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Utilization of COVID-19 Street Programs in 5 U.S. Cities

Bob Pishue, Transportation Analyst, INRIX

ABOUT INRIX RESEARCH

Launched in 2016, INRIX Research uses INRIX proprietary big data and expertise to make the movement of people and goods more efficient, safer and convenient.

We achieve this by leveraging billions of anonymous data points every day from a diverse set of sources on all roads in countries of coverage. Our data provides a rich and fertile picture of urban mobility that enables INRIX Research to produce valuable and actionable insights for policy makers, transport professionals, automakers, and drivers.

The INRIX Research team has researchers in Europe and North America, and is comprised of economists, transportation policy specialists and data scientists with backgrounds from academia, think tanks and commercial research and development groups. We have decades of experience in applying rigorous, cutting-edge methodologies to answer salient, real-world problems.

INRIX Research will continue to develop the INRIX Traffic Scorecard as a global, annual benchmark as well as develop new industry-leading metrics and original research reports. In addition to our research outputs, INRIX Research is a free and valuable resource for journalists, researchers and policymakers. We are able to assist with data, analysis and expert commentary on all aspects of urban mobility and smart cities. Spokespeople are available globally for interviews.

KEY FINDINGS:

- Total activity on restricted streets lagged overall city activity significantly in New York, and somewhat significantly in Washington D.C., while activity in Oakland was slightly higher on restricted streets and significantly higher in Minneapolis.

- New York City's Full Block implementation saw higher levels of activity (78%) than "Open Restaurant" streets (62%) and far higher levels of activity compared to "Protected Bike Lane" streets (51%). Designs geared toward the commuting in Manhattan, seemed to attract fewer people and cyclists than those geared toward recreation.

- Minneapolis's recreational-focused streets saw the largest increase in activity out of the five cities studied, however their program was shelved by September.

- Seattle's and Minneapolis' shared streets saw more unique visitors versus control streets possibly due to the recreational nature of the programs.

- Activity near Oakland's "Slow Streets" was significantly higher on those with more visits from lower-income households. Low activity was observed on streets with a greater share of high-income visitors.

- Pass-through trips appear to have been significantly reduced.

METHODOLOGY

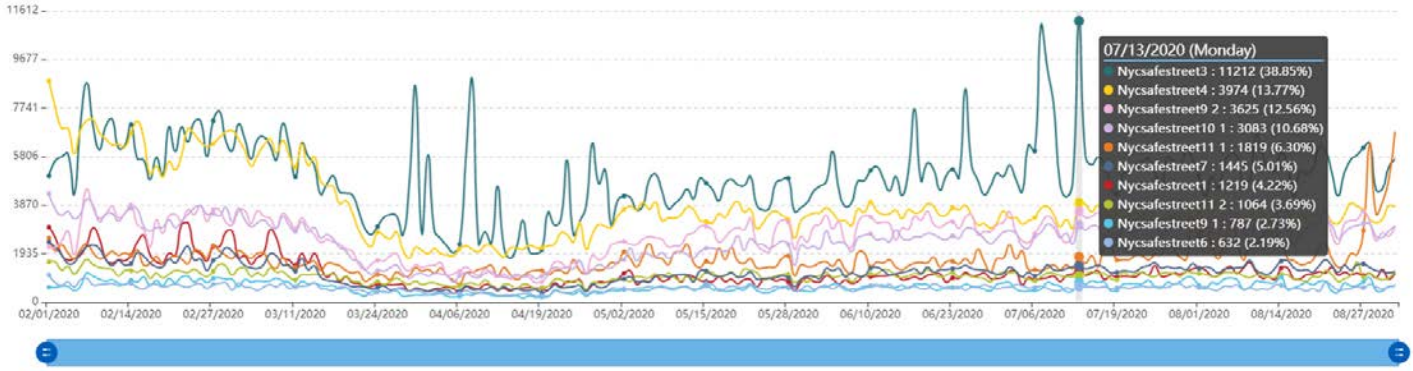
INRIX analyzed "safe street" programs in Minneapolis, New York, Oakland, Seattle and Washington DC based on their respective size, implementation, length of operation and the relative permanence of changes made for these projects

Two types of analyses were done to study these restricted street programs:

1) **Normalized INRIX Visits data by census block.** This analysis looks at activity at census blocks that intersect with a restricted street. These streets are then compared to the cities' proper to determine how utilization compares to the city as a whole. We consider this an activity metric.

2) **INRIX Visits "Home Location" data:** This analysis is used to determine the visit characteristics (frequency, demographics, etc.) on a particular corridor or set of corridors. Control streets were chosen based on utilization, location, functional classification and direction.

