

Evaluating San José's 4th Street Pop-Up Bikeway: What Does The Public Think?

Hilary Nixon, PhD



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EVALUATING SAN JOSÉ'S 4TH STREET POP-UP BIKEWAY: WHAT DOES THE PUBLIC THINK?

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I. INTRODUCTION

Promoting cycling as an alternative means of daily travel has garnered significant attention at the local, state, national, and international levels for the past two decades.¹ The benefits of increased cycling include improved public health,² reduced vehicle emissions,³ reduced traffic congestion,⁴ as well as potential economic benefits.⁵ However, the percentage of commuters biking to work remains low in the U.S. Only 0.6% of Americans travel to work by bike, although in California, 1.1% commute by bike, and in Santa Clara County, close to 2% are bike commuters.⁶ Certainly, urban areas can be attractive for bike commuters due to the geographic proximity of jobs and housing and the greater likelihood of bike infrastructure. Figure 1 documents the top 20 cities in the U.S. (as of 2014) with populations over 100,000 by percentage of bike commuters.

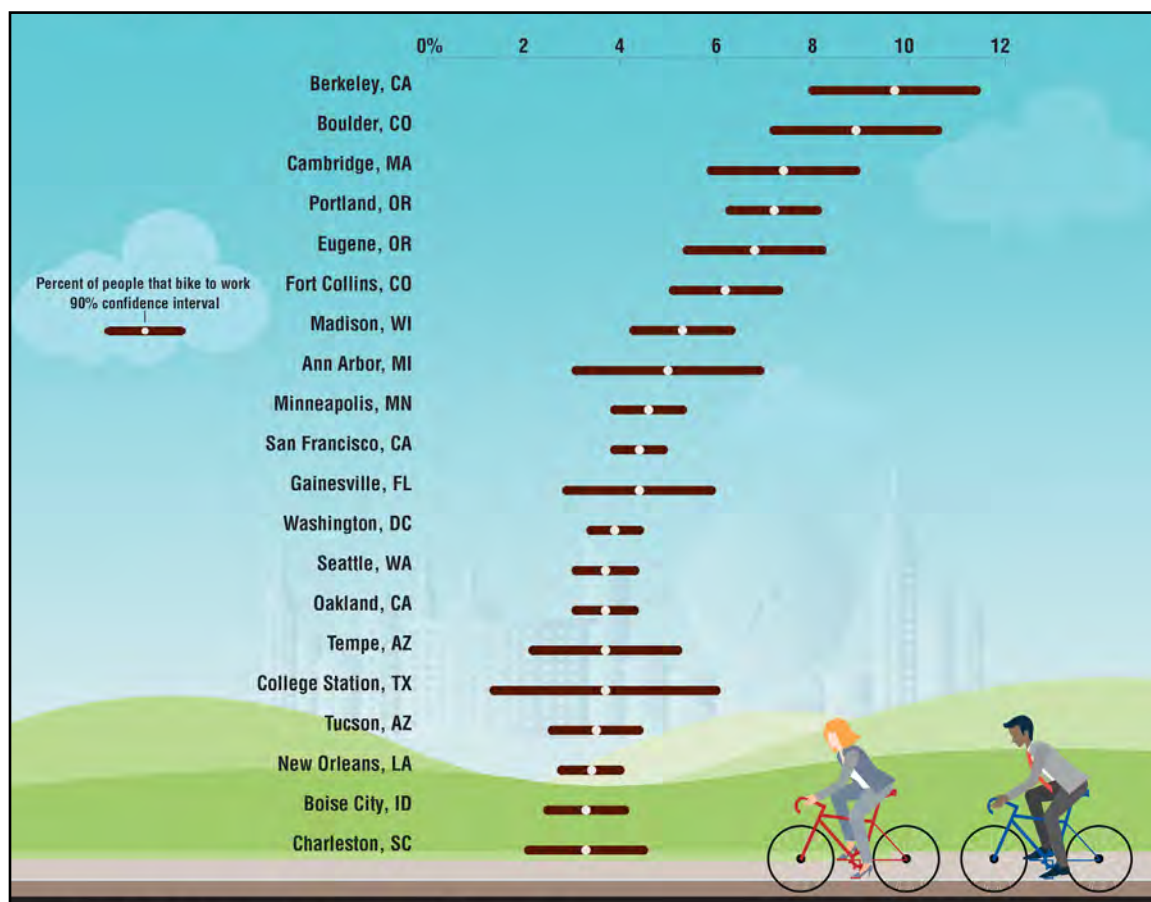


Figure 1. Cycling Commuters: Top 20 Cities (of 100,000 population or more), by Percentage of People Biking to Work

Source: U.S. Department of Commerce, Economics and Statistics Bureau, U.S. Census Bureau. 2014 American Community Survey. Accessed January 25, 2018 from https://www.census.gov/content/dam/Census/library/visualizations/2016/comm/cb16-tps96_bike2work.jpg.






