Van Ness Bus Rapid Transit

Final Evaluation Report

SFMTA.com/VanNess

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SFMTA

Contents

Executive summary

The Van Ness Improvement Project represents a multimodal and multiagency effort to improve transit, traffic and pedestrian safety and modernize utilities along the Van Ness Avenue corridor between Lombard and Mission Streets.

Project work began with utility relocation and reconstruction in October 2016, which was completed in 2021. Between 2021 and 2022, Van Ness Bus Rapid Transit (BRT) improvements were constructed and installed, and the Van Ness BRT busway opened for service on April 1, 2022.

This project evaluation covers several objectives centered around transit performance and traffic safety. Key results include:

- Transit travel time decreased by up to 36% in the project area after project implementation.
- There was up to a 45% improvement in travel time variability, which means less time spent waiting at a bus stop and less time stuck on slow-moving buses.
- Ridership on the Van Ness BRT corridor has reached 103% of pre-pandemic levels, even when accounting for the removal of the 47 Van Ness route.
- Traffic collisions decreased by 50% when looking at data from one year before project construction compared to one year after the project opened. Looking at a longer “before” and “after” period, collisions were still reduced by 33%.
- Transit-involved collisions decreased by 82%.
- Over 86% of Muni riders on the corridor say their travel time improved, and over 83% are supportive of the project.
- Before the project, nearly all roadway space was dedicated to private vehicles. Now, the share of the roadway dedicated to transit is about one-third, which matches its mode share.
- While there’s no room to expand automobile capacity, the BRT busway has room to expand frequency and capacity by as much as 500% if needed in the future.
- Van Ness BRT is one of just four projects in the United States designated as BRT Silver by the Institute for Transportation & Development Policy, which maintains the globally recognized BRT Standard for assessing BRTs.

More information is available at SFMTA.com/VanNess. Information about transit priority improvements across the Muni system is available at SFMTA.com/MuniForward.

Introduction

The Van Ness Improvement Project focused on bringing transit and safety improvements to one of the busiest bus corridors in North America. The centerpiece of the Van Ness Improvement Project is the dedicated Bus Rapid Transit busway consisting of center-running transit lanes between Lombard Street at the northern end and Mission Street at the southern end. The busway connects numerous San Francisco neighborhoods, including the Marina, Russian Hill, Pacific Heights, Cathedral Hill, the Tenderloin, Civic Center, and South of Market.

The project received environmental approvals in 2013 from the San Francisco County Transportation Authority Board, the SFMTA Board, and the Federal Transit Administration, and traffic approval in 2014 from Caltrans.

Project work began in 2016 and initially focused on utility relocation and upgrades. Construction continued through early 2022, with the long duration due primarily to the complexity of utility replacement. Substantial project completion was celebrated with a ribbon-cutting ceremony outside the War Memorial Opera House on April 1, 2022, after which Muni, Golden Gate Transit, and PresidiGo service began using the busway.

Project construction was overseen by the SFMTA's Capital Programs and Construction division in close coordination with the Transit, Streets, Communications, and Finance & Information Technology divisions, as well as with project partners at San Francisco Public Works and the San Francisco Public Utilities Commission. In addition to BRT and pedestrian safety improvements, the project included state of good repair upgrades such as utility replacement, repaving, and rehabilitating the overhead contact system for trolleybuses.

The Van Ness Improvement Project added center-running transit lanes and nine high-quality transit stops per direction with center boarding islands, providing continuous transit lanes for the 49 Van Ness/Mission and 90 San Bruno Owl as well as Golden Gate Transit routes 101, 130, and 150 and the PresidiGo Downtown route.

To improve transit performance and calm highway-like traffic conditions from its previous design, Van Ness Avenue was converted to two general travel lanes and one center-running transit lane per direction between Mission and Filbert Streets. In

addition, a southbound-only transit lane stretches from Lombard Street to Filbert Street. Side-running transit lanes will be installed on Van Ness Avenue between Chestnut and North Point streets later in 2025. In total, the project includes over four lane miles of new transit lanes, all of which are colorized red for improved driver compliance.

Signals were retimed along the corridor to increase the likelihood that buses have a green light at intersections and increase the amount of time for people walking to cross Van Ness. Transit signal priority was also activated at most signals.

In addition, some closely spaced stops were consolidated to improve transit reliability. Inbound stops were removed at Grove, Turk, Geary-Post, California and Greenwich streets. Outbound stops were removed at Greenwich, Pacific, Pine and Grove streets. See Figure 1.

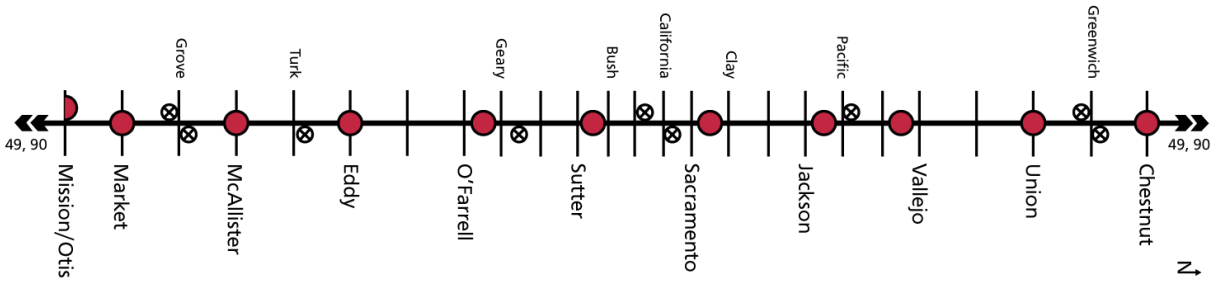

Figure 1: Stop consolidation as part of the project

Pedestrian safety improvements included new pedestrian countdown signals to let people walking know how much time they have to safely cross the street. To shorten the crossing distance of San Francisco's widest street, enhanced medians include a curb-protected space for pedestrians to wait. Also added at every intersection in the project area are pedestrian bulbs—curb extensions at intersection corners—to shorten crossing distances, make people walking more visible to motorists, and reduce vehicle turning speeds. Leading pedestrian intervals were added at most intersections to give pedestrians a head start to cross Van Ness Avenue. Block-by-block graphics of all project changes are available online at SFMTA.com/VanNess.

