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Analyzing the Use and Impacts of Oakland Slow Streets and Potential Scalability Beyond Covid-19

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MTI MINETA TRANSPORTATION INSTITUTE

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Mineta Transportation Institute

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Report 22-31

Analyzing the Use and Impacts of Oakland Slow Streets and Potential Scalability Beyond Covid-19

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16. Abstract This report presents the results of a mixed-methods study of the 2020-2022 Oakland Slow Streets program. An official response to the Covid-19 pandemic, the program used signs and temporary barricades to limit thru-traffic on 21 miles of city streets to create more and safer space for walking, cycling, and outdoor recreation. Researchers collected data throughout the summer of 2021 on seven designated slow streets plus one cross street and one control street for each – a total of 21 street segments representing conditions in seven different neighborhoods across Oakland. Data collection comprised in-person passerby counts, observations and photographs of local conditions, and logged traffic speed data. Findings vary widely across study sites. In certain cases, observed slow streets saw less car traffic or more bicycle/pedestrian use than one or both of their comparison streets, and in at least one case the slow street was clearly embraced by the local community and used as planners intended; in others the slow street was no different than neighboring streets. The study draws on these findings to identify local conditions that seem likely to make slow treet treatments more or less successful. However, acknowledging that all neighborhoods deserve safer streets and greater outdoor recreational opportunities, the authors argue that better community outreach must be implemented to ensure areas not predisposed to make full use of slow streets can have the opportunity to do so. The study also makes suggestions regarding the potential for rapid, low-cost bike and pedestrian street safety improvements going forward.			
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In April 2020, in response to the COVID-19 pandemic, the City of Oakland announced it would begin temporarily closing certain streets to through traffic throughout the city in order to make more space for bicycle and pedestrian uses. Called Oakland Slow Streets and managed by the city's Department of Transportation, the program used signage and temporary barricades to discourage vehicles from certain neighborhood corridors. Planners ultimately used these methods to establish 21 miles of slow streets with the aim of prioritizing geographic and socioeconomic diversity across the city of 440,000.

This study examines how the Oakland Slow Streets were used, what impacts they had on vehicular traffic speeds, and what differences could be identified in the uses and impacts of the slow streets across the city. Working in consultation with the City of Oakland Department of Transportation (OakDOT) and a member of the city's Bicycle and Pedestrian Advisory Commission, the research team, led by a San José State University faculty member and a graduate student researcher, collected data throughout the summer of 2021 on a total of 21 street segments, including seven designated slow streets plus one cross street and one control (no-intervention) street for each. From north to southeast, the Oakland Slow Streets studied were Shafter St. in North Oakland, 16th St. in West Oakland, Alice St. downtown, E. 19th St. & 11th Av. in Clinton, E. 16th St. in San Antonio, Arthur St. in Arroyo Viejo, and Plymouth St. in East Oakland's Webster neighborhood. The data collection comprised in-person passerby counts for each segment on eight separate dates during May, June, and July 2021, when researchers also recorded local street and environmental conditions and other observations in field notes and photographs. During the same period, traffic speeds were logged for each segment three times a day for 68 days. The counts and speed data represent a variety of times of day and days of the week for each segment throughout the summer of 2021.

Overall, the passerby counts and traffic speed data for the streets we observed make for highly varied findings about the apparent success of slow streets from one neighborhood to another. They do not constitute clear evidence that a slow streets designation itself reliably yields reduced through traffic, slower traffic speeds, or increased pedestrian and bicycle uses in any general sense: some streets exhibited desired outcomes while others did not. Where there are differences between the observed slow streets and their respective non-intervention streets, intervening variables may explain the differences as much as the slow street designation. That said, certain observed slow streets did have either less car traffic or more bicycle/pedestrian use than one or both of their nearby comparison streets, and in at least one case, we can say that the slow street was clearly embraced by the local community and used as planners intended; in others, the slow street was observed to have modal uses and traffic speeds essentially the same as the neighboring streets that we compared it to.

Drawing on these findings, the study identifies local conditions that seem likely to make a street a better or worse candidate for the Slow Street program. Data suggest that the most successful slow

streets were those in locations that were, due to preexisting mobility habits and local street conditions, set up to succeed. However, acknowledging that all neighborhoods deserve safer streets and greater outdoor recreational opportunities, we argue that future slow street programs should also prioritize community outreach both before and after their rollout to ensure that even areas not predisposed to embrace or make use of slow street treatments initially can work with planners to emphasize local priorities and opportunities. Finally, as Oakland formally ends its pandemic-era Slow Streets program and considers ways it might employ similar street treatments in the future, the report concludes by offering some thoughts on the potential for rapid, low-cost bike and pedestrian street safety improvements going forward.

1. Introduction

On April 10, 2020, in response to the rising COVID-19 pandemic, the City of Oakland announced it would temporarily close nearly 10% of all city streets (74 miles) to through traffic in order to make more space for bicycle and pedestrian uses. Called Oakland Slow Streets and managed by the city's Department of Transportation (OakDOT), the program would use signage and temporary barricades to discourage vehicles from certain neighborhood corridors, aiming to transform them into safer, non-motorized community spaces.[1] Though it would not reach the full extent of 74 miles (a number the city had based on closing all streets already identified in the city's Bike Plan), the program immediately received a great deal of positive attention as one of the most ambitious such initiatives in the world. Planners aimed explicitly to roll Oakland Slow Streets out quickly and equitably across the diverse city of 440,000 and had designated more than 21 miles of road as Slow Streets by the summer of 2020. These 21 miles would remain in place, with minor adjustments for school and bus routes, until January 2022, when Oakland transportation officials announced their intentions to end the COVID-era Slow Streets program.

As we consider the planning of our streets in times of crisis and beyond, there are many reasons it is important to understand the COVID-19 Slow Streets phenomenon. These include implications for public health and safety, how we prioritize active transportation facilities and their users, and whether urgent "tactical" planning responses such as these can present cities a model for rapid, low-cost project implementation going forward. This study uses a mixed methods approach combining digital traffic speed data with on-site observations and passerby counts to assess the use and impacts of Slow Streets created by the City of Oakland in 2020. In understanding the daily use and traffic impacts of these interventions, we also aim to consider their long-term value as models for affordable and rapid street safety improvements in California. In this way, the project aligns with the SB1 High Priority Research Area of "Pedestrian and Cyclist Safety."

In what follows, we begin with a brief background on the slow streets program and prior analyses of slow streets and related street interventions. This is followed by a description of this study's research methods, the data collected, and a discussion of the findings. We conclude with some summary observations and recommendations for cities and transportation planners considering slow street programs in the future.

2. Slow Streets

The outbreak of the COVID-19 pandemic in early 2020 led to a dramatic increase in people staying home or working from home when possible, meaning fewer cars on the streets and more people seeking outdoor exercise and recreational opportunities near their homes.[2] In this context, many cities recognized a need to provide space for greater distancing during outdoor activities and noticed the opportunity presented by reduced roadway traffic.[3] A result was the creation of "slow streets": roads, usually smaller residential streets, on which motor vehicle traffic is limited to local access only in order to make the right of way a safer additional space for cycling, pedestrians, and outdoor recreational activities.

As one of the earliest adopters of the slow streets movement in the U.S., Oakland was widely regarded as one of the original models on which other cities based their programs.[4] The majority of slow street programs have relied on soft closures, utilizing signs notifying drivers that the street is closed to through traffic, warning signs alerting drivers to pedestrians and cyclists, and barricades blocking one lane of traffic. While generally not enforceable by law, these systems rely on drivers to respect the restrictions rather than accepting them out of fear of enforcement.