According to Fruhen and Flin, good cycling infrastructure is an effective way to reduce the risks—and perceived risks—associated with the interaction between drivers and cyclists.⁷ As cities look for ways to increase the number of people bicycling, the quality of the infrastructure matters. This white paper explores people’s opinions regarding a temporary

protected bikeway installation in the City of San José, California. Key research questions are as follows:

1. What were the general impressions of users of the bikeway, both positive and negative? Did opinions vary depending on how the individual experienced the bikeway, either on foot, by bicycle, or by car?
2. Are there improvements that the City of San José could make for future bike infrastructure installations based on feedback about the pop-up bikeway along 4th Street?

Before exploring the existing literature and discussing research methods and results, it is important to explain some terminology associated with bike infrastructure. Table 1 describes some common types of bike infrastructure, ranging from separated, off-street bike paths to sharrows, whereby bikes and vehicles share the same space on the road.

Table 1. Examples and Description of Different Types of Bike Infrastructure

Graphic Representations of Bike Infrastructure	Description of Bike Infrastructure
	<p>Bike Path: Paved pathway, separated from vehicular traffic. Can be used for a range of active transportation activities (e.g. pedestrians, bicyclists, scooters, skateboards, etc.). Categorized as a Class I bikeway by Caltrans.</p>
	<p>Protected Bikeway/Cycle Track: Located on street, but with physical separation from traffic (usually pillars or similar structures). For exclusive use of bicyclists. Categorized as a Class IV bikeway by Caltrans.</p>
	<p>Buffered Bike Lane: Located on street, combining a bike lane with a painted buffer to provide separation from traffic and more room for the bicyclist to maneuver. Categorized as a Class II bikeway by Caltrans.</p>
	<p>Bike Lane: Located on the street; provides a dedicated area for bicyclists. Categorized as a Class II bikeway by Caltrans.</p>
	<p>Sharrow: Located on lower volume/speed roads, often in neighborhoods. Painted markings on the road alert vehicles and bicyclists that both users can occupy the same space on the road. Often accompanied by street signs denoting that "Bikes May Use Full Lane." Categorized as a Class III bikeway by Caltrans.</p>

Source: City of Los Angeles, LADOT Bike Program. "Types of Bicycle Infrastructure." Accessed February 8, 2018 from <http://bike.lacity.org/what-we-do/infrastructure/>; Caltrans. "A Guide to Bikeway Classification, July 2017." Accessed February 8, 2018 from http://www.dot.ca.gov/d4/bikeplan/docs/caltrans-d4-bike-plan_bikeway-classification-brochure_072517.pdf.

The rest of this report is structured as follows. In Chapter II, the author presents a summary of existing literature focusing on the relationship between the built environment and travel behavior as well as public preferences for bicycle infrastructure. Chapter III describes San José's 4th St. Pop-up Bikeway project in detail. An overview of the methods used to gather and analyze data on the public's opinion of the project follows in Chapter IV. Key findings are then presented and some recommendations provided for future efforts by the City of San José to develop additional bike infrastructure in Chapters V and VI.

II. LITERATURE REVIEW

A large body of literature explores the relationship between the built environment and travel behavior. According to Handy et al., a strong correlation exists between higher density, mixed-use, transit and active-transportation-friendly neighborhoods and fewer vehicle miles travelled (VMT).⁸ What isn't always clear, however, is the direction of causality—that is, do neighborhood characteristics influence people's behavior, or do certain types of people seek out neighborhoods because they wish to drive less and use other travel modes? Handy et al.'s longitudinal research in Northern California seems to suggest that, even accounting for socio-demographic factors and attitudes, people adjust their travel behavior and drive less as their built environment changes to accommodate easier access to alternative modes. For cities such as San José looking to reduce VMT and increase active transportation commuting, this is a good sign: build it, and they will come.

Bicycling rates in the United States are low, particularly in comparison to European countries.⁹ As efforts to increase bicycle commute mode share accelerate, there is considerable interest in understanding people's attitudes and perceptions to bicycling conditions and infrastructure.

