Image: The Boston Globe

LIFE IN THE BUS LANE

Best Practices for Envisioning a Better LA

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Disclaimer

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Bus riders in Los Angeles deserve fast, frequent, and reliable service, and the bus lane represents a low-cost intervention that could improve service for riders (NACTO, 2022). This study envisions more bus lanes for Los Angeles by asking: what best practices can Los Angeles learn from other cities' on-street bus lane implementations? I define on-street bus lanes as transit lanes that prioritize bus travel in a shared right-of-way alongside normal vehicular traffic. I use this terminology to distinguish on-street bus lanes from bus rapid transit (BRT) lanes, which typically require more capital and often an exclusive right-of-way. I narrow my study to on-street bus lanes as they represent a feasible near-term goal for planners and advocates to consider.

Bus lanes have been shown to improve average bus speed, and improve reliability through alleviating bus bunching (Higashide, 2019). Better reliability leads to better service quality, which is directly linked to ridership (Manville et al., 2018). Improving reliability through bus lane implementation could potentially boost rider loyalty and retain bus riders (Diab et al., 2015). Agencies can implement bus lanes as quick-build pilot projects, known as tactical transit lanes. Tactical transit lanes offer promising solutions as they require little capital costs, provide immediate benefits for bus riders, and serve as data and public input collection (Matute & Gahbauer, 2019). Bus lanes require enforcement to realize their benefits, with patrolled enforcement differing from automated enforcement in that automated closes gaps in enforcement while high detection rates serve as a strong deterrent (Agrawal et al, 2013).

Key Findings

Through document review and interviews of transit advocates and agency staff in Boston, Chicago, Seattle, and Sydney, this study found that bus lane implementation requires consideration of: planning and strategy, governance, bus lane typology, and enforcement.

Planning and Strategy

Tactical, temporary, or pop-up bus lanes provide opportunities for immediate low cost intervention, while also serving as public input forums for riders and motorists.

- Boston and Chicago utilized tactical bus lanes not only as proof of concept, but also as opportunities for public engagement.
- Whereas Seattle leveraged the systemwide strategic push for better access to light rail as a means for opening more bus stops and implementing more bus lanes.

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Governance & Political Considerations: Bus lane implementation can be a political battle, and often hinges on the support of key political players.

- Chicago advocates found political champions to turn a pop-up lane into a permanent lane
- Advocates in Boston pressured MBTA by intentionally targeting surrounding suburban neighborhoods, using policy diffusion to obtain permanent bus lanes in Boston
- Sydney's boom in bus lane implementation happened when Transport NSW prioritized buses by evaluating the performance of corridors in person throughput instead of vehicle throughput

Bus Lane Typology and Effectiveness: Peak hour bus lanes are best suited to travel corridors with ample street parking, but dedicated bus lanes also deserve consideration.

- Seattle expanded the hours of its Interbay peak hour lanes after surveying riders
- Boston implemented New England's first center running bus lane along Columbus Ave, saving peak-hour riders 4-8 minutes per trip
- Sydney deployed transit lanes that allowed carpoolers to share the bus lane, but lack of enforcement and high congestion rendered the lane ineffective

Enforcement: Automated bus lane enforcement is low cost and avoids interactions between police and people, and self-enforcing design should be considered as added deterrence to unpermitted uses.

- Sydney has been doing automated enforcement for almost a decade while also utilizing passive "self-enforcing" strategies such as bus lanes that are offset from the curb to provide space for temporary vehicle parking.
- Seattle has struggled with enforcement, but has responded with their own automated enforcement that has resulted in over 100,000 recorded violations. It's unclear if citations from automated enforcement deter bus lane violations.

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Conclusions and Recommendations

Los Angeles advocates and agency staff should consider implementing more tactical bus lane projects as they offer benefits in a short timeline for low capital costs, and also serve as data and input gathering forums. When moving tactical projects forward as permanent lanes, advocates can take pilot data and find a policy champion within the City of LA or LA Metro that will petition for implementation. Alternatively, advocates can learn from Boston in diffusing policy from the outside-in by courting supportive smaller cities surrounding LA to implement tactical projects. The appropriate lane typology should be considered in fittin a given corridor's physical and political contexts, and enforcement needs. Automated enforcement can provide advantages over patrolled enforcement, but additional research is required on the racial disparities and privacy impacts of automated enforcement in order to recommend it.

As LA navigates its transit future, bus riders should be rewarded for their resiliency with fast, frequent, and reliable service. Bus lanes might not win over choice riders from driving their cars, but they do prioritize bus riders, which can boost loyalty and retain ridership. The working class, immigrant, and BIPOC bus riders of LA should be prioritized in transit projects as they are the lifeblood of the system.

Introduction

Despite a global pandemic, Los Angeles's bus ridership has remained resilient and is almost back to pre-pandemic levels, showing LA's reliance on the bus (LA Metro ISOTP, 2023). But at the beginning of 2023, trip cancellations spiked, in part due to a bus operator shortage (TransitCenter, 2022). Simultaneously, Los Angeles County Metropolitan Transportation Authority (LA Metro) reported that riders want buses to arrive on time more than anything else (LA Metro the Source, 2022). Meanwhile in December 2021, LA Metro adopted a major bus network redesign in the form of the NextGen Bus Study and Plan (LA Metro, 2021). While NextGen aims to improve bus service, it has not yet responded to the core issues with LA's bus service: slow, infrequent, and unreliable service (TransitCenter, 2022). Bus service hours have steadily been cut since 2007, and much of what LA Metro is touting as improvements are simply getting bus service back to pre-pandemic levels. In fact, "if Metro were to provide a level of bus service equal to what was provided in 2000, it would need to dramatically accelerate its bus fleet or provide 1.5 million service hours above what is currently proposed in the 2022 budget" (Frazier, 2021). The decline in quality and level of bus service calls for an intervention. While network redesigns often require years of planning and funding, LA's transit agencies should also consider tangible lower cost interventions like bus lanes.

Transit agencies have been turning to the bus only lane as a solution to improve bus service. The earliest instance of a dedicated busway was recorded in 1948 when a trolley tunnel in Rhode Island was converted to allow for motor buses and "trackless trolleys" usage (Blomquist, 1949). Traffic engineers understood the value in grade separation for non-rail mass transit, noting that the trackless trolley system saw an increase of 11 percent in revenue after the tunnel conversion (Blomquist, 1949). This early usage of an exclusive right-of-way for buses shows that the bus lane is by no means a new idea.

The greater Los Angeles area received its first dedicated bus lane between El Monte and Downtown LA in 1974 (Metropolitan Transportation Commission, 2007). LA has added dedicated busways like the Metro G Line, a bus rapid transit line that crosscuts the San Fernando Valley, but other examples of high volume bus lanes remain relatively sparse. As of May 2021, Los Angeles County has 107 miles of bus lanes, which breaks down into 80 miles of freeway lanes and 27 miles of mixed use "on-street" bus lanes (Huang et al., 2021). For context, LA Metro's rail network spans 113.5 miles (LA Metro, 2022) and LA County's interstate system includes over 300 miles (Omishakin et al., 2021). For a network that relies on its buses so much, LA's bus lane development has lagged behind rail and even highways.

