Road Diet Feasibility Study

Park Boulevard, E 18th Street to MacArthur Boulevard; and E 18th Street, Lakeshore Avenue to Park Boulevard

OakDOT
Oakland Department of Transportation

Safe Streets Division
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The City of Oakland's Department of Transportation (OakDOT) completed this study to investigate cost-effective ways to improve safety and access for all roadway users. Specifically, the study addresses speeding; safety for pedestrians, bicyclists, and motorists; and traffic congestion. The study evaluates the feasibility of a "road diet" – reducing the number of travel lanes to match traffic volumes and to improve safety. Reallocating travel lanes to other purposes may create a better match with how a street is designed, how it is used, and how people would like it to be used. National research shows that typical road diet projects reduce the number of crashes by 28 percent. Road diets can be inexpensive to implement, particularly when coordinated with paving, because they can be as simple as re-striping the roadway. To determine if a road diet would be feasible and beneficial, this study examines the existing conditions at the project location and how the proposed project would affect traffic safety and circulation.

This study was completed by Jennifer Stanley, David Pené, and Jason Patton (OakDOT, Safe Streets Division), and Kittelson & Associates, Inc. The study uses the City's Methodology for Road Diet Feasibility Studies.

Purpose & Planning Context

Park Blvd is an arterial roadway that connects Lake Merritt to Montclair, crossing Interstate 580 and MacArthur Blvd at Oakland High School. At its southern endpoint, Park Blvd ends in the Lake Merritt Parkway District with E 18th St providing the remainder of the connection to Lake Merritt. This study evaluates Park Blvd (E 18th St to MacArthur Blvd) and E 18th St (Lakeshore Ave to Park Blvd). The study area is in the neighborhoods of Lake Merritt Parkway, Peralta Heights, Haddon Hill, and Bella Vista. A road diet is proposed to address neighborhood concerns regarding speeding, pedestrian safety, and bicyclist access.

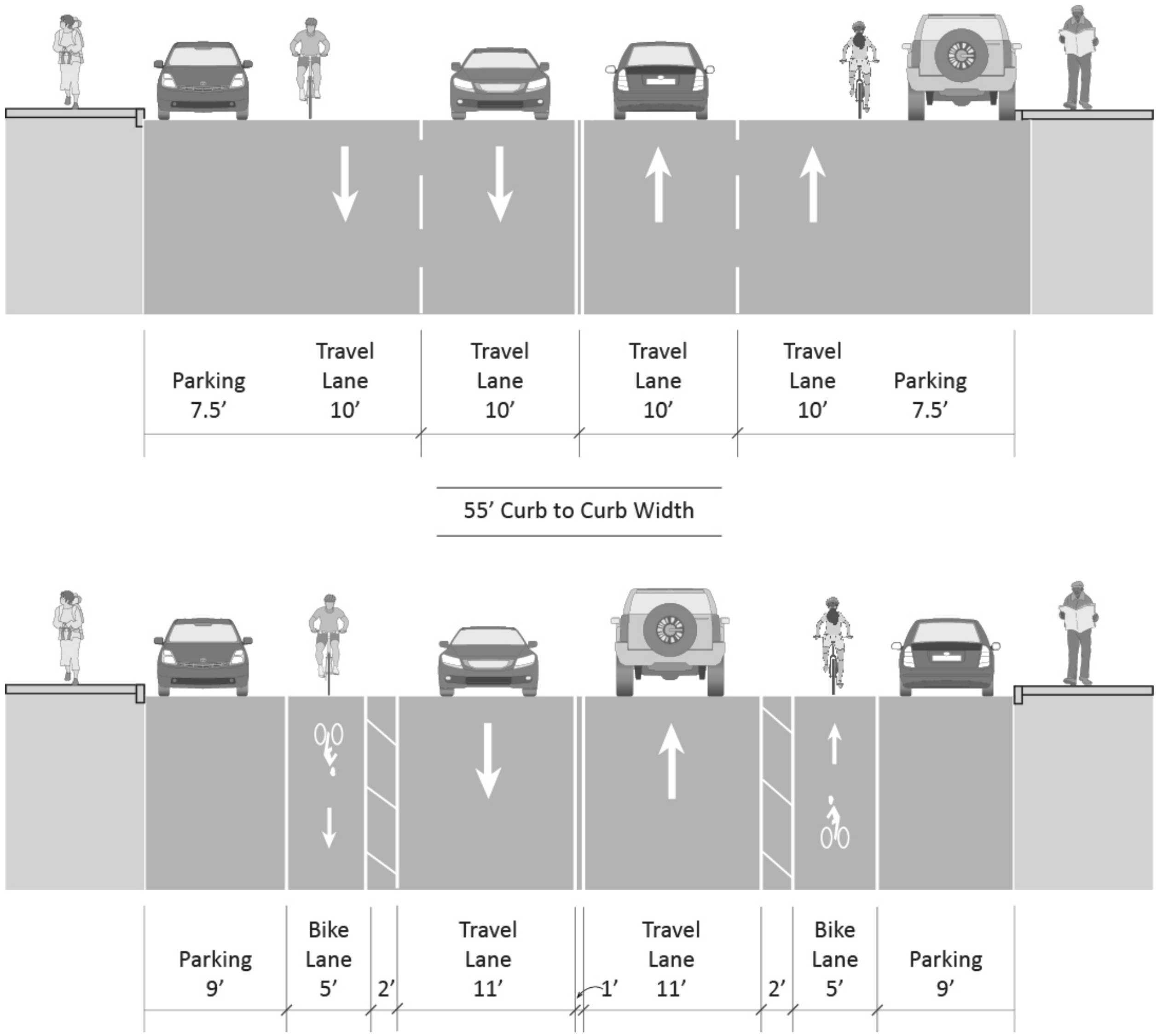
Park Blvd from E 18th St to Spruce St was identified as one of the Oakland streets with the greatest concentration of pedestrian-involved crashes (OakDOT All Modes High Injury Network, 2018). E 18th St and Park Blvd are part of the City's Bicycle Plan with the road diet on Park Blvd identified as a priority project. AC Transit's Line 33 provides bus service on the corridor to downtown Oakland and Montclair with headways of 15 to 20 minutes. Park Blvd from E 18th St to MacArthur Blvd is on the City's Pavement Prioritization Plan. This feasibility study was undertaken to coordinate improvements with the scheduled paving.

Figure 1: Context Map

Description of Proposed Project

Park Blvd from E 18th St to MacArthur Blvd is a four-lane roadway with on-street parking on both sides. E 18th St from Lakeshore Ave to Park Blvd is also four lanes with on-street parking and includes a raised median. The proposed project will reconfigure Park Blvd and E 18th St to one travel lane per direction with pedestrian safety islands and left turn pockets at selected locations. The project includes buffered bike lanes along its length. It also includes a buffered bike lane on 3rd Ave from Park Blvd to E 18th St. Crosswalks will be improved with high-visibility markings and additional raised islands will be installed at intersections with wide, sweeping corners to slow turning motorists. Bus stops are being consolidated, relocated, and lengthened at multiple locations to reduce delay to buses. This is achieved primarily by eliminating stops with the lowest ridership; adjusting stop locations to create more even spacing; and relocating stops from the near-side to the far-side of signalized intersections. The complicated intersection of Park Blvd / 5th Ave / Ivy Dr will be simplified by eliminating the least common (and most hazardous) movements. The project will be implemented as part of a citywide paving project. It is funded through the City's paving budget with additional funds covering the costs of the pedestrian safety islands. To comply with the City's Accessible Parking Policy, four existing parking spaces will be converted to blue zones.

Figure 2: Existing and Proposed Cross-sections



Summary & Recommendations

Based on the findings explained below, this study recommends reconfiguring the lanes as follows:

On Park Boulevard, E 18th Street to MacArthur Boulevard: remove one travel lane in each direction and install left turn pockets at key intersections, continuous buffered bike lanes, high-visibility crosswalks, and pedestrian safety islands at select locations.

On E 18th Street, Park Boulevard to Lakeshore Avenue: remove one travel lane in each direction, retaining left-turn pockets, and install buffered bike lanes except for the westbound block face between Park Boulevard and 3rd Avenue where the existing condition has a single travel lane.