The aim of the Oakland Slow Streets program was to reduce motor vehicle traffic to necessary local trips, such as residents travelling to or from home, deliveries, or emergency and essential services. The reductions in vehicle traffic were intended to produce a greater sense of safety among pedestrians and support the use of the roadway for exercise, travel via bikes and micro mobility, or recreational purposes. Reduced speeds along programmed streets were also encouraged by way of signage, existing traffic-calming features such as speed humps or traffic diverters, and, it was hoped, the increased presence and visibility of pedestrians utilizing the street.

Unfortunately, although the dramatic circumstances of the global pandemic inspired considerable research activity almost immediately, including in areas of transportation and urban planning, relatively little academic research has yet been published on slow streets or similar pandemic-motivated public space and active transportation measures. Still, some preliminary studies (in many cases conducted by the implementing cities themselves) offer a glimpse into the effects of slow streets had relative to their intended goals. For instance, in an evaluation conducted in the summer of 2021, San Francisco found an average reduction in traffic speeds of 15% along designated slow streets.[5] A separate study of San Francisco's Slow Street program found an average traffic speed reduction of 27% compared to free flow speeds, although, of the 14 slow streets evaluated in this study, only four achieved slower speeds than non-slow streets nearby that were analyzed in comparison.[6] Research in the UK suggests that low Street measures resulted in an increase in cyclists along programmed streets and, to a lesser extent, typical streets.[7] A relevant study of COVID-inspired "pop-up" bicycle infrastructure in 106 European cities also found that these provisional measures likewise appeared to stimulate a swift and dramatic increase in cycling.[8] One study evaluating Slow Streets programs in five U.S. cities (New York, Minneapolis, Seattle, Washington D.C., and Oakland) found mixed results: findings indicated that activity along designated street segments in New York and Washington was below

the city averages, while Oakland and Minneapolis saw significant increases in activity compared to overall city averages.[9] On the whole, few broad conclusions can be drawn from these preliminary studies given the variation in such programs and the limitations in the data available.

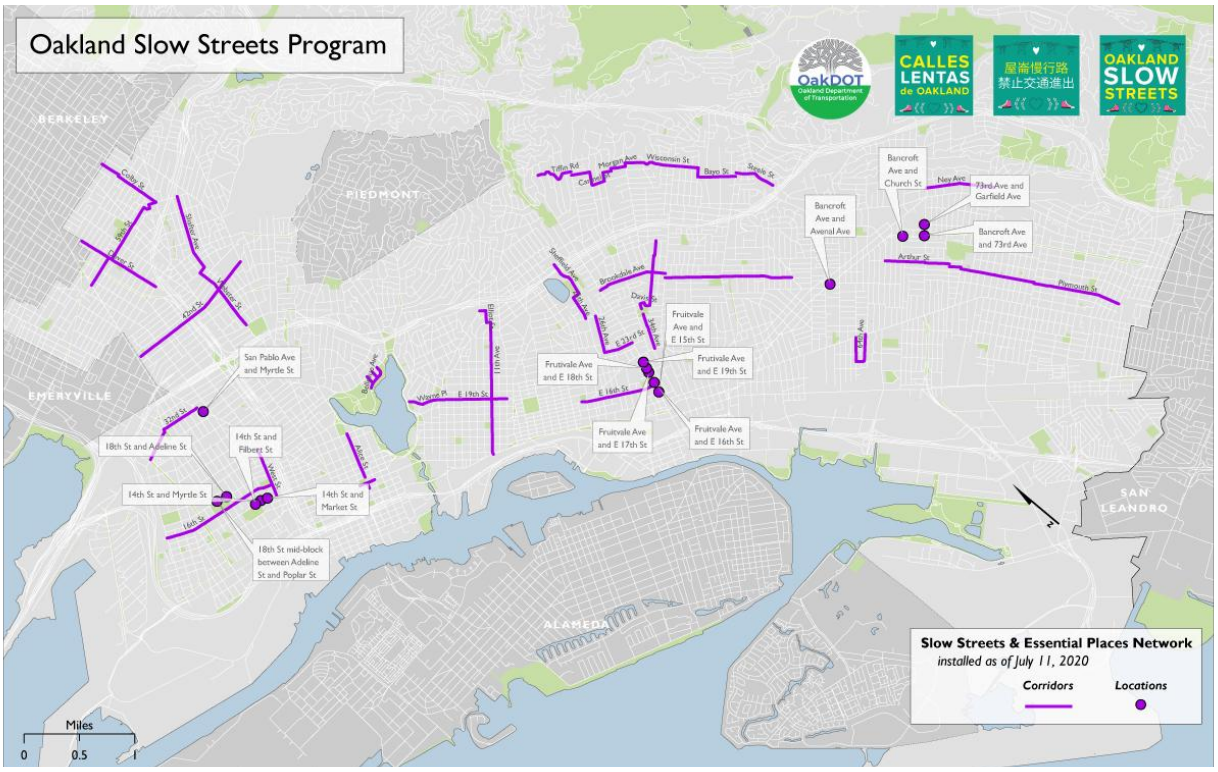
The City of Oakland conducted the first study of its Slow Streets program during the summer of 2020 and collected feedback directly from residents through an online survey and the city's 311 information line.[10] Reporters at the local news website *Oaklandside* also analyzed the city slow street data, compared it to safety and collision data from prior years, and conducted interviews to produce a report of their own in November of that year.[11] These analyses found that traffic dropped on designated slow streets (even more than it did generally during the early months of the pandemic) and that the slow streets were not sites of any more collisions or pedestrian injuries than regular streets, as some had feared. They also noted that while the program was popular among the majority of survey respondents, it produced strong mixed opinions, with a vocal minority very concerned about the program, the way it had been implemented, and perceived negative impacts in terms of traffic congestion, safety, and access.[12]

OakDOT also sent written surveys to residents of many of the designated slow streets at varying points throughout 2020 and 2021, including three of the study streets included in this report: the Arthur & Plymouth slow street (surveyed in December 2020), 16th Street in West Oakland (March 2021), and E. 16th St. in the San Antonio District (March 2021). Between 55% and 60% of residents supported their local slow street, according to these surveys.[13] Less clear across all of these studies is whether the Oakland Slow Streets were a particular draw for their intended users (compared to regular streets) as well as whether they were discernibly safer than anywhere else in terms of traffic collisions or viral transmission.[14]

It is worth noting that many cities that launched slow streets or similar initiatives at the outset of the COVID-19 pandemic have since made a variety of changes, from ending programs outright to pledging to keep them in perpetuity. After closing around 30 miles (50 km) of public streets in a slow streets initiative, Paris has built more than 30 miles of new bike lanes, and mayor Anne Hidalgo has permanently closed the iconic Rue de Rivoli to cars.[15] Seattle has said it is planning to keep some of its "Stay Healthy Streets" (the moniker given to the city's slow streets program) and has conducted community outreach to assist in determining which streets are most viable.[16] San Francisco's Municipal Transportation Authority (Muni) is currently working to make some slow streets permanent and has stated that "all Slow Streets are being evaluated for a post-pandemic future."[17]

In its earliest projections, Oakland planned to designate 74 miles of streets as Slow Streets. However, after the initial rollout and feasibility evaluations, only 21 miles ultimately received the slow street treatment. The following map shows the full extent of Oakland's slow streets in July 2020.

Figure 1. Oakland's Slow Streets and Essential Places in July 2020



Note: Map from City of Oakland Department of Transportation

OakDOT began making changes to the Oakland Slow Streets program in October 2020, including adding more durable barricades in some places. Other barricades were adjusted or removed the following summer in advance of the reopening of Oakland public schools, including making room for AC Transit school bus service. In January 2022, OakDOT staff announced their intentions to end the COVID-era Slow Streets program by removing signage and barricades in the following weeks.