Installing bus only lanes requires operators working together with local partners who own and operate roadways. With the advent of a bus speeds working group between the Los Angeles Department of Transportation (LADOT) and LA Metro, the number of bus lanes is now growing. But more bus only lanes are needed to continue to improve service.

In response, this project partners with Alliance for Community Transit - Los Angeles (ACT-LA) to explore bus lane models that can improve service in LA. Working class, immigrant, and black, indigenous, people of color (BIPOC) Angelenos comprise an overwhelming majority of bus riders (LA Metro the Source, 2022), making bus improvements inherently an equity issue. Within ACT-LA, the Transit Justice Committee is interested in exploring bus only lanes as a relatively low-cost solution to issues with bus reliability and speed. Given that LA Metro customers' top five asks include bus reliability and frequency (LA Metro the Source, 2022), bus lanes present an opportunity to address gaps in bus service directly.

In this report, I ask and answer the research question: what best practices can Los Angeles learn from other cities' on-street bus lane implementations? I define on-street bus lanes as transit lanes that prioritize bus travel in a shared right-of-way alongside normal vehicular traffic. I use this terminology to distinguish on-street bus lanes from bus rapid transit (BRT) lanes, which typically require more capital and often an exclusive right-of-way. While cities like Bogotá and Mexico City have successfully prioritized bus travel in the form of BRT, other cities and agencies have also utilized on-street bus lanes to great effect. While it may be an effective long-term approach to improving LA Metro service, BRT requires large capital improvements and resources and takes longer to deliver. In contrast, deploying on-street bus lanes can be done relatively quickly and can be applied to a greater number of existing LA Metro bus lines. I narrow my study to on-street bus lanes as they represent a feasible near-term goal for planners and advocates to consider.

I answer my research question through analyzing bus lane implementation in four key case study cities: Boston, Chicago, Seattle, and Sydney, Australia. These cities were chosen through a review of literature on bus lanes and similarities to LA in urban and transit characteristics. I aim to obtain tangible best practices and recommendations for envisioning the future of LA's bus lanes. Ultimately, my case studies and interviews inform a set of recommendations for how ACT-LA should proceed with Transit Justice Committee member organizations and their community of bus riders.

Literature Review

The National Association of City Transportation Officials (NACTO) suggests that “redesigning city streets to get the bus out of slow traffic is one of the most effective ways to improve transit speed and reliability, and win back riders” (NACTO, 2022). Bus only lanes ideally provide buses that opportunity to get out of traffic, so what does the literature say about the effect of bus lanes on average speeds and service reliability? Service reliability is defined as “a measure of on-time performance: Do vehicles arrive and depart when they are supposed to” (Manville et al., 2018)? And ultimately, how does improved bus speed and reliability affect service quality for riders? Service quality includes speed and reliability, but also experience (Manville et al., 2018).

Getting buses out of traffic means improvements overall for bus speed (Mohring, 1979; SCAG, 2022), and improved speeds often translate to time saved for riders (Cesme et al., 2016; Russo et al., 2022). Much of the research around bus lanes and travel speeds is focused on bus rapid transit, but recent studies set in American cities have shown promising results for on-street bus lanes. Improvements to bus speed can be measured in travel time saved over a fixed distance. Researchers in Washington D.C. saw time savings of up to five minutes per mile along D.C.’s downtown core (Cesme et al., 2016). In Arlington, Massachusetts, planners measured time savings of around five to ten minutes along a 1.25 mile bus lane (Gahbauer, 2019), corroborating numbers obtained in D.C. In Rome, Italy, researchers were able to record 18% time savings, showing that the “beneficial effect of providing a separate lane for buses is that bus speed increases” (Russo et al., 2022).

In *Better Buses, Better Cities*, author Steven Higashide notes that “frequent bus service promises freedom, but when that bus service is unreliable, it’s a false promise” (Higashide, 2019). Heavy street traffic causes buses to all arrive at the same time at some stops, but leaves long gaps between service at others, leading to an effect called bus bunching. Bunching then leads to unreliable service, and one way to alleviate bunching is by giving buses their own lane (Higashide, 2019). Bunching can bring even the most meticulously planned schedules to a halt as buses no longer are able to follow a typical timetable.

Choke points that increase bus congestion along routes cause the speed variability that can lead to bus bunching (He et al., 2019; Bartholdi & Eisenstein, 2012). Bus lanes can alleviate some of this variability “since it is possible to slow down or speed up a bus on a [dedicated

bus lane] DBL...using DBL to alleviate or remove bunching from a bus line becomes very promising" (He et al. 2019). Alleviating bus bunching not only saves travel time, but also improves reliability, as bus headways will be more predictable leading to better on-time performance (Vismara, 2022). Riders would be able to depend on buses arriving at regular intervals, instead of multiple buses queuing at certain stops and being noticeably absent at stops downstream.

Bus lanes show promising results in addressing both average bus speed and bus bunching, making them well-suited to addressing overall service quality issues. But how does improving service affect ridership? Researchers at UCLA report that shifting neighborhood demographics and increasing car ownership have more of an effect on ridership trends in LA than service reliability (Manville et al, 2018). Rider perceptions around wait times at transit stops are also highly susceptible to distortion when compared to perceived wait times in the vehicle (Mohring, 1987), suggesting that improvements to the experience portion of service quality are very important.

Other research suggests that reliability is tied to rider satisfaction, as “providing reliable transit services is necessary in order to maintain an efficient and attractive system, which increases users' satisfaction and loyalty” (Diab et al., 2015). While implementing bus lanes and improving service reliability may not win riders back from their cars, improving reliability through bus lane implementation could potentially boost rider loyalty and retain bus riders.

Bus lanes can improve service quality via reliability improvements. Overall service quality is directly linked to ridership (Manville et al., 2018), suggesting that improvements to bus service quality could have a positive effect on ridership. Bus lanes increase average bus speeds, which can then allow agencies to operate more efficiently, hitting scheduled headways with less buses and drivers (Higashide, 2019). In the current era of bus operator shortages, bus lanes seem to provide the hope of solving multiple problems. But how should agencies go about implementing bus lanes?

In “Best Practices in Implementing Tactical Transit Lanes”, the UCLA Institute of Transportation Studies (ITS) provides guidance on implementing quick-build bus lane projects that seem to result in encouraging benefits for bus riders. This report highlights how bus lanes in Boston and Everett, MA experienced 20-28% peak travel time savings, as well as an overall improvement in the predictability of travel times (Matute & Gahbauer, 2019).

ITS distinguishes between tactical lanes and traditionally planned projects by highlighting the unique advantages of pilot projects. Tactical lanes that use a pilot approach allow agencies to collect public input and data before implementing something permanent like a dedicated bus lane.