Several studies have explored preferences for different types of bike infrastructure, such as bike lanes, separated bike paths, etc. For example, Teschke and Brauer, in their study of bicycling in two large Canadian cities (Montréal and Vancouver), find that access to protected bike lanes (i.e. cycle tracks) led to increased cycling mode share and that a connected network was also important.¹⁰ These factors were particularly important for women increasing their cycling rates. Similarly, Buehler and Dill, in their analysis of the literature on the effects of bike infrastructure on cycling, note that there is a clear hierarchy in preferences (both among cyclists and non-cyclists) across infrastructure types: separated bike paths or cycle tracks are preferred over bike lanes or wide shoulders.¹¹ Of particular relevance for the current study is research by Mitra et al. that examined whether the replacement of a bike lane with a cycle track in Toronto, Canada, led to increased cycling.¹² The researchers found that 38% of cycle track users had switched from using other travel modes. Of those who switched, 55% switched from transit, 24% switched from driving, and 13% had previously walked. While the authors caution about generalizing broadly from this study, its results do suggest the possibility that as San José upgrades existing bike infrastructure and builds new infrastructure, cycling rates will increase and at least some portion of those cyclists will have switched from driving.

While access and convenience of bicycle infrastructure are important for users, research by Tilahun et al. suggests that people are willing to make fairly noticeable trade-offs in order to use a higher quality bike facility.¹³ In their study of 167 University of Minnesota employees, respondents were willing to travel up to 20 minutes longer to switch from an unmarked on-road facility with vehicle parking to an off-road bicycle trail. Using a similar stated preference survey, Caulfield et al. discover that direct routes with short journey times and traffic-segregated cycling infrastructure were most preferred.¹⁴

Like Teschke and Brauer, several studies address the importance of connected bicycle networks for increasing bicycling rates. Schoner and Levinson conducted a study of 74 U.S. cities and found that a connected network that provides more direct route access is an important predictor for bike commuting.¹⁵ When the system is fragmented, cyclists must choose between riding in mixed traffic or taking potentially lengthy detours to avoid riding with traffic; both options often discourage cycling. Mekuria et al. develop a technique for evaluating a network based on its “weakest link”—that is, those breaks in the system which, if addressed, could provide enhanced connectivity to support cycling, particularly for those who may be reluctant to ride due to safety concerns.¹⁶

Safety, both real and perceived risks, impacts a person’s decision to bike. A complete, accurate picture of bicycle crash data is challenging to come by because crashes often aren’t reported, particularly for minor injuries or non-injury crashes. In March 2017, the National Highway Traffic Safety Administration (NHTSA) released a report on bicyclist fatality and injury data for 2015.¹⁷ Cyclists comprised 2.3% of all road fatalities in the U.S. with a total of 818 reported deaths. In addition, NHTSA estimated that approximately 45,000 cyclists were injured in 2015. A detailed study by Teschke et al. on the risk of injuries to cyclists by infrastructure type found that, unsurprisingly, the lowest risks are on low traffic volume streets and streets with bicycle-specific infrastructure.¹⁸ In their study, the lowest injury risk was associated with cycle tracks (i.e. protected bikeways) with 1/9th the risk compared to a major street with no infrastructure and parked cars. Standard bike lanes, without separation from traffic, were associated with 1/2 the risk compared to major streets.

According to Hull and O’Holleran, good infrastructure design can lead to more cycling, but it does require considerable government support to prioritize cycling in order to develop a safe, convenient, and attractive system that is also integrated with other land use planning decisions, such as compact, mixed use development.¹⁹ Similarly, Clayton and Musselwhite recognize that infrastructure improvements enhance the experience for existing cyclists and can help encourage new cyclists, but emphasize that infrastructure alone is not sufficient.²⁰ As the City of San José looks to build a more robust bicycle infrastructure network, understanding people’s opinions about the infrastructure is important. Ensuring that the City’s General Plan and other planning documents work together to support the development of bicycle-friendly infrastructure as well as more compact, mixed-use development where appropriate will also be key for long-term success and changes to people’s travel behavior.

III. ABOUT THE 4TH STREET POP-UP BIKEWAY

Over the next two years, the City of San José has planned significant improvements to its bike network, focusing on downtown and connections to the surrounding neighborhoods. Nearly half of San José's 1 million+ residents and half of all jobs are within a 4-mile, 30-minute bike ride to downtown.²¹ Over the next 20 years, the City's population is expected to increase by 400,000, bringing the total to nearly 1.5 million.