The key findings are:

- There were 84 total crashes during the five-year study period, 40 of which caused injury and one of which killed a motorist. Of injury crashes, six (or 15%) involved pedestrians and one involved a bicyclist.
- Approximately 84% of motorists exceed the posted speed limit.
- The current roadway design can accommodate 1,625 vehicles per hour. The maximum number of vehicles are 769 vehicles per hour in the afternoon peak commute.
- One travel lane per direction and turn pockets at key intersections can accommodate current motor vehicle traffic.
- The proposed project would improve pedestrian safety and access with new high-visibility crosswalks, pedestrian safety islands, and one less lane to cross changing very poor conditions at most intersections to good or very good.
- The proposed project would improve bicyclist safety and access by providing buffered bike lanes and slowing motor vehicle traffic.
- In the future, motor vehicle traffic could increase by about 11% and still be accommodated by the proposed project.
- All traffic signals are expected to operate acceptably in the project condition. However, if there are traffic delays in the future, the City may wish to adjust signal timing at key intersections.
- Bus travel times could increase slightly. This should be mitigated through bus stop relocation, consolidation, and other design changes.
- Left-turn pockets should be included at key intersections.

Study Topics

OakDOT evaluates the feasibility of road diets using methods that respond directly to the lived experiences of people who travel on the roadway and those who live or work along the corridor. This study investigates the following topics:

- **Traffic Crashes:** What traffic crashes were reported in the past five years? Who was injured or killed? What are the causes of these crashes?
- **Traffic Speeds:** How fast are motorists driving? How many motorists are driving faster than the speed limit?
- **Traffic Volumes:** How many motor vehicles use the street? With the current configuration, how many vehicles could use the street? With the proposed configuration, how many vehicles could use the street?
- **Pedestrian Safety:** How challenging is it for pedestrians to cross the street? Would the proposed project make it safer and easier to cross?
- **Bicyclist Safety:** Do people feel safe bicycling on the street? Would the proposed project make more people feel safe bicycling?
- **Future Traffic Growth:** If the project were implemented, could the street accommodate more motor vehicle traffic in the future?

- **Traffic Signals:** Traffic signals are important for safety on major streets. But they are also the potential bottlenecks that can create traffic congestion. How would the proposed project affect the signalized intersections along the street?
- **Bus Travel Times:** It is important for buses to provide quick and reliable service. How would changing the number of travel lanes affect the time it takes for buses to travel the street?
- **Left Turns:** It is not always possible to provide left turn lanes at every intersection. At which locations would left turn lanes provide the greatest benefit?
- **Traffic Diversion:** Neighbors may be concerned that removing travel lanes on a busy street could cause congestion that pushes motorists onto nearby residential streets. What streets might motorists divert to? Would motorists save time by diverting to those streets?

Study Findings

This section summarizes the findings of the Study Topics listed above. Technical documentation on the findings is provided in the appendices to this study.

Traffic Crashes

The City of Oakland is seeking to eliminate all fatal and severe traffic crashes. Over the ten-year period from 2007 through 2016, 205 people died in Oakland traffic crashes and over 800 people were severely injured. At a fundamental level, these deaths and injuries are preventable by designing, building, and maintaining safe streets.

From 2012 to 2016, there were 84 traffic crashes on the two streets in the study area. This included six (6) crashes involving pedestrians and one (1) crash involving a bicyclist, all causing injuries. There were 77 crashes involving vehicles only. Of these, one resulted in a fatality and 32 resulted in injuries. The remaining 44 crashes resulted in vehicle and/or personal property damage.

Figure 3 shows the locations and number of crashes involving pedestrians and bicyclists in the project area during the study period. **Figure 4** shows the locations and number of crashes involving only motor vehicles.

Figure 3: Pedestrian- and Bicyclist-involved Crashes

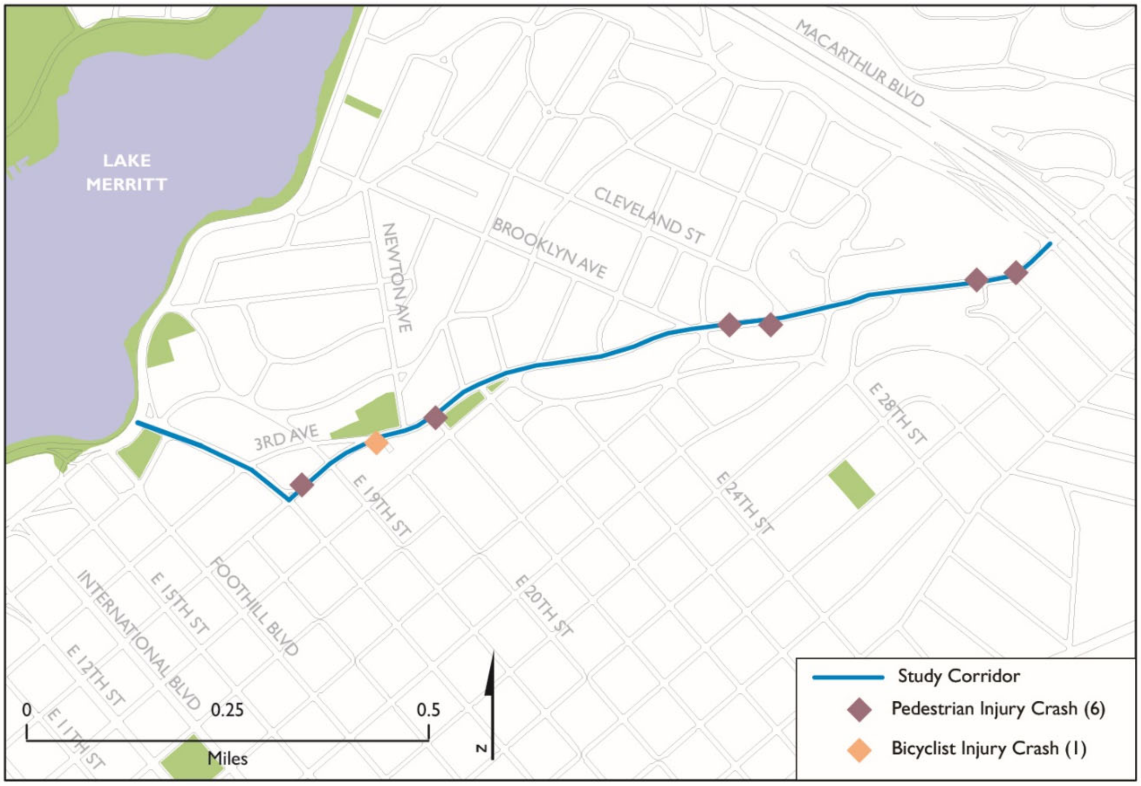
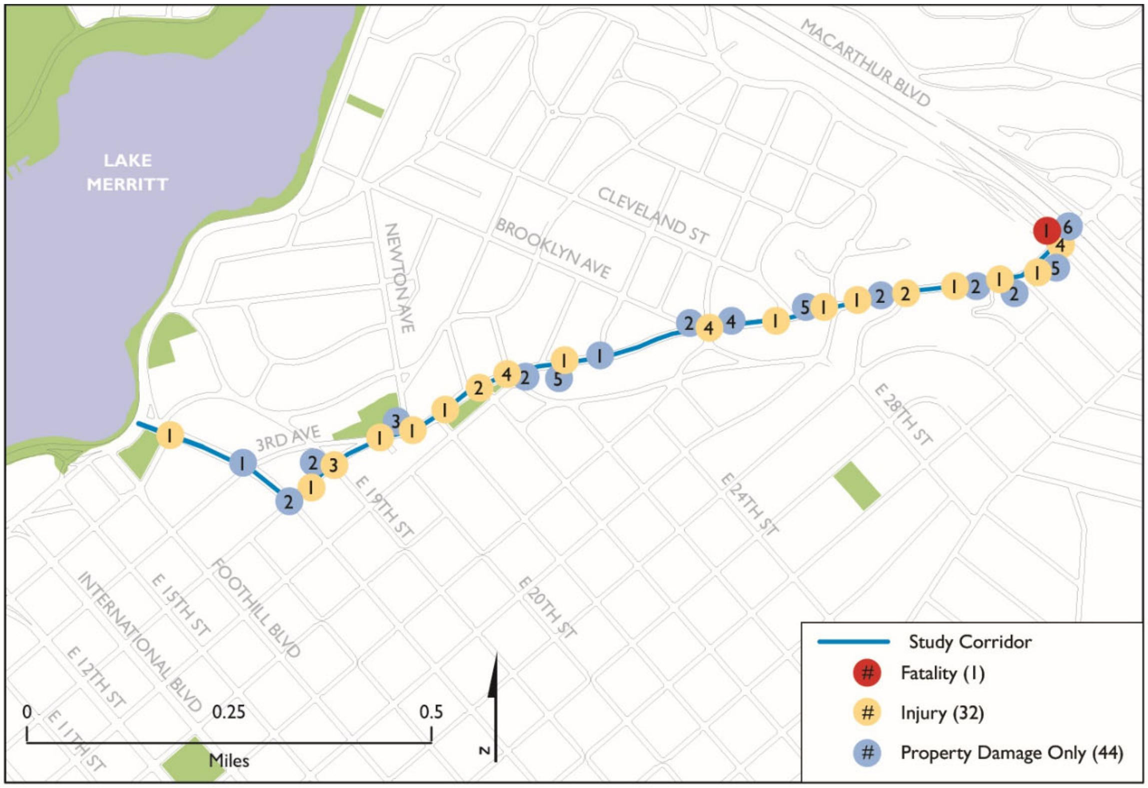


Figure 4: Auto-only Crashes



Broadside crashes (collisions with the side of a vehicle or bicycle) were the most common, with 24 such collisions—13 resulting in injury—followed by 21 total rear end crashes, nine (9) resulting in injury. The third most common crash type was vehicle-pedestrian crashes. Over 17% of the fatal and injury crashes reported involved bicyclists or pedestrians. **Figure 5** summarizes the number of injury-crashes for each crash type reported during the analysis period.