A 2013 report conducted a comparative case study across major cities worldwide that have implemented bus lanes, noting the additional considerations required for bus lane implementation. In “Shared-Use Bus Priority Lanes on City Streets: Approaches to Access and Enforcement”, researchers particularly highlight the divergence between cities in their approaches to bus lane enforcement. Enforcement is ensuring only the bus and permitted users, such as emergency vehicles or cyclists, are using the bus priority lanes. Patrolled enforcement differs from automated enforcement in that automated closes gaps in enforcement while the high detection rate serves a strong deterrent (Agrawal et al, 2013). Bus lanes at their core are a set of usage exclusions, so the enforcement of those exclusions is required for bus lane benefits to be realized.

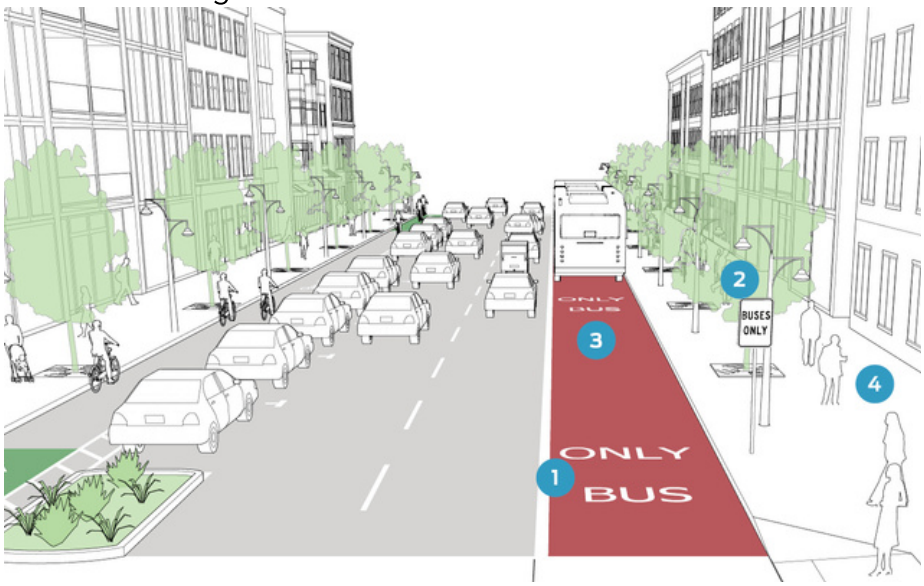
More recent research shows additional benefits of automated enforcement over patrolled enforcement. New York City recently implemented automated enforcement utilizing cameras on moving buses as well as fixed positions on poles along routes (Heaslip et al., 2019). Automated enforcement in NYC has led to a 11-14% and even 40% in some places (Heaslip et al., 2019). San Francisco Municipal Transportation Agency (SFMTA) reported a 50% reduction in repeat bus lane violators (at least three citations) between 2009 and 2011 when they first started using video evidence to enforce parking violations (Heaslip et al., 2019).

In summary, bus lanes serve as a potential solution to LA’s bus service quality issues, which in turn can boost ridership. The tactical approach to building bus lanes allows agencies to use quick-build methods as data gathering and public input processes while also being low-cost. Enforcement of bus lanes is required for benefits to be realized, and cities are grappling with the use of patrolled versus automated enforcement. In the next section, I explore some of the different ways that bus lanes are applied to city streets to cover the full range of solutions available to advocates and planners.

On-Street Bus Lane Designs

The Transit Street Design Guide and Urban Street Design Guide produced by NACTO outline different forms of transit lanes that currently exist throughout the US (National Association of City Transportation Officials, 2016). NACTO provides guidelines for each design while also listing additional considerations for implementation. Below is an abbreviated account of the relevant on-street transit lanes to this study:

Figure 1: Dedicated Curbside Bus Lane

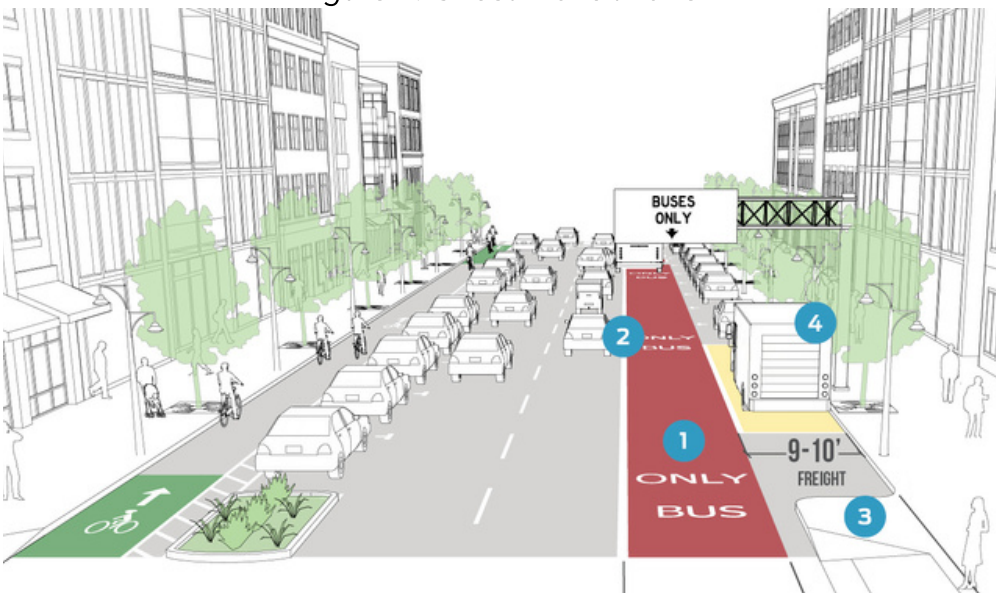


Source: NACTO Transit Street Design Guide

Dedicated curbside bus lane

- BUS ONLY pavement markings should be applied to emphasize the lane and to deter drivers from using it
- Subject to encroachment due to double-parking, deliveries, or taxicabs
- Strict enforcement is necessary to maintain their use and integrity
- Can serve as a travel lane for cyclists and emergency vehicles

