. 16th Street between Castro Street & Market Street
    a. Remove meters on 16th St. This is a residential area with limited parking. When residents come home late at night sometime those are the only available spaces and they should not be penalized by having to pay to park on their residential street. Yellow Zone in front of Lookout entrance should become 2 metered yellow zone spaces.
6. Noe Street- North of Market Street
    a. 2 yellow zones is too many in front of La Med, they will not get used.
7. Noe Street- South of Market Street
    a. Need commercial parking
8. 16th Street, between Market Street & Sanchez Street
    a. No green zone necessary in front of Bank of the West.
    b. 2 yellow zones is one more than necessary in front of Flower Stand
9. Market Street north side, Noe Street to 15th Street
    a. 2 driveways in front of Sullivan's no longer necessary or grandfather one for residence parking (Both of these will go away when new project is constructed. Parking entrance will be on 15th St.)
    b. Can Beck's double driveway be converted to a single curb cut?
10. 15th Street and Market Street
    a. Remove the meters on 15th Street. This is a residential area with limited parking. When residents come home late at night sometime those are the only available spaces and they should not be penalized by having to pay to park on their residential street.

Bulbouts:

Bulbouts at 16th /Noe/ Market Streets will contribute to shorter travel distance. However, the most critical issue at this intersection is the Market Street travel distances and SFMTA has no recommendations. The suggested bulbouts in this intersection are nice to have but not necessary to have.

Bulbouts at 15th/Sanchez/ Market Street are unnecessary and actually create a hazard for bikes. Cyclists are currently pinched Northbound on Sanchez in the approach to Market Street. Multiple neighborhood cyclists have noted that he current SFMTA proposal as creating an increased danger to an already dangerous approach. DTNA strongly recommends removing the bulbout in front of the pet store to prevent endangering cyclists.

The additional proposed bulbout at this intersection is at the Chase Bank and the Hecho restaurant. The crossing distance is currently completely acceptable and we see this as a waste of financial resources. The funding is critical to the safety of our neighborhood and these two bulbouts offer no gain. The planned bulbout at the current constructions site of GreyStar is consistent and valid to serve pedestrians, cyclists and car circulation. We strongly urge you not to spend our money in pointless solutions looking for a problem.

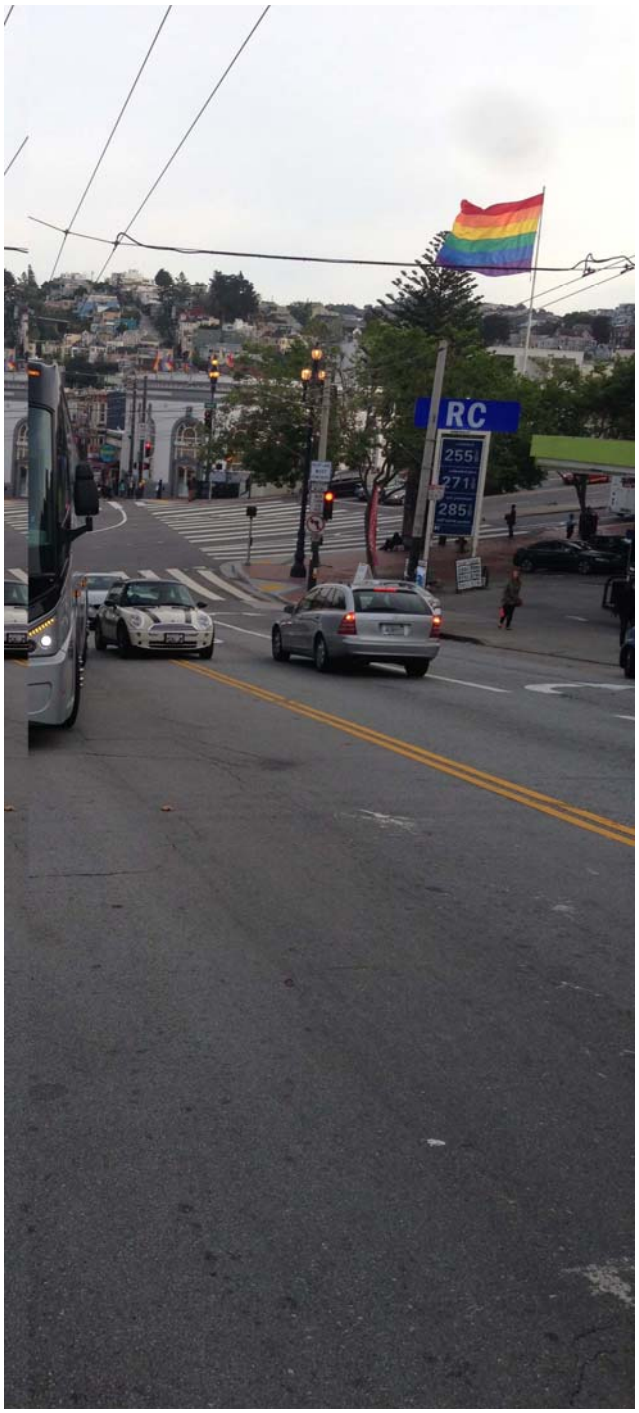
Bulbout addition to Duboce Street and Market Street with the elimination of the right turn onto Market Street is understandable. What is not acceptable is the design of the bulbout. This massive amount of concrete brings no appealing value to our neighborhood. We would like to see some thought put into this pork chop replacement.

Lighting

The Upper Market Safety project is not just about making Market Street safer, it is about making our neighborhood safer. Pedestrian lighting along side streets leading to Market Street is an important addition to this plan. Sanchez Street between Market Street and Noe Street is a perfect example of where pedestrian lighting would solve the problem of dark areas and make walking more accessible to residents. The island at the corner of Noe Street and Beaver Street could greatly improve the pedestrian realm. We want to reinforce spaces for pedestrians to populate and feel safe. The money is approved for public realm improvements. While it is known that lighting is not under SFMTA, the Duboce Triangle neighborhood is requesting that city agencies work together and share the funding available for Upper Market. This is an areas of great interest for the neighborhood and we would like to get more input and work with you to make this a key feature in the overall plan.

While DTNA is not a professional organization like SFMTA, we are a San Francisco community. We would like to remind SFMTA of the feedback that we have shared with you from 335 people.

- 73% don't want left turns eliminated off Market Street
- 74% felt that directional turn signal should be added.
- 79% of participants felt that directional street graphics should be painted on the pavement for drivers at the intersections of 15th /Sanchez/Market Street and 16th/Noe/Market Street
- 76% of participants want graphic treatments on the crosswalks to clearly delineate walking area to make it safer for pedestrians.
- 75% of pedestrians want a leading pedestrian interval before cars are allowed to turn onto Market Street from Noe Street
- 71% felt that pedestrians should receive a leading pedestrian interval before the green light to allow more time for crossing.
- 45% of the participants found the current signage at all intersections within the corridor is not effective to inform and guide drivers, cyclist and pedestrians.


RC
255
271
285

Duboce Triangle Neighborhood Association

WALK SAN FRANCISCO

SAN FRANCISCO BICYCLE COALITION

Wednesday, April 29 2015

Ed Reiskin
Director
San Francisco Municipal Transportation Agency
1 South Van Ness, 7th Floor
San Francisco, CA 94103

CC: Supervisor Scott Wiener

RE: Upper Market Street Pedestrian and Bicycle Safety Improvements

Walk San Francisco, the Duboce Triangle Neighborhood Association (DTNA), and the San Francisco Bicycle Coalition have come together to discuss in-depth the various safety issues concerning Upper Market Street. We are pleased that the SFMTA is considering a series of streetscape and safety changes to Upper Market Street, a high injury corridor that also serves as an important neighborhood and merchant corridor. We strongly encourage you to implement strong safety improvements as well as improvements to maintain the vitality of the local retail and neighborhood scene.