Changes to traffic circulation included new left-turn restrictions at nearly every intersection along the Van Ness corridor, which improves safety for all road users as well as transit performance. Left turns are now only permitted northbound at Lombard Street, where US 101 travels north of the corridor, and southbound at Broadway.

Evaluation approach and objectives

The purpose of this evaluation is to assess the Van Ness Improvement Project with respect to key transit performance and safety objectives. This framework was developed to quantify relevant metrics that are of interest to the SFMTA and community stakeholders. A list of evaluation metrics is shown in Table 1.

Metrics
1. Reduce Muni travel time
2. Improve Muni travel time reliability
3. Decrease transit-involved collisions in the project area
4. Improve traffic safety
5. Improve the Muni customer experience in the corridor

Table 1: Evaluation metrics for the Van Ness Bus Rapid Transit Project

Transit ridership and performance numbers are derived from the daytime Muni routes that operate or previously operated on the corridor: 47 Van Ness (discontinued) and 49 Van Ness/Mission.

The COVID-19 pandemic began during the construction phase of the Van Ness Improvement Project. Changes to travel patterns during the pandemic affect every metric in the evaluation, making it difficult to separate the effects of the project from those of changed travel patterns. As much as possible, attempts have been made to control for the effects of the pandemic, as well as noting analysis limitations in relevant sections of the report.

Looking north at Grove Street

Looking north at McAllister Street

Looking north at Market Street

Looking north at O'Farrell Street

Travel time

Methods

Transit travel time data was processed from GPS-enabled Automatic Passenger Counter (APC) software and hardware which are installed on all Muni buses.

Travel time data was calculated between 13th and Chestnut streets. The blocks between 13th Street and the South Van Ness/Mission Street/Otis Street intersection, as well as the block of Van Ness Avenue between Chestnut and Lombard streets, were not part of the Van Ness Improvement Project, but were included to provide the most consistent stop pairs possible for pre- and post-project travel time.

Fiftieth percentile (median) travel times were calculated for the 49 Van Ness/Mission route, approximating the typical passenger experience. Travel times include dwell times (the time that buses have their doors open at stops). Each direction was analyzed separately: inbound (IB; northbound) and outbound (OB; southbound). The following time periods were analyzed: morning peak (6-9 a.m.) and evening peak (4-7 p.m.).

To perform the best possible analysis of the Van Ness Improvement Project's impacts, our transit performance includes several different windows of time:

- Pre-Construction (April 2016)
- Pre-Opening (February 28, 2022 – March 25, 2022)
- Post-Opening (April 2, 2022 – June 24, 2022)
- Post-Opening – First Month of School (August 17, 2022 – September 23, 2022)
- 1 Year Post-Opening (April 2, 2023 – June 24, 2023)

The analysis windows selected allow for consistent data comparisons across multiple rotations of the Muni schedule, while also allowing for adjustments in travel time based on changes to the schedule, increased familiarity and training for operators and changes in ridership.

Key findings

Transit travel time improved immediately upon the opening of the busway and has continued to improve since, with time savings as great as 36% (inbound) and 26% (outbound) compared to pre-construction conditions.

Note that the decrease in traffic due to the COVID-19 pandemic may also have contributed to some of the travel time savings experienced between 2019 and 2022,

which is why post-project travel time data was compared to both pre-construction and pre-opening.

Further analysis was later conducted in 2022 and in 2023 to account for the completion of signal timing which followed the opening of the busway, and for increased ridership in 2023 as part of the ongoing recovery of the city. This data is shown in Figures 2 and 3.