Figure 2: Offset Transit Lane



Source: NACTO Transit Street Design Guide

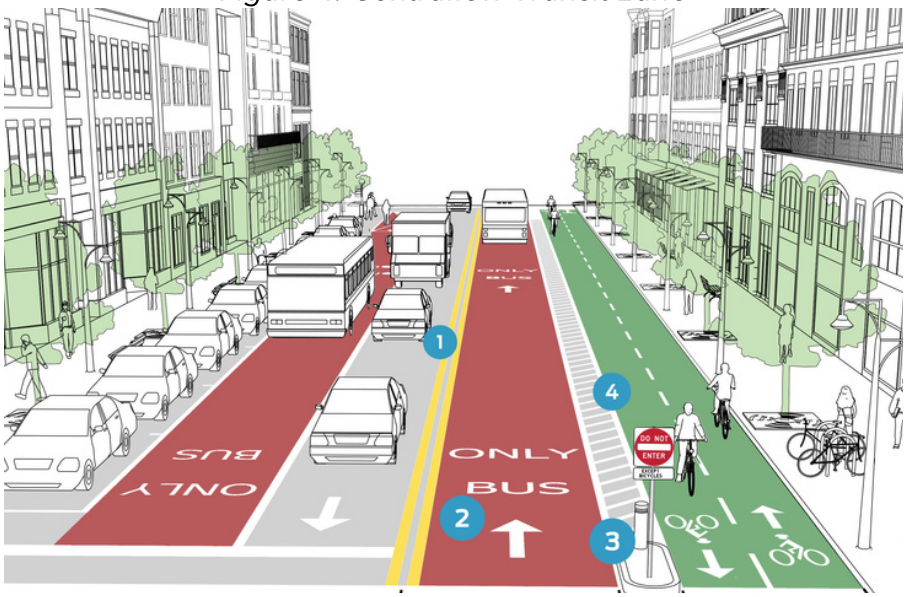
- Offset Transit Lane
  - Also known as “floating” or “parking-adjacent” lanes
  - For use on streets with in-lane stops in the form of bus bulbs, islands, and other significant stop amenities
  - Similar benefits to a curbside lane, but also maintains space for other curbside uses, such as parking, loading, bulb-outs, or parklets
  - Can accommodate high transit vehicle volumes and improve both reliability and travel times on streets operating near or beyond their motor vehicle traffic capacity

Figure 3: Center Transit Lane

Source: NACTO Transit Street Design Guide

- Center Transit Lane
  - Typically used on major routes with frequent headways, and where traffic congestion may significantly affect reliability
  - Center transit lanes eliminate conflicts with drop-offs, deliveries, or illegal parking along the roadway edge, as well as with bicyclists and some turning movements
  - Stops for center lanes may need more street space than curbside lanes, since boarding islands must be placed in the street
  - Boarding islands must be used for most transit vehicle types to create accessible boarding conditions
  - This design is most like Bus Rapid Transit in its right-of-way exclusivity, but municipalities and agencies can decide to open this lane to cyclists or other types of uses if necessary

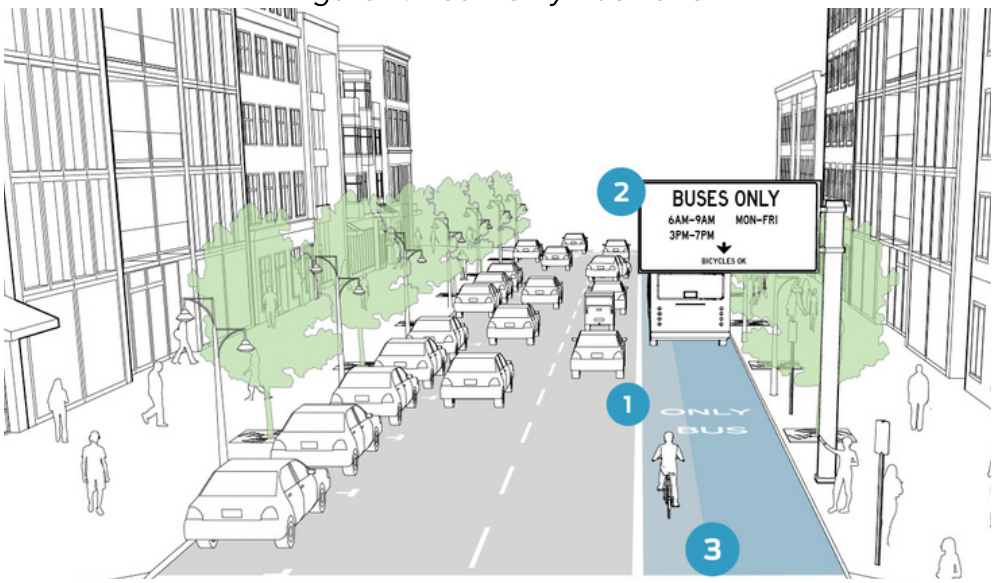
Figure 4: Contraflow Transit Lane



Source: NACTO Transit Street Design Guide

- Contraflow Transit Lane
  - The contraflow lane can be thought of as a conventional two-way street, but with non-transit vehicles prohibited in the contraflow direction.
  - Allows more efficient transit service where a one-way street network would otherwise involve route deviations or additional turns
  - Self-enforcing design discourages unpermitted users from parking or traveling in the lane
  - Application limited to existing one-way vehicle traffic streets or requires converting a two-way street into a one-way street

Figure 4: Peak-Only Bus Lane



Source: NACTO Transit Street Design Guide

- Peak-Only Bus Lane
  - Allows transit to take precedence over parking and curbside access at peak hours
  - Peak-only bus lanes allow stationary uses such as metered parking, freight loading, and street vending during non-peak periods
  - Peak-only lanes are not preferred on streets with narrow sidewalks, as the absence of parking may place pedestrians uncomfortably close to traffic
  - Curbside peak-only bus lanes involve a trade-off between faster peak travel times and slower off-peak bus travel times
  - Pavement markings must indicate that the lane is dedicated to transit, and signage must clearly indicate the lane restriction, as well as hours of enforcement and any turn allocations

Bus Lanes in Los Angeles

How do some of these bus lane benefits translate to the Los Angeles area? I highlight specific bus lane case studies in the Los Angeles Region. I start with the most recent example in the MOVE Culver City project, followed by the older examples in the Flower Street pilot and MyFigueroa projects in Downtown Los Angeles.

MOVE Culver City

MOVE Culver City started in 2020 as a project that "prioritizes safety through the design of the street" (MOVE Culver City, 2022). In November 2021, Culver City implemented 1.3 miles of mobility lanes through their Downtown corridor that included dedicated bus lanes, protected bike lanes, and pedestrian safety enhancements like painted curb extensions.

Figure 6: MOVE Culver City Aerial Image

Source: MOVE Culver City Mid-Pilot Report

A year after installation, Culver City produced a mid-pilot evaluation report to understand the effects on transit usage, transit travel time, bike and pedestrian activity, and vehicle traffic. They found that the mobility lanes were showing signs of positive impacts on bus efficiency with minimal effects on vehicle travel. Specifically, bus ridership grew by 52%, while vehicle