The City of San José partnered with the Knight Foundation and the National Association of City Transportation Officials (NACTO), among others, to develop a plan to shape San José's bike network in a way that would facilitate an increase in bike commute share and reduce VMT.

Currently, there are 320 miles of on-street bikeways and 58 miles of trails in San José, but only 5 streets have protected bikeway facilities. Of these protected facilities, 4 are quite short distances which were recently installed. As discussed in the preceding literature review, in order to encourage the potential cyclists who are "interested, but concerned," issues related to safety and convenience of the bike infrastructure need to be addressed.

From August 7–14, 2017, a temporary, "pop-up" protected bikeway was installed along 4th St. from St. James St. to San Fernando St., and an existing one-way protected bike lane was expanded to a two-way, cycletrack, bike lane from San Fernando St. to San Salvador St. in downtown San José (see Figure 2). The purpose of the temporary installation was to gather community feedback on new bike infrastructure to assist with planning for an expanded bicycle network in downtown and the surrounding neighborhoods.

As shown in Figure 2, the pop-up bikeway extended for approximately 0.6 miles along a major north-south street in downtown San José. A number of different infrastructure "treatments" were installed along the route (see Figure 3). The segment on 4th St. from San Carlos to San Fernando received a two-way cycletrack treatment with additional amenities such as seating, trees, chalk art, and a parklet at the south end. From San Fernando to St. James, a contraflow northbound protected bike lane was installed and different barriers between the vehicle travel lanes and the bike lane were implemented. These included parking and traffic cones, wooden planter boxes, trees, and plastic wave-shaped delineators.



Figure 2. Diagram Showing Pop-Up Bikeway Installation



Parklet located at south end of pop-up bikeway



Northbound contraflow lanes



Two-way cycletrack



Trees as barriers along bikeway



Wooden planter boxes as barriers along bikeway



Plastic wave-shaped delineators along bikeway

Figure 3. Photos Showing Different Treatments Along the Pop-Up Bikeway

In addition to the one-week temporary installation, two additional community events were held to solicit feedback, including a community roundtable on August 9, and a meet-and-greet happy hour on August 10. These activities also coincided with a weeklong series of events in collaboration with NACTO and their conference which brought experts from Chicago, Atlanta, and Vancouver to San José to discuss bike planning.

IV. RESEARCH METHODS

In order to assess public opinion concerning the bikeway and gather suggestions for future improvements, the City of San José conducted a non-random sample survey of bicyclists, pedestrians, and motorists who experienced the bikeway.

Surveys were distributed online via a Google Form. It was available from August 7–20, 2017, and links to the survey were posted on social media pages, including the Department of Transportation’s Bike Program Twitter Feed, on three public Facebook event pages associated with the concurrent NACTO conference, and shared with the Silicon Valley Bike Coalition.

In addition, on August 10, two employees from the Department of Transportation distributed survey questions on postcards to vehicle drivers exiting the City’s employee parking garage located on 4th St. (see Figure 4). Postcards were also distributed to pedestrians and bicyclists passing by during this time. Postcards were stamped and addressed to City Hall.