Over the course of several conversations, we have jointly identified pedestrian and bicycle safety improvements along the Upper Market corridor that we recommend for immediate implementation. These recommendations would not only help to improve pedestrian and bicycle safety in the Upper Market Street area, they would help to achieve the City and SFMTA's Vision Zero goal to eliminate all traffic deaths and serious injuries in ten years. The recommendations are as follows:

- **Improved signal timing**: Currently the signal timing at several complex intersections (such as Market/16th/Noe, and Market/15th/Sanchez) forces pedestrians to wait multiple cycles in order to continue walking straight across the intersection. Improved signal timing will make crossing these intersections more convenient for pedestrians and people biking, reducing safety issues like jaywalking. Signal timing has also been an issue for people biking, and in particular for people trying to cross Market Street on 14th Street who, because of the short signal timing, don't have enough time to complete the crossing on bike.

- **Pedestrian Safety Zones and Bulbouts:** The complex intersections along Market Street are a major pedestrian safety concern for the community. We would like to see the immediate implementation of Pedestrian Safety Zones at the intersections of Market and 14th/Church, Market and 15th/Sanchez, and Market and 16th/Noe. The complex intersection at 16th Street and Market Street is also of particular concern for the community. A bulbout was installed at this intersection to improve pedestrian safety, but due to the angle at which traffic approaches the intersection, the bulbout appears to be dangerous for pedestrians. This is evidenced by tire marks on the concrete curb, and anecdotal evidence of near misses, and should be addressed through Upper Market safety improvements.

  Pedestrian Safety Zones should be implemented in the interim only and should not replace future permanent bulbouts. It is our understanding that concrete bulbouts should be implemented sometime in 2016 and the SFMTA must stick to this timeline. Attention should also be paid to the design of the Pedestrian Safety Zones to reflect and enhance the character of the streetscape.

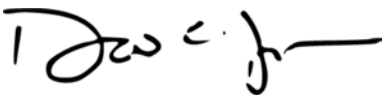
- **Bicycle Safety Improvements:** Collision data on Upper Market dictates a strong need for bicycle safety upgrades along the length of the corridor. We would like to see safety upgrades to the existing bicycle lanes from Octavia to Castro, with a parking-protected bicycle lane on the uphill portions of the route, and in particular between Octavia to Market/Duboce/Buchanan. Protected bicycle lanes are shown to significantly increase safety not only for people biking, but also for people walking and people driving. The data show that protected bike lanes are needed on this section of Market Street to reduce the unusually high rate of collisions.

- **Improved signage:** Much of the signage along Upper Market Street is currently confusing to people walking, biking, and driving. We encourage the SFMTA to implement signage to help simplify intersection movements and reduce driver confusion.

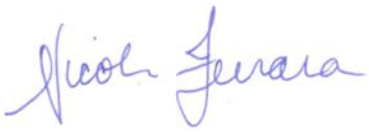
- **Begin a comprehensive traffic study:** We would like to see SFMTA undertake a comprehensive traffic study of the Upper Market corridor that considers more permanent solutions to the pedestrian and bicycle safety issues that currently exist. This study should include consideration of street closures, road diets, and other measures that may significantly improve the safety of the corridor. This study should not preclude any interim traffic safety improvements.

Walk San Francisco, DTNA, and the San Francisco Bicycle Coalition strongly encourage you to take these recommendations into consideration as you finalize designs for the Upper Market Street Improvement Project. These suggestions are in alignment with the City and SFMTA's Vision Zero goal, and with the neighborhood goal of improving safety and quality of life for residents and merchants alike. We look forward to celebrating this project with you and appreciate your efforts to improve the Upper Market Street area.

Sincerely,



David Troup
President
Duboce Triangle
Neighborhood Association



Nicole Ferrara
Executive Director
Walk San Francisco

Noah Budnick
Executive Director
San Francisco Bicycle
Coalition

ATTACHMENT C

April 29, 2016

Proposed Circulation Changes on Upper Market Street at 17th/Castro, 16th/Noe and 15th/Sanchez Streets

Executive Summary

Introduction

The SFMTA's Upper Market Street Safety Project includes the design and implementation of safety improvements for people walking, riding bikes, taking transit, and driving in the Upper Market Street corridor from Castro Street to Octavia Boulevard. The core of the project is a suite of engineering improvements including signal timing, striping and concrete work to improve the safety and comfort of pedestrian crossings, better separate bicycle and vehicle traffic, and improve the safety of intersections for vehicles and bicycles.

SFMTA has developed two additional components of the project, in response to community inputs. One is a comprehensive plan to better manage curb space for parking, loading and delivery. The other is this circulation study.

Circulation Study

At the request of the community, SFMTA undertook this circulation study to explore additional changes to signal timing, phasing, and vehicle movements at the intersections of 17th/Castro/Market, 16th/Noe/Market, and 15th/Sanchez/Market Streets. SFMTA based the design of potential circulation changes on community input, as well as staff observations and analysis, as described in this report. Shaped by this input, the primary goals of the study were to:

- Better protect people walking, bicycling, and driving
- Reduce complexity and the potential for conflicts between various modes of travel
- Reduce the prevalence of vehicles weaving between each other through intersections

Proposed Changes

Appendix I provides an illustrated map of the proposed changes and safety improvements along with a bulleted summary. Appendix II provides an illustrated map of anticipated diversion, or net changes in vehicle volumes as modeled by SFMTA staff. The proposed circulation changes are:

- 17th/Castro/Market
  - Add protected left turn phases for east- and westbound Market Street
- 16th/Noe/Market
  - Add protected left turn phase for westbound 16th Street
  - Prohibit left turns from Noe Street and eastbound 16th Street
- 15th/Sanchez/Market
  - Prohibit left turns from Sanchez Street

Background

Prior Planning

The improvements in this circulation study are strongly rooted in recommendations from years of prior planning as documented in the following reports: Castro & Upper Market Retail Strategy (2015), Duboce Triangle Neighborhood Association (DTNA) Online Upper Market Survey (2013), Market-Octavia Area Plan (2010), Upper Market Vision & Recommendations (2008), and Castro/Upper Market Community Benefits District (Castro CBD) Neighborhood Beautification and Safety Plan (2008). Appendix III includes excerpts from these reports that document some of the community's requests for transportation safety improvements along Upper Market Street, which influenced the recommendations of this study.

Public Outreach

As SFMTA has worked to translate the recommendations of the community's prior plans into physical designs, agency staff conducted numerous meetings with members of the public and Community Leaders (representing Duboce Triangle Neighborhood Association, Castro Merchants and Castro CBD) to solicit input, including but not limited to:

- Market Octavia Citizen Advisory Committee – October 20, 2014
- Community Leaders Meeting – October 27, 2014
- DTNA Monthly Meeting – December 8, 2014
- Community Leaders Meeting – March 13, 2015
- Community Open House – May 5, 2015
- Community Leaders Meeting – September 25, 2015
- Curb Management Workshop – November 18, 2015
- Community Leaders Meeting – April 1, 2016

In addition, SFMTA has briefed Walk San Francisco (WalkSF) and the SF Bicycle Coalition (SFBC) on the project several times at regularly scheduled SFMTA meetings. Throughout these meetings, and in the prior planning documents, Upper Market Street community leaders, members of the public, and pedestrian and bicycle advocates have repeatedly requested that SFMTA develop technical solutions to address the complexity of the 5- and 6-legged intersections along Market Street to reduce confusion and potential for conflict between modes of travel – especially between people walking and driving.

In May 2015, SFMTA proposed a circulation study as a "future possibility" that would follow the implementation of long-term improvements that are currently in design; however, in response to community requests, SFMTA has undertaken a *focused* circulation study to accelerate exploration of opportunities to reduce complexity at the following intersections:

- 17th/Castro/Market
- 16th/Noe/Market
- 15th/Sanchez/Market

SFMTA elected not to study additional changes at 14th/Church/Market because of recent signal improvements made at that intersection. This report summarizes the study and its findings, and also describes potential circulation changes that were not studied in detail, but which could be explored at a future date if additional improvements are desired by the community and/or the SFMTA.