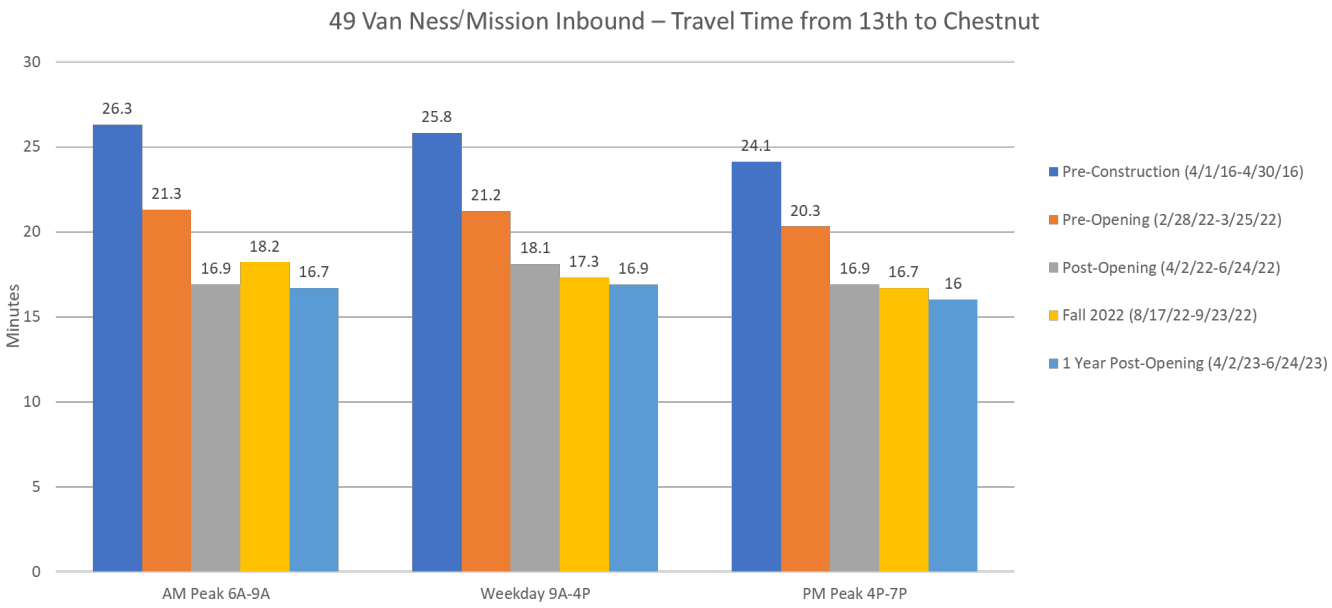

Figure 2: Inbound (northbound) 49 Van Ness/Mission travel time comparison

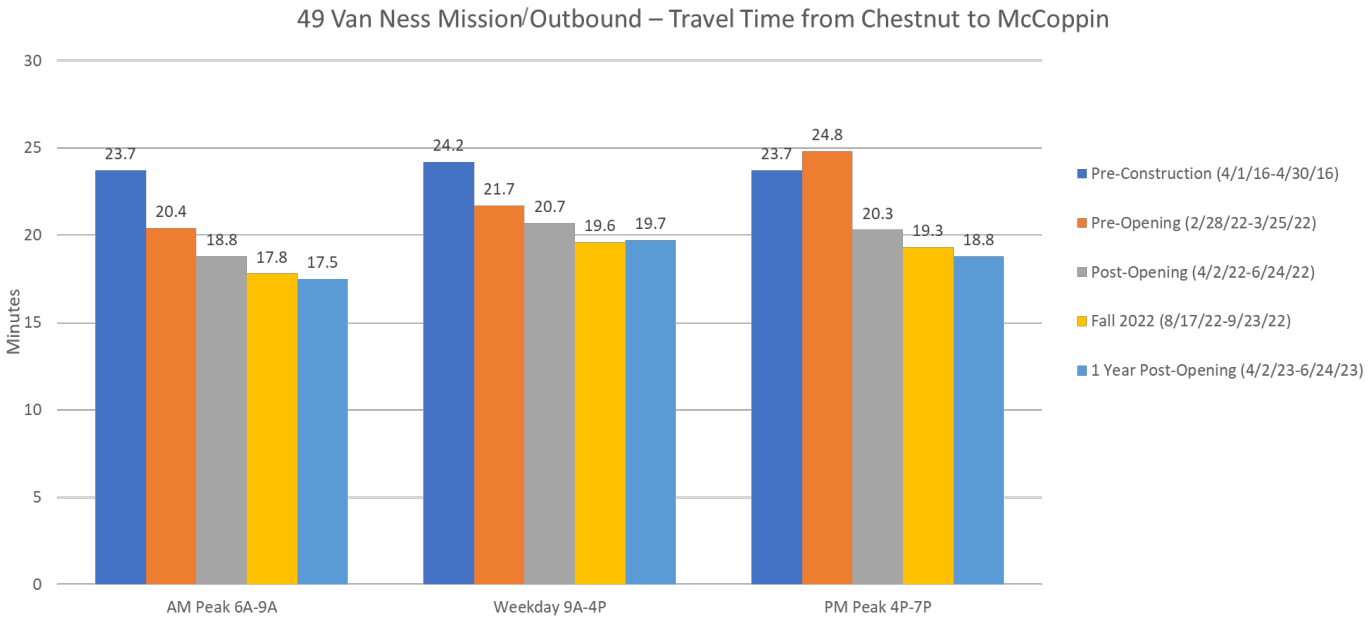

Figure 3: Outbound (southbound) 49 Van Ness/Mission travel time comparison

In both directions, travel times on the 49 Van Ness/Mission reduced significantly from the pre-project condition, up to 9.5 minutes in some cases. Travel time savings are visible at every time of day and direction evaluated, and continued through into 2023 as ridership grew. Despite this ridership growth, which can add delay due to increased dwell (boarding) time, travel times continued to improve compared to April 2022 due to a combination of increased operator familiarity with the route, ongoing signal timing improvements to Van Ness, and systemwide improvements in Muni's dispatching and headway management.

Reliability

Reliability is key to high-quality transit service. Consistent travel times reduce the amount of time that riders must schedule to complete their trip. This also reduces "bus bunching and gapping," when no bus comes for a while, then several arrive at once, which leads to greater predictability and less crowding.

Methods

Travel time reliability was measured using the same data sources as the median travel time analysis. The difference between median travel times and 90th percentile travel times (slower than 90% of trips on the route) was measured to provide a measurement of typical variability in travel times. This analysis used the same time periods as travel time.

Key findings

Travel time reliability improved compared to pre-project and pre-opening conditions. Variability decreased up to 45% southbound and up to 24% northbound when comparing pre-opening conditions to conditions one year after the busway's opening. Variability increased slightly at some times of day over the course of the first 15 months of BRT service compared to the period immediately after the project opened in April 2022. However, almost all service is still more reliable than before the project, and it has generally stayed constant or improved. Detailed results are shown in Figures 4 and 5.