3. Research Design

This study set out to examine how the Oakland Slow Streets were being used and what impacts, if any, they were having on vehicular traffic speeds. In particular, it asked what differences might be identified in the uses and impacts of the Slow Streets across Oakland, and what might the equity implications of these differences be? It also sought to consider the implications of the findings for understanding slow streets after the urgency of the COVID-19 pandemic – both in terms of maintaining the slow streets themselves and whether the program might serve as a model for rapid, low-cost street safety improvements more generally.

In order to answer these questions, the research team collected three types of data about how streets in Oakland are used: real-time traffic speed and congestion data for specific times of day, on-site passerby counts logging vehicles and pedestrians on streets during set periods of time, and other on-site observations regarding physical conditions and other qualitative data. Throughout the summer of 2021, these data were collected for designated Slow Streets and select comparison (non-treatment) streets nearby in seven different Oakland neighborhoods. The chosen neighborhood sites reflect a wide diversity of Oakland communities from across most "parts of town" (other than the upper hills, which had no designated Slow Streets). Crucially, the seven study areas reflect a variety of socioeconomic contexts, enabling the critical consideration of social justice and equity in analyzing the use and impacts of the Slow Streets.

3.1 Study Locations

Six of the study locations were chosen based on Slow Streets that OakDOT had previously selected for study in its own September 2020 Interim Findings Report: Shafter St. in North Oakland, 16th St. in West Oakland, Alice St. downtown, E. 16th St. in the San Antonio district, Arthur St. in Arroyo Viejo, and Plymouth St. in East Oakland's Webster neighborhood. Continuing to analyze these six areas in the present study allowed the research team to more effectively build upon the earlier OakDOT study's design, data, and findings, extending the amount of data available on these carefully chosen slow streets and making the findings that much more useful to OakDOT and other researchers assessing the slow streets program over time. Thus, this study took those same six slow streets and their surrounding neighborhoods. However, it also added a seventh: a unique intersection of two slow streets at an existing traffic-calming barrier at E. 19th St. & 11th Av. in the central Clinton neighborhood. The site was selected to examine whether the junction of two slow streets, both designated bike routes, at an intersection median traffic diverter (which is also home to a significant local cultural site, described below), would amount to an especially visible level of traffic calming or alternative bike and pedestrian activity. More details are provided below.

As a basis for comparison, for each of these seven slow street locations, two nearby non-programmed streets were also identified: one cross street intersecting the slow street itself, and one "control street" in the same neighborhood that was selected to ensure similarities in street type and

mode split, posted speed limits, number of households, and general demand for the street / operational traffic loads to the slow street in question. Demand and operational characteristics included number of lanes, adjacent land uses and character of fronting properties, and number of retail amenities within a quarter mile. It was necessary to include these comparisons because, although it was not possible to gather historic (pre-pandemic) observations for each slow street pre-treatment, similar non-programmed streets still offer something of a control, as they are non-treatment cases for similar streets in the same neighborhood.

Figure 2. Map Showing Example of Designated Slow Street (dark blue)
and Selected Cross Street and Comparison Street (light blue)

With three street segments per neighborhood, data were collected on a total of 21 street segments. Table 1 provides details for each street segment studied, by slow street name and corresponding Oakland neighborhood, listed from north to southeast.

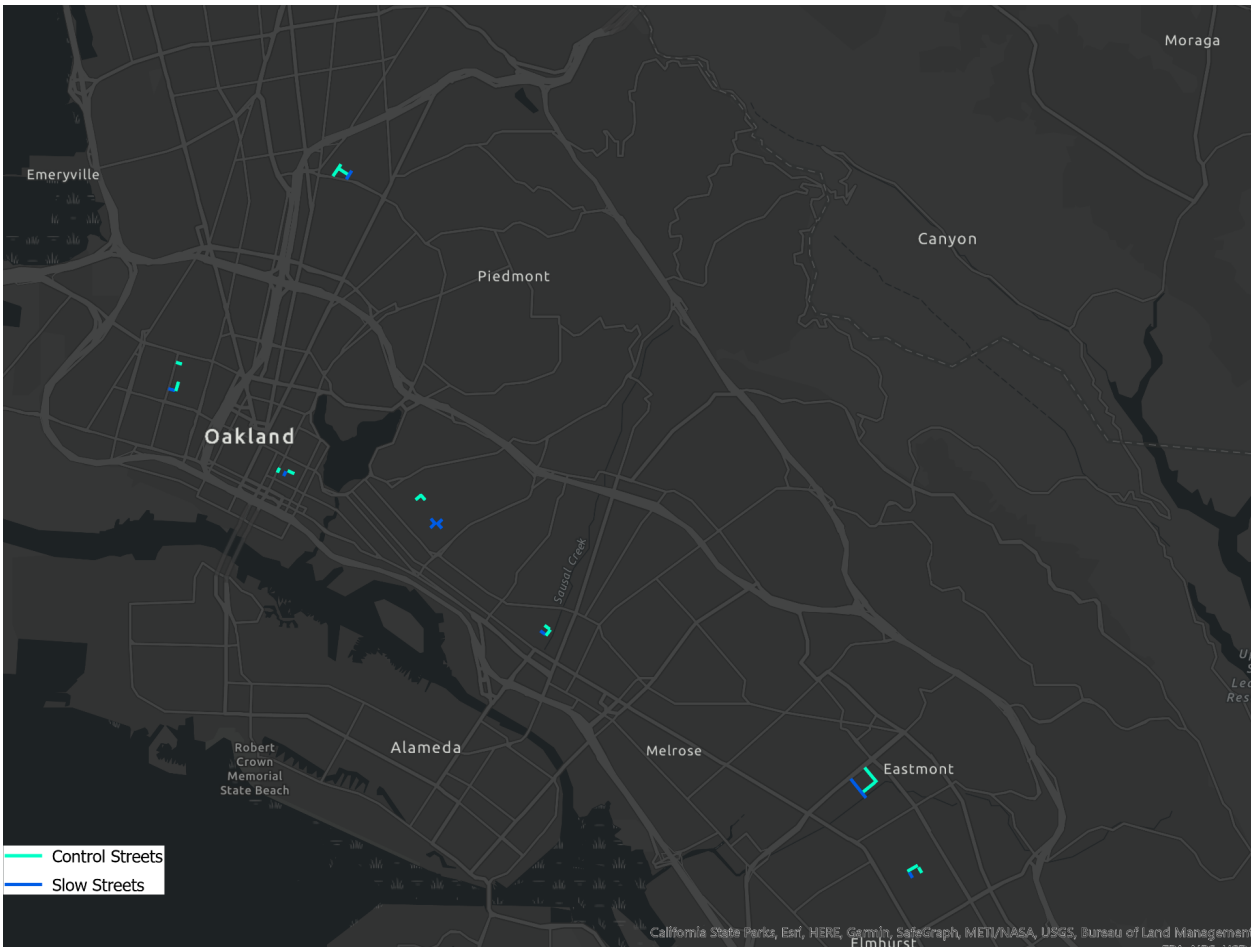
Table 1. Study Streets by Slow Street Name and Neighborhood

Name	Neighborhood	Slow Street Segment	Cross Street Segment	Control Street Segment
Shafter	North Oakland	Shafter St. betw. 51st St. and Cavour St.	Avon St. betw. Shafter and Miles Ave.	Miles Ave. betw. 51st St. and Cavour St.
16th St.	West Oakland	16th St. betw. Adeline and Chestnut Sts.	Chestnut St. betw. 18th and 16th St.	21st St. betw. Adeline and Chestnut St.
Alice	Downtown	Alice St. between 11th and 12th Sts.	12th St betw. Alice and Jackson St.	Harrison St. betw. 11th and 12th St.
E. 19th St. & 11th Av.	Clinton	E. 19th St. and 11th Av. to the northwest[(a)]	E. 19th St. and 11th Av. to the southeast[(a)]	E. 20th St. and 9th Av. to the southwest
E. 16th St.	San Antonio	E. 16th St. betw. 28th and 29th Avs.	29th St. betw. E. 16th and E 17th St.	E 17th St. betw. 28th and 29th Ave.
Arthur	Arroyo Viejo	Arthur St. betw. 73rd and 78th Avs.	Dashwood Ave. betw. Arthur St. and Krause Ave.	Krause Ave. betw. 73rd and Dashwood Ave.
Plymouth	Webster	Plymouth St. betw. 89th and 90th Avs.	89th Ave. betw. 90th Ave and Birch St.	Birch St. betw. 89th and 90th Ave.