IMAGE 1 Screenshot of INRIX Visits analysis of New York City



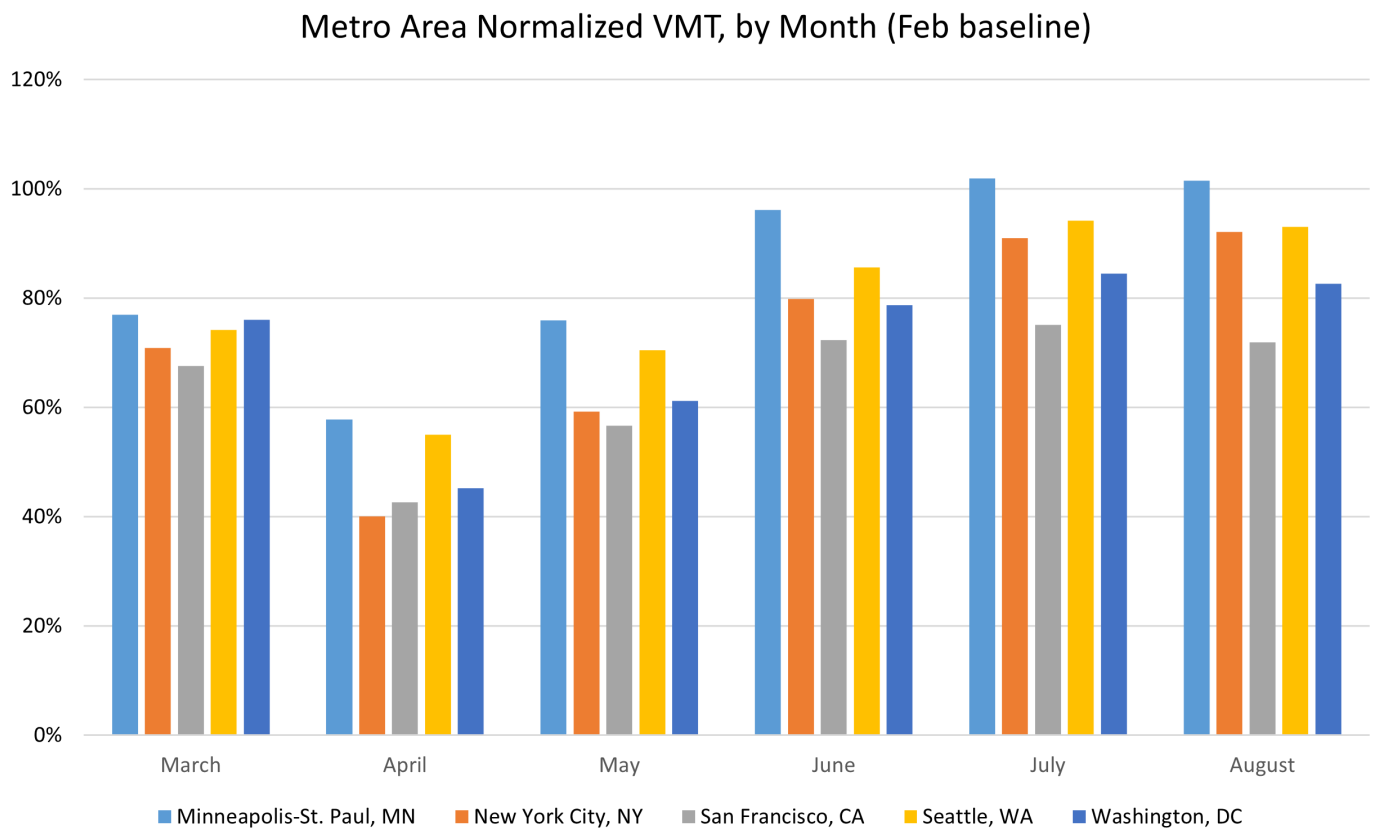
BACKGROUND

Since health officials imposed COVID-19 restrictions on public and private gatherings, road authorities across the world have implemented several policies to promote social distancing, cycling and walking, all while decreasing car use on a particular street. These programs have been given different monikers – "Slow Street," "Safe Street," "Stay Healthy Street," "Keep Moving Street" or another variant – depending on the city. While all "restricted streets" attempt to limit car traffic, our research reveals that different versions of these programs can be implemented based on the goals of transportation officials and public use.

Closing a public street is not a silver bullet for urban policy goals, and there are a number of justifications as to why a street should be closed: safety, cut-through traffic, social distancing, economic stimulus (open dining, open-air retail, etc.), recreation (increase walking and cycling for adults and children), commuting (shifting commute mode from auto to bike/ped), reduce greenhouse gas emissions and improving access for essential trips (grocery stores, pharmacies, hospitals, other services), among others.

During COVID-19, a reduction in traffic has allowed public officials to implement these policies with minimal opposition. Yet as Figure 1 shows, traffic is returning, and as congestion builds on highways and freeways, drivers will seek less-congested arterial and city streets for travel. With continued growth in vehicle-miles traveled, city officials face mounting pressure to reopen streets, requiring strong quantitative analysis to determine if (and how) these changes should be made permanent.