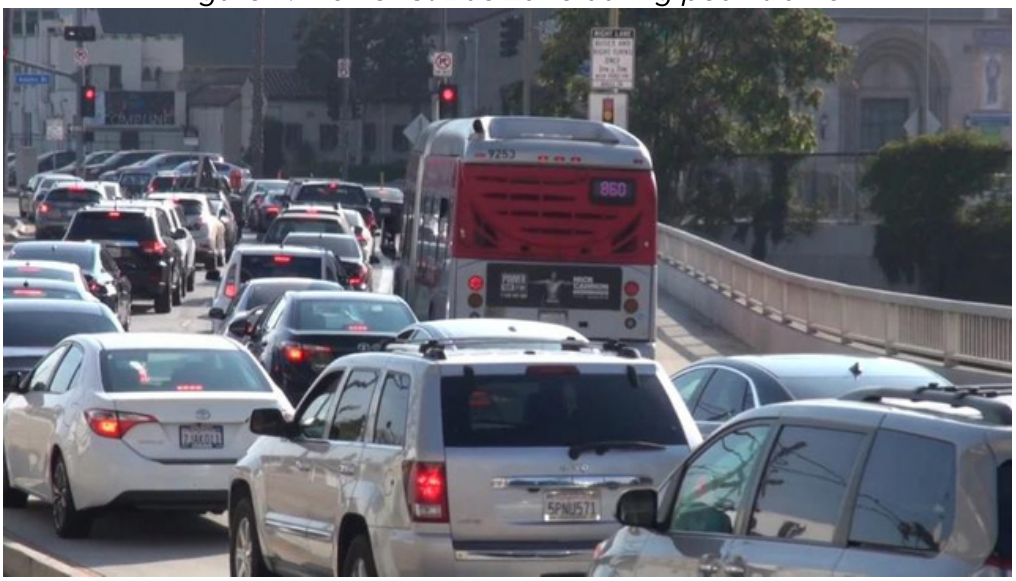
traffic saw negligible impacts (-1 min in AM peak and +2 min in PM peak). Bus lane violations, as collected by bus operators, reduced by 60% to an average of 3 daily violations compared to the beginning of the pilot. MOVE Culver City's data tracking highlights the strength of a tactical quick-build program: built in tracking and public engagement into the project itself.

MOVE Culver City has shown promising improvements to mobility, and the reception of the pilot program has been favorable among transit users, with 64% of respondents saying they're spending more time in Downtown Culver City since implementation (Linton et al, 2022). The pilot program provides a model to follow for a comprehensive yet tactical approach to mobility improvements in a bustling downtown core. However, political tides have turned since the implementation of the pilot. With program-supportive council members losing re-election, Culver City's city council voted 3-2 in favor of ending MOVE Culver City and combining previously separated bike and bus lane infrastructure to give a lane of travel back to vehicles. The mobility wins that MOVE Culver City recorded were not enough to insulate the project from political backlash. In the end, the end of MOVE Culver City shows that without political will and public support, promising data and results alone cannot implement a permanent bus lane.

Flower St Bus Lane

The Flower Street bus lane pilot project in Downtown Los Angeles was active from June through November 2019. A temporary shutdown to parallel rail service made a series of bus bridges necessary, creating an opening for the bus lane project. In an effort to match travel times on the replacement bus to typical rail service, LA Metro and LADOT installed a 1.8 mile peak hour bus lane. Due to the project's location along a major street in Downtown Los Angeles, other buses in addition to the replacement buses were able to take advantage of time savings and reliability improvements. The bus lane was a low-cost tactical lane, requiring only $75,000 in capital costs and less than a month of construction time. The project provided benefits without other typical bus improvements like signal priority or signal queue jumping, providing an optimal testing opportunity for the effects of a bus lane.

Figure 7: Flower St Bus Lane during peak traffic



Source: Flower Street Bus Lane Streetfilms video via Streetsblog LA

Top-line findings from the pilot program include (Huang et al., 2021):

- Increased person throughput by 37% compared to pre-pilot (but this is also because most people were taking the train)
- Over 80% of people moving through the corridor were in the bus lane
- General use lanes saw average speed reductions of two miles per hour, or 12%
- Increased reliability in bus commute times reflected in positive sentiments from riders and operators; two-thirds of bus customers and two-thirds of operators reported time savings

Interagency collaboration was crucial for project implementation, primarily between the LA Mayor's Office, LADOT & LA Metro. These parties were brought together in a series of working groups that led to the creation of the project.

The tactical nature of the bus lane is largely responsible for its positive reception as the "framing the project as temporary, and as a pop-up, influenced acceptance" (Huang et al., 2021). The community relations and public engagement teams attempted face-to-face outreach with every business and resident within the project area, further influencing public acceptance.

Enforcement of the bus lane was also noted as a positive takeaway. Law enforcement was tasked with improving bus flow through “proactive enforcement” rather than zero tolerance. This was a departure from existing processes where vehicles patrol bus lanes to ensure safety on the bus rather than to ensure flow. Utilizing actual police officers, as opposed to LADOT parking officers, was beneficial because they could issue both moving and parking citations. However, active enforcement was the largest pilot project cost, totaling $26,000 per day (Huang et al., 2021). Enforcing all shared use bus lanes in LA county this way would cost $36.5 million a year (Huang et al., 2021), indicating that constant enforcement would be very costly and potentially infeasible. Automated forms of enforcement via stationary cameras and cameras located at the front of buses were suggested as a more cost-effective approach (Huang et al., 2021).

MyFigueroa Complete Street Project

The MyFigueroa Project is a complete streets project that provided a bus lane, bike share, bike lanes, pedestrian improvements, and more. The downtown project cost more than $20 million and took approximately one decade to build (Fleischer, 2019). The first community meetings were held in 2010 with some strong opposition from the local business community and pushback from local cyclists (Linton, 2018). The Keep MyFig on Track Working Group was formed on Facebook for mostly cyclists and pedestrian advocates to collectively voice their concerns and record issues that would come up with the project. Their complaints include the usage of beg buttons to prioritize drivers, a bus boarding island being located too close to a driveway, and both the bike and bus lanes being blocked by cars.

Complaints came from mostly cyclists, but also bus riders and pedestrians too. Bike community members complained that bike lanes were being cut off by drivers, and bike signal timing was causing delays:

“With regressive signal timing and pedestrian beg-buttons, the MyFigueroa project seems to be sending Angelenos the message that, even in downtown L.A., even on a multi-million-dollar multi-modal makeover, cars remain the city’s only priority.” (Linton, 2018).

In an attempt to adjust to mounting discontent, LADOT eliminated the beg buttons and re-timed the signals (Newton et al, 2018). However, many of the issues with MyFigueroa were

not fixable by simply appeasing the public. The project ended abruptly at Wilshire Boulevard, interrupting what could have been interconnected bike and bus lane networks through downtown LA. The right turn from Figueroa Street to 7th Street was not allowed, but drivers either ignored or were ignorant to it, clogging bus traffic with right turns. In response, MyFig bus lanes got the red paint treatment in 2020 (Linton, 2020), which has proven effective in cities like DC (Schmitt, 2019).

Figure 8: Red paint fill along the Figueroa St Bus Lane

Source: Joe Linton Streetsblog LA

Overall, the MyFig project has been largely seen as an example of how not to handle a bus lane project in Los Angeles. The backlash from both the business community and users of the project's infrastructure showed that the project needed to be reworked. MyFig's challenges are particularly stark when considered in juxtaposition to the perceived success of the Flower St project. Unlike the Flower St project, MyFig required millions of dollars and would be more difficult to adapt to community needs.

Bus lanes provide a promising solution to slow and unreliable buses. They come in a variety of forms and designs, each with their own strengths and weaknesses. ACT-LA's Better Bus campaign is interested in improving bus service in Los Angeles, and the LA examples so far have shown some promise. In order to explore the ways in which LA can have more successes with bus lanes, I answer my research question below through in-depth case studies into American and global cities with successful bus lane implementations.