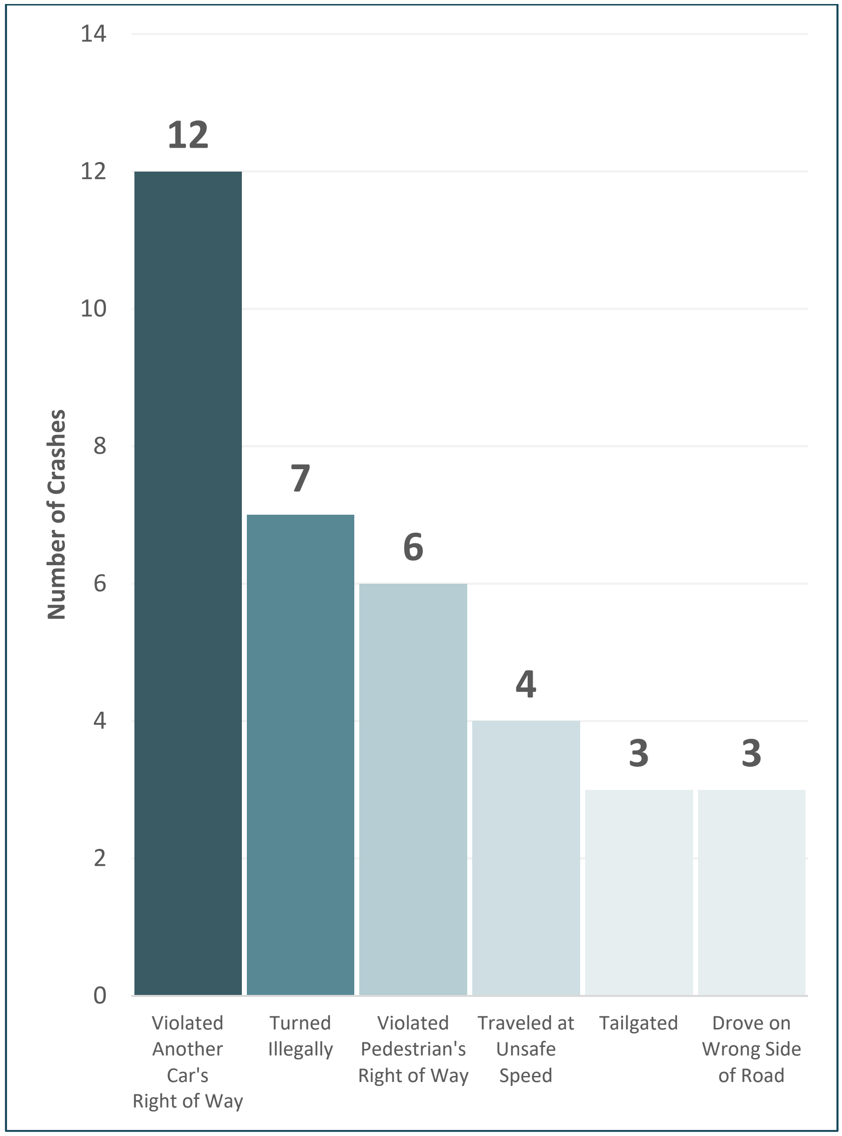
The most common reason (or primary collision factor) for crashes resulting in injuries was motorists not yielding right-of-way when they were supposed to (30%, or 12 injury crashes), followed by illegal motorist turns (18% or 7 injury crashes). Violations of the pedestrian right of way was the next most common, with six pedestrians injured. The five most common reasons for injury crashes on the corridor during the analysis period are illustrated in **Figure 6**.

The documented crash pattern suggests that the current roadway configuration does not clearly reinforce the rules of the road and that motorists are exceeding the posted speed (also documented in the speed surveys, see next section). Park Blvd in the project area is on Oakland's All Modes High Injury Network (2018).

Figure 5: Injury Crashes by Type

Crash Type		# of Injury Crashes
Broadside		13
Rear End		9
Vehicle/ped		6
Head On		4
Sideswipe		3
Hit Object		3
Overturned		1
Other	?	1

Figure 6: Top Five Reasons for Injury Crashes



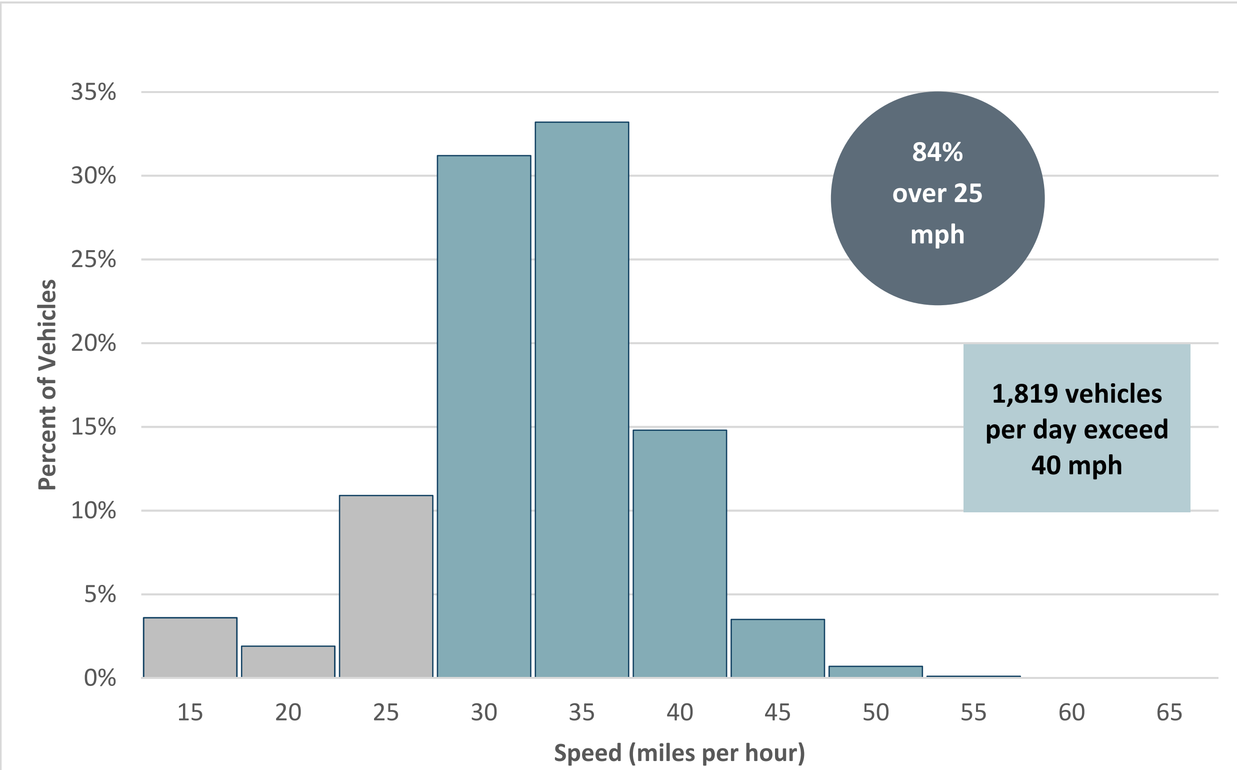
Traffic Speeds

Higher speeds result in more crashes and more severe crashes. Cars traveling faster require longer distances to stop, resulting in a greater risk of crashes. Research by the National Highway Traffic Safety Administration (NHTSA) shows that 5% of pedestrians are killed when struck by a vehicle traveling at 20 miles per hour. In contrast, 40%, 80%, and nearly 100% of pedestrians die when struck by a vehicle going 30, 40, and 50 mph, respectively.