FIGURE 1 Demand for car travel continues to increase



However, there is often a gap between clearly articulated project goals and metrics leveraged to measure relative success. For example, should a street see less activity, for social distancing and lack of through traffic, or more activity, with increased person-throughput?

To provide insight into project performance, INRIX analyzed streets in five different cities to reveal how these “restricted” streets operated and performed. While this information helps public officials make a more informed decision regarding specific projects, it also provides road authorities the ability to share key information with the public.

FINDINGS

Monthly Utilization

Utilization versus other streets is a simple method of analyzing restricted streets. However, it is critical that officials implementing restricted streets clearly define its specific context and goal. For example, public agencies may want less overall vehicle traffic while simultaneously desiring more pedestrian and bicycle traffic. Since bicycle traffic is often a fraction of vehicle traffic, however, even a doubling or tripling of cycling along a corridor may have a negligible effect on traffic patterns. Therefore, it is important that public agencies define a specific street's purpose to accurately gauge the program's success or failure.

FIGURE 2 Normalized and Month-to-Month Change in Trip Share

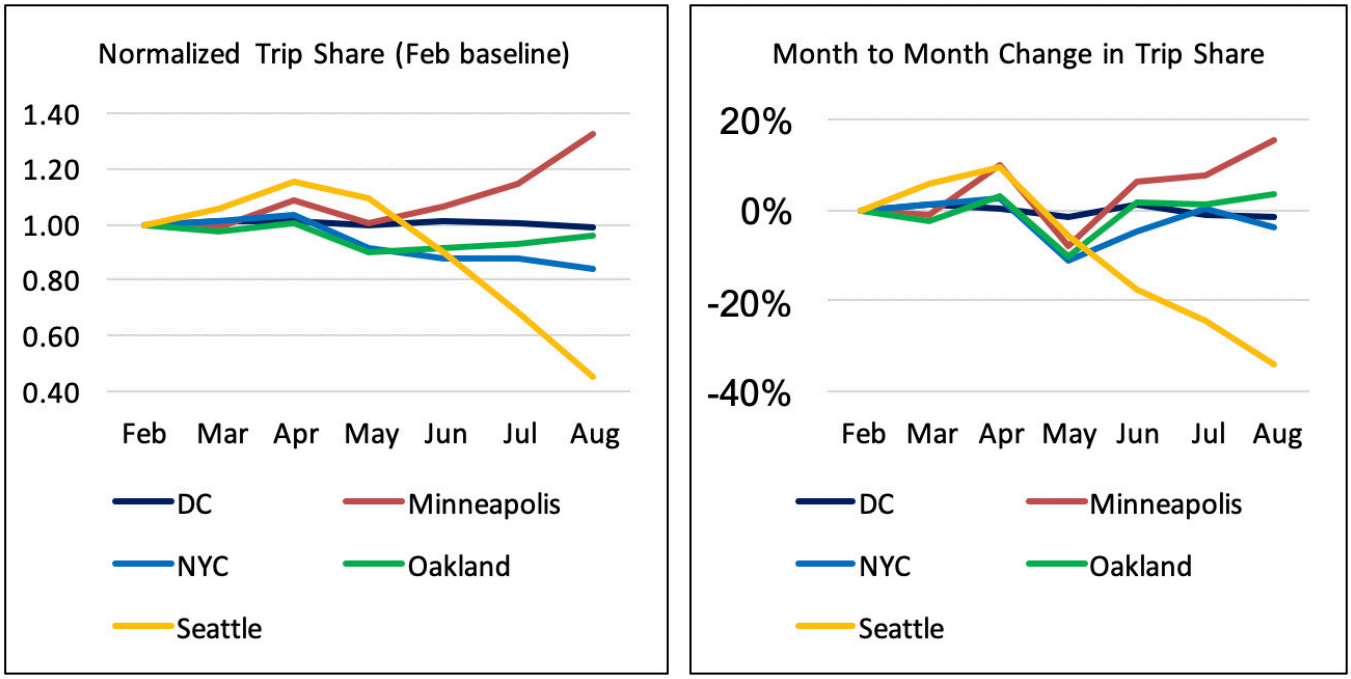


Figure 2 provides the utilization of restricted streets and their respective control streets across the five cities analyzed. After seeing an increase in trip-share versus control streets during March and April, streets that were a part of Seattle's "Keep Moving Streets" saw utilization begin to fall even before project implementation this summer. This may be as intended, as Keep Moving Streets are "located on streets with higher speed and traffic volume than Stay Healthy Streets and are temporarily closed to cut-through traffic." The numbers are also likely affected by multiple park closures since COVID-19 to limit gathering sizes in public spaces.

Minneapolis saw traffic build prior to implementation of its restricted streets, which began on April 29, A slight dip in May led to a six percent rebound in June. Officials ended the pilot program in September despite seeing a 32% higher utilization versus control streets in August.