E. 19th St. and 11th Av. is the intersection of two slow streets, so both the slow street and the cross street here are official slow street segments—two block lengths apiece.

Figure 3 shows the location of all of the studied segments in Oakland.

Figure 3. Oakland Map Highlighting Designated Slow Streets (dark blue) and Selected Control Street (light blue)



3.2 Data Collection

As mentioned above, the data collection stage included in-person passerby counts and observations for each segment, as well as logging real-time traffic speed data from the website HERE.com (a product of the geospatial analysis software company Esri) for each segment. Fieldwork for passerby counts and other on-site observations was conducted by a team of researchers (the two study authors and a rotating team of seven student data collectors), with one person assigned to visit each neighborhood on eight separate occasions during May, June, and July 2021. The speed data were logged digitally from the HERE.com website three times a day for 68 days for each segment (yielding 204 data points for each of the 21 street segments) also in May, June, and July 2021. The data collection times were planned to reflect a variety of times of day and days of the week. For instance, the eight passerby count days comprised two different weekday mornings, two different weekday afternoons, a Saturday morning and afternoon, and a Sunday morning and afternoon,

distributed across the three months. Traffic speed data were collected at 8 am, 12 pm, and 6 pm each day for 68 days.

For the passerby counts, researchers stood at a vantage point along the segment in question and counted the number of people and vehicles that passed through during a 30 minute timeframe at each site on each visit. Passing people and vehicles were separated into four categories: cars/trucks, pedestrians, bicycles, and "other" (for scooters, strollers, wheelchairs, and any other personal mobility devices); delivery vehicles were counted, but public busses were not. Counters would begin with the designated Oakland Slow Street and its selected cross street and then relocate after 30 minutes to the selected control street. All counters used identical count forms (see Appendix A) and conducted their counts more or less simultaneously on the same date and time all across town.

The passerby count researchers were also tasked with observing additional details about the sites and how they were used by taking notes on their count forms and capturing photographs with their smartphones. In addition to noting street and environmental conditions during each count, these researchers were instructed to add relevant details, where possible, about the vehicles and people observed. This included noting whether vehicles appeared to be local or through traffic (e.g. "most of these cars passed through, only three parked") and noting perceived race, gender, and approximate age of people on their count sheets when possible (e.g. "older white woman walking dog" or "Black family with kid on bike," etc.). There are significant limitations to such subjective and often inconsistent assessments by individual observers, not least when it comes to personal, cultural, or demographic traits that cannot be confirmed by anyone but the subject in question. However, there is also value in the sense of place, people, and community captured in these field notes and photographs. We have been careful in our analysis to separate subjective assessments from the more objectively precise and rigorous count data. We considered noteworthy details ("huge pothole"), general characteristics ("predominantly Asian elders shopping here"), or particular trends ("lots of neighbors chatting on the street today!") simply to flesh out the differences in the overall character of a particular street segment on a particular day.

The traffic speed data were collected digitally from existing data provided by HERE.com. After mapping all of our study streets in ArcGIS mapping software, we captured point-in-time traffic speeds from Esri's HERE.com data for each segment three times a day on 68 total days (i.e. 204 different time stamps) between May 15 and July 24, 2021. HERE.com uses color to indicate speed as a percentage of free flow conditions: red represents 0–25%, orange 26–50%, yellow 51–75%, and green 76–100% of free flow speed. (One hundred percent of free flow speed is generally the posted speed limit, or how fast cars tend to travel when unencumbered by other vehicles.) For instance, a road segment that has a speed limit of 30 MPH and a yellow designation would indicate travel speeds of 15–23 MPH. The speed for each segment was logged in a color-coded spreadsheet for analysis. The speed data represent a variety of times of days and days of the week for each slow street, its cross street, and its selected non-treatment segment. We also compiled archival speed data from the same streets in May, June, and July 2019, before the pandemic, for comparison. We

looked at three Saturdays and three Wednesdays throughout the summer of 2019 and compared to averages for Saturdays and Wednesdays in the 2021 data.

All numerical data were input and organized in Google Sheets spreadsheets. Count data were cleaned and summed in crosstabs for comparison; speed data were color-coded and notated as percentages of free-flow speed (based on posted speed limits), and then translated into estimated mile per hour speeds for comparison. Field notes and photographs were analyzed qualitatively using a simple coding method and used to inform or simply flesh out the interpretations of the quantitative data and overall impressions of the observations on different streets in different neighborhoods.

4. Findings

Overall, the data cannot be said to demonstrate clear evidence that the Oakland Slow Street designation yielded reduced through traffic, lower speeds, or increased pedestrian and bicycle use in any general or predictable sense. When differences were found between the observed slow streets and their respective non-intervention comparisons, particular factors of local context appear likely to explain the differences as much as the Slow Street designation in most cases. The traffic speed data were especially homogenous: hourly and daily averages on the slow streets and their comparison streets from throughout the summer of 2021 show traffic moving consistently between 51% and 75% of the posted speed limit (with the exception of 3:30 pm on July 24, when the average speed across most study streets was slightly faster for unknown reasons).

That being said, when parsing the passerby count data site by site, *certain* slow streets did appear to have either less car traffic or more bicycle/pedestrian use than one or both of their nearby comparison streets. In at least one case, we can surmise that the Slow Street treatment likely did make some difference. Yet the idiosyncrasies of each site play an important role in any interpretation. For this reason, because the results are not easily generalizable across the seven study areas (or beyond), the findings are best discussed on a case-by-case basis so that the qualitative data for each location can be described as well. As such, this section gives details on the most relevant findings for each study area, organized in three sections: those areas where the slow streets had more auto traffic than their comparison streets, those with less auto traffic, and those where passerby and speed numbers were effectively the same regardless of street status.

4.1 Busy Slow Streets

In three of the seven study locations (North Oakland, San Antonio, and Arroyo Viejo), the slow streets were actually found to be *busier* than their comparison segments in terms of auto traffic. This could suggest these slow streets were "not working" as intended, and indeed there is little to suggest the Slow Street designation on Arthur St. in Arroyo Viejo was successful. However, findings for the other two actually suggest some success in attracting intended slow street uses, even if they were still busy with car traffic.

In San Antonio, the E. 16th St. slow street had almost twice as much car traffic as its comparison streets, and most of these cars appeared to be through traffic. The average speeds were quite a bit faster than the control and cross streets nearby. This is likely because E. 16th St. is a local artery of somewhat greater utility than the comparisons. However, the slow street did have more pedestrians (and people using wheelchairs) as well as slightly more cyclists and other non-motorized users than its control streets. This is a relatively dense residential area, not far from major bus lines on Foothill and International Boulevards. We observed that most of the pedestrian traffic on the slow street was headed to a small grocery store at the corner of the observed segment.