Developing and Testing the Potential Changes

At the request of the community, the goal of this circulation study was to explore changes to signal timing, phasing, and vehicle movements to reduce complexity and the potential for conflicts between various modes of travel at the intersections of 17th/Castro/Market, 16th/Noe/Market, and 15th/Sanchez/Market Streets. SFMTA staff based the design of potential circulation changes on the observations, analysis and community input as described in the above existing conditions and background sections. The primary goal of the study was to better protect people walking, bicycling, and driving, and to reduce or better separate the weaving between vehicles that occurs when people driving are allowed to make permitted turn movements.

Data Driven Approaches to Safety

Upper Market Street is on the vehicle, bicycle and pedestrian high injury network. In support of Vision Zero, the City's goal of eliminating severe and fatal traffic injuries, the SFMTA seeks to employ data-driven strategies to improve intersection safety for all modes, with special emphasis on the most vulnerable road users: people walking.

As documented by the joint San Francisco Planning Department and SFMTA WalkFirst pedestrian safety program[1], left turn movements disproportionately contribute to traffic injuries, citywide. Vehicles making left turns are also cited by SFMTA staff and members of the public as less predictable for people walking. As such, this focused circulation study explored the potential of reducing and/or better controlling left turn movements at the large, multi-legged intersections on Market Street to improve safety for all road users.

In general, staff studied left turn prohibition on the streets with the lowest volume of left turns to minimize the volume of vehicles that would be diverted. Where higher volumes of left turns were present or expected, staff chose instead to study the potential of protecting the left turn movement.

Methodology

SFMTA performed intersection Level of Service (LOS) analysis using Synchro software to evaluate the performance of each of the three intersections along the corridor for both AM and PM peak hours. LOS provides a letter grade 'A' through 'F' corresponding to the level of delay, with 'A' meaning there is no delay and 'F' meaning there is a long delay before a vehicle can clear the intersection. This analysis provides a "worst case" scenario using the peak 15-minutes of the AM and PM peak hour volumes on the corridor and provides the existing and proposed vehicle delay for each movement, to allow side-by-side comparisons.

SFMTA staff modeled the performance of potential individual circulation changes at each intersection in isolation. Staff then combined the proposed changes that proved feasible into a larger scenario model to determine impacts across all four intersections, including 14th/Church/Market[2].

Appendix IV includes detailed tables showing traffic volumes and LOS for approach, approach average, and intersection average, for both existing and proposed scenarios.

[1] http://walkfirst.sfplanning.org/

[2] While no circulation changes are proposed at 14th/Church/Market, some diversion of vehicles to this intersection is expected, as shown on the map in Appendix II in the tables within Appendix IV.

Making Trade-offs

Simplifying movements at these complex intersections necessarily requires making certain trade-offs. When one vehicle movement is prohibited to reduce potential conflicts with pedestrians, bicyclists or other drivers, that movement must go to another segment of the network. As such, SFMTA acknowledges that restrictions on vehicle movements at certain intersections will result in diversion of volumes and turn movements to adjacent streets and intersections.

SFMTA attempted to limit or mitigate increases in vehicle delay and diversion that would result from the proposed changes. However, in line with the study's goals of reducing complexity at the corridor's large and multi-legged intersections, some diversion of left turns to simpler 4-way intersections, and some diversion of left turns to a series of right turns or alternative routes was determined to be acceptable. Where possible, SFMTA staff has been able to improve the level of service for certain approaches by adjusting signal timing along with the proposed circulation changes.

Diversion

Appendix II includes a "context" map that shows traffic diversion anticipated by SFMTA staff. The figures on this map represent the net increase/decrease of traffic on each street that is expected to result from the proposed changes. While SFMTA cannot accurately predict all of the choices drivers will make, the agency is committed to studying the impacts of any implemented changes and responding to community feedback. Should the community and/or SFMTA determine that adverse impacts result from the implementation of proposed improvements, SFMTA will work with the community to reinstate the prior configurations and/or pursue modifications to the changes.

Existing Conditions

The SFMTA conducted AM and PM peak hour traffic counts at the study intersections in January 2016 to ensure the most recent data would be used in the circulation study. See Appendix IV for traffic volumes. The following section details SFMTA analysis and community input that framed the circulation study's approach to developing improvements at each intersection.

17th/Castro/Market – Existing Conditions
Vehicle through, left, and right turn volumes are highest along Market Street, and lower along Castro Street. The eastern leg of 17th Street is closed at Jane Warner Plaza except for Muni F-line movements, and the western leg of 17th Street is one way away from Market Street. Currently, left turns are prohibited from Castro Street onto Market Street in both directions and prohibited from eastbound Market Street to northbound Castro Street; left turns are permitted/protected from westbound Market Street to southbound Castro Street.

Because the left turn from westbound Market onto southbound Castro Street is permitted-protected, people crossing Castro on the south side of Market may be exposed to vehicles making left turns. Because left turns are prohibited on eastbound Market Street, some people choose to drive on eastbound 18th Street to reach northbound Castro Street. This results in increased through traffic on these streets, as well as increased left turns from eastbound 18th Street onto northbound Castro Street.

16th/Noe/Market – Existing Conditions
Vehicle through and right turn volumes are highest along Market Street, and lower and roughly equal along Noe and 16th Streets. The highest volume left turn at this intersection is from westbound 16th Street onto westbound Market Street, comprising nearly half of all left turns at this intersection. No turn movements are prohibited or protected.

Because all turn movements are currently allowed, a person entering this intersection – whether they are walking, riding a bike or driving – can expect a vehicle to potentially cross their path during all phases. The geometry of these three intersecting streets creates an especially large intersection and therefore long travel distances for vehicles making most turns. These factors contribute to confusion and an increased perception of risk for people walking, riding bikes and driving. It can be difficult for people to anticipate the movements for vehicles, bikes and pedestrians under these conditions.

In addition to these general conditions, the SFMTA and community members have observed the following specific challenges at this intersection:

16th Street traffic often experiences delay and confusion as opposing directions of traffic attempt to make through and left turn movements. For example, when one driver is waiting to make a left turn from westbound 16th Street onto Market Street, they may temporarily block the path of a vehicle coming toward them that is attempting to make a through or left turn movement along eastbound 16th Street. This condition sometimes results in westbound vehicles being unable to complete their turn movements within the allotted signal time, and they may end up blocking the intersection or crosswalk.

Noe Street traffic experiences similar delay and confusion with opposing through and turning movements. Additionally, people driving northbound on Noe Street making right turns onto

Market Street are sometimes confused by the red traffic signal they observe on Market Street (which is holding Market Street traffic) and stop before completing their turn. When this happens, these vehicles may block traffic on 16th Street, which has the following phase.

Because left turns are currently prohibited from eastbound Market Street onto northbound Castro Street, people driving inbound the from the west who want to access northbound Castro or Divisadero Streets contribute to part of the volume of left turn movements from eastbound Market Street onto westbound 16th and northbound Noe Streets. These left turn movements create the potential for conflict between people driving and people walking across 16th and Noe Streets on the north side of Market Street.

15th/Sanchez/Market – Existing Conditions

Vehicle through volumes are highest along Market Street, and left turn volumes are roughly equal along Market and along 15th Streets. Sanchez has the lowest left turn volumes.

People driving and riding bikes are permitted to make left and right turns from all approaches to this intersection. As such, a vehicle may be expected in any crosswalk during every phase. The three intersecting streets also create an especially large intersection and therefore long travel distances for vehicles making most turns. These factors contribute to confusion and an increased perception of risk for people walking, riding bikes and driving. It can be difficult to anticipate the direction of movements for vehicles, bikes and pedestrians under these conditions.

In addition to these general conditions, the SFMTA and community members have observed the following specific challenges at this intersection:

Sanchez Street traffic often experiences delay and confusion as opposing directions of traffic attempt to make through and left turn movements. For example, when one driver is waiting to make a left turn from southbound Sanchez Street onto Market Street, they may temporarily block the path of a vehicle coming toward them that is attempting to make a through or left turn movement along northbound Sanchez Street.