Other programs, like those found in New York, Oakland and Washington DC, ranged from a one percent reduction in trip share to a 16% reduction versus control streets.

Visitor Characteristics

One measure of performance may be the frequency of new visitors using the restricted streets. In some instances, restricted streets attract new people from outside the neighborhood, like a public park. As referenced in Figure 3, both Minneapolis's and Seattle's restricted streets had a larger share of unique visitors than the control streets, indicating those facilities may be more recreationally focused rather than "destination-based." This is interesting given that the utilization/trip share of restricted streets in Minneapolis and Seattle are inversely related.

FIGURE 3

Unique Visitor Share by City

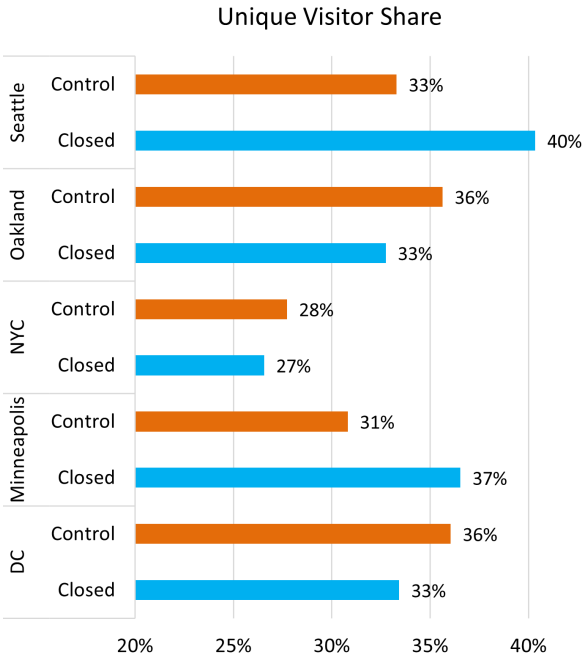
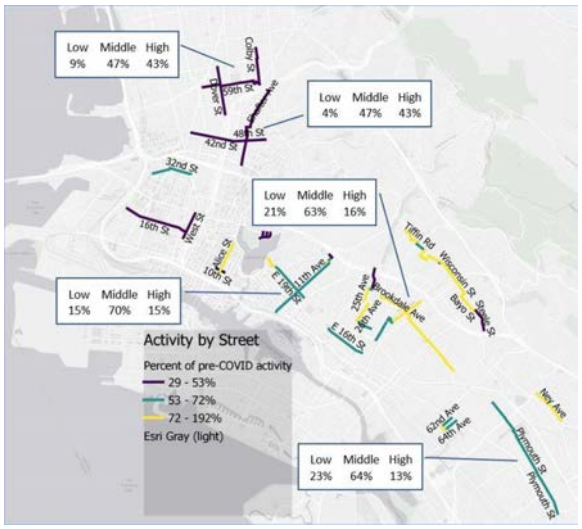


IMAGE 2 Oakland Street Activity & Visitor Share by Income Group



Low = MI less than $45,000/year; Middle = MI $45,000-$90,000; High = MI $90,000+

By eliminating and restricting parking and thru-traffic, cities may be discouraging those from outer neighborhoods frequenting restaurant districts and other street-based activities. Figure 3 shows, for example, that unique visitor counts on restricted streets in Oakland, New York City and Washington D.C. tracked their open, control street counterparts.

Often, these programs are carefully analyzed to ensure equitable access for all residents. This analysis can include key demographics like race, household income, family size and access to a vehicle. For this example, we examined all restricted streets in Oakland in terms of activity along with household income.

Our analysis found that activity along Oakland's Slow Streets significantly varied by income. For example, Image 2 reveals that 58th & Dover, 42nd/48th/Webster, and 16th & West all had a very high share of visits from the high-income group ($90,000+) along with lower than average activity (below 53%). While Brookdale/Humboldt and Arthur/Plymouth had relatively larger shares of low-income visitors (21% and 23%, respectively) and higher activity. However, nearly a third of Oakland households report an income of less than $45,000 per year (Census Bureau B19001), and all Slow Streets analyzed in Oakland fell below that portion for the lower income group using the project.