Methods

Through the review of relevant literature, namely *Better Buses, Better Cities*, the UCLA Institute of Transportation Studies report titled “Best Practices in Implementing Tactical Transit Lanes”, and Agrawal et al’s study titled “Shared-use bus priority lanes on city streets: Approaches to access and Enforcement”, I selected Boston, Chicago, Seattle, and Sydney for further case study. These cities were selected because of particular characteristics of their bus lane programs, and also approximate similarities to LA in transit ridership characteristics. I considered studying other global cities with high bus lane mileage, such as London, Bogotá, New York City, Seoul, and more; but many of these cities achieve their high bus lane mileage through bus rapid transit or highway bus lanes. Additionally, many of these cities have transit mode shares or land use densities that make comparisons to Los Angeles difficult.

Table 1 shows a comparison of case study cities with the local context, Los Angeles. This comparison was done to better understand the similarities and differences between case study cities and Los Angeles.

Table 1: Case Study Cities and Local Context (Los Angeles)

	Boston	**Seattle**	**Chicago**	**Sydney**	**Los Angeles**
Greater Metro area (MSA) Population (2021)	4,899,932	4,011,553	9,509,934	5,231,147	9,811,842
Public Transit Mode Share	13.3%(2019)	10.7%(2019)	12.4% (2019)	22.8%(2016)	5.7%(2019)
Weekday Avg Bus Ridership (Oct 2019)	409,728 Weekday Trips	423,874 Weekday Boardings	801,026 Weekday Boardings	828,600 Daily Ridership	952,506 Weekday Ridership
On-Street Bus Lane Mileage	10	40	11	17	27

Sources: United States Census Bureau, 2021 (Tables B01003, B08141); Australian Bureau of Statistics, 2021; Massachusetts Bay Transportation Authority, 2019; King County Metro, 2019; Chicago Transit Authority, 2019; Transport for New South Wales, 2019; LA Metro, 2019

Los Angeles County was used in place of the LA's MSA because it includes counties that are outside of LA Metro's service area. LA County had the lowest public transit mode share yet the highest average weekday bus ridership; the Chicago MSA is similar in population to LA County, has a transit mode share twice as large as LA, yet still has less bus ridership than LA. This comparison further demonstrates the importance of the bus in LA.

For each case study, I reviewed academic journal articles, traditional print media, informal media (e.g. blog posts, online only publications), and organization or agency website materials and interviews. I reviewed these documents to obtain information on each city's bus lane program to understand their strengths and weaknesses, as well as their origins and effectiveness. I relied on authors cited in the literature review and my personal network to help connect to interviewees in each case study city. Once the pool of interviewees was established, starting in January 2023, I reached out to sixteen agency and advocacy organization staff within the 3-month data collection period. Interviewees were not compensated for their time and were representing their respective organizations and agencies in an official capacity. As a result, the case study cities are treated as the subjects of study, not the interviewees.

Interviewees were separated into two groups: city transit agency staff and transit advocates. Each group received a different set of interview questions aimed at obtaining insights to verify and supplement data gathered in the case studies (See Appendix A for interview instrument). Questions were crafted after review of relevant literature, including Susan Berkowitz's "User-Friendly Handbook for Mixed Method Evaluations". The interviews were conducted over Zoom and recorded for later transcription. Interviews lasted between forty five minutes to one hour. The following transit agency staff, advocates, and scholars were interviewed:

- Mathew Hounsell - University of Technology Sydney
- Glen Hunter - Hunter Consulting (Sydney)
- Chris Saleeba -Seattle Department of Transportation
- Christine Alar - Seattle Department of Transportation
- Ben Smith - Seattle Department of Transportation
- Stacy Thompson - Livable Streets Alliance (Boston)
- Lisa Jacobson - Barr Foundation (Boston)

Findings

As a result of conducting case studies, I present findings along the following themes:

Planning and Strategy
Once corridors in need of bus lanes are identified by the city or by advocates, implementation relies on a carefully planned strategy in order to implement a bus lane effectively. This section explores how the case study cities planned and strategized around bus lane implementation in these ways.

Governance and Political Considerations
A successful bus lane implementation often requires favorable governance structures and political will. This section explores how the case study cities navigate their own governance challenges and drum up political will.

Tailoring the Bus Lane to the Corridor
Bus lane implementers have to consider what category of bus lane to install, which involves considerations of design, right-of-way exclusivity, capital costs, and more. This section explores the case study cities' considerations of all of these factors.

Enforcement
Bus lane benefits are only realized when the lane is unobstructed for buses. As a result, cities have to enforce the usage exclusivity of bus lanes. This section explores how the case study cities decided to enforce their bus lanes.

As previously mentioned, bus lanes come in varying degrees of right-of-way exclusion (buses having their own exclusive usage versus sharing usage). Table 2 shows a comparison of dedicated, peak hour, and tactical bus lanes comparing right-of-way exclusivity, costs, and benefits. Bus Rapid Transit (BRT) lanes are included here as well to show the aforementioned higher capital costs and ROW exclusivity.

Table 2: Case Study Cities and Local Context (Los Angeles)

Bus Lane Type	ROW Exclusivity	Usage Exclusivity	Infrastructure	Cost Per Mile	Project Benefits
Bus Rapid Transit (BRT)	Exclusive ROW	Bus only 24/7	Physical barriers (metal fences, cement walls), line specific stations, park-and-ride lots, signal timing	$1M+	• Full priority for buses • Supports transit oriented development • Does not require active enforcement
Dedicated 24/7	Shared ROW	Bus only with exceptions often for cyclists, delivery vehicles, right turning vehicles, etc.	Physical barriers (bollards, cement bumpers), road striping & shading, bus boarding islands (for offset or center lanes)	$500k	• Full priority for buses but allows for bikes and emergency vehicles • Lower cost than BRT • Reduces bus bunching • Increases speeds and reliability
Intermittent (Peak Hour, Queue Jumping)	Shared ROW	Same as dedicated during peak hours, converts back to parking/all travel lane during off-peak	Signage, striping & shading	$200k	• Similar benefits to dedicated, but targets pinch points along corridors and only temporarily • Lower cost than dedicated • Allows parking and vehicle travel when not in use
Tactical	Shared ROW	Can be either dedicated or intermittent	Temporary quick-build materials, striping & shading, cones, variable message signage	$100k	• Better for congested areas • Quick buildable • Allows for data and public input gathering during pilot

Sources: Matute & Gahbauer, 2019; Boston Region Metropolitan Planning Organization, 2019

Planning and Strategy

Identifying the need for a bus lane is where all projects start. Some cities identify needs based on system wide metrics and longer-term planning processes. Others moved faster by building tactical bus lanes, providing opportunities for immediate low cost intervention, while also serving as public input forums for riders and motorists. Tactical bus lanes are quick build, and can be implemented as permanent, pilot, or quick pilot (Matute et al., 2019), with many pilot lanes eventually becoming permanent. Among the case study cities, Boston and Chicago in particular used tactical bus lanes as proof of concept, opportunities for public engagement, and even political strategy.