On Park Blvd, the posted speed limit is 25 mph. Traffic speeds were measured on Tuesday and Wednesday, April 12-13, 2016 at two locations: between E 18th Street and 7th Avenue, and between 7th Avenue and MacArthur Blvd. Figure 7 graphs the segment with the higher speeds, 7th Avenue to

MacArthur Blvd. Eighty-four percent of motorists exceeded the posted speed limit of 25 mph. Fifteen percent of motorists were traveling at or above 37 mph. On average, 1,819 motorists per day traveled faster than 40 mph. On E 18th St, traffic speeds were measured on Tuesday and Wednesday, April 12-13, 2016 between 2nd Ave and 4th Ave. The posted speed limit is 25 mph. Forty-two percent of motorists exceeded the speed limit and 12% of motorists traveled at over 30 mph.

Figure 7: Traffic Speeds – Park Blvd



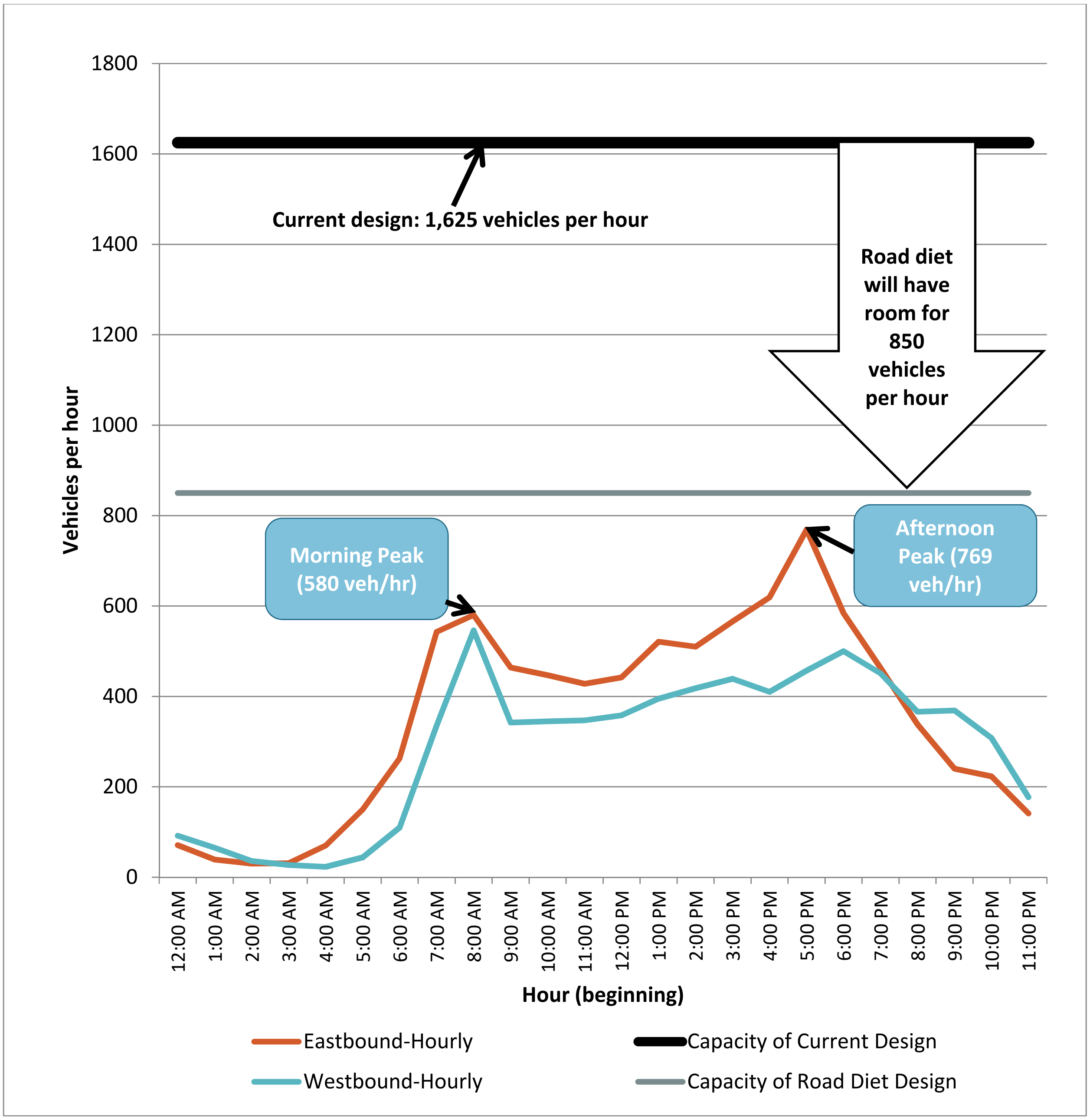
Traffic Volumes

Most streets are the busiest during the morning and evening commutes, with less traffic during the day and little traffic at night. Historically, many streets were designed to accommodate the busiest one hour (or even 15 minutes) of the day, resulting in streets being under-used for the other 23 hours (or 23 hours and 45 minutes). Extra travel lanes may encourage speeding and make it challenging for pedestrians to cross. These are unintended consequences of designing for the busiest time of day. By examining traffic volumes throughout the entire day, a project's benefits and costs can be evaluated more fairly.

On Park Blvd, traffic volumes were collected on Tuesday and Wednesday, April 12-13, 2016 at two locations. Between E 18th Street and 7th Avenue, an average of 13,841 cars were counted each day, and between 7th Avenue and MacArthur Blvd, an average of 15,493 cars were counted each day. Figure 8 graphs the segment with the higher volumes, 7th Avenue to MacArthur Blvd. During the busiest hour, between 5:00 PM and 6:00 PM, 769 vehicles were traveling eastbound. The existing cross-section with two travel lanes per direction has room for 1,625 vehicles per hour (vph) per direction. The road diet cross-section has room for 850 vph per direction.

On E 18th St, traffic volumes were collected on Tuesday and Wednesday, April 12-13, 2016 between 2nd Ave and 4th Ave. This roadway has an average of 9,370 vehicles per day. The busiest one hour on this roadway is between 5:00 PM and 6:00 PM in the eastbound direction with 499 vehicles per hour. Like Park Blvd, the current condition on E 18th St has a capacity of 1,625 vph, while the proposed project has a capacity of 850 vph.

Figure 8: Traffic Volumes – Park Blvd



Pedestrian Safety

Pedestrians are especially vulnerable to being hit when crossing streets with more than one travel lane in each direction. A pedestrian crossing a four-lane street needs up to four drivers to yield. If the driver in the first lane yields, that vehicle will likely block the view for the driver in the second lane. This scenario – where the pedestrian and the second driver cannot see each other – is such a severe problem that it has its own name: a *multiple threat crash*. Additionally, speeds on such streets are higher, and speeding drivers are less likely to yield to pedestrians.