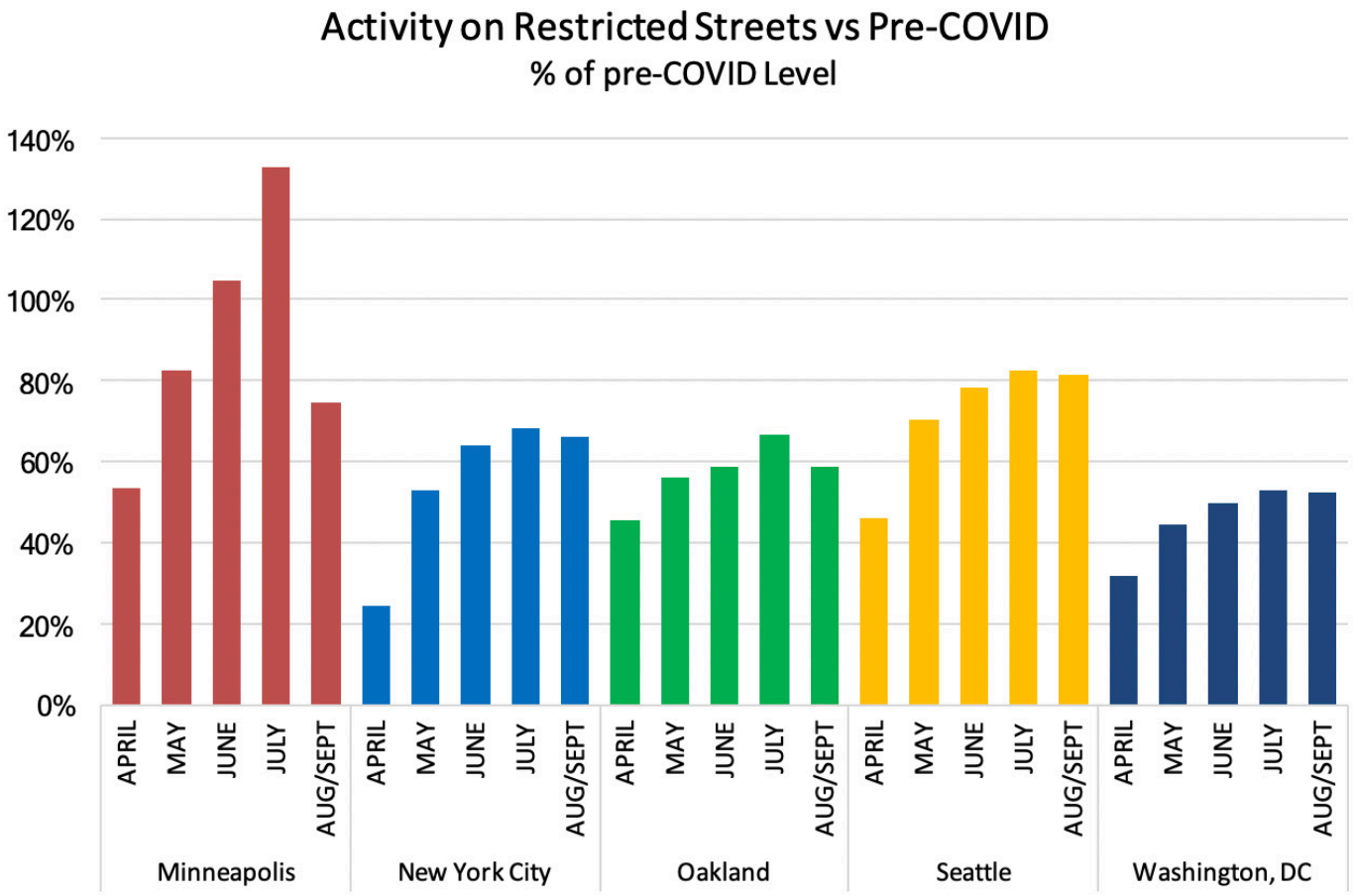
This suggests that while activity is greatest along those streets with a larger lower-income share of visitors, lower-income households were underrepresented. This representation varied significantly depending on street location.

Visitors to 58th & Dover had the highest income per unique visitor of all streets analyzed at $92,500, while East 16th had the lowest income per unique visitor at $60,500.

Comparing Street Activity to Overall City Activity

Though comparing restricted streets to control streets can be informative, another metric to understand is activity along the corridor. This metric indicates an uptick of general activity in the "neighborhood" or "district" versus simply the street right of way. Figure 4 provides insight into activity and compares it to the activity within the city proper.

FIGURE 4 Activity by City



Looking at the entire City of Seattle provides useful insights. In the "Monthly utilization" metric, we saw Seattle's "Keep Moving Streets" plummet in usage versus nearby control streets. Yet when looking at all "Stay Healthy Streets" compared to the overall activity within the city, Stay Healthy Streets outpaced the rest of the city significantly. This finding reveals the importance of specific quantitative performance metrics tailored toward street design. In other words, a one-size fits all metric may not perform well across all street types.

Table 1 compares activity levels on restricted streets to activity across the respective city. Minneapolis saw the largest jumps on their restricted streets, with activity levels in July one-third higher than pre-COVID. While Washington DC had the lowest utilization of any city, activity city-wide was on-par with restricted lane use. Restricted bike lanes in New York, on the other hand, saw the lowest activity in relation to the city as a whole, likely due to the drop in commuter activity in Manhattan as a result of COVID, where the bulk of restricted streets are located (see Figure 5).