Sanchez Street is a designated bicycle route in part because of the connection it provides to the Wiggle bike route. Left turn movements from Sanchez Street onto Market and 15th Streets can pose a particular hazard to people riding bikes on Sanchez, as they may be obscured behind vehicles waiting to make left turns.

Proposed Circulation Changes

The following section describes the proposed changes at each study intersection, including benefits and trade-offs. Readers may find it helpful to reference the maps in Appendix I and Appendix II in parallel with the following descriptions of proposed changes.

17th/Castro/Market – Proposed Changes

SFMTA proposes a new dual protected left turn phase for turns from east- and westbound Market onto Castro Street. Eastbound Market Street would be given a new 100-foot long left turn pocket, and westbound Market Street would use the existing left turn pocket. New signal hardware would be required at this intersection, and signal timing would be adjusted to create the new separated phase.

17th/Castro/Market – Benefits

A dual protected left turn phase would better serve the demand for vehicle travel from points west of Upper Market to northbound Castro and Divisadero Streets. Protecting the phases would eliminate the potential for left turn collisions between vehicles and pedestrians crossing both legs of Castro Street.

This change would reduce the volume of cut through traffic using 18th Street to access Castro Street, thereby improving traffic flow on both 18th and Castro Streets, and reducing the potential for left turn collisions between vehicles and pedestrians crossing Castro Street on the north side of 18th Street.

This change would also reduce the volume of left turns from eastbound Market Street to westbound 16th and northbound Noe Streets; some of these turns are now assumed to take place in the new protected left turn phase on northbound Castro Street. This would further reduce the potential for conflicts between vehicles and people crossing 16th and Noe Streets on the north side of Market Street.

In the AM peak hour, northbound Castro Street experiences a decrease in delay of one letter grade, from D to C, and there is a minor decrease in delay on northbound Castro Street in the PM peak hour.

17th/Castro/Market – Trade-offs

In the AM peak hour, the proposed improvements result in increased delay for westbound Market Street of three LOS letter grades, from A to D, staying within acceptable performance. There are minor increases in delay on eastbound Market Street and for the intersection overall, but the changes remain within existing letter grades.

In the PM peak hour, the proposed improvements result in increased delay for westbound Market Street of two LOS letter grades, from A to C, staying within acceptable performance. There are minor increases in delay for Market Street east- and westbound, and for the intersection overall, but the changes remain within existing letter grades.

Existing AM Peak	Castro NB	Market WB	Castro SB	Market EB
Approach LOS	D (36.2)	A (4.8)	D (45.8)	C (28.7)
Intersection LOS	C (27.3)			

Proposed AM Peak	Castro NB	Market WB	Castro SB	Market EB
Approach LOS	C (31.5)	D (35.8)	D (45.8)	C (30.5)
Intersection LOS	C (34.1)			

Existing PM Peak	Castro NB	Market WB	Castro SB	Market EB
Approach LOS	C (32.3)	A (2.6)	F (115.6)	C (22.7)
Intersection LOS	D (35.2)			

Proposed PM Peak	Castro NB	Market WB	Castro SB	Market EB
Approach LOS	C (29.8)	C (24.4)	F (115.6)	C (26.9)
Intersection LOS	D (44.1)			

Key:
blue text indicates negative change from existing scenario (higher volumes, more delay)
green text indicates positive change from existing scenario (lower volumes, less delay)

<u>16th/Noe/Market – Proposed Changes</u>
SFMTA proposes a new protected left turn phase for westbound 16th Street, and prohibiting left turns from eastbound 16th Street onto eastbound Market Street as well as southbound Noe Street, and north- and southbound Noe Street. Westbound 16th Street would use the existing left turn lane for the new protected turn phase. New signal hardware would be required at this intersection, and signal timing would be adjusted to create the new separated phase. Signal timing would also be adjusted to change the sequence of phases (the order in which streets get a green light) from the current *Market > F-line > Noe > 16th* to the proposed *Market > 16th > Noe > F-line*.

16th/Noe/Market – Benefits
A protected left turn phase for westbound 16th Street, combined with a left turn prohibition for eastbound 16th Street would greatly simplify movements during the 16th Street phase. Vehicles and bikes making left turns from westbound 16th onto westbound Market or southbound Noe Streets during the protected phase would not encounter any conflicts with on-coming vehicles. Vehicles and bikes making through movements along 16th Street would not encounter any on-coming left turns, or be blocked behind vehicles queued while waiting for a gap to make left turns. This would also eliminate conflicts between vehicles making left turns and pedestrians during the 16th Street phase.

SFMTA expects a small amount of vehicle diversion to westbound 16th Street, so that phase – which would now include the protected left turn – would be extended and would actually reduce delay over existing conditions despite the increase in volume, by a full letter grade from ‘E’ to ‘D’ (approach average LOS).

Prohibiting left turns from north- and southbound Noe Street would similarly simplify movements along Noe Street for people driving, riding bikes and walking. Vehicles and bikes making through movements along Noe Street would not encounter any on-coming left turns, or be blocked behind vehicles queued while waiting for a gap to make left turns. This would also eliminate conflicts between vehicles making left turns and pedestrians during the Noe Street phase.

Finally, changing the sequence of phases (the order in which streets get a green light) from Market > F-line > Noe > 16th to Market > 16th > Noe > F-line would allow any vehicles that stop in the intersection after making the right turn from northbound Noe onto Market Street to clear the intersection on the following phase, which would now be Market Street, rather than block traffic on 16th Street as would previously have been the case.

In the AM peak hour, westbound 16th Street experiences a decrease in delay of one LOS letter grade, from E to D. There is a minor decrease in delay for southbound Noe Street. In the PM peak hour, the proposed improvements result in a decrease in delay of one LOS letter grade for northbound Noe Street and westbound 16th Street, from E to D, and there are minor decreases in delay for southbound Noe Street and for the intersection overall.

16th/Noe/Market – Trade-offs

In the AM peak hour, the proposed improvements result in increased delay for eastbound Market Street of one LOS letter grade, from A to B, staying within acceptable performance. There are minor increases in delay on westbound Market Street and eastbound 16th Street and for the intersection overall, but the changes remain within existing letter grades.

In the PM peak hour, there and minor increases in delay on east- and westbound Market Street and eastbound 16th Street, but the changes remain within existing letter grades.

Existing AM	Noe NB	16th St WB	Market WB	Noe SB	16th St EB	Market EB
Approach LOS	D (50.7)	E (60.0)	C (34.5)	D (45.1)	E (57.1)	A (6.8)
Intersection LOS	C (28.6)					

Proposed AM	Noe NB	16th St WB	Market WB	Noe SB	16th St EB	Market EB
Approach LOS	D (48.3)	D (40.4)	D (49.7)	D (39.9)	E (69.7)	B (15.9)
Intersection LOS	C (33.4)					

Existing PM	Noe NB	16th St WB	Market WB	Noe SB	16th St EB	Market EB
Approach LOS	E (55.2)	E (58.6)	C (20.5)	D (44.5)	D (44.1)	B (15.0)
Intersection LOS	C (31.0)					

Proposed PM	Noe NB	16th St WB	Market WB	Noe SB	16th St EB	Market EB
Approach LOS	D (42.1)	D (41.8)	C (24.4)	D (44.3)	D (54.8)	B (19.0)
Intersection LOS	C (30.7)					

Key:
blue text indicates negative change from existing scenario (higher volumes, more delay)
green text indicates positive change from existing scenario (lower volumes, less delay)

15th/Sanchez/Market – Proposed Changes
SFMTA proposes prohibiting left turns from north- and southbound Sanchez Street.

15th/Sanchez/Market – Benefits
Prohibiting left turns from north- and southbound Sanchez Street would simplify movements along Sanchez Street for people driving, riding bikes and walking. Vehicles and bikes making through movements along Sanchez Street would not encounter any on-coming left turns, or be blocked behind vehicles queued while waiting for a gap to make left turns. This will especially improve safety for people riding bikes on Sanchez coming to and from the Wiggle as they would no long be obscured behind vehicles waiting in a queue to make left turns. This would also eliminate conflicts between vehicles making left turns and pedestrians during the Sanchez Street phase.