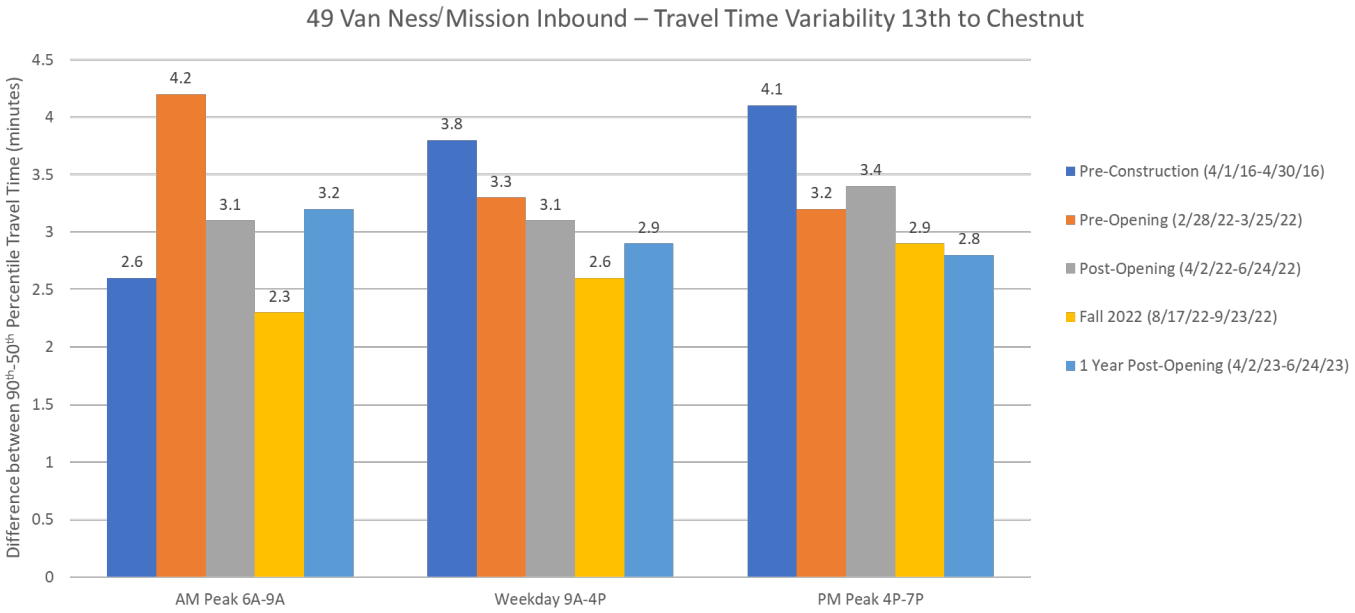

Figure 4: Inbound 49 Van Ness/Mission travel time variability comparison

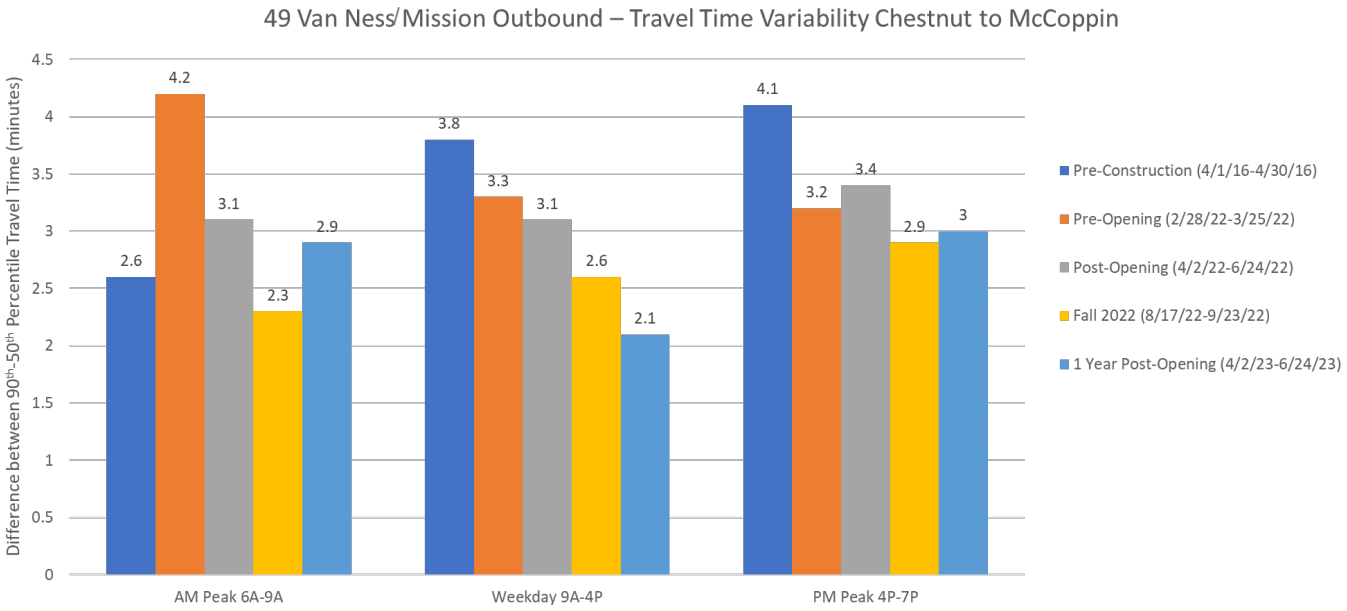

Figure 5: Outbound 49 Van Ness/Mission travel time reliability comparison

Street space allocation

Before the Van Ness BRT project was built, the allocation of street space on Van Ness Avenue did not reflect actual usage of the street. Nearly all of the street space was dedicated to private automobiles, even though transit accounts for about one-third of people traveling along Van Ness Avenue. The Van Ness Improvement Project reallocated some street space from general traffic to transit and pedestrians to better align street space with how it is used, and thus make the street more efficient overall.