North Oakland's Shafter slow street is the most obviously successful treatment street in the study in terms of use by bicyclists and pedestrians. Though it did log more vehicular traffic than its cross street (and slightly more than its control street), it consistently attracted *dramatically more cyclists and pedestrians* than either comparison as well. Across all eight point-in-time counts, a total of 241 pedestrians and 179 bikes were logged on Shafter, in comparison to just 27 pedestrians and 8 bikes on the cross street and 93 pedestrians and 37 bikes on the control street (which is otherwise quite similar). Far more dogs, strollers, and skateboards were also noted on Shafter (in the "other" category) than its comparison streets or other study areas. It is important to note, however, that Shafter Ave. is a well-established bikeway dating back to 1988, a direct route to College Ave. with an existing culture of bike and pedestrian use, so it essentially functioned much like a slow street even prior to the pandemic.

The Arthur St. slow street may be the most clearly unsuccessful slow street among those we examined. Like the others just described, our passerby counts logged more cars on Arthur than on the comparison streets we studied. And in this case that did not even translate to higher bike or pedestrian use as well. In fact, the control street, Krause St., saw more of the non-motorized uses desired for slow streets, probably because it leads directly to the Arroyo Viejo Park and Recreation Center, where many of the bikes and pedestrians we counted were headed. Arthur, meanwhile, is a quiet and narrow residential street that seems to nonetheless function as a pass-through for vehicles cutting through the neighborhood. Official slow street signage and temporary barricades were often seen moved to the side of the roadway, or even knocked over.

4.2 A Quiet, Walkable Slow Street Downtown

One slow street had notably *less* vehicle traffic and slower traffic speeds than its comparisons. The Alice St. slow street downtown was not only quieter than its comparison streets in terms of motorized vehicles: it also saw a large number of pedestrians, especially on weekdays. However, the fundamental character of all three observed downtown streets seems to explain the difference between them more than the presence or absence of a slow street per se. The stretch of Alice St. that we observed is inherently fairly quiet, ending at the bottom of the segment where cars are forced to turn on 11th St. while pedestrians may head straight into a popular city park attached to an elementary school; the comparison streets (12th St. and Harrison St.) are by their nature much busier and faster thoroughfares where we counted hundreds of cars (and many buses) during every observation period. Still, we did count a large number of pedestrians on Alice St., and it is one of only six segments we observed out of all 21 that consistently saw *more pedestrians than vehicles* in our counts. The only other slow street we studied where this was the case is Shafter in North Oakland. On the other hand, Alice St. did not see very many bicycles.

4.3 Invisible Slow Streets

Three locations remain: West Oakland's 16th St., the Plymouth slow street in East Oakland, and the distinctive intersection of E. 19th St. and 11th Avenue in the Clinton area. Like Arthur St. (described above), in these three locations the speed and count numbers are similar enough across

all categories to suggest that little impact one way or the other can be attributed to the slow streets themselves. Where there is some small variation within these areas, local particularities in one place or another — especially the presence of particular businesses or larger apartment buildings — seem likely to explain the observations better than the presence of the slow street treatment.

16th St. in West Oakland showed little sign of being used as a slow street, with a similar number of cars observed as on its control street, fewer cyclists, and far fewer pedestrians. We noted far more bikes, cyclists, and "other" passersby (notably several wheelchair users) on the chosen control street, 21st St. A brewery and the East Bay Municipal Utility District yard along 21st St. probably explain its higher pedestrian activity. But the lack of desired slow street usage on 16th was striking given that it leads directly to one side of historic De Fremery Park.

The Plymouth slow street in East Oakland was not clearly successful in attracting more pedestrians or fewer cars than other streets nearby. Traffic speeds were even notably higher on Plymouth than on the nearby comparison streets. Plymouth did seem to attract somewhat more bicyclists according to our count, which may have something to do with the nearby "Scraper Bikeway" on 90th Avenue (a celebrated community bike infrastructure initiative), though, still, the number of bicycles was an average of just about one per hour in our observations. The Webster area has one of highest crime rates in the city, and pedestrian activity on streets around this predominantly low-rise residential district, which includes an unused AC Transit bus stop, was quiet in general.

The corner of E. 19th St. and 11th Avenue in the Clinton neighborhood was chosen as a particularly unique site: the intersection of two slow streets that come together at a diagonal traffic diverter median (also known as an "elbow" or "forced turn" median). In the median is a handmade, "DIY" place of gathering and worship, including three handmade Buddhist shrines, known as the Oakland Buddha.[18] Here, two segments of designated slow streets were observed, along with a control street segment also impacted by a traffic diverter (but not designated as a slow street) several blocks away. The traffic volumes and speeds were remarkably similar across all three observed segments here. The small differences observed in car and pedestrian counts likely have as much to do with differences in residential density or pre-existing traffic calming interventions as the presence or absence of a slow street treatment: the control street has a relatively large apartment building on it, and the neighborhood is full of traffic diverters dating to "urban renewal" efforts in the 1950s and '60s. In fact, more through traffic was counted on the slow streets than the control street. Still, it is worth noting that the two slow streets studied here were observed being utilized for some slow street uses such as children riding bikes and skates. Further, these segments did see more bicycle traffic than the comparison street, which may be reassuring given that they are also city-designated bike routes.

5. Discussion

The most concrete finding in this study is that the Oakland Slow Streets program functioned very differently from street to street and from neighborhood to neighborhood, and that these differences likely have more to do with underlying local conditions than with the Slow Streets programming itself. As described above, some of the slow streets we observed seemed to perform at least somewhat as their designers might have hoped: with fewer cars and/or more pedestrian and bicycle uses than their local comparison streets. Others, however, appeared no different from their local comparisons, or even worse in terms of intended slow street outcomes. What's more, because no two street segments are the same, and no two neighborhoods are the same, it is difficult to say whether the slow street treatments were necessarily the causal factor, even where they do appear to have worked best (e.g. Shafter St. and Alice St.). Nor can we attribute any differences in logged traffic speeds to the presence or absence of a slow street designation. Even when looking at sampled pre-pandemic speed data from the same street segments in 2019, we found virtually no differences from 2021.

As a result, we cannot say that a slow streets program like Oakland's—comprising signage, temporary barricades, and related public information efforts—appears to be a *reliable* way to discourage through traffic, slow vehicle speeds, or encourage bicycle, pedestrian, or other non-motorized uses in any generalized sense. What we can say is that certain Oakland Slow Streets seemed to work well and others did not. A question, then, is whether we can say more generally that slow streets in places with certain conditions are more likely to be successful than slow streets in places with different conditions.

What patterns do emerge? Most obviously from our study, communities where people already walk and bike in greater numbers (such as Shafter Ave. and Alice St., and to a lesser extent E. 16th St.) seemed to more clearly make use of the Slow Street designation. Across all 21 segments observed, pre-existing street features such as traffic calming measures or access to parks and local services were associated with higher bike and/or pedestrian use. Because passerby count numbers for the broad "other" category also varied from neighborhood to neighborhood in ways that roughly correspond with the findings for motor vehicles, pedestrians, and bicycles, siting slow streets in areas with greater numbers of wheelchair users, parents pushing strollers, or children learning to skate or scoot may also be a way to target likely users. (However, the numbers in the "other" category overall were so small as to be ungeneralizable.) Also, the simultaneous presence of considerable motor vehicle traffic (including through traffic) on these streets did not appear connected to less bike and pedestrian use. It is possible that selection of a good slow street may have more to do with tapping into existing community uses, habits, or opportunities than with effectively curtailing through traffic.