In the AM peak hour, the proposed improvements result in a decrease in delay for eastbound Market Street with a change in LOS grade of one letter, from B to A, a minor decrease in delay for north- and southbound Sanchez Street, and a slight decrease in delay for the intersection overall. In the PM peak hour, there is a minor decrease in delay for north- and southbound Sanchez Street.

15th/Sanchez/Market – Trade-offs
In the AM peak hour, the proposed improvements result in minor increases in delay for westbound Market Street and east- and westbound 15th Street, but the changes remain within existing letter grades.

In the PM peak hour, the proposed improvements result in minor or no changes in delay, with no change in LOS letter grades. There are increases in delay for east- and westbound 15th Street, eastbound Market Street, and for the intersection overall, but the changes remain within existing letter grades.

Existing AM	Sanchez NB	15th St WB	Market WB	Sanchez SB	15th St EB	Market EB
Approach LOS	D (46.6)	E (56.1)	C (21.6)	D (40.2)	F (99.8)	B (13.6)
Intersection LOS	C (33.7)					

Proposed AM	Sanchez NB	15th St WB	Market WB	Sanchez SB	15th St EB	Market EB
Approach LOS	D (45.2)	E (56.8)	C (21.7)	D (36.8)	F (106.3)	A (7.1)
Intersection LOS	C (31.1)					

Existing PM	Sanchez NB	15th St WB	Market WB	Sanchez SB	15th St EB	Market EB
Approach LOS	D (51.4)	E (71.4)	A (3.8)	D (44.4)	E (58.9)	C (26.4)
Intersection LOS	C (29.9)					

Proposed PM	Sanchez NB	15th St WB	Market WB	Sanchez SB	15th St EB	Market EB
Approach LOS	D (46.2)	E (78.3)	A (3.8)	D (40.0)	E (64.1)	C (30.1)
Intersection LOS	C (31.5)					

Key:
blue text indicates negative change from existing scenario (higher volumes, more delay)
green text indicates positive change from existing scenario (lower volumes, less delay)

14th/Church/Market – Benefits and Trade-offs Only

No circulation changes are proposed at this intersection. However, SFMTA assumes the proposed changes at 16th/Noe/Market and 15th/Sanchez/Market will result in some vehicle diversion onto eastbound 14th Street. Despite the additional volume, SFMTA's proposed adjustments to signal timing result in only minor changes in delay with no change in LOS letter grades, with the exception of a *reduction* in delay from B to A for eastbound Market Street in the AM peak hour. See Appendix IV for the detailed tables.

Options and Scenarios for Future Study
The following section describes potential circulation changes that SFMTA explored but did not ultimately include in scenario modeling. A future study could consider these changes, if the community and/or SFMTA determined there was demand and identified additional staff resources.

Protected left turns from Market Street onto 16th/Noe and 15th/Sanchez
The community has voiced support for protecting left turns, which this study has proposed at three locations. SFMTA staff decided not to study protected left turns from Market Street onto 16th/Noe or 15th/Sanchez Streets because the ratio of through movements to left turns is very low, and because of the anticipated additional signal time required to safely separate the through and left turn phases. Additionally, the highest existing volume of permitted (not protected) left turns from Market onto a side street are from eastbound Market Street onto westbound 16th and northbound Noe Street – a share of these left turns are expected to use the proposed protected left turn phase onto northbound Castro Street, reducing the volume of left turns at 16th/Noe Streets.

Additional Noe Street Changes
SFMTA considered additional changes to Noe Street, including converting the street to one-way only – away from Market Street – to remove some of the traffic volume moving through the intersection of 16th/Noe/Market. Staff considered this change individually on the north and south legs, as well as to both legs simultaneously. SFMTA also considered the potential to close the north leg of Noe Street to traffic, to similarly reduce traffic volume through the intersection. These changes were not included in the combined scenario modeling component of this study; they were anticipated to have more negative impacts than benefits when compared with the other potential changes being considered. However, the presence of the seasonal Wednesday farmer's market, which closes the north leg of Noe Street, indicates there may be potential for this or other changes as described above. A future study, perhaps in partnership with the SF Planning Department, could further explore such options.

SFMTA also considered the potential of a Noe Street right turn prohibition (on red and green) as a way to eliminate the risk of drivers stopping in the middle of the intersection after turning onto Market Street, which blocks 16th Street traffic. This right turn prohibition was excluded from the scenario modeling component of this study because the resequencing of phases at 16th/Noe/Market will accomplish the same goal.

Funding and Implementation
SFMTA accelerated this focused circulation study ahead of the originally anticipated schedule. As such, there is no dedicated implementation funding available at this time.

However, as some of the signal timing changes require adjustment to signal programming only, and the proposed left turn prohibitions require installation of signage only, it is potentially feasible to implement some of the recommendations in the near-term. If community support exists for a phased implementation, SFMTA will need to study the specific impacts of each phase to ensure there are no circulation issues with partial implementation.

Installation of new signal hardware is necessary to add protected left turn phases, as recommended by this study. Unlike turn prohibitions, these improvements require signal design and coordination, and may be complicated by the need to upgrade signal infrastructure. As such, the timeline for these improvements is long-term, and requires design and capital funding be identified.

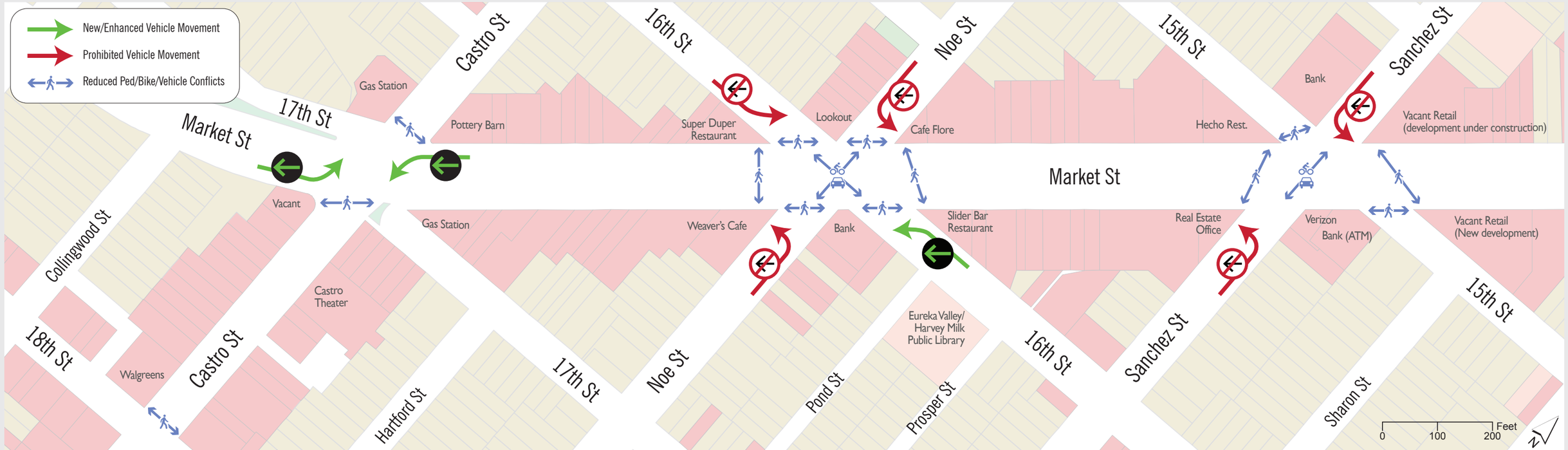
The proposed improvements are all reversible. Should the community and/or SFMTA determine that adverse impacts result from the implementation of proposed improvements, it will be possible to reinstate the prior configurations and/or pursue modifications to the changes.