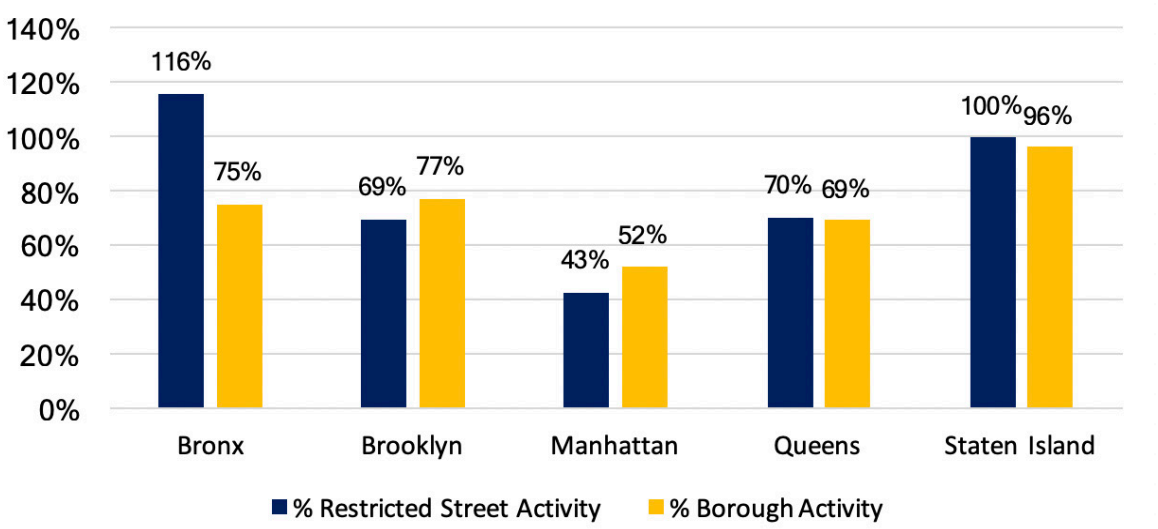
TABLE 1 Activity by City, by Month, Comparison

CITY	PERIOD	% ACTIVITY ON RESTRICTED STREETS	% ACTIVITY CITYWIDE
Minneapolis	APRIL	54%	41%
Minneapolis	MAY	83%	76%
Minneapolis	JUNE	105%	85%
Minneapolis	JULY	133%	85%
Minneapolis	AUG/SEPT	75%	82%
New York City	APRIL	24%	31%
New York City	MAY	53%	68%
New York City	JUNE	64%	77%
New York City	JULY	68%	87%
New York City	AUG/SEPT	66%	86%
Oakland	APRIL	46%	38%
Oakland	MAY	56%	54%
Oakland	JUNE	59%	57%
Oakland	JULY	67%	66%
Oakland	AUG/SEPT	59%	52%
Seattle	APRIL	46%	35%
Seattle	MAY	70%	59%
Seattle	JUNE	78%	65%
Seattle	JULY	82%	75%
Seattle	AUG/SEPT	82%	72%
Washington, DC	APRIL	32%	30%
Washington, DC	MAY	44%	48%
Washington, DC	JUNE	50%	59%
Washington, DC	JULY	53%	54%
Washington, DC	AUG/SEPT	52%	52%

New York City Activity, Explained

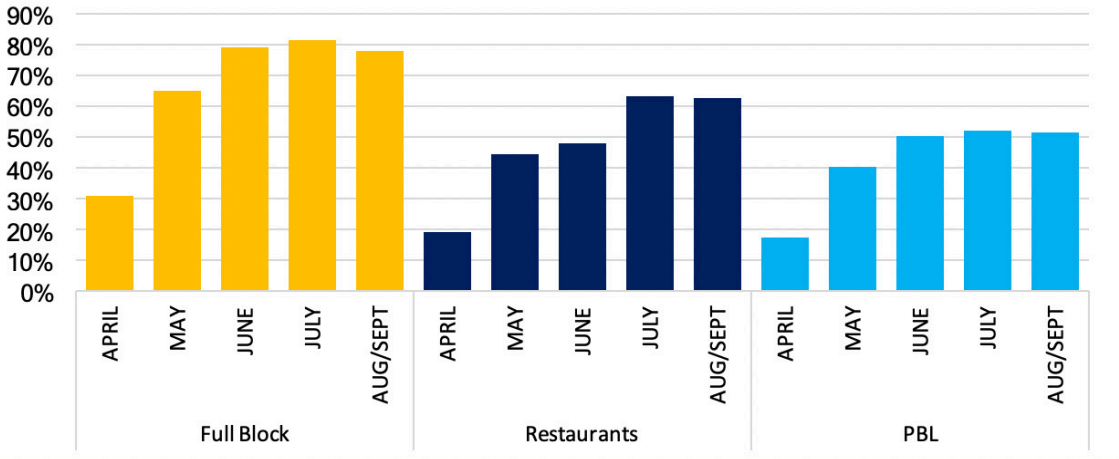
New York City's usage of restricted streets appears to lag other cities, needing further investigation to determine the cause. First, New York adopted fairly strict social distancing and travel restrictions, which may have affected activity considerably by borough, as shown in yellow in Figure 5. The low activity seen on restricted streets in New York (blue) is weighted heavily on the general lack of activity in Manhattan, which comprises the large majority of restricted streets analyzed (in terms of Census Blocks that intersect with a restricted street, not length of streets).