Meanwhile, the least apparently successful slow streets we observed were in West Oakland (16th St.) and deeper East Oakland (Arthur and Plymouth streets). It cannot be ignored that these are among the poorest and most traditionally underserved neighborhoods in Oakland; they are also

areas with relatively high crime rates and communities where many residents' occupations may have meant they were less likely to be able to work from home throughout the pandemic. Indeed, of the five slow streets examined besides Alice and Schafter, all are in relatively poorer areas. These factors perhaps made converting streets into outdoor leisure space a comparatively lower priority to local residents than, for instance, continued vehicular access for commutes — even if such areas are as deserving and in need of quality outdoor spaces as anywhere else in the city.

These findings reinforce concerns that others, including at the City of Oakland, had begun to identify earlier in the pandemic.[19] OakDOT's own Interim Findings Report saw uneven slow street performance across different neighborhoods as early as summer 2020, and this report confirms that this was still the case a year later in much the same way. It is also consistent with the uneven support for slow streets in public feedback from certain areas.

To this end, however, our study's findings do appear to challenge some community members' concerns about negative impacts of Oakland Slow Streets in their neighborhoods. According to reporting by local news organization *Oaklandside*, many residents of East and West Oakland worried that streets nearby or adjacent to designated Slow Streets "became more crowded and dangerous as cars had to find alternate routes."[20] Although limited to the seven areas analyzed here, our findings are not particularly supportive of that being the case. Across East Oakland, for instance, both slow streets and control streets were observed to be similarly busy and to have comparable speeds. In Downtown Oakland, the one study area where comparison streets were clearly much busier than the local slow street, it seems unlikely that the slow street designation on already-quiet Alice St. had any negative impact on congestion or safety nearby.

Residents living on streets identified as part of the city's High Injury Network (where a large number of severe and fatal car-involved collisions occur) also expressed concerns with the Slow Streets program, especially worrying that it could lead to even more collisions between cars and pedestrians. Unfortunately, while we had hoped to be able to isolate collision data for the selected Oakland Slow Streets in 2021 in comparison to a similar time frame on those streets prior to the pandemic, the data available are quite limited. For what it's worth, data for 2020 show no collisions on any of the slow streets we looked at, and none of our on-site observations recorded any collisions or injuries.

In sum, the performance of Oakland's Slow Streets program was uneven. Slow street treatments did not reliably garner the use and support planners had hoped for across the city. Their use varied from neighborhood to neighborhood, seemingly based as much as anything on the particularities of local needs, norms, and preexisting traffic patterns. Impacts on traffic speeds were especially imperceptible in our data, with average speeds no different on designated slow streets than their comparison streets, nor different in 2021 than 2019. Yet none of this is to say that the program should be considered a failure. In some areas, slow streets were clearly beloved by the local communities and at the very least complemented and encouraged existing non-motorized street use patterns there. Even where they were not locally embraced, our findings do not suggest they

had negative impacts in terms of street safety or area traffic flow. While the program might appropriately be remembered as imperfect, the initiative has important lessons for Oakland and other cities, and it may yet serve as a model for street safety interventions.

6. Lessons and Looking Ahead

Oakland's slow streets seemed to really "work" in places where existing conditions left them especially well set up to succeed, and they seemed to fail — or, perhaps more accurately, to make little difference — elsewhere. If the slow streets with the highest non-motorized usage in our counts were a quiet street terminating at a park in a dense area with many walkers (Alice St.) and an established bike route through a neighborhood where a large number of residents had the privilege of working from home and flexible leisure time (Shafter Ave.), is the lesson that Oakland should have built more slow streets in places like that, and removed them from areas where they were not used, or may have been disliked? That seemed to be the opinion of some residents who called into city meetings to advocate for keeping the slow street in their own neighborhood even if others were viewed as unpopular.[21]

Alice St. *is* a great place for a slow street. It is a natural choice for people heading to a downtown park and school, being located in an area with many pedestrians and not on a major route for vehicular through traffic. When seeking sites for future slow streets, planners might look for similar sites with an existing proclivity for walking or biking, proximity to parks and schools, and limited utility for through traffic. Based on this logic, the stretch of Krause St. east of 73rd Avenue in East Oakland (our control street for the Arthur slow street), which leads directly into a park and saw many desired non-motorized uses in our counts, could make a stronger choice than Arthur for a future slow street treatment. Streets with existing traffic-calming measures could be good candidates for the same reasons. And of course, communities that *want* slow streets are obviously likely to be successful homes for them.

But all neighborhoods deserve safer streets and more opportunities for walking, cycling, and outdoor recreation. And it cannot be ignored that the apparently "least successful" slow streets in this study were in low-income and predominantly Black and Latinx census tracts. Oakland planners can only be applauded for attempting to install the slow streets citywide, with equity considerations in mind, even if community engagement around the rollout could have been more robust. We do know from pre-pandemic research that system-wide approaches, rather than isolated improvements, appear more effective in obtaining desired outcomes such as increased bike and pedestrian use and reduced traffic injuries and deaths, as demonstrated by the limitations of New York City's Neighborhood Slow Zones and the success of London's slow street program.[22]

Perhaps the biggest missed opportunity with the Oakland Slow Streets program, then, was not in the choice of sites but the failure to better engage, learn from, and encourage participation among communities in areas that were not predisposed to embrace the changes outright. Research suggests that political commitment and community engagement are essential to the success of street safety and cycling uptake campaigns.[23] As Destiny Thomas has argued, greater outreach and engagement, especially among communities of color, should have been a priority before the first temporary barrier went up so that the program might have been more sensitive to different concerns and priorities.[24] More could have been done after as well, both to respond to community

input and to nurture the sorts of slow street uses that were intended in ways that mesh with local realities. Future slow streets programs, whether in Oakland or elsewhere, might take this into account to encourage more even uptake and support across diverse communities. Indeed, perhaps findings like those from this study and others about how slow streets are used in different neighborhoods, as well as their seemingly minimal impacts on traffic speeds overall, could be part of such outreach. And an ideal approach might be to enable more locally specific slow streets that respond to and build upon particular community needs and opportunities.

On January 20, 2022, OakDOT officials announced that the Oakland Slow Streets program would be ending, with signs and barricades to be removed within the following weeks. As society began to return to pre-pandemic norms, it was time to consider the future of Oakland's streets. Officials have explained that a version (or versions) of Oakland Slow Streets may be recreated in the future in concert with the city's bicycle plan (a planned system of more than 70 miles of bike routes) and that permitting for temporary neighborhood street closures would be streamlined. But maintaining the established 21 miles of pandemic-inspired Oakland Slow Streets was not possible for cost and staffing reasons: while they were cheap to initially install, they were expensive to keep up, and OakDOT lacks the resources to simultaneously advance the goal of a permanent program and maintain the temporary one.

This question of cost is not one we have considered here, but of course it is an essential one for developing slow streets as a model for future street safety interventions. We do know that the slow streets themselves, while intentionally relatively inexpensive to implement in the short term, can be very expensive over the long term because materials disappear and city staff must be specially assigned to replace or maintain them. Though financial data would have enabled a detailed analysis of cost effectiveness or scaling, precise financial information was not available or provided to the researchers. OakDOT leadership noted that the way work time is assigned across the department makes it hard to track staff time costs by individual task, since individuals are baseline funded for their regular jobs.