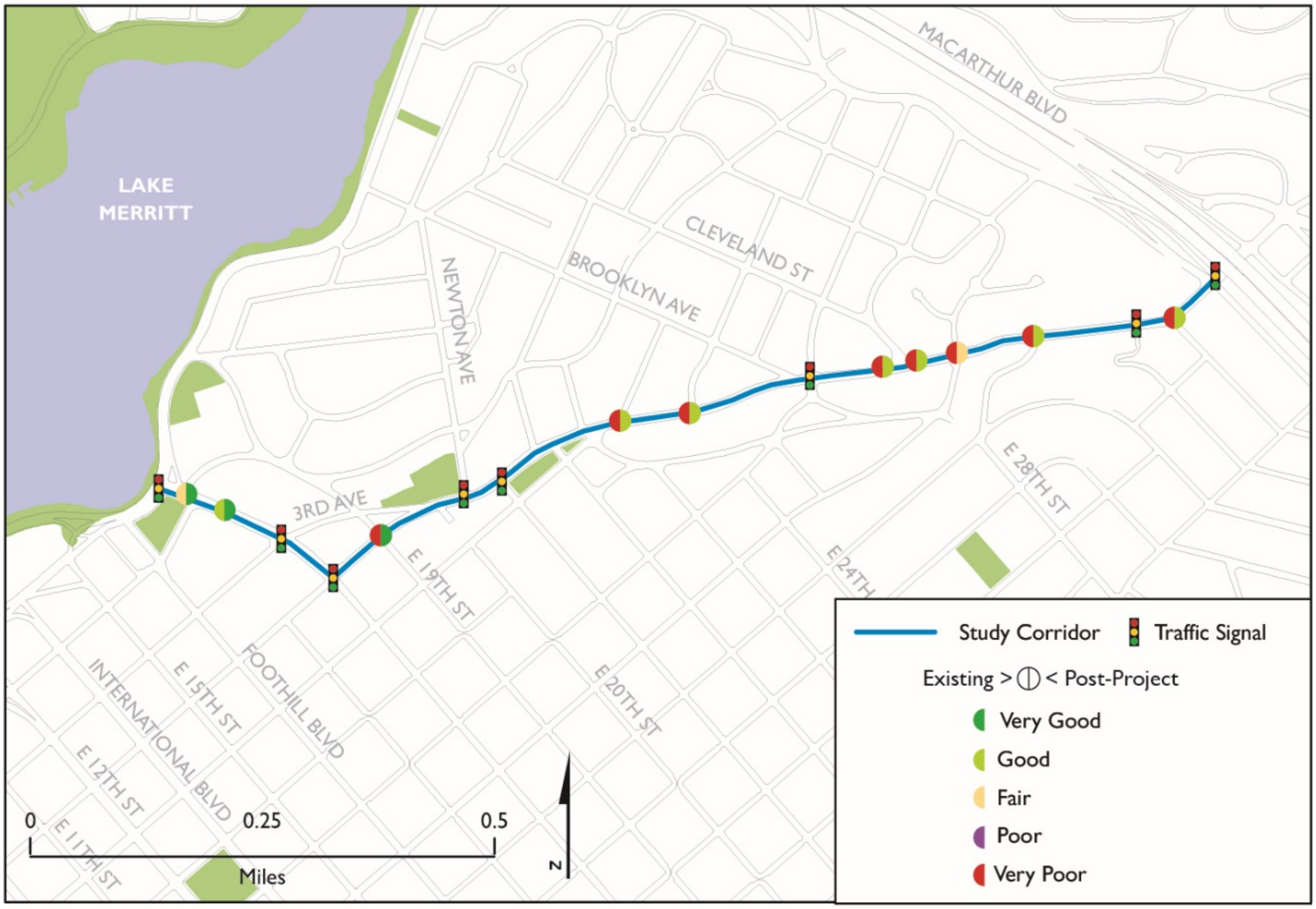
This analysis examines how long pedestrians must wait for a safe opportunity to cross the street at crosswalks without traffic signals or stop signs. This method is useful for understanding pedestrian safety because longer wait times result in people taking risks. Without safe opportunities to cross, pedestrians attempt to force drivers to yield. In California, drivers are required to yield to pedestrians at both marked and unmarked crosswalks, but not all drivers do so. With fewer lanes and lower speeds, drivers are more likely to yield to people crossing the street, improving safety and access for pedestrians.

There are existing crosswalks at eight traffic signals and an additional 10 crosswalks at uncontrolled locations. The project includes upgrading crosswalks to the high-visibility “continental” marking style and building pedestrian safety islands at 10 crosswalks. (Two crosswalks on E 18th St already have pedestrian safety islands as part of the median on that street.) There are school crosswalks at Van Dyke Ave (for Cleveland Elementary) and at E 28th St, E 33rd St, E 34th St, and MacArthur Blvd (for Oakland High School).

The proposed road diet and pedestrian safety islands would make it significantly easier and safer for pedestrians to cross at uncontrolled crosswalks. Under existing conditions during commute hours, a cautious pedestrian would need to wait multiple minutes for a safe gap in traffic – a very poor condition. With one travel lane per direction and the safety islands, the cautious pedestrian would need to wait between 10 and 30 seconds for a safe gap – a very good to good condition. Currently, it is estimated that one in 20 motorists yield to a pedestrian waiting at an uncontrolled crosswalk. With the project, that rate is expected to increase to almost half (40%).

The project also improves pedestrian safety at corners that community members identified as locations where motorists turn too quickly and are less likely to yield to pedestrians. The project includes islands and corner extensions at Brookyln Ave, Cleveland Ave, 8th Ave, E 28th St, and MacArthur Blvd.

Figure 9: Pedestrian Crossings



Bicyclist Safety

The City of Oakland is moving bicycling into the mainstream by making it a safe, enjoyable, and practical means of travel. Bicycling has the most opportunities for growth in the Oakland Flatlands, and in proximity to downtown, BART stations, and the waterfront. Many Oaklanders are interested in bicycling, but concerned about riding in traffic. OakDOT groups people who are willing to bicycle into four categories based on their level of comfort and concern with riding in traffic.

(1) **Youth:** For young people (and their parents) to feel comfortable biking, Youth should be separated from all but the slowest and lightest traffic. Youth are served by bicycle paths, bicycle boulevards, and – in some instances – buffered bike lanes and separated bike lanes.
(2) **Most Adults:** This is the largest portion of the population who is interested in biking (or biking more), but is often discouraged by motor vehicle traffic. Most Adults will feel comfortable biking on streets with wide, buffered, and/or separated bike lanes and low traffic speeds.
(3) **Experienced Commuter Bicyclists:** This type of bicyclist has ridden in Oakland for years and is generally comfortable riding on streets with basic bike lanes. While a small percentage of the overall population, this group has an important role in growing the culture of bicycling.

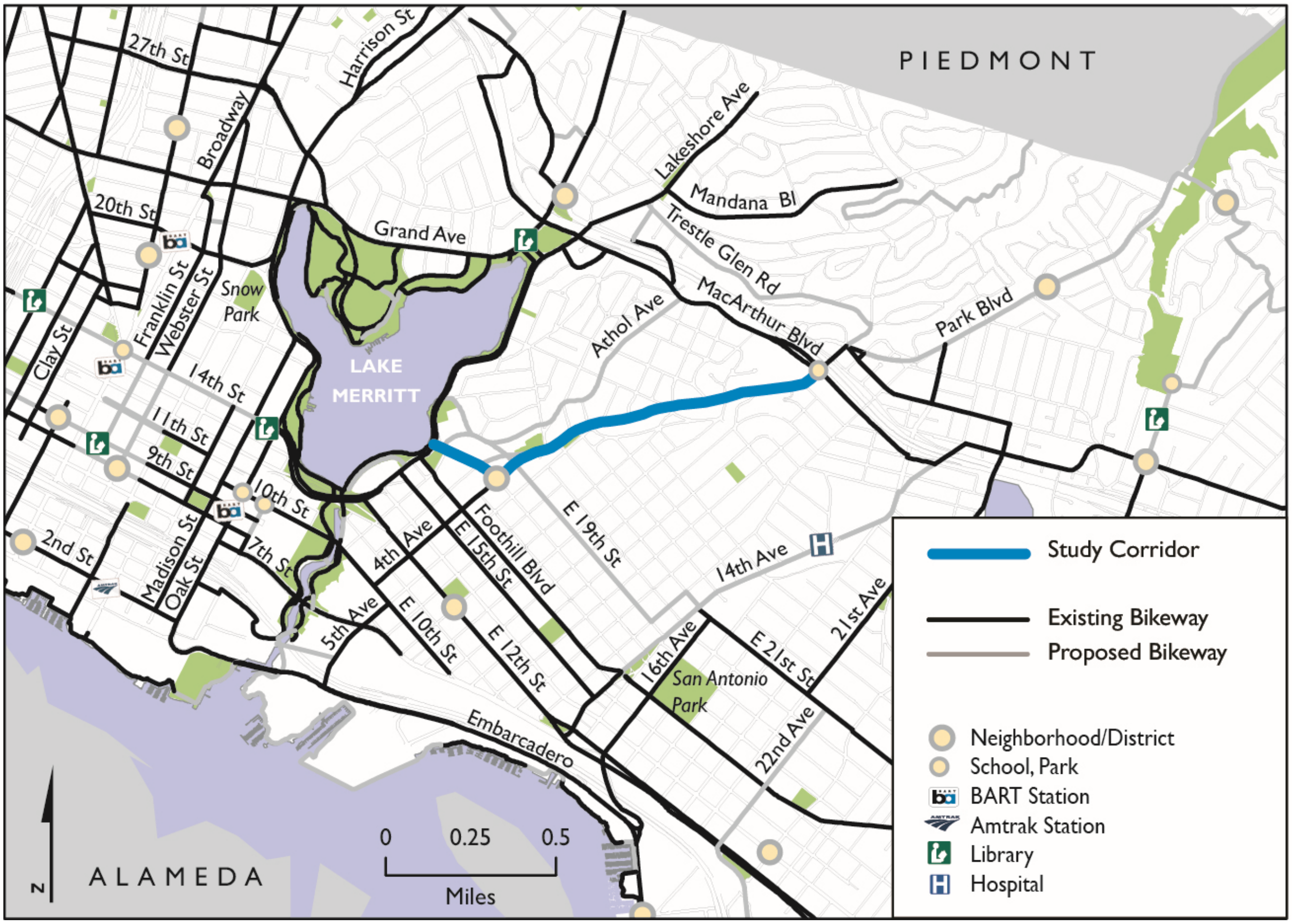
(4) **Strong & Fearless:** This very small percentage of the population has little to no concern with riding in traffic, and generally little interest in dedicated bikeways.