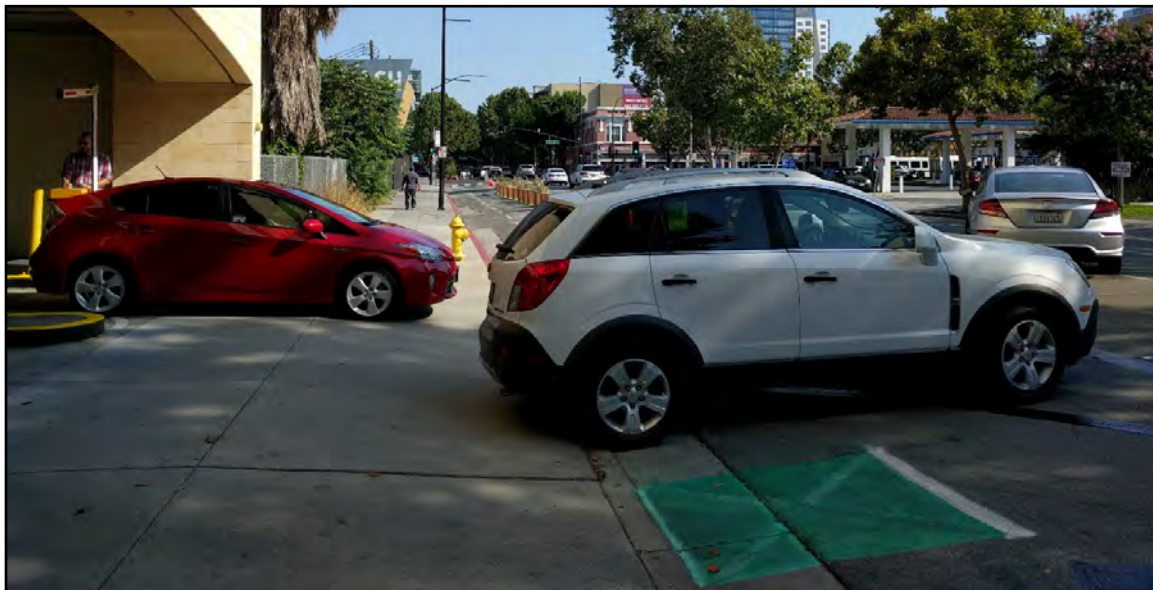


Figure 4. DOT Employee (in plaid shirt, standing just inside garage entrance) Distributing Surveys to Drivers

Finally, from August 11–13, 2017, a box with surveys was mounted on a sign pole at the corner of 4th St. and Santa Clara. Passers-by were encouraged to take a survey and return it via mail.



Figure 5. Box of Surveys Available at 4th St. and Santa Clara from August 11–13

A total of 104 survey responses were received. Forty-two were received via postcard or as a direct email to DOT employees, and the remaining 62 were received via the online Google Form.

The surveys were short and simple, designed to solicit feedback on the pop-up bikeway. The following questions were asked:

1. How did you experience the pop-up bikeway? (By Automobile; By Bicycle; On Foot; Another Mode)
2. What is your overall impression of the pop-up bikeway? (Positive; Neutral; Negative)
3. What did you like about the pop-up bikeway?
4. What did you dislike about the pop-up bikeway?
5. What would you add to or change about the pop-up bikeway?
6. Would you like to see protected bike lanes in San José? (Yes; No; Not Sure)

Questions 3–5 were open-ended questions to which respondents could provide detailed written responses. Qualitative data analysis techniques were used to code and categorize the responses. A deductive coding process was used to identify common themes across responses based on common themes identified in the literature review.

V. FINDINGS

HOW RESPONDENTS EXPERIENCED THE POP-UP BIKEWAY

Bicycle was the most common mode by which respondents experienced the bikeway, followed by on foot. Nearly 70% indicated that they experienced the bikeway by bike, while 28% were on foot. This high percentage is not unexpected, as it was easier for these individuals to receive the surveys as they traveled along the bikeway area. Figure 6 shows the percent of respondents who experienced the bikeway by different modes. Respondents could select multiple modes, so totals across the modes do not sum to 100%. A total of 20% indicated multiple modes, as shown on the far right side of Figure 6.