Still, innovative planners and traffic safety advocates might be emboldened to see how the COVID-19 pandemic motivated cities to take radical action in transforming their streets. Small-scale or community-level efforts can be integral parts of disaster response and long-term resilience, including as part of community-based response to the pandemic itself.[25] Can such tactics not be used in the longer term and in more situations, perhaps as rapid low-cost ways of making streets safer in general? Is the ongoing crisis of unsafe streets in Oakland — with an average of 173 serious or fatal injuries per year on the city's roadways recorded between 2016 and 2021[26] — not itself a disaster worth responding to with rapid, creative interventions? Indeed, in the wake of several cyclist and pedestrian killings in Oakland in June 2022, community activists and elected officials alike emphasized the need for rapidly deployed quick-build improvements to address street safety; a grassroots "Traffic Violence Rapid Response Team" organized on social media not only advocates but uses simple cheap materials to temporarily change streets themselves. The "Safe and Seamless Mobility Quick-Strike Program" being pursued by the Metropolitan Transportation Commission

aims to support such an approach even to capital projects, and OakDOT now is considering ways to make its commercial "Flex Streets" permanent and to make temporary street closures in residential areas simpler and faster to permit as well.

If nothing else, the rapid rollout of expansive slow streets networks in Oakland and other cities during the pandemic is evidence that significant street safety efforts can be made quickly and relatively cheaply. It is the hope of this study's authors to have provided here an even-handed analysis of the 2020–2022 Oakland Slow Streets program, necessarily understood within the context of the COVID-19 pandemic in an incredibly varied and diverse city facing, like any city, underlying challenges of its own. There are lessons both in appraising the program itself and considering its wider implications. We hope that planners will find here some insights into how these lessons can be applied in the future.

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Abbreviations and Acronyms

AC Transit	Alameda Contra Costa Transit District
DIY	Do-it-yourself
MTI	Mineta Transportation Institute
Muni	San Francisco Metropolitan Transportation Agency
OakDOT	City of Oakland Department of Transportation
SB1	California Senate Bill 1 (2017), the Road Repair and Accountability Act of 2017

Appendix A

Oakland Slow Streets Passerby Count

Location _____

Date and start time _____ **Recorder**_____

Cars and trucks	Notes (thu-traffic / local?)
Peds	Notes (incl. demogs)
Bikes	Notes (incl. demogs)
Other	Notes (incl. description)

Fieldnotes (describe weather, physical conditions of the street and surroundings, other noteworthy observations about the place today)

Appendix B

Appendix B. Sample Passerby Count Sheets

Oakland Slow Streets Passerby Count

Location Plymouth & 89th Ave

Date and start time 8:00 5/19/21 **Recorder** Trevor Brown

Cars and trucks	Notes (thu-traffic / local?)
𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 | | |	1 truck on Plymouth. Mostly thru traffic, about 1 local pulling into driveway
Peds	Notes (incl. demogs)
1	1 Black guy walking down 89th onto plymouth
Bikes	Notes (incl. demogs)
1	Biker down Plymouth
Other	Notes (incl. description)

Fieldnotes (describe weather, physical conditions of the street and surroundings, other noteworthy observations about the place today)

This is the hood! We are right off 90th Ave & Bancroft Ave. When I drive by yesterday on 90th Ave someone sped around me at the stop sign, going like 50+ mph and ran the light. At the corner of 89th & Plymouth there is a memorial with multiple empty liquor bottles / flowers, meaning someone was killed at or near this corner. This is deep east oakland neighborhood. There is a traffic circle at the next block up plymouth & 88th that further slows the traffic coming down the plymouth st the area.

Appendix C. Traffic Speed Data

All speeds calculated as Miles Per Hour

0-6 mph	7-13 mph	14-19 mph	20-25 mph

May 2021	All street speeds calculated as MI			0-6 mph		7-13 mph	14-19 mph	20-25 mph																
Weekend	Slow Street	Control	Control																				Average speed per time stamp, per day	Average speed per day	Weekend Designation
15-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	19	13	16	16	16	22	19	13	13	19	18	19	13	19	17	16	
3:30	19	13	22	13	13	13	13	19	25	14	16	13	22	19	13	13	16	15	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	19	25	14	14	16	22	19	13	16	16	1	19	13	13	15		
					6																			
16-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	16	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	16	19	19	19	13	13	16		
17-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	16	19	13	13	15	15	
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	16	19	13	13	15		
6:30	16	19	22	13	13	19	13	19	13	14	13	16	19	13	13	16	16	16	19	13	13	16		
18-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16	
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16		
6:30	19	13	16	19	19	19	13	25	13	16	13	13	19	19	13	16	19	15	19	13	19	17		
19-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	15	15	
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15		
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16		
20-May	Shafter Ave						Alice St						E 16th St			Arthur St			Plymoth St					
21-May	Shafter Ave						Alice St						E 16th St			Arthur St			Plymoth St					
24-May	Shafter Ave						Alice St						E 16th St			Arthur St			Plymoth St					
28-May	Shafter Ave			16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	13	19	19	13	19	13	16	13	13	19	13	13	16	19	19	19	6	13	16	15	
3:30	16	16	19					19	13	16	13	13	19	13	13	16	19	13	19	6	13	15		
6:30								19	13	16	13	13	19	13	13	16	19	13	19	6	13	15		

29-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	17	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	16	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		

30-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	17	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	19	19	19	19	13	13	17		

31-May	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St		
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	17	19	13	13	15	15
3:30	16	19	22	13	6	19	13	13	13	16	13	16	19	13	13	13	19	17	19	13	13	15	
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16	

June — **All street speeds calculated as MPH** — 0-6 mph — 7-13 mph — 14-19 mph — 20-25 mph

Weekend	Slow Street	Control	Control																					
1-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St	Average speed	Average speed	Weekend
8:30	**16**	16	16	**19**	13	19	**13**	19	19	**16**	13	13	**19**	13	13	**16**	19	15	**19**	13	19	16	16	
3:30	**16**	13	16	**19**	13	19	**13**	19	13	**16**	13	13	**19**	13	13	**16**	19	15	**19**	13	19	16		
6:30	**19**	13	16	**19**	19	19	**13**	25	13	**16**	13	13	**19**	19	13	**16**	19	15	**19**	13	19	17		

2-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St		
8:30	**19**	16	19	**13**	6	19	**13**	13	13	**13**	13	16	**19**	13	13	**16**	19	19	**19**	13	19	15	15
3:30	**16**	16	16	**13**	6	13	**13**	19	13	**13**	13	16	**19**	13	13	**16**	19	15	**19**	13	13	15	
6:30	**19**	19	19	**13**	13	13	**13**	25	13	**13**	16	16	**19**	13	13	**16**	19	15	**19**	13	13	16	

3-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St		
8:30	**19**	22	**19**	**19**	13	19	**13**	13	13	**16**	13	16	**19**	13	13	**16**	19	17	**19**	19	13	16	16
3:30	**16**	16	19	**13**	13	13	**13**	19	13	**16**	13	13	**19**	13	13	**16**	19	15	**19**	13	13	15	
6:30	**16**	16	19	**13**	13	13	**13**	25	13	**16**	13	13	**19**	13	13	**16**	19	17	**19**	13	13	15	

4-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St		
8:30	**19**	19	22	**13**	19	19	**13**	19	13	**16**	13	13	**19**	13	13	**16**	19	19	**19**	6	13	16	15
3:30	**16**	16	19	**13**	13	13	**13**	19	13	**16**	13	13	**19**	13	13	**16**	19	13	**19**	6	13	15	
6:30	**16**	16	19	**13**	13	13	**13**	19	13	**16**	13	13	**19**	13	13	**16**	19	13	**19**	6	13	15	

5-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St			
8:30	**19**	13	22	**19**	13	19	**13**	25	19	**16**	16	16	**22**	19	13	**16**	19	17	**19**	13	19	17	17	
3:30	**19**	13	22	**13**	13	13	**13**	25	19	**13**	16	13	**22**	19	13	**13**	16	17	**19**	13	13	16		Weekend
6:30	**19**	13	19	**13**	13	13	**13**	25	19	**16**	16	16	**22**	19	13	**16**	16	17	**19**	13	13	16		