To attract more people to bicycling, OakDOT is working to create more space for bicyclists on Oakland's streets and thereby serve Most Adults and Youth, while growing the pool of Experienced Commuter Bicyclists.

E 18th St (Lakeshore Ave to Park Blvd) is an existing bikeway with sharrows, and Park Blvd (E 18th St to MacArthur Blvd) is a proposed bikeway. The project would add buffered bike lanes to these lengths of E 18th St and Park Blvd. It would also add a buffered bike lane to 3rd Ave (Park Blvd to E 18th St), and add a "climbing" bike lane to 4th Ave in the uphill direction from E 18th St to E 17th St. The current conditions on Park Blvd and E 18th St are suitable for only the "Strong & Fearless" because these streets are four-lanes without bike lanes and the prevailing speeds are 36 mph. By converting travel lanes to bicycle lanes, the streets will be suitable for more types of bicyclists. If speeds are reduced to 35 mph, the streets will be suitable for Experienced Bicycle Commuters. If speeds are reduced to 30 mph, the streets will be suitable for Most Adults. The posted speed limit is 25 mph, and a goal of the overall project is to improve safety by reducing speeding.

These bikeways would connect to the existing bike lanes on Lakeshore Ave, the bike path along Lake Merritt, the bike boulevard on 4th Ave, and the bike lanes on MacArthur Blvd. The proposed buffered bike lanes on Park Blvd would fill a significant gap in the bikeway network between MacArthur Blvd and E 18th St, as illustrated in **Figure 10**.

Figure 10: Bicycle Network

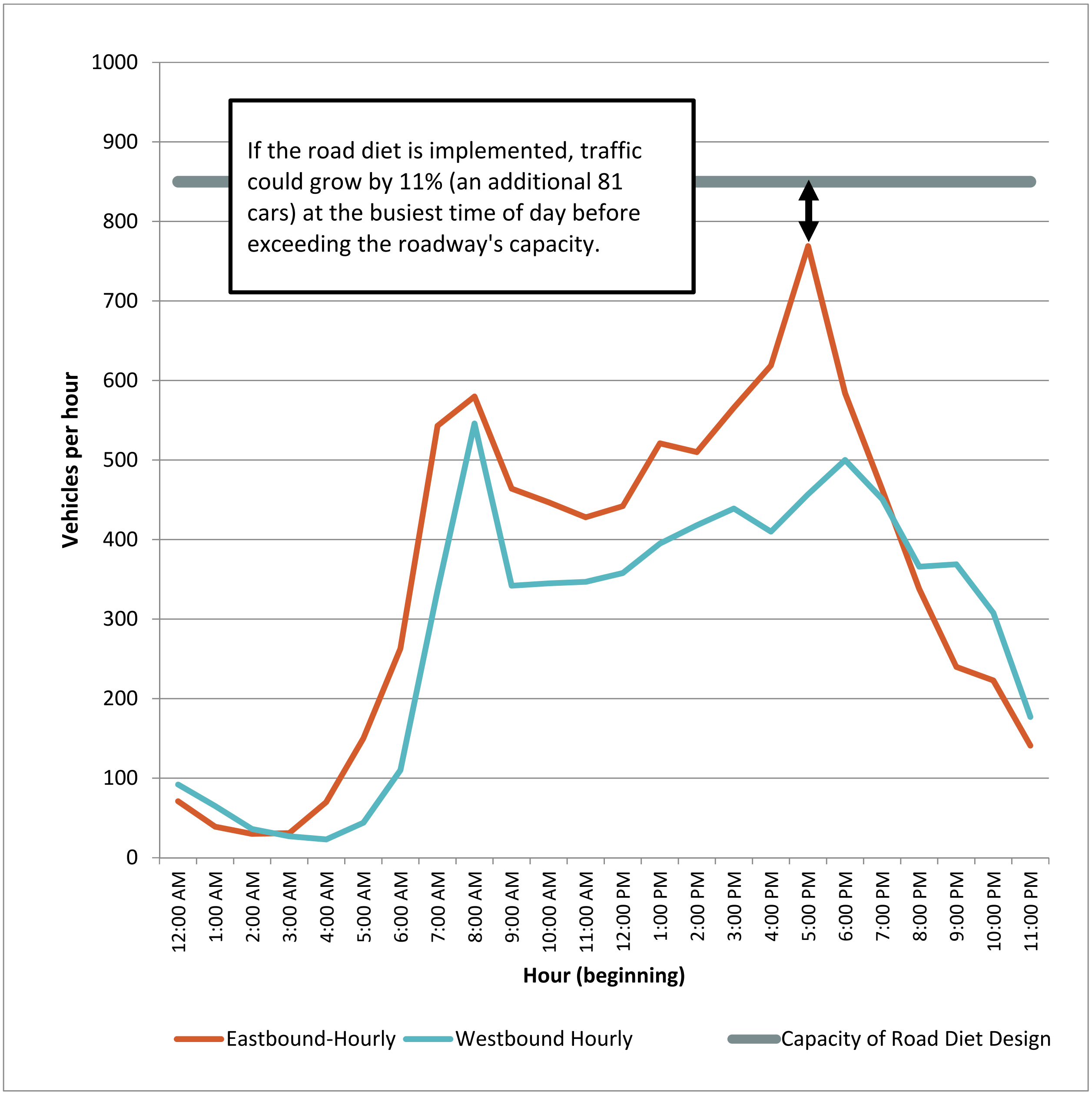


Future Traffic Growth

As Oakland builds housing and creates jobs, more people are using Oakland's streets. The City of Oakland's policies seek to shift more people from driving to transit, walking, and biking. These modes make more efficient use of street space and improve public health and the environment. Across the United States, and particularly in metropolitan areas, young people are less interested in driving than their parents' and grandparents' generations. Yet traffic congestion remains a concern. If the City reduced the number of travel lanes on this street now, and more people drove in the future, what would happen?

The proposed project, with one lane per direction, could accommodate 850 vehicles per hour in each direction. The current peak hour directional volume is 769 per hour between 5:00 PM and 6:00 PM in the eastbound direction. This volume could increase by 11% – an addition of 81 vehicles – before reaching the capacity of the road diet configuration as illustrated in **Figure 11.**

Figure 11: Available Capacity for Future Growth



If the project is implemented, it is likely that it will take slightly more time to drive along this section of Park Blvd during peak commute hours, a maximum of 36 seconds longer on average. (See **Figure 14** in the next section.) This delay may be partly mitigated if commuting motorists change the timing of their trips to avoid congestion (a phenomenon known as "peak spreading"). There is also the possibility that motorists may divert to other streets; see Traffic Diversion section below. Overall, the project will calm traffic on Park Blvd, making the street safer and quieter for pedestrians, bicyclists, and those that live on the street while still supporting through trips by drivers.

Traffic Signals

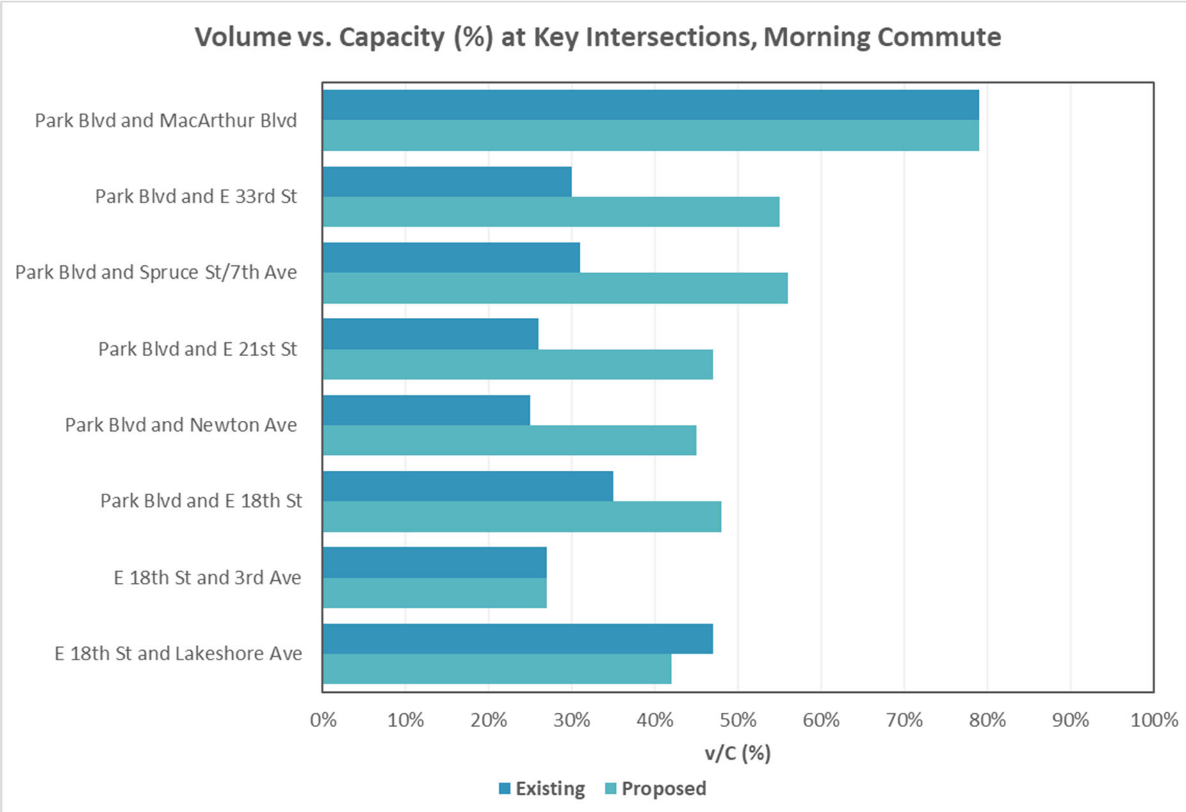
Traffic signals are important for safety on major streets. But they are also the potential bottlenecks that can create traffic congestion. How would the proposed project affect the major intersections along the street? This analysis focuses on the busiest times of day – the weekday morning and evening commute hours – to provide a "worst case" understanding of current conditions and the proposed project. At other times of day when traffic is lighter, there is less pressure on the traffic signals and thus less delay from red lights and queuing.