FIGURE 5 New York City Activity by Borough



Delving further, we decipher which type of streets saw the largest activity. As shown in Figure 6, "Full Block" restrictions (general neighborhood street closures) saw the largest gains in activity versus pre-COVID level, surpassing 80% in July. Yet restaurants, and especially protected bike lanes (PBL) lagged behind. Again, this has to do with the outsized impact Manhattan has on the results, as PBL's and Restaurant-related street restrictions are heavily concentrated in Manhattan, while Brooklyn, Queens and Manhattan share higher amounts of Full Block streets. Due to the varying nature of street closures surrounding restaurants, a time of day and day of week analysis is warranted

FIGURE 6 Activity by Street Type, New York

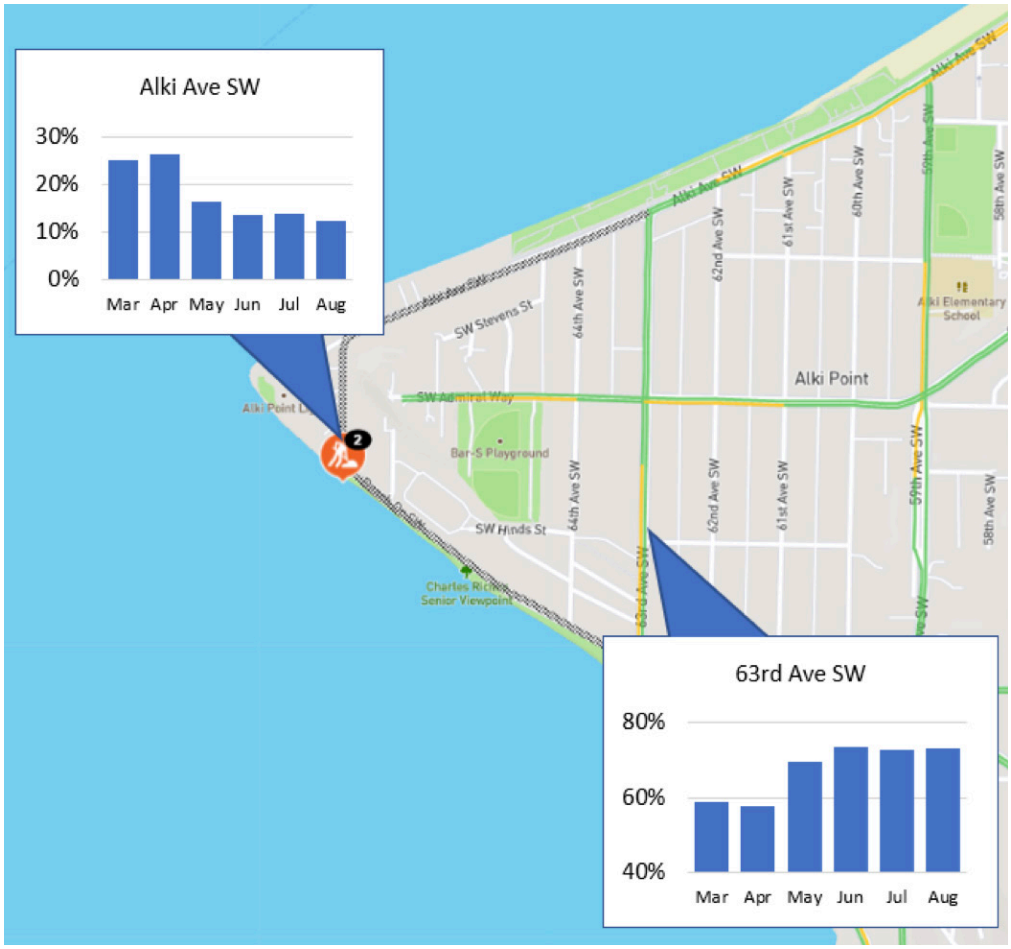


Passthrough Traffic Study, Alki Beach, Seattle, WA

Nearly all restricted street programs attempt to restrict the number of vehicles on a roadway. Many of these streets are only open to vehicles that: 1) have a destination on that street (local access); 2) are non-motorized; or 3) local delivery vehicles. As a result, it is important to understand the impact to adjacent streets and determine how detours are functioning.

Alki in Seattle, WA, a peninsula, provides an interesting test case. In this example, Beach Drive and Alki Ave SW were closed to motorized vehicles on May 7, 2020 between 63rd Ave SW on the North and South. INRIX Trips data indicate that vehicle trips dropped 20% on Beach Drive/Alki Ave in between March and May, yet trips jumped 44% on 63rd Ave SW.