6-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymouth St	89th Ave	Birch St			
8:30	**19**	16	19	**13**	6	19	**13**	25	25	**16**	19	16	**22**	19	13	**19**	**19**	21	**19**	13	13	17	16	
3:30	**19**	13	19	**13**	6	19	**13**	25	13	**16**	16	13	**19**	19	13	**13**	16	19	**19**	13	13	16		Weekend
6:30	**19**	13	19	**13**	19	19	**13**	25	13	**16**	13	13	**19**	19	13	**16**	19	19	**19**	13	13	16		

7-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16	

8-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16	
6:30	19	13	16	19	19	19	13	25	19	16	13	13	19	19	13	16	19	15	19	13	19	17	

9-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	16	19	19	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	16	15
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15	
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16	

10-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	16
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15	
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15	

11-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	19	22	13	19	19	13	19	13	16	13	13	19	13	13	16	19	19	19	6	13	16	15
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15	
6:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15	

12-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	17	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		

13-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	16	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	16	19	19	19	13	13	16		

14-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	19	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	17	19	13	13	15	
6:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	

15-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16	
6:30	16	13	13	19	13	19	13	13	13	16	13	13	19	13	13	16	19	15	19	13	19	15	

16-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	16	19	19	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	16	15
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15	
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16	

17-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	16
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15	
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15	

18-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	22	13	19	19	13	19	13	14	13	13	19	13	13	16	19	19	19	6	13	16	15
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15	
6:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15	

19-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	17	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		

20-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	17	
3:30	19	13	19	19	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	16	19	19	19	13	13	16		

21-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16	

23-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	16	19	13	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	15	15
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15	
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16	

24-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	16
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15	
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15	

25-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	22	13	19	19	13	19	13	16	13	13	19	13	13	16	19	19	19	6	13	16	15
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15	
6:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15	

26-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	17	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		

27-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	16	16	22	19	13	19	19	21	19	13	13	17	16	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	19	19	19	13	13	16		

28-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16	

29-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16	
6:30	19	13	16	19	19	19	13	25	13	16	13	13	19	19	13	16	19	15	19	13	19	17	

30-Jun	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St		
8:30	19	16	19	13	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	15	15
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15	
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16	

July All street speeds calculated as MP 0-6 mph 7-13 mph 14-19 mph 20-25 mph

Weekend	Slow Street	Control	Control																					
1-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St	Average speed	Average	Weekend
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	15	
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15		
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15		
2-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	13	19	19	13	19	13	16	13	13	19	13	13	16	19	19	19	6	13	16	15	
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15		
6:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15		
3-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	16	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		
4-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	16	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	16	19	19	19	13	13	16		
5-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15	
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15		
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16		
6-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16	
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16		
6:30	19	13	16	19	19	19	13	25	13	16	13	13	19	19	13	16	19	15	19	13	19	17		
7-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	15	15	
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15		
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16		
8-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	18	
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15		
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15		

10-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	16	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		

11-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	16	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	16	19	19	19	13	13	16		

12-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15	
3:30	16	19	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15		
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16		

13-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16	
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16		
6:30	19	13	16	19	19	19	13	25	13	16	13	13	19	19	13	16	19	15	19	13	19	17		

14-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	25	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	16	16	
3:30	16	16	16	13	25	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	16		
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16		

15-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	15	
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15		
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15		

16-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	13	19	19	13	19	13	16	13	13	19	13	13	16	19	19	19	6	13	16	15	
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15		
6:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	13	19	6	13	15		

17-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	22	19	13	19	13	25	19	16	16	16	22	19	13	16	19	17	19	13	19	18	16	
3:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16		Weekend
6:30	19	13	19	13	13	13	13	25	19	16	16	16	22	19	13	16	16	17	19	13	13	16		

18-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	25	25	16	19	16	22	19	13	19	19	21	19	13	13	17	16	
3:30	19	13	19	13	6	19	13	25	13	16	16	13	19	19	13	13	16	19	19	13	13	16		Weekend
6:30	19	13	19	13	19	19	13	25	13	16	13	13	19	19	13	16	19	19	19	13	13	16		

19-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	22	19	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15	15	
3:30	16	19	22	13	6	19	13	13	13	13	13	16	19	13	13	13	19	15	19	13	13	15		
6:30	16	19	22	13	13	19	13	19	13	13	13	16	19	13	13	16	16	15	19	13	13	16		

20-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	16	19	13	19	13	19	19	16	13	13	19	13	13	16	19	15	19	13	19	16	16	
3:30	16	13	16	19	13	19	13	19	13	16	13	13	19	13	13	16	19	15	19	13	19	16		
6:30	19	13	16	19	19	19	13	25	13	16	13	13	19	19	13	16	19	15	19	13	19	17		

21-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	16	19	13	6	19	13	13	13	13	13	16	19	13	13	16	19	19	19	13	19	15	15	
3:30	16	16	16	13	6	13	13	19	13	13	13	16	19	13	13	16	19	15	19	13	13	15		
6:30	19	19	19	13	13	13	13	25	13	13	16	16	19	13	13	16	19	15	19	13	13	16		

22-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	22	19	19	13	19	13	13	13	16	13	16	19	13	13	16	19	17	19	19	13	16	15	
3:30	16	16	19	13	13	13	13	19	13	16	13	13	19	13	13	16	19	15	19	13	13	15		
6:30	16	16	19	13	13	13	13	25	13	16	13	13	19	13	13	16	19	17	19	13	13	15		

23-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	16	16	19	13	13	13	13	19	19	13	16	13	19	13	13	16	19	13	19	6	13	15	16	
3:30	16	19	25	19	25	13	13	25	13	16	16	16	19	19	13	19	22	19	19	19	19	18		
6:30																								

24-Jul	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th Ave	E 19th St/11th Ave	7th Ave/E 20th St	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St			
8:30	19	13	22	13	13	13	13	25	19	13	16	13	22	19	13	13	16	17	19	13	13	16	18	Weekend
3:30	19	16	19	19	25	13	19	25	25	22	19	19	22	19	19	19	22	21	19	25	25	21		
6:30																								

2021 Monthly Average Speeds

MAY

	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th	E 19th St/11th	7th Ave/E 20th	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St
Monthly Avg	18	16	20	15	11	17	13	18	14	15	14	14	20	15	13	15	18	16	19	12	14
		-2	2		-4	2		5	1		-1	-1		-5	-7		3	1		-7	-5

JUNE

	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th	E 19th St/11th	7th Ave/E 20th	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St
Month Avg	18	16	19	15	11	17	13	20	14	15	14	14	20	15	13	15	18	16	19	12	14
		-2	1		-4	2		7	1		-1	-1		-5	-7		3	1		-7	-5

JULY

	Shafter Ave	Avon St	Miles Ave	16th St	Chestnut St	21st St	Alice St	12th St	Harrison St	E 19th St/11th	E 19th St/11th	7th Ave/E 20th	E 16th St	29th Ave	E 17th St	Arthur St	Dashwood Ave	Krause Ave	Plymoth St	89th Ave	Birch St
Monthly Avg	18	16	20	15	13	16	13	20	15	15	14	14	20	15	13	15	18	16	19	13	16
		-2	2		-2	1		7	1		-1	-1		-5	-7		3	1		-6	-3

Pre-Pandemic Vs Pandemic Weekend and Weekday Samples

	May '19	May '21
Saturday	17	16
Wednesday	15	15

	June '19	June '21
Saturday	16	16
Wednesday	15	16

	July '19	July '21
Saturday	17	16
Wednesday	15	16

About the Authors

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