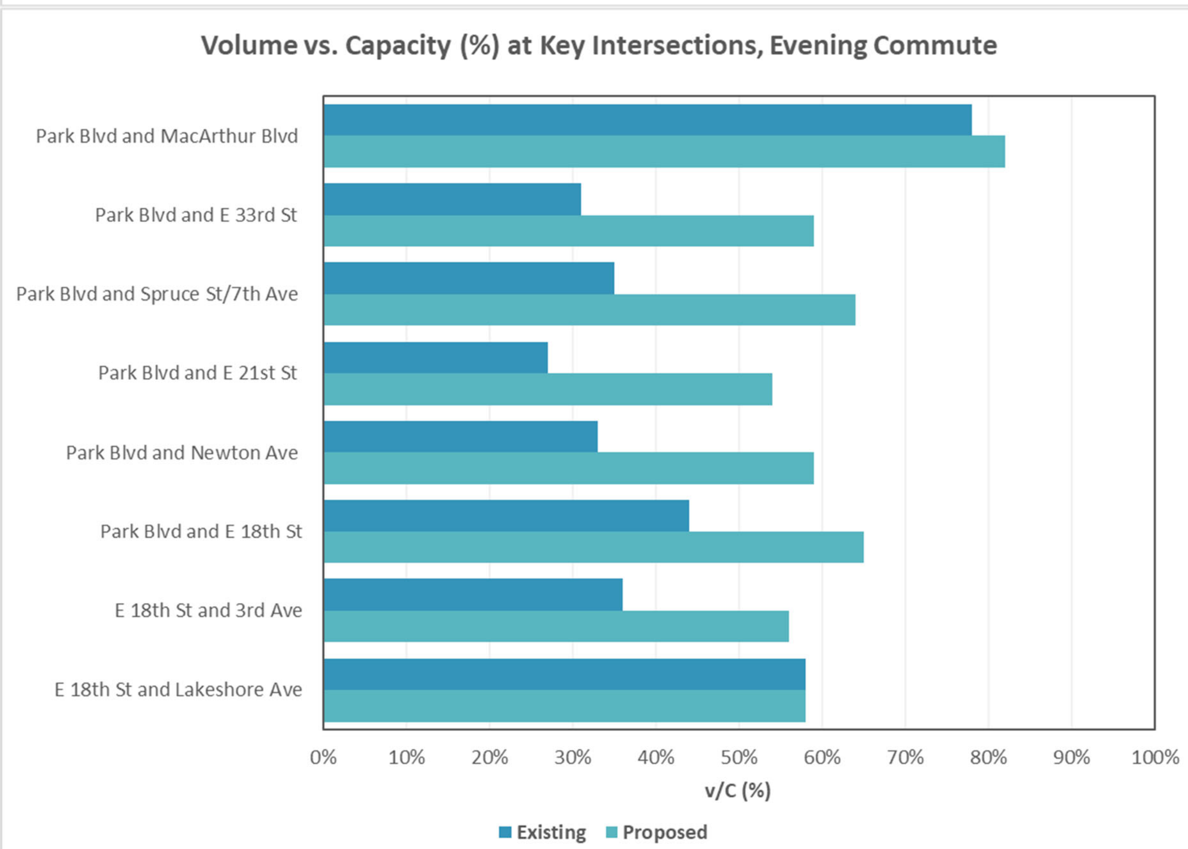
The City studied all eight signalized intersections in the project area, measuring traffic volumes and evaluating the existing signal timing to model traffic operations under existing and proposed conditions during the peak morning and evening commute hours. This evaluation measures the capacity of each traffic signal and compares it to the volume of motor vehicles passing through that signal. The capacity of a traffic signal depends upon many factors including the length of the green light for each movement, the number of travel lanes on each street, the time for pedestrians to cross, and the number of movements controlled by the traffic signal. Because road diets remove travel lanes, road diets reduce the capacity of traffic signals. This evaluation examines if the reduced capacity of the traffic signals would be sufficient for the volumes of motor vehicle traffic.

The evaluation calculates the "volume-to-capacity" for each traffic signal: the volume of motor vehicle traffic compared to the capacity of that traffic signal to serve motor vehicles. A volume-to-capacity of 100% means that the traffic signal is "full" and cannot keep up with the number of cars. Generally, a traffic signal functions well at 85% capacity or less, meaning that the traffic signal can keep up with demand. As the volumes approach 100% of capacity back-ups become increasingly likely, and that may entail changing the traffic signal timing or modifying the project.

As shown in **Figure 12**, the proposed project generally increases the volume-to-capacity of the traffic signals. This is the result of removing travel lanes. The changes are largest at the minor intersections that currently have the most excess capacity, where the traffic signals change from being ~30% full to ~60% full. At the busiest intersections – Park Blvd/MacArthur Blvd and E 18th St/Lakeshore Ave – the current volume-to-capacity is already higher, with the road diet making much smaller changes. This is because the project was designed to accommodate these busy intersections by leaving the current number of travel lanes. Overall, the traffic signals will have 35% to 50% remaining capacity, except for Park Blvd/MacArthur Blvd which will remain comparable to its current condition.

Figure 12 - Existing and Proposed Volume-to-Capacity Ratio at Signalized Intersections





In addition to capacity at signalized intersections, vehicle travel time (the time required to travel the entire length of the corridor) was evaluated. As shown in **Figure 14**, motorist travel times in either direction along the corridor (between E 18th St at Lakeshore Ave and Park Blvd at MacArthur Blvd) are expected to increase by up to 37 seconds during the busiest times of day.

Figure 14 - Vehicle Travel Time Summary

Time	Direction	Existing (min:sec)	With Project (min:sec)	Change (sec)
Morning Commute	**Eastbound**	5:44	5:47	+03
	Westbound	5:45	6:22	+37
Evening Commute	**Eastbound**	6:00	6:27	+27
	Westbound	5:40	5:41	+01

Bus Travel Times

It is important for buses to provide quick and reliable service. There are three main sources of delay to buses: stopping at traffic signals, pulling into and out of bus stops, and waiting for passengers to enter and exit the bus. Road diets may affect the first two because of their relationship to traffic signals. In addition to a longer wait at a traffic signal, other vehicles waiting at a traffic signal may delay the bus from pulling into or out of a bus stop. This analysis examines these two potential sources of delay to evaluate the proposed project, and to identify how the proposed project could be designed to improve bus travel times.

In the project area AC Transit operates the Line 33 bus on Park Blvd and E 18th St plus the Line 14 bus on E 18th St. The Line 14 has two bus stops in the project area and thus the road diet would have little effect on this bus's travel times. The following analysis addresses the more extensive overlap of the Line 33 which runs along the length of the project on both E 18th St and Park Blvd.

To determine the project's effects on the Line 33, the analysis of traffic signal delay was combined with an analysis of the delay associated with individual bus stops. While the road diet tends to delay buses at traffic signals and bus stops, other elements of the project's design reduce bus delay. These elements include removing bus stops with low use and lengthening bus stops to make them easier for drivers to access. The project would also relocate some bus stops from the near-side of intersections to the far-side of those intersections. "Far-side stops" are generally easier for bus drivers to access because they are less likely to be blocked by cars that are queued at the intersection. These stop changes have additional benefits that are unrelated to bus travel times: bus stops that are more evenly spaced and thus more accessible to patrons; and reducing conflicts with crosswalks by moving stops from the near-side to the far-side of intersections. The following bus stop changes would be made in collaboration with AC Transit.