Next Steps

SFMTA will review the results of this circulation study with community leaders, advocacy groups, and members of the public to gauge support for the recommended changes and collect input on possible adjustments and/or phased implementation. Based on this feedback and in consultation with the City Traffic Engineer, SFMTA will determine if and how to move forward with a funding and implementation strategy.

UPPER MARKET STREET SAFETY PROJECT: Circulation Study Proposal

Appendix I



17th/Castro/Market

Today, people typically use 18th Street to access northbound Castro Street, because left turns are prohibited on eastbound Market Street at Castro.

Proposed changes:

- Add new **protected left turns** for people driving on Market Street, turning onto Castro Street (both directions)

Benefits:

- Reduce conflict points in Castro Street crosswalks at Market Street
- Improve pedestrian safety at 18th/Castro intersection
- Reduce the volume of cut-through traffic on 18th and Castro Streets
- Reduce the volume of people making left turns from Market onto 16th and Noe Streets

Cost: $$$

www.sfmta.com/uppermarket

16th/Noe/Market

Today, people making left turns from 16th Street and Noe Street experience delay and potential conflicts with other vehicles; additionally, people making left turns from Noe and eastbound 16th Streets may conflict with people in crosswalks.

Proposed changes:

- **Prohibit left turns** from Noe Street and eastbound 16th Street
- Add a new **protected left turn** for people driving westbound on 16th Street, turning to westbound Market or southbound Noe
- **Re-order signal phases** from Market-Noe-16th to Market-16th-Noe

Benefits:

- Reduce conflict points between people driving and walking in every crosswalk at 16th/Noe/Market
- Simplify traffic flow and reduce vehicle-vehicle and vehicle-bike conflict points for people driving and biking on 16th and Noe Streets

Cost: $ to $$$$

15th/Sanchez/Market

Today, people making left turns from Sanchez Street experience delay and potential conflicts with other vehicles and bicycles; additionally, people making left turns from Sanchez Street may conflict with people in crosswalks.

Proposed changes:

- **Prohibit left turns** from Sanchez Street

Benefits:

- Reduce conflict points between people driving and walking in 15th and Market Street crosswalks
- Reduce conflict points between people driving and biking on Sanchez Street
- Simplify traffic flow for people driving on Sanchez Street
- Reduce queuing of eastbound Market Street vehicles in intersection

Cost: $

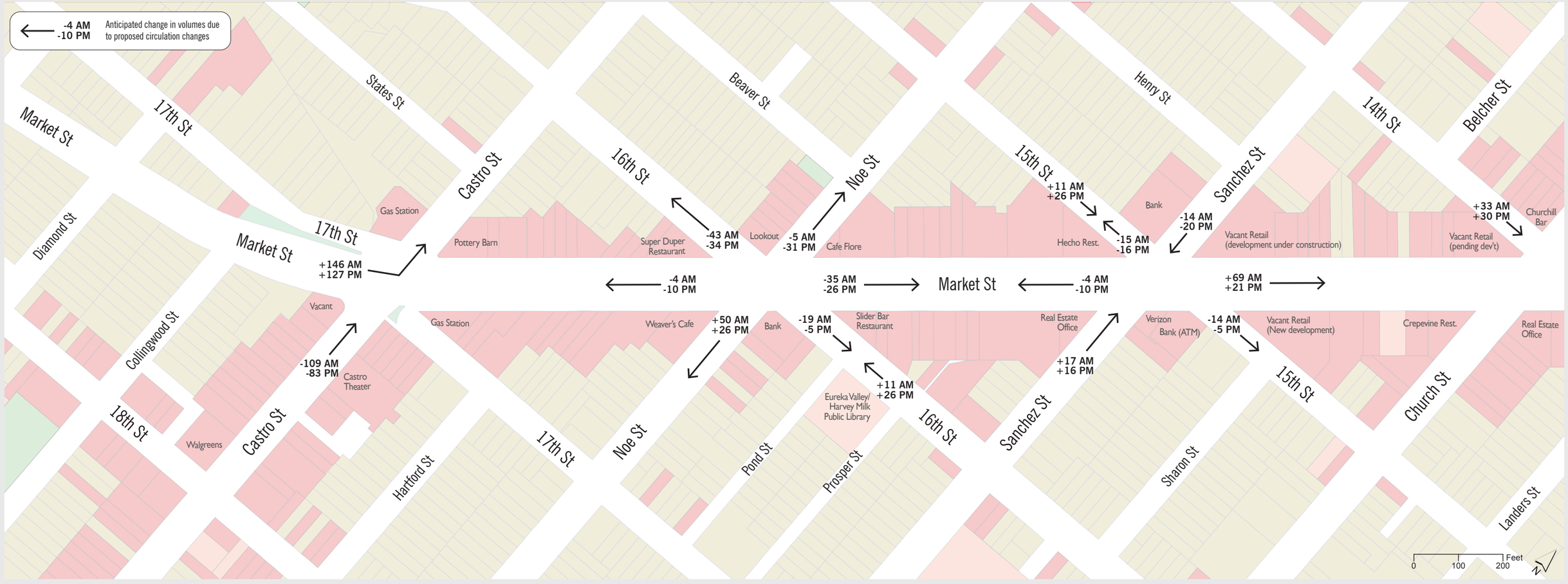
VISION ZERO SF

SFMTA Municipal Transportation Agency

UPPER MARKET STREET SAFETY PROJECT: Circulation Study

Appendix II

Context Map Showing Anticipated Traffic Diversion



VISION ZERO SF

SFMTA Municipal Transportation Agency

Appendix III: Excerpts from Prior Planning Documents

Castro & Upper Market Retail Strategy (2015):
"…despite the large number of walkers, significant barriers prevent the retail district from being a safe and inviting environment for pedestrians: 6-way intersections have long crosswalk distances and chaotic paths of vehicular travel… (56)."

"Working in close collaboration with the SFMTA, community leadership should continue to advocate for streetscape improvements that address pedestrian safety concerns and improve bicycle and vehicle circulation. Planned transportation, bicycle and pedestrian improvements funded by development impact fees from projects along the corridor should be spent expeditiously in order to prevent potential traffic injuries, improve overall walkability and minimize conflicts between bicycles, automobiles and pedestrians (57)."

DTNA Survey Report (2013):
"The unique character of the 6-point intersection design along the Upper Market Street corridor creates a challenge due to a high level of multimodal activities. We want to better understand usage patterns to incorporate mitigating measures to minimize conflict resulting from pedestrian, cyclist and motorist merging into these wide intersections all at once."

"We need to reduce the traffic volumes and vehicle-pedestrian conflicts at the intersection of 16th St/Noe St/ Market St."

"The majority [73 percent] of [survey] participants don't want to lose left turns off of Market St."

"74 percent [of survey respondents] felt that directional [protected] turn signals should be added."

Market-Octavia Area Plan (2010):
"In future studies, the City should weigh the total range of impacts of the current vehicular traffic configuration versus changes that may impact other City goals including: reducing pedestrian conflicts and increasing pedestrian oriented facilities… [and] ensuring that bicycles can be used as a primary means of transportation in the area (72)."

Upper Market Community Vision & Recommendations (2008):
"Perhaps the most challenging aspect of the street for pedestrians is the enormous (often five-way) intersections. Overall, pedestrians have . . . little sense of refuge or protection in crossing the street. (32)."

Castro/Upper Market CBD Neighborhood Beautification and Safety Plan (2008):
"Pedestrian injury is a complex issue. It involves pedestrian and driver behaviors, road characteristics, travel patterns, vehicle speed, and environmental variables—no single intervention is likely to sufficiently reduce the number of pedestrian injuries. The best solutions result from a combination of interventions and our recommendations reflect this concept (7)."

"An analysis of the data gathered at the community meetings highlights the participants' ideas and concerns and helps to frame the process for making design decisions. Clearly, the most important issue for each group was the safety of pedestrians at intersections and crossings (11)."