Before project completion, nearly all curb-to-curb roadway space was dedicated to private vehicles, except at bus zones. With the completion of the project, the share of the roadway dedicated to transit ranges from about 25-46% depending on the location, averaging about one-third. The roadway space allocation is now closely aligned to the share of people using transit (one third) and private vehicles (two thirds), respectively.

Looking to the future, BRT provides the greatest capacity for meeting growing travel demand through the corridor. While existing auto lanes are largely at capacity and there is no room to expand the roadway for cars, transit frequency and capacity could be increased within the existing busway by as much as 500% if needed to meet future demand. This reflects the greater efficiency and capacity of transit in a constrained city.

Ridership

Methods

Transit ridership data for Muni buses is calculated using onboard Automatic Passenger Counters (APC) which determine the boardings and alightings on each vehicle as well as the average loading of each vehicle.

This analysis looks at the overall change in ridership between the two daytime Muni routes that operated on Van Ness in the pre-project condition and the one daytime Muni route that operates on Van Ness in the post-project condition.

Pre-project, ridership data was taken from the entire 49 Van Ness/Mission route as well as the Van Ness corridor portion of the 47 Van Ness. This is compared to post-project data on the 49 Van Ness/Mission exclusively, since the 47 Van Ness is no longer in service.

Key findings

Ridership for the daytime routes (47 and 49) is summarized below in Figure 6:

Period	47 Van Ness (project area only)	49 Van Ness/Mission (full route)	Combined Ridership	Ridership Recovery
Before (Sept. 2019)	10,111	26,000	36,111	-
After (Sept. 2024)	0	37,300	37,300	103%

Figure 6: Ridership comparison, before and after project completion

As of September 2024, weekday ridership on the 49 Van Ness/Mission averaged 37,300 boardings. This is significantly higher than pre-project, but is partially related to the suspension of the 47 Van Ness route that previously served the corridor. The 47 Van Ness was suspended in March 2020, along with several other Muni routes, due to falling ridership and operational and budgetary constraints caused by the COVID-19 pandemic. As part of its pandemic recovery service plan, the SFMTA increased frequency of the 49 Van Ness/Mission and did not restore service of the 47 Van Ness.

Thus, compared to pre-pandemic conditions, ridership on Van Ness corridor Muni service was at 103% of pre-pandemic weekday ridership levels, while the entire Muni system ridership remained at 70% of pre-pandemic weekday levels as of September 2024. This suggests a strong correlation between transit travel time and reliability improvements and ridership recovery, which is supported by similar results on other

Muni Forward transit priority improvements in San Francisco, such as the Geary Rapid project and the 16th Street Improvement Project.

Traffic safety

Van Ness Avenue is part of the "High-Injury Network" – the 12% of city streets where 68% of severe and fatal traffic crashes occur. The Van Ness Improvement Project aimed to improve safety for all users by implementing safety improvements that work together to reduce vehicle speeds and decrease the frequency of injury-causing collisions. Several treatments, such as crosswalk refuges on the median and sidewalk extensions, were specifically designed to improve safety for people walking, as they are more vulnerable to serious injury or death in a collision. Left turn restrictions are also a key component of improving pedestrian safety -- in 2019, almost 40% of crashes in San Francisco involved a left- turning vehicle[1].

The Van Ness Improvement Project reduced the number of through travel lanes from three to two for most of the corridor and reduced the width of some traffic lanes. The narrower lanes and other safety components of the project were designed to discourage speeding in support of Vision Zero goals. Because collisions at higher speeds are more likely to cause death or serious injury – with the risk of death for pedestrians increasing dramatically at collision speeds over 30 mph – reducing the speeds of the fastest vehicles is expected to have the largest effect on collision severity.

Methods

The TransBASE Dashboard (https://transbase.sfgov.org/) displays the location and basic data for all traffic collisions in San Francisco involving injury or death, or which were otherwise reported to the police. The data is provided by the SFMTA, the San Francisco Police Department (SFPD) and the San Francisco Department of Public Health (SFDPH). Collision data is updated quarterly, typically near the end of the following quarter. Collisions were monitored on the same road segments as for transit collisions, consisting of the segment of Van Ness Avenue and South Van Ness Avenue between Mission and Chestnut streets.

[1] https://www.sfmta.com/press-releases/sfmta-announces-traffic-calming-measures-and-campaign-safer-left-turns

Key findings

Traffic collisions declined significantly on Van Ness Avenue and South Van Ness Avenue in the project area during and following construction of the Van Ness Improvement Project. The rate of collisions decreased by 33% in the two years after the project opened compared to the five years prior to construction—and by 50% when comparing one year before construction to one year after project opening.

In the five years prior to construction (October 1, 2011, through September 30, 2016), there were an average of 93 collisions per year on Van Ness Avenue in the project area. In the two years following completion of the project (April 1, 2022 through March 31, 2024), there were an average of 62.5 collisions per year, representing a reduction of 33%. The rate of collisions per year (2011-2024) is shown in Figure 7.