Stops moved from near to far side of intersection:

- Westbound at E 18th St;
- Eastbound at 7th Ave;
- Eastbound and westbound at E 28th St.

Stops removed:
- Eastbound and westbound at Montclair Ave;
- Eastbound and westbound between Cleveland St and McKinley Ave;
- Eastbound and westbound at E 33rd St;
- Eastbound at Chatham Rd.

As shown in **Figure 15**, despite increases in delay at some individual traffic signals and bus stops, the project is expected to reduce bus travel times in both directions along the corridor. Because of the proposed bus stop configuration changes, it will take less time for buses to traverse the corridor in the project condition.

Figure 15 – Bus Travel Times

Time	Direction	Existing (min:sec)	With Project (min:sec)	Change (sec)
Morning Commute	**Eastbound**	9:35	8:38	-57
	Westbound	9:30	9:19	-11
Evening Commute	**Eastbound**	10:10	9:50	-22
	Westbound	9:20	8:30	-52

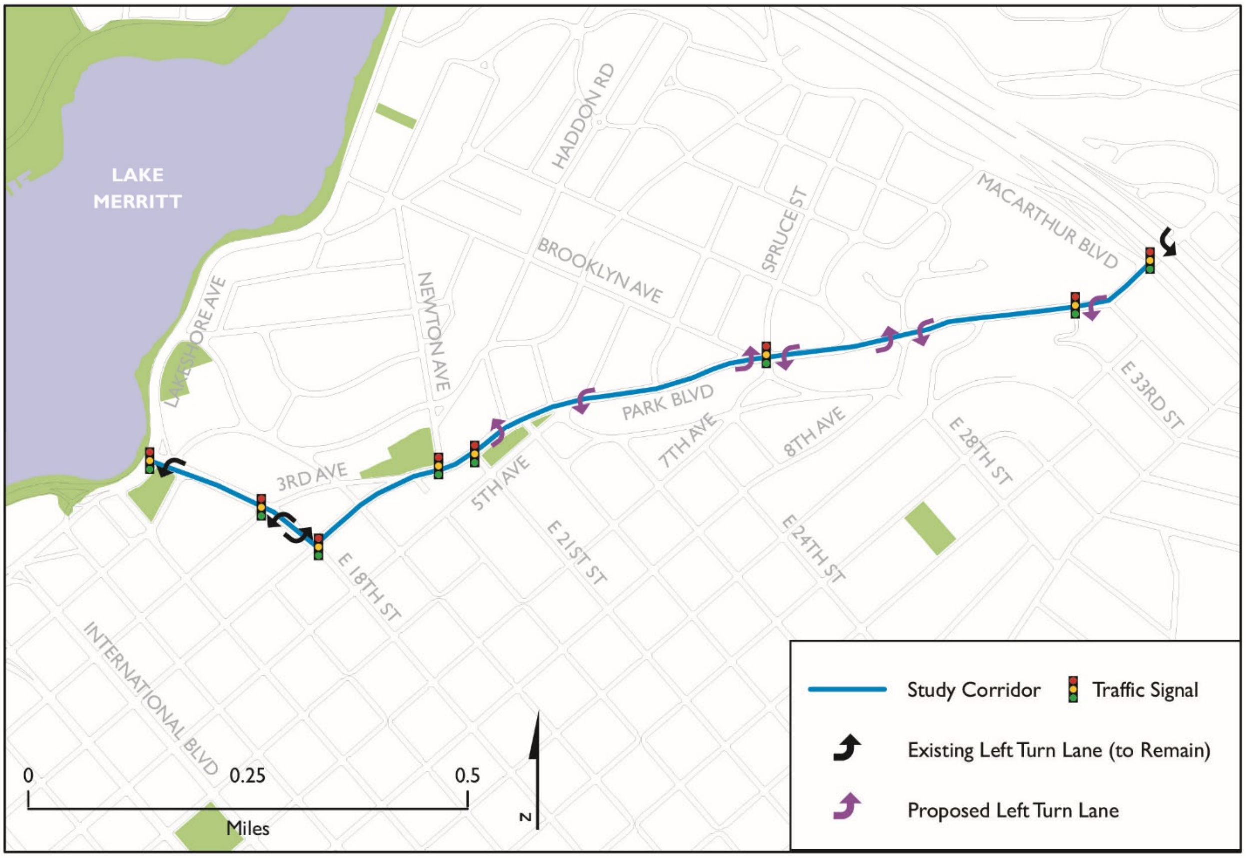
Left Turns

Left turn lanes are beneficial to motorists and bicyclists by providing a place to wait that is separated from overtaking traffic. Left turn lanes also allow for protected left turn phases at traffic signals. The green arrow for the left turn improves pedestrian safety by having turning motorists and crossing pedestrians go at different times. However, the space for turn pockets could also be used for pedestrian safety islands or to add buffers to bike lanes. The purpose of this analysis is to investigate the locations that would benefit the most from left turn lanes. This benefit can then be weighed against the competing demands of pedestrian safety and bicyclist safety.

Turning drivers need to wait for gaps in oncoming traffic to make left turns, and in the current configuration with two travel lanes in each direction, the left-most travel lane is used by drivers waiting to make left turns. To assess the locations where left turn pockets would be beneficial, traffic counts were collected at all signalized intersections in April 2016 during the peak traffic hours (7-9am and 4-6pm). Subsequently, based on community feedback during project outreach, the City collected traffic counts at three additional non-signalized intersections in May 2018 during peak traffic hours (7-9am and 4-6pm). Each of these intersections was analyzed for the number of left-turning motorists and conflicting oncoming motorists to see if a left turn lane would be beneficial.

Each potential location for a left turn pocket was then weighed against using that space instead for a pedestrian safety island and buffers along the bike lanes. As the roadway width cannot accommodate all treatments in all locations, the final recommendations were based on the detailed design of each intersection. The left turn pocket locations proposed in the project are shown in **Figure 16**.

Figure 16 – Project Proposed Left Turn Lanes



Traffic Diversion

Neighbors may be concerned that removing travel lanes on a busy street could cause congestion that would push motorists onto nearby residential streets. What streets might motorists divert to? Would motorists save time by diverting to those streets? This section summarizes the discussion of traffic diversion that took place as part of the community outreach for the road diet on Park Blvd between E 18th St and MacArthur Blvd.

In the development of this project, residents from the Trestle Glen neighborhood voiced concerns that a road diet on Park Blvd could divert traffic to Trestle Glen Rd, a narrow street that provides a direct connection between the Glenview neighborhood and the Lakeshore Ave commercial district. Trestle Glen residents organized a petition, appealed to City leaders, and turned out for community meetings about Park Blvd.

In response, OakDOT staff initiated the Park Blvd Corridor Study as a community process on possible changes to the length of Park Blvd from Lake Merritt to Montclair. The study defined and examined three distinct sections of roadway:

- Lower Park Blvd from E 18th St to I-580, corresponding to the project area for this Park Blvd Road Diet Study;
- Middle Park Blvd from I-580 to Leimert Blvd, comprising the Glenview neighborhood; and
- Upper Park Blvd from Leimert Blvd to Highway 13, the length of roadway along Dimond Canyon.

These three sections of roadway have very different roadway characteristics, and the Park Blvd Corridor Study explored these differences and the City's planning to date for the corridor. The Corridor Study also developed new concepts for Middle Park Blvd, including a road diet concept.

Through the Park Blvd Corridor Study, OakDOT staff worked with the Trestle Glen residents to clarify that their concerns over traffic diversion were associated with the possible road diet on Middle Park Blvd. For example, if a road diet were implemented on Middle Park Blvd and that project caused significant congestion, drivers from Montclair and Oakmore might bypass Middle Park Blvd by diverting to Trestle Glen Rd to access the Grand Lake neighborhood and I-580 westbound. In contrast, Trestle Glen Rd does not provide a practical alternative to Lower Park Blvd, as the two roads start and end in quite different places. Additionally, this road diet feasibility study for Lower Park Blvd suggests traffic diversion is unlikely because travel times along Lower Park Blvd with the road diet are anticipated to be comparable to current travel times.

Appendix

A. Traffic Crashes
B. Speed Survey, Average Daily Traffic Counts
C. Pedestrian Level of Service
D. Bicyclist Level of Traffic Stress
E. Intersection Operations and Vehicle Travel Time
F. Bus Travel Times
G. Left Turn Pocket Analysis