Appendix II: Detailed Synchro Modeling Outputs

Blue text indicates negative change from existing scenario (higher volumes, more delay)
Green text indicates positive change from existing scenario (lower volumes, less delay)
Due to software limitations in modeling 13T (F-line) accurately at 16th/Noe/Market, that phase is not included at that node
Existing traffic counts from Tuesday, January 12, 2016; AM Peak Hour: 7:30am - 8:30am; PM Peak Hour: 5:00pm - 6:00pm

AM Peak Hour

EXISTING

	17th/Castro/Market									
	Castro NB		Market WB				Castro SB		Market EB	
	T	R	L	T	R	R'	T	R	T	R
		to Market	to Castro		to 17th	to Castro				to Castro
Volumes	328	48	53	268	30	200	256	144	1189	41
Approach LOS	D (37.4)	C (27.6)	B (12.1)	A (6.1)	A (1.8)		D (45.8)		C (29.7)	A (0.1)
Approach Ave LOS	D (36.2)		A (4.8)				D (45.8)		C (28.7)	
Intersection Ave LOS	C (27.3)									

	16th/Market/Noe																														
	Noe NB					16th St WB					Market WB					Noe SB					16th St EB				Market EB				
	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 16th		to Market	to 16th	to Noe	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe	to Market	to 16th		to Market	to 16th	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe
Volumes	15	19	178	44	8	1	136	158	51	12	9	9	377	7	10	19	19	109	19	2	16	155	11	4	47	99	918	167	29
Approach LOS	D (50.7)					E (75.1)		D (50.6)			D (39.5)		C (34.3)			D (45.1)					E (57.1)				A (9.0)	A (7.7)		A (0.8)	
Approach Ave LOS	D (50.7)					E (60.0)					C (34.5)					D (45.1)					E (57.1)				A (6.8)				
Intersection Ave LOS	C (28.6)																														

PROPOSED

17th/Castro/Market: EB Market protected lefts at 17th/Castro + WBLT protected only
16th/Noe/Market: 16th St WB lagging left with EBLT prohibited + Noe left turn prohibition + switched phase order at 16th
15th/Sanchez/Market: Sanchez left turn prohibition

	17th/Castro/Market										
	Castro NB		Market WB				Castro SB		Market EB		
	T	R	L	T	R	R'	T	R	L (new)	T	R
		to Market	to Castro		to 17th	to Castro			to Castro		to Castro
Volumes	219	48	53	268	30	200	256	144	146	1189	41
Approach LOS	C (32.3)	C (27.6)	D (42.6)	D (44.1)	C (24.8)		D (45.8)		E (70.6)	C (25.8)	
Approach Ave LOS	C (31.5)		D (35.8)				D (45.8)		C (30.5)		
Intersection Ave LOS	C (34.1)										

	16th/Market/Noe																														
	Noe NB					16th St WB					Market WB					Noe SB					16th St EB				Market EB				
	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 16th		to Market	to 16th	to Noe	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe	to Market	to 16th		to Market	to 16th	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe
Volumes	0	0	223	44	8	1	147	158	51	12	9	9	377	7	10	0	0	159	19	2	0	155	11	4	24	50	918	167	29
Approach LOS	D (48.3)					D (45.1)		D (37.3)			E (62.4)		D (49.1)			D (39.9)					E (69.7)				B (16.5)	B (19.0)		A (1.3)	
Approach Ave LOS	D (48.3)					D (40.4)					D (49.7)					D (39.9)					E (69.7)				B (15.9)				
Intersection Ave LOS	C (33.4)																														

PM Peak Hour

EXISTING

	17th/Castro/Market									
	Castro NB		Market WB				Castro SB		Market EB	
	T	R	L	T	R	R'	T	R	T	R
		to Market	to Castro		to 17th	to Castro				to Castro
Volumes	248	68	102	584	44	324	250	311	744	51
Approach LOS	C (33.5)	C (28.3)	A (4.7)	A (3.4)	A (0.8)		F (115.6)		C (24.2)	A (0.1)
Approach Ave LOS	C (32.3)		A (2.6)				F (115.6)		C (22.7)	
Intersection Ave LOS	D (35.2)									

	16th/Market/Noe																														
	Noe NB					16th St WB					Market WB					Noe SB					16th St EB				Market EB				
	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 16th		to Market	to 16th	to Noe	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe	to Market	to 16th		to Market	to 16th	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe
Volumes	36	18	124	17	13	0	184	195	37	20	7	30	808	20	12	12	5	165	40	7	14	130	11	16	31	57	587	95	49
Approach LOS	E (55.2)					E (74.4)		D (47.1)			B (12.8)		C (20.8)			D (44.5)					D (44.1)				D (53.6)	B (12.6)		A (0.8)	
Approach Ave LOS	E (55.2)					E (58.6)					C (20.5)					D (44.5)					D (44.1)				B (15.0)				
Intersection Ave LOS	C (31.0)																														

PROPOSED

17th/Castro/Market: EB Market protected lefts at 17th/Castro + WBLT protected only
16th/Noe/Market: 16th St WB lagging left with EBLT prohibited + Noe left turn prohibition + switched phase order at 16th
15th/Sanchez/Market: Sanchez left turn prohibition

	17th/Castro/Market										
	Castro NB		Market WB				Castro SB		Market EB		
	T	R	L	T	R	R'	T	R	L (new)	T	R
		to Market	to Castro		to 17th	to Castro			to Castro		to Castro
Volumes	165	68	102	584	44	324	250	311	127	744	51
Approach LOS	C (30.5)	C (28.3)	D (40.5)	C (29.7)	B (11.4)		F (115.6)		E (72.5)	B (19.6)	
Approach Ave LOS	C (29.8)		C (24.4)				F (115.6)		C (26.9)		
Intersection Ave LOS	D (44.1)										

	16th/Market/Noe																														
	Noe NB					16th St WB					Market WB					Noe SB					16th St EB				Market EB				
	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 16th		to Market	to 16th	to Noe	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe	to Market	to 16th		to Market	to 16th	to Market		to Noe	to Market	to 16th	to Noe		to 16th	to Noe
Volumes	0	0	184	17	13	0	210	195	37	20	7	30	808	20	12	0	0	191	40	7	0	130	11	16	16	29	587	95	49
Approach LOS	D (42.1)					D (48.5)		D (36.4)			B (16.3)		C (24.8)			D (44.3)					D (54.8)				E (55.7)	C (20.6)		A (0.8)	
Approach Ave LOS	D (42.1)					D (41.8)					C (24.4)					D (44.3)					D (54.8)				B (19.0)				
Intersection Ave LOS	C (30.7)																														

Appendix II: Detailed Synchro Modeling Outputs

Blue text indicates negative change from existing scenario (higher volumes, more delay)
Green text indicates positive change from existing scenario (lower volumes, less delay)
Due to software limitations in modeling 13T (F-line) accurately at 16th/Noe/Market, that phase is not included at that node
Existing traffic counts from Tuesday, January 12, 2016; AM Peak Hour: 7:30am - 8:30am; PM Peak Hour: 5:00pm - 6:00pm

AM Peak Hour

EXISTING

	15th/Sanchez/Market																										
	Sanchez NB				15th St WB				Market WB					Sanchez SB					15th St EB					Market EB				
	L'	L	T	R	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 15th		to Market	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez	to Market	to 15th		to Market	to 15th	to Sanchez	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez
Volumes	7	15	181	30	31	141	69	18	0	22	307	17	6	14	14	81	11	4	22	60	141	6	7	3	38	903	80	19
Approach LOS	D(46.6)				E (56.1)				C (26.9)			C (21.2)		D (40.2)					F (99.8)					B (13.8)		B (15.0)		A (0.9)
Approach Ave LOS	D(46.6)				E (56.1)				C (21.6)					D (40.2)					F (99.8)					B (13.6)				
Intersection Ave LOS	C (33.7)																											

PROPOSED

17th/Castro/Market: EB Market protected lefts at 17th/Castro + WBLT protected only
16th/Noe/Market: 16th St WB lagging left with EBLT prohibited + Noe left turn prohibition + switched phase order at 16th
15th/Sanchez/Market: Sanchez left turn prohibition