Looking at just one year of data immediately before project construction (October 1, 2015, through September 30, 2016) compared to the first year after project opening (April 1, 2022 through March 31, 2023) offers additional perspective. This is a less robust dataset than the longer period discussed above but represents a closer snapshot of the immediate impacts of the project. Looking at these two periods, collisions were reduced by 50%, from 115 collisions to 57.

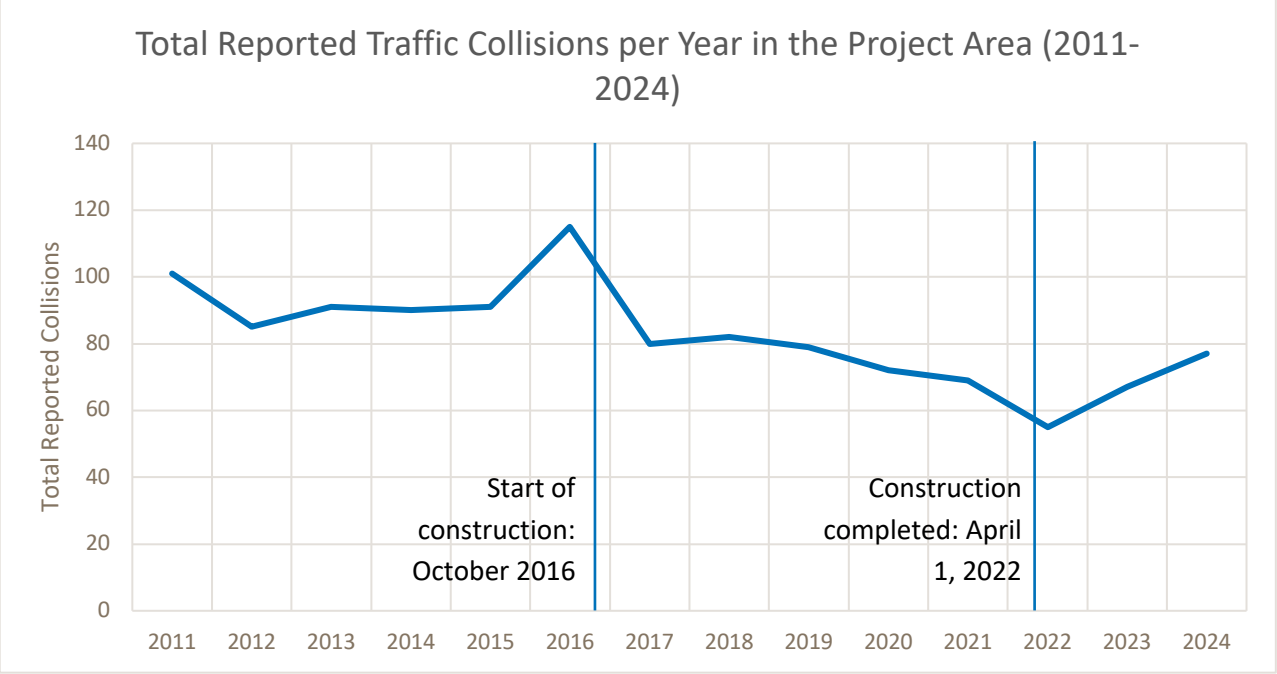

Figure 7: Total reported injury traffic collisions (Source: TransBASE)

In the five years prior to the start of Van Ness Improvement Project construction in October 2016, there were 10 fatal collisions on the corridor, an average of two fatal

collisions per year. In the first two years after the project opened on April 1, 2022, there were two fatal collisions, an average of one fatal collision per year, a decrease of 50% compared to the pre-construction period. During the 5.5 years of project construction, there were three fatal collisions, an average of 0.55 collisions per year, which is also well below the pre-construction period rate.

While the project was under construction, collision rates may have decreased in part due to calmed traffic due to lane closures. Van Ness Avenue was reconfigured into a two-lane roadway with numerous lane shifts that slow down traffic, which conceptually follows the post-project condition. In addition, important safety improvements were implemented early in the construction process. Left turn restrictions were implemented prior to project construction, which is a possible contributing factor to the reduced rate of fatalities during construction compared to the pre-construction period.

While overall fatal collisions have declined significantly, there were two fatal collisions in the first two years after project completion, as noted above. Both collisions involved pedestrians crossing Van Ness Avenue against a red traffic signal. The first collision occurred on August 12, 2022, and involved a taxi and a pedestrian, who crossed Van Ness Avenue against a red traffic signal.

The second of the two fatal collisions involved a Muni bus on Van Ness Avenue at O'Farrell Street, on October 19, 2023. The collision occurred at 12:51 AM, when a pedestrian walking on O'Farrell Street crossed Van Ness Avenue against a red traffic signal and was struck by a bus. The SFMTA will continue to closely monitor collision trends on the corridor to identify any new patterns or issues that need to be addressed.

Transit-involved collisions

Methods

Reducing transit-involved collisions was a critical aim of the project. Providing dedicated transit lanes reduces points of friction between transit and general traffic. Transit collisions were monitored within the project limits on Van Ness Avenue and South Van Ness Avenue between Mission and Chestnut streets, with annual rates calculated. This data comes from SFMTA's internal database which records all incidents involving Muni vehicles, both in active service and out of service, and includes all reported collisions regardless of severity, property damage or injuries.

Key findings

The Van Ness BRT project significantly reduced Muni-involved collisions. Compared to pre-project rates, transit collisions decreased by 82%.

Post-project, the collision rate remains significantly lower than the pre-project condition, even when considering that the suspension of the 47 Van Ness has reduced the amount of service on Van Ness by 28% compared to the pre-project condition.