Figure 9: Arlington, MA pilot Bus Lane

Credit: Ann Ringwood, Wicked Local

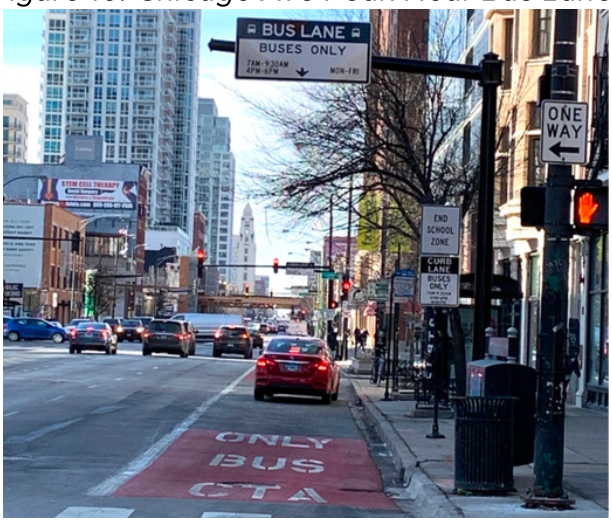
In their report “Get it Rolling: A brief guide to mobilize bus improvements in Greater Boston”, the Metropolitan Area Planning Council (MAPC) details six tactical bus lane projects in Boston and its surrounding cities. From 2016 to 2019, these six bus lane projects were implemented in the cities of Boston, Arlington, Everett, Cambridge, Watertown, and Somerville. Every pilot tactical lane is now permanent as they resulted in notable time savings for commuters, with Everett and Boston showing peak travel time reductions of 20-28%, and Arlington showing reductions in travel time variability of 2-3 minutes (Matute et al., 2019).

Additionally, nearby Roslindale’s pilot was a huge success, yielding support from bus riders and transit agency officials, while notably garnering few, if any, complaints from drivers (S. Thompson, personal communication, February 22, 2023). The average rider along Washington Street in Roslindale saved an hour in travel time over the course of a week (City of Boston Transportation Department, 2018). The business community even stepped up in some of these projects, as advocates had leaned on prominent business leaders in the community to generate support for bus lanes (L. Jacobson, personal communication, March 23, 2023).

The benefits of the tactical bus lane strategy approach are realized in these greater Boston area projects in that both public support and favorable data were garnered in the pilot periods, providing justification for implementers to make these pilots permanent. Chicago saw similar results with their tactical bus lanes as well.

Chicago Transit Authority (CTA) aims to alleviate bus congestion through their Bus Priority Zone Program (BPZ), which is both a framework/toolkit for improving bus service and a list of corridors for project implementation. Bus lanes are one of the tools identified in the BPZ toolkit, which also includes elements like queue jumping and pedestrian improvements. Chicago leveraged political will for planning innovation during the height of the COVID-19 pandemic to pilot bus lanes. One of these pop-up bus lanes was along a 3.5 mile stretch of Chicago Ave, which was identified by the CTA as a congestion bottleneck for the No. 66 bus. Pre-pandemic, the No. 66 bus was the second highest ridership route in the system, but was dealing with increased travel times as a result of drivers blocking the curb lane (Spielman, 2018). In 2022, the Chicago Ave pop-up bus lane was officially made permanent, and has other accompanying pedestrian safety improvements slated for the coming years.

Figure 10: Chicago Ave Peak Hour Bus Lane



Source: Streetsblog Chicago

In addition to utilizing tactical projects, Seattle implements bus lanes through the traditional planning process, leveraging agency goals for better access to light rail as a means for more bus stops and bus lanes.The Seattle Department of Transportation (SDOT) approaches bus

lane implementation by using pilot programs alongside a more traditional planning process.

Seattle has implemented their bus lanes in partnership with Sound Transit and King County Metro to increase access to their newest stations along the Link, their light rail line (Wakayama, 2022). Sound Transit is a regional transit agency that handles rail and express buses in and out of Seattle (Sound Transit, 2023). King County Metro is the greater Seattle area's largest transit agency and provides bus service as well as operating Sound Transit's Link system (King County Metro, 2023). One staff member at the Seattle DOT's role is explicitly to coordinate with King County Metro and Sound Transit and this position is one of the strengths in coordinating the bus lane effort. As a part of this partnership, SDOT is already planning opportunities to link up bus networks to Sound Transit projects that are slated for 2032.

Accompanying these longer-term projects, SDOT implements bus lanes as spot treatments for particularly slow sections of a bus route. Last year. SDOT was "using [Seattle Transit Fund] money and going rogue and installing [bus lanes] that way" (C. Alar, personal communication, February 14, 2023). But "rogue" did not mean without reason, as SDOT installed transit lanes on three of the highest ridership bus routes during the pandemic. In this instance, Seattle utilized tactical projects to fulfill larger planning objectives, like serving low-income communities of color, through tactical bus lane projects.

Figure 11: Seattle Rainier Ave Dedicated Bus Lane

Source: Seattle DOT

Governance & Political Considerations

Bus lane implementation can often be a political battle that hinges on the support and actions of key political players. The Chicago-based transportation advocacy organization, Active Transportation Alliance, found political champions to turn a pop-up lane into a permanent lane. Advocates in Boston pressured Massachusetts Bay Transportation Authority (MBTA) by intentionally targeting surrounding suburban neighborhoods for tactical lane implementation. Using these smaller cities' pilots as proof of concept, Boston advocates were able to point to data and public input to convince MBTA and Boston Department of Transportation to implement tactical transit lanes. Sydney's boom in bus lane implementation was in no small part due to Transport NSW prioritizing buses by measuring traffic efficiency in person throughput instead of vehicle throughput. Measuring vehicle throughput biases planning improvement evaluation towards low occupancy personal vehicles, making car improvements seem more attractive.

Boston's first bus lane, the Silver Line, was implemented in 2002 with funding from the US Department of Transportation (USDOT). To continue on the success of the Silver Line, Massachusetts Department of Transportation (MDOT) later received more funding from USDOT during the Obama administration in 2009. For example, the 28x project was "an ambitious bus priority project with BRT features, but it never moved forward" (Holland, 2021). But concerns over increased traffic and reduced parking killed projects like the 28x bus lane, which would have served many low income riders of color.

In 2013, the Barr Foundation convened a working group of transportation advocates aimed at engaging municipalities and transit agencies in funding bus priority projects, which eventually led to Everett's 2016 dedicated bus lane pilot. As a part of the strategy to build support for bus only lanes in Boston, the working group intentionally targeted projects in cities surrounding Boston:

"We didn't support pilots in Boston very intentionally. It was a little bit of a shaming strategy. It got them to move, and they're like, well if Everett and Arlington and Cambridge and Watertown are doing it, and Somerville getting ready to do one, [Boston] can't be left behind. So they stepped up and started doing some, too"
(L. Jacobson, personal communication, March 23, 2023).