	15th/Sanchez/Market																										
	Sanchez NB				15th St WB				Market WB					Sanchez SB					15th St EB					Market EB				
	L'	L	T	R	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 15th		to Market	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez	to Market	to 15th		to Market	to 15th	to Sanchez	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez
Volumes	**0**	**0**	181	**47**	31	141	69	18	0	22	307	17	6	**0**	**0**	81	11	4	22	60	141	6	**18**	3	38	**969**	80	19
Approach LOS	D (45.2)				E (56.8)				C (28.3)			C (21.2)		D (36.8)					F (106.3)					A (6.3)		A (7.9)		A (0.3)
Approach Ave LOS	D (45.2)				E (56.8)				C (21.7)					D (36.8)					F (106.3)					A (7.1)				
Intersection Ave LOS	C (31.1)																											

PM Peak Hour

EXISTING

	15th/Sanchez/Market																										
	Sanchez NB				15th St WB				Market WB					Sanchez SB					15th St EB					Market EB				
	L'	L	T	R	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 15th		to Market	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez	to Market	to 15th		to Market	to 15th	to Sanchez	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez
Volumes	16	16	176	45	65	133	45	41	4	32	779	23	34	20	5	115	37	5	32	31	109	5	9	4	52	565	49	21
Approach LOS	D (51.4)				E (71.4)				A (3.1)			A (3.8)		D (44.4)					E (58.9)					D (40.6)		C (27.7)		A (5.0)
Approach Ave LOS	D (51.4)				E (71.4)				A (3.8)					D (44.4)					E (58.9)					C (26.4)				
Intersection Ave LOS	C (29.9)																											

PROPOSED

17th/Castro/Market: EB Market protected lefts at 17th/Castro + WBLT protected only
16th/Noe/Market: 16th St WB lagging left with EBLT prohibited + Noe left turn prohibition + switched phase order at 16th
15th/Sanchez/Market: Sanchez left turn prohibition

	15th/Sanchez/Market																										
	Sanchez NB				15th St WB				Market WB					Sanchez SB					15th St EB					Market EB				
	L'	L	T	R	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'	L'	L	T	R	R'
	to Market	to 15th		to Market	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez	to Market	to 15th		to Market	to 15th	to Sanchez	to Market		to Sanchez	to Market	to 15th	to Sanchez		to 15th	to Sanchez
Volumes	**0**	**0**	176	**61**	65	133	45	41	4	32	779	23	34	**0**	**0**	115	37	5	32	31	109	5	**35**	4	52	**590**	49	21
Approach LOS	D (46.2)				E (78.3)				A (3.3)			A (3.8)		D (40.0)					E (64.1)					D (43.7)		C (31.5)		A (7.3)
Approach Ave LOS	D (46.2)				E (78.3)				A (3.8)					D (40.0)					E (64.1)					C (30.1)				
Intersection Ave LOS	C (31.5)																											

Appendix II: Detailed Synchro Modeling Outputs

Blue text indicates negative change from existing scenario (higher volumes, more delay)
Green text indicates positive change from existing scenario (lower volumes, less delay)
Due to software limitations in modeling 13T (F-line) accurately at 16th/Noe/Market, that phase is not included at that node
Existing traffic counts from Tuesday, January 12, 2016; AM Peak Hour: 7:30am - 8:30am; PM Peak Hour: 5:00pm - 6:00pm

AM Peak Hour

EXISTING

	14th/Church/Market																							
	Church/Market								14th/Market								14th/Church							
	Church NB		Market WB		Church SB		Market EB		Market WB		14th St EB		Market EB		Church NB	14th WB		Church SB		14th St EB	
	T	R	L	T	T	R	T	R	T	R	L	T	T	R	T	T	R	T	R	T	R
Volumes	321	59	47	1	216	20	945	4	431	215	208	369	914	109	321	186	29	232	19	577	4
Approach LOS	D (47.4)		D (41.4)	A (4.0)	A (6.0)		C (23.5)		C (25.1)	D (35.9)	B (15.8)		B (10.0)		B (10.2)	A (5.0)		D (36.5)		D (50.9)	
Approach Ave LOS	D (47.4)		D (40.6)		A (6.0)		C (23.5)		C (28.7)		B (15.8)		B (10.0)		B (10.2)	A (5.0)		D (36.5)		D (50.9)	
Intersection Ave LOS	C (27.1)								B (16.9)						C (31.5)						

PROPOSED

17th/Castro/Market: EB Market protected lefts at 17th/Castro + WBLT protected only
16th/Noe/Market: 16th St WB lagging left with EBLT prohibited + Noe left turn prohibition + switched phase order at 16th
15th/Sanchez/Market: Sanchez left turn prohibition

	14th/Church/Market																							
	Church/Market								14th/Market								14th/Church							
	Church NB		Market WB		Church SB		Market EB		Market WB		14th St EB		Market EB		Church NB	14th WB		Church SB		14th St EB	
	T	R	L	T	T	R	T	R	T	R	L	T	T	R	T	T	R	T	R	T	R
Volumes	321	59	47	1	216	20	945	4	431	215	**241**	369	914	109	321	186	29	232	19	**610**	4
Approach LOS	D (47.4)		D (41.4)	A (4.0)	A (6.0)		C (22.3)		C (25.1)	D (35.9)	B (19.2)		A (9.9)		B (10.2)	A (5.0)		D (36.5)		D (54.6)	
Approach Ave LOS	D (47.4)		D (40.6)		A (6.0)		C (22.3)		C (28.7)		B (19.2)		A (9.9)		B (10.2)	A (5.0)		D (36.5)		D (54.6)	
Intersection Ave LOS	C (26.4)								B (17.8)						C (33.6)						

PM Peak Hour

EXISTING

	14th/Church/Market																							
	Church/Market								14th/Market								14th/Church							
	Church NB		Market WB		Church SB		Market EB		Market WB		14th St EB		Market EB		Church NB	14th WB		Church SB		14th St EB	
	T	R	L	T	T	R	T	R	T	R	L	T	T	R	T	T	R	T	R	T	R
Volumes	237	72	35	795	266	48	575	29	830	195	143	311	562	95	305	170	25	294	19	454	20
Approach LOS	D (40.6)		A (5.3)	A (5.6)	A (8.7)		E (56.7)		C (31.2)	D (35.9)	A (8.3)		A (3.5)		B (15.5)	A (4.9)		D (40.2)		D (44.4)	
Approach Ave LOS	D (40.6)		A (5.6)		A (8.7)		E (56.7)		C (32.1)		A (8.3)		A (3.5)		B (15.5)	A (4.9)		D (40.2)		D (44.4)	
Intersection Ave LOS	C (26.3)								B (18.2)						C (30.5)						

PROPOSED

17th/Castro/Market: EB Market protected lefts at 17th/Castro + WBLT protected only
16th/Noe/Market: 16th St WB lagging left with EBLT prohibited + Noe left turn prohibition + switched phase order at 16th
15th/Sanchez/Market: Sanchez left turn prohibition

	14th/Church/Market																							
	Church/Market								14th/Market								14th/Church							
	Church NB		Market WB		Church SB		Market EB		Market WB		14th St EB		Market EB		Church NB	14th WB		Church SB		14th St EB	
	T	R	L	T	T	R	T	R	T	R	L	T	T	R	T	T	R	T	R	T	R
Volumes	237	72	35	795	266	48	575	29	830	195	**173**	311	562	95	305	170	25	294	19	**484**	20
Approach LOS	D (40.6)		A (5.3)	A (5.6)	A (8.7)		E (57.1)		C (31.2)	D (35.9)	A (9.9)		A (3.5)		B (15.5)	A (4.9)		D (40.2)		D (45.8)	
Approach Ave LOS	D (40.6)		A (5.6)		A (8.7)		E (57.1)		C (32.1)		A (9.9)		A (3.5)		B (15.5)	A (4.9)		D (40.2)		D (45.8)	
Intersection Ave LOS	C (26.4)								B (18.5)						C (31.4)						