In the year prior to construction (October 1, 2015 through September 30, 2016), there were 55 collisions involving Muni on Van Ness Avenue and South Van Ness Avenue in the project area, from Mission Street to Chestnut Street (reliable data is not available for earlier years). In the two years following completion of the project (April 1, 2022 through March 31, 2024), there were an average of 10 collisions per year, representing a reduction of 82%.

Muni-involved collisions from 2016 to 2024 are shown in Figure 8 below.

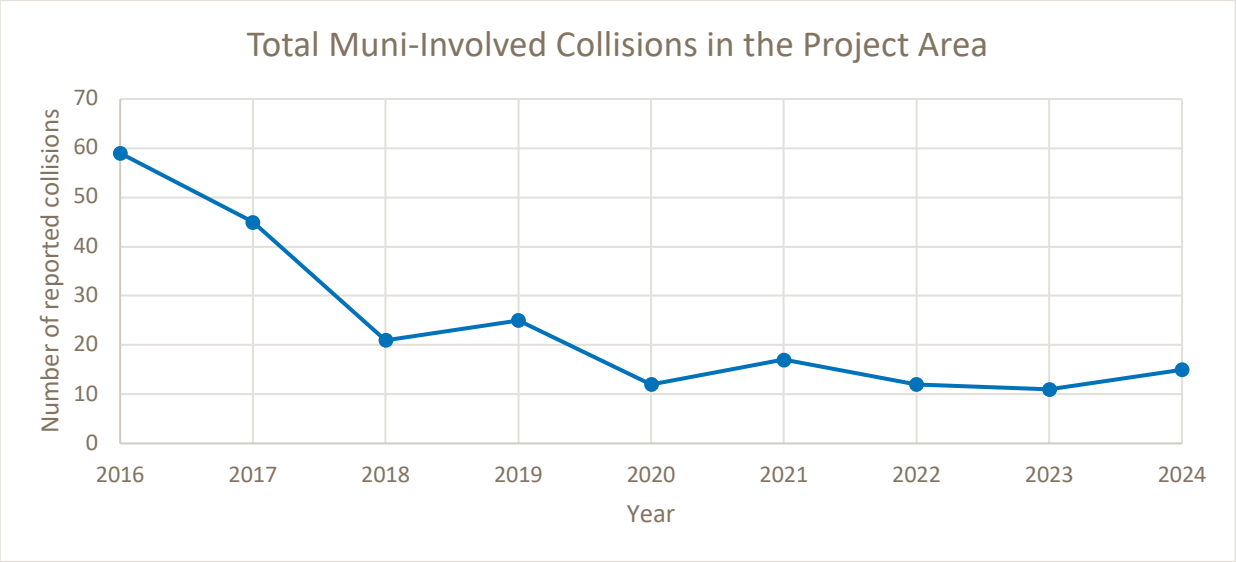

Figure 8: Total reported Muni-involved collisions (on the 47 Van Ness and 49 Van Ness/Mission lines) in the project area (Source: SFMTA System Safety Database)

The transit collision rate decreased significantly during construction as well as following the opening of the busway. These reductions in collisions are most likely due to the dedicated busway, which reduces potential points of conflict between motorists and transit vehicles and also removes the need for transit to frequently make lane changes and pull in and out of curbside bus zones, as in the pre-project condition.

In addition, the reduction in transit-involved collisions during construction--similar to that seen with overall traffic collisions--may also be due to construction-induced traffic calming, as well as successful mitigation efforts for transit safety. These efforts included temporary boarding islands for buses, which reduced conflicts at the curb and the risk of fixed-object collisions.

As noted in the previous section, there was one fatal collision involving a bus in 2023. The SFMTA continues to closely monitor transit collision trends on the corridor to identify any new patterns or issues that emerge.

Customer experience

Methods

An overarching aim of the Van Ness Improvement Project was to improve the experience for Muni customers in the corridor. This section reports qualitative findings from an on-board survey of bus riders that was conducted in January 2024. The survey was conducted on weekdays between January 11 and 18, in four languages (English, Spanish, Filipino and Chinese). About 145 surveys were completed.

Results

Most of Van Ness BRT corridor riders noticed an improvement in their travel time after implementation of the project. Of those surveyed, over 86% perceived an improvement in travel time as shown in Figure 9 below.

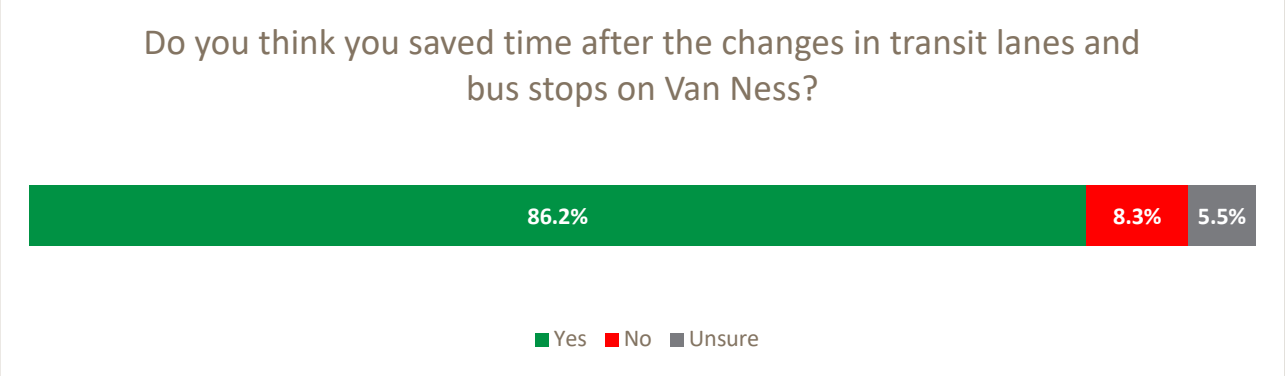

Figure 9: Response to on-board survey question regarding perception of travel time savings (N=145)

A majority of riders supported the project, with only 1.4% indicating they did not support it. Of those surveyed during the 2024 on-board survey, over 83% supported or strongly supported the changes, as shown in Figure 10 below.