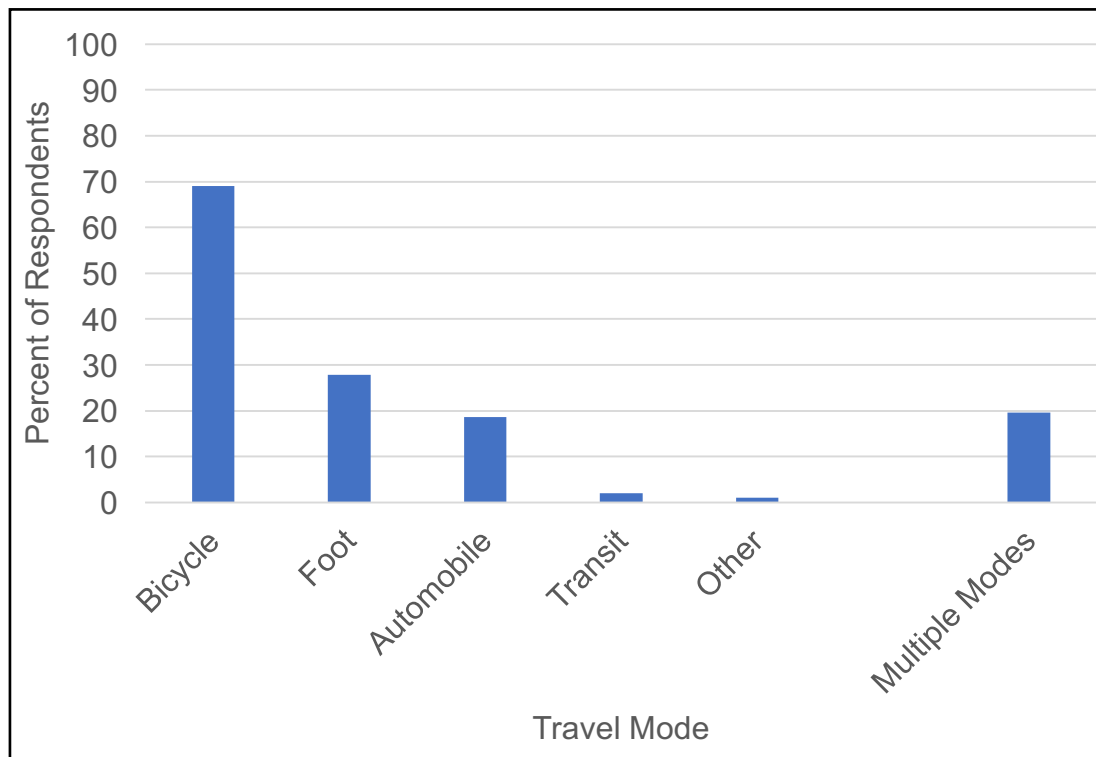


Figure 6. How Respondents Experienced the Bikeway, by Mode

Note: Participants could select multiple modes; percentage selecting multiple shown by rightmost column.

IMPRESSION OF THE POP-UP BIKEWAY

Overall, survey respondents overwhelmingly indicated a positive impression of the pop-up bikeway (see Figure 7). Of 104 respondents, only 11% stated that they had a negative impression, while 75% of all respondents indicated a positive impression.

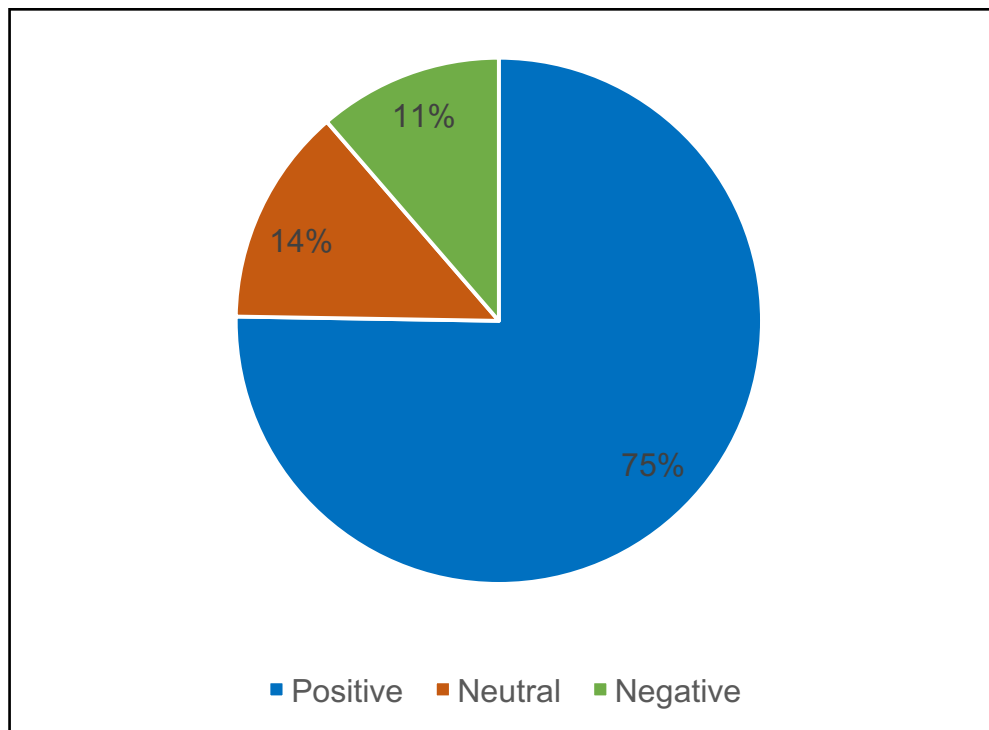


Figure 7. Respondents' Impression of Bikeway (in percent)

Not surprisingly, bicyclists and pedestrians tended to have a more favorable impression of the bikeway compared to motorists. Figure 8 shows the percentage of respondents with a positive impression of the bikeway by travel mode. Eighty-two percent of both bicyclists and pedestrians expressed a positive opinion of the bikeway, compared to only 61% of motorists.