FIGURE 7 Passthrough trips by street (% of total trips)



City-wide traffic and related congestion is still below pre-COVID level. However, likely due to displaced vehicles from closing Beach Drive/Alki Ave, traffic volumes on 63rd Ave SW mirror last year. This indicates that traffic congestion, while similar to last year with diversion onto the street, would likely be lower had Alki not been closed to through traffic.

Conclusion

Using INRIX Visits, along with INRIX Trips, and U.S. Census demographics, allows a deeper look into non-traditional roadways. In all but New York, average daily traffic data has been limited or non-existent regarding many of the closed and controlled streets, likely due to costs of collection and monitoring, in addition to analytical time. Using INRIX Visits allows we were able to approximate relative volumes, agnostic of mode, in order to compare street activity before and after changes. In this study, we found: motorists are largely obeying through-traffic restrictions; utilization of restricted streets varies with the type of program offered; unique visitors are more prevalent in some street closings versus others; and the importance of location on user demographics.

This data is especially valuable given the demands for finite roadway space once traffic and congestion return to pre-COVID levels. There was also little factoring of seasonality, as Spring and Summer may represent a larger user base than Fall and Winter. With continued monitoring public officials can determine the best way to maximize person throughput and public right of way utilization throughout the city.

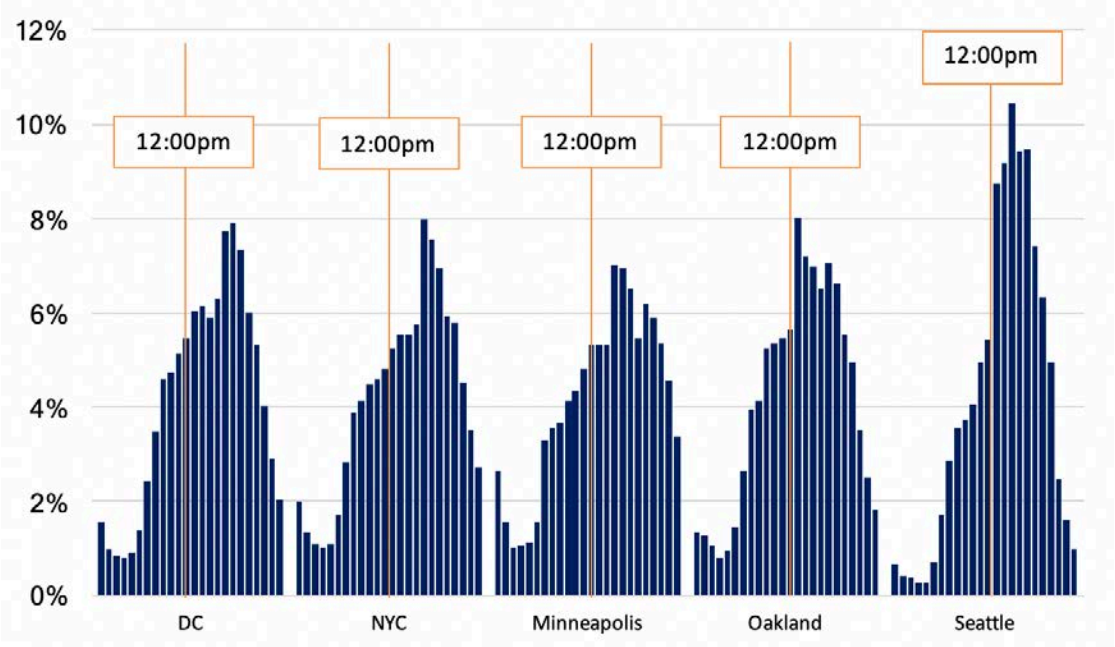
Appendix

Additional information not used in the report, but beneficial to analysis.

Time of Day & Day of Week

Time of day patterns allow public officials to make more informed decisions when it comes to closing streets. For example, many restricted streets have hour requirements, like 8AM to 8PM, or go 24 hours, 7 days per week. Figure 4 provides the trip distribution, by hour, for restricted streets by city, starting in April.

Trip Distribution Metrics – By Hour



Out of all of the cities analyzed, Seattle stands out as having the most unequal distribution . Seattle has the largest share of any city between 1PM and 5PM and the smallest share of trips between 8PM and 8AM, at just 12%. Visits in Minneapolis are spread fairly evenly throughout the day, while New York City, DC,and Oakland share similar distributions somewhere between these extremes. It is important to note that street selection in Seattle may be skewing the results, as these “Keep Moving Streets” were placed near heavy recreation.

NORTH AMERICA
10210 NE Points Drive
Suite 400
Kirkland
WA 98033
United States

+1 425-284-3800
info@inrix.com

EMEA
Station House
Stamford New Road
Altrincham
Cheshire
WA14 1EP
England

+44 161 927 3600
europe@inrix.com