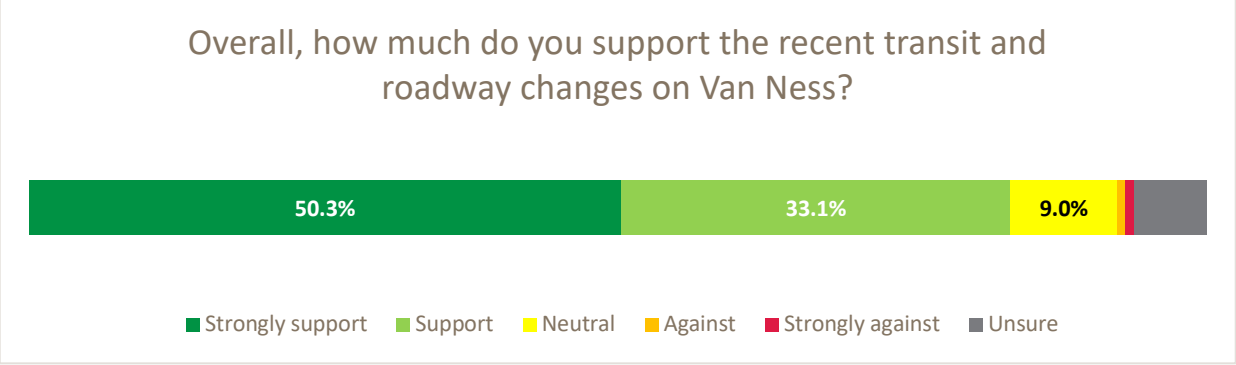

Figure 10: Response to on-board survey question regarding support of project (n=145)

Over half of riders report riding the bus more often after implementation of the project. As shown in Figure 11, of those surveyed, about 52% indicate riding the bus more often after implementation.

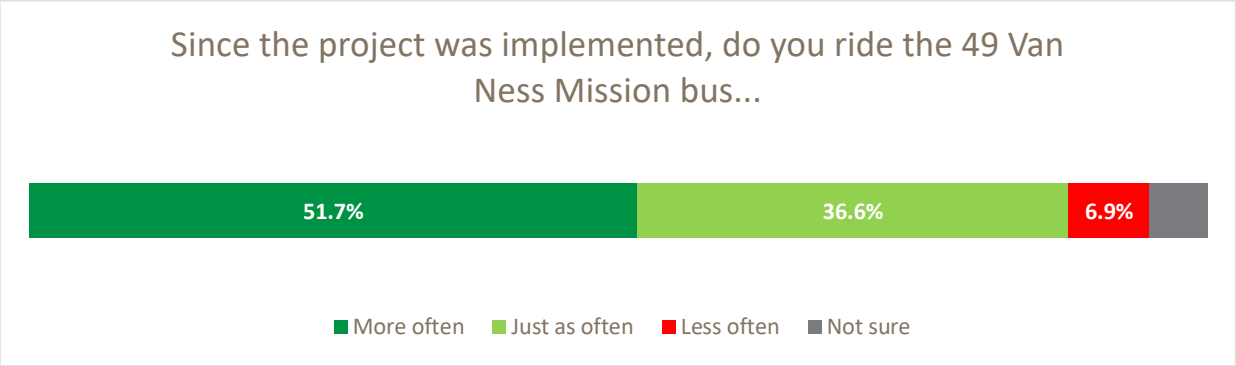

Figure 11: Response to on-board survey question regarding frequency of riding the bus since project implementation (n=145)

BRT Standard score

Upon completion of the project, the SFMTA sought certification of the project by the Institute for Transportation & Development Policy (ITDP), which maintains the BRT Standard, a globally recognized benchmark for evaluating the quality of BRT projects. Per ITDP, the BRT Standard "is the centerpiece of a global effort by leaders in bus rapid transit design to establish a common definition of BRT and ensure that BRT corridors consistently deliver world class passenger experiences, significant economic benefits and positive environmental impacts."

Based on an exhaustive review grounded in the BRT Standard scorecard, Van Ness BRT received BRT "Silver" certification, one of only four projects in the United States to receive this level of certification, and the only BRT in California with this designation.

The other BRT Silver projects in the United States include the New Britain Busway in Hartford, CT, the Healthline in Cleveland, OH, and the newly "Silver"-certified Pulse corridor in Richmond, Virginia. California has two BRT "Bronze" projects: the Orange line in Los Angeles and the sbX E Street Bus BRT corridor in San Bernardino. There are currently no BRT Gold projects in the United States.

More information about Van Ness BRT and Muni Forward

More information about the Van Ness BRT project is available at SFMTA.com/VanNess.

Van Ness BRT is part of Muni Forward, a systemwide program to improve reliability on Muni's most heavily used bus and rail lines. Since 2014, Muni Forward has delivered over 100 miles of reliability improvements, helping to reduce travel time, improve reliability, enhance safe access to transit for people walking and biking, and improve rider amenities at stops. Learn more at SFMTA.com/MuniForward.