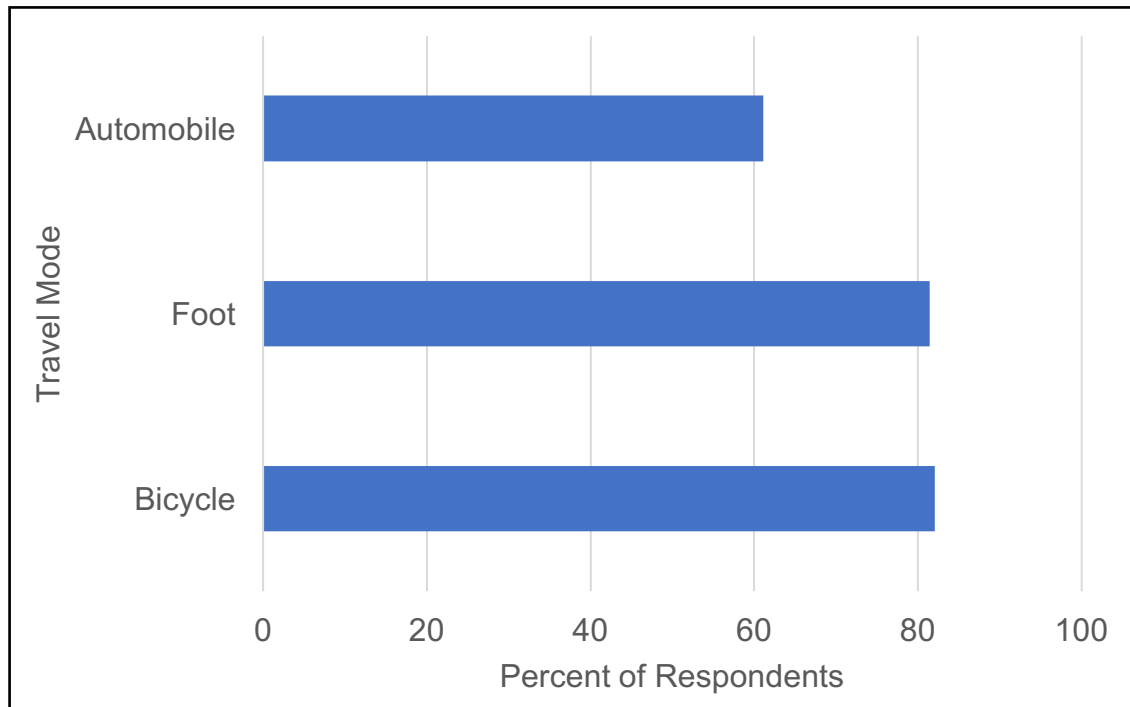


Figure 8. Percent of Respondents with a Positive Opinion of the Bikeway, by Travel Mode

WHAT DID RESPONDENTS LIKE ABOUT THE BIKEWAY?

The vast majority of respondents provided qualitative feedback on what they liked about the bikeway. Only 12 of 104 returned surveys (11%) did not provide a response to this question. If the collective opinion could be summarized in a single word, it was this: safety. Fifty-nine respondents indicated that aspects related to safety were what they liked about the bikeway. Across those 59 individuals, comments addressing some aspect of safety were coded 70 times. While some comments referenced issues related to safety in general, such as, “Improved safety for cyclists” or “I felt much safer,” some respondents were more specific regarding safety concerns. Comments focused on protection, either from moving traffic in the travel lanes, or the door zone next to parked vehicles, were common themes. “I liked the separation,” “You’re protected from the door zone,” “I like the extra space between the bike lane and the cars,” and “Room for bikes separate from cars” were representative comments.

Another safety-focused theme concentrated specifically on the physical barrier. Respondents noted that “Having a barrier that is more than a line of paint is much safer” or that they liked the “physical separation of cyclist and cars on [a] busy downtown street.” One respondent wrote, “I really felt safe biking where there was a physical barrier to traffic rather than a painted one ... I regularly take the 10th/11th St. bike lanes to San Fernando, where there are the larger buffered bike lanes, but people still ignore the paint and drive on them.”

Less common themes across the comments focused on design elements and/or functionality of the bikeway. Thirteen respondents noted that they liked the contraflow functionality of the bikeway. Said one respondent, “One-way streets are an impediment to getting around easily by bicycle. Counterflow bike lanes are a good solution to this problem,” while another noted, “I think the idea of making that stretch of bike lane bi-directional is great. People already ride in both directions there, so new markings, etc., would be great.” Regarding specific design elements such as the stylized barrier, chalk art, and park area along the pop-up bikeway, 11 respondents wrote about these features in their comments: “I loved the white wave barriers. I like the design and think it makes the street more attractive,” or “I liked the plants that were incorporated (the trees and planter boxes).” Even as people noted design elements they liked, suggestions for improvement were also offered. “Loved the waves, but wondering if another color would be better,” and “Trees are also very nice when they can be used without limiting visibility.”

A small number of respondents (6) commented specifically about liking the signage used along the bikeway. Specifically, the signage for motorists was called out by respondents: “The green signs in the Fourth Street garage that told me to look out for cyclists,” “Great signs to make sure cars exiting garages looked for cyclists,” and “Signs posted near parking garage exit” were all noted by respondents as aspects they liked.

WHAT DID RESPONDENTS DISLIKE ABOUT THE BIKEWAY?

Eighty-four respondents responded to the question, “What did you dislike about the pop-up bikeway?” However, 20 of the 84 comments specified that there was “Nothing” that the individual disliked about the bikeway. Nine of these individuals indicated that they would like to see it permanent, with comments indicating disappointment that “It’s not permanent” or “It’s only temporary.”

Among the respondents who did provide specific dislikes about the bikeway, the most common theme focused on confusing aspects of the installation. In fact, 25 individuals (30% of those responding to this question) commented about issues related to confusion. Fourteen respondents commented specifically that they found the contraflow functionality of the bikeway confusing. This figure is nearly identical to the number of individuals (13) who liked this functionality. Said one respondent, “The main thing I did not like about the pop up bikeway was that it was a contraflow lane on a busy one-way street. I did not feel safe crossing at intersections and past driveways because I felt like cars were not expecting me to be going against traffic.” A similar comment noted that, “On a one-way street, drivers looking to merge simply aren’t looking in the contrary direction, and that puts cyclists at high risk. I feel comfortable on city streets, but that made me uncomfortable.”

VI. CONCLUSIONS

Overall, survey results indicate that the majority of respondents had an overall positive impression of the bikeway. This finding is not entirely surprising, since most respondents experienced the installation via bike and hence were likely to think positively about the City's efforts to improve and/or expand bike infrastructure. However, even the 61% of respondents who experienced the bikeway by automobile also had a positive impression of the facility, suggesting that there is general support for this type of infrastructure. It should be noted, though, that nearly 20% of respondents experiencing the bikeway on foot or bike didn't have a positive opinion, so there is not a 100% consensus.

Without question, issues related to safety and the perception of safety motivated the positive comments about what survey respondents liked about the bikeway. In general, people seem to like and want more protection and space between bikes and cars on the roadway. As the City looks to expand and improve bike infrastructure throughout San José, emphasizing design elements that take safety into consideration is recommended. When possible, look to provide physical space and visual barriers to better alert drivers to the presence of bicyclists, and use clear design to reinforce for bicyclists where they are supposed to travel.

Issues related to confusion were the most common dislikes reported by respondents. This frequency is unsurprising, since the installation was temporary, so markings were not as clear as one would expect from a permanent installation. In addition, the City was trying out bike infrastructure features not common in the area such as two-way cycle tracks and the contraflow bike lane along a one-way street, so there was lack of familiarity with how to use and react to the different treatments. As the system expands, until similar types of infrastructure are common, particular attention to signage and clear markings will be essential to ensure that pedestrians, bicyclists, and drivers all know what to expect and how to use the facilities.

A major limitation for this study was the survey design and administration. While a very short, five-question survey can be appealing because it is quick and simple for people to complete, it limits what a researcher can learn about the respondents as well as the type of analysis that can be done. In terms of survey administration, a true random sample would have been the preferred approach. Unfortunately, it is impossible to determine whether the responses are representative of a broader population. Future research studies can look to carefully design both the survey instrument and the administrative protocol in order to more effectively generalize results to the city's population.

ABBREVIATIONS AND ACRONYMS

NACTO	National Association of City Transportation Officials
NHTSA	National Highway Traffic Safety Administration
U.S.	United States
VMT	Vehicle Miles Travelled

ENDNOTES

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