The Barr Foundation's working group kicked off a chain reaction of smaller cities implementing bus lanes. Using the lowest cost method, Everett put out cones to block off their tactical bus lane. While low cost, this pilot garnered "positive attention on Everett's elected officials, as well as the project, [emboldening] local decision-makers to rethink their own processes for implementing new bus projects" (Holland, 2021). The project was eventually made into a permanent bus lane in 2017 with paint and pavement markings.

Everett's success set off a chain reaction in the Boston area. Later in 2017, the City of Boston tasked its Department of Transportation with piloting their own lane in the neighborhood of Roslindale. Then Arlington, Cambridge, and Watertown followed suit, with Boston also making some of their temporary lanes permanent along the way. Boston and its surrounding cities were engaged in policy diffusion; as surrounding cities implement policy, Boston decides that they want to implement that policy too (Gilardi et al., 2020).

Figure 12: Everett, MA Pilot Bus Lane

Source: The Boston Globe

Advocates in Chicago tapped into relationships with political players. In a panel hosted by TransitCenter titled "Bus Lanes are Essential: Speeding Transit During COVID", Mayor Lori Lightfoot's transportation policy advisor Maulik Vaishnav detailed how Chicago ended up with more bus lane miles as a result of the pandemic. Vaishnav shared that Active Transportation Alliance, partnered with Mayor Lightfoot's office to engage community members, aldermen and bus drivers about bus lanes. Utilizing an outside advocacy strategy, Active Transportation Alliance worked directly with Mayor Lightfoot's office on pushing their

discourse on bus lanes. Advocates were invited into conversations with the Mayor's office, but seemingly were not financially compensated by the Mayor (Whitehead, 2019). This partnership resulted in a rollout of "pop-up" bus lanes that used quick build tactics as a low-cost intervention. Active Transit Alliance also advocated for additional interventions to bus service that can accompany bus lane benefits to enhance service overall. They recommended giving buses priority as they approach traffic signals, as well as allowing boarding from all doors on the bus (Active Transportation Alliance, 2018).

In Sydney, planning priorities have been shifting at Transport for New South Wales (Transport NSW), the regional transit agency in Sydney, to prioritize the travel times of those in cars over travel times of bus riders:

"The previous minister was very much committed to moving people, whereas the transport engineers, their [key performance indicators] are vehicle based. So what we tend to find is that it requires a lot of push from on high to get bus priority. But it can happen, it just requires the departmental secretary to keep on the matter... The guidelines for economic evaluation are fundamental to everything that happens in Sydney. So that means that the value for travel time of persons within a bus is about 60% of the value of travel times for persons in the car" (M. Hounsell, personal communication, February 15, 2023).

The way that Transport NSW prioritizes efficiency and performance measurements drastically affects how Sydney ends up valuing bus riders. If the travel time of bus riders is worth 60% of the travel time for drivers, then bus lane projects are inherently worth less than projects improving car congestion. Transport NSW's priorities are dependent on those in power and what kind of goals the administration has for Sydney's streets.

Figure 13: Sydney Bus Priority Lane in Paramatta

Source: Transport for New South Wales

Tailoring the Bus Lane to the Corridor

Each type of bus lane has its tradeoffs. Peak hour curbside bus lanes are best suited to travel corridors with ample street parking, while contraflow bus lanes reduce the need for enforcement but reduce car traffic to a one-way. Each case study city has certain criteria they considered in tailoring a bus lane project to the corridor, including the geometric design, pavement markings, hours of operation, and allowable vehicles.

Boston implemented New England's first center lane bus lane along Columbus Ave, saving peak-hour riders 4-8 minutes per trip (Massachusetts Bay Transportation Authority, 2023). This project required the installation of boarding platforms and relocation of bus stops to these platforms. While costly at $10 million (Mass Transit, 2020), the Columbus Ave lane offers opportunities for implementing additional pedestrian safety improvements such as mid-block crosswalks and safety barriers to separate riders from traffic.

Chicago's pop-up curbside lane along Chicago Ave was made permanent and enhanced with red paint, which filled in the existing white pavement markings delineating the lane and the "BUS ONLY LANE" lettering. This red paint fill was done in an attempt to alert drivers of the travel restrictions in the bus lane (Chicago Transportation Authority, 2022), but it remains to be seen how the lane will fare in terms of enforcement.

Seattle was able to expand the hours of its Interbay peak hour lanes after surveying riders on their needs which included bus travel outside of typical peak hours (Bancroft, 2022). After assessing the needs of riders and the constraints of the corridor, SDOT chose to go with the peak hour lane given the amount of street parking and loading zones available for conversion (Bancroft, 2022).

In Sydney's neighborhood of Parramatta, Transport NSW decided to utilize dedicated bus lanes where they could, but due to road width constraints, opted for bus and carpool lanes called T3 lanes instead (O'Sullivan, 2023). T3 lanes are transit lanes, which can all be used by buses, taxis, motorcycles, bicycles, emergency and essential service vehicles as well as personal vehicles with three or more passengers (Brisbane City Council, 2023). Sydney has struggled with enforcing these types of transit lanes, as the lines between bus and car are increasingly blurred.

Enforcement

Bus lane benefits are dependent on unobstructed bus usage in those lanes. As a result, bus lanes require some type of enforcement mechanism to deter unpermitted users from parking or traveling in bus lanes. But traditional patrolled enforcement is expensive and increases interactions with police. Black and brown drivers are 20% more likely to be stopped than white drivers, highlighting an explicit racial disparity in patrolled enforcement (The Stanford Open Policing Project, 2020). However, enforcement has proven necessary to realize bus lane benefits across all of the case study cities.

In Chicago, the No. 66 route suffered from the longest delays in travel time in the system due to blocking of the curb lane by ride-hail and delivery vehicles (Whitehead, 2019). Even with the now permanent bus lane along Chicago Ave, paint on the street only goes so far. Interestingly, when red paint and pavement markings are used, vehicles are “up to 50 percent less likely to block the lane” (Higashide, 2019). However, the rest of the time that lane will require some sort of enforcement to keep it clear from moving and parked cars.

Boston’s Chief of Streets Jascha Franklin-Hodge stated that when bus lanes are being blocked “the speed of buses is dependent on the speed of traffic because the lanes are not enforced” (Vargas, 2022). Franklin-Hodge also commented that active enforcement by police patrol was unreliable, urging the state legislature to approve the roll out of automated bus lane enforcement.

Automated bus lane enforcement is lower cost and avoids interactions between police and people, while self-enforcing bus lane designs allow cities and transit agencies to avoid the costs associated with active enforcement. Self-enforcing bus lane designs deter and prevent unpermitted uses through their physical elements. For example, a bus lane protected with bollards and red paint sends a clear message to drivers that they are not supposed to drive or park in the lane while also making those behaviors inconvenient. Sydney has utilized “fully-automated” enforcement for almost a decade, which relies on photo enforcement and automatic computer algorithm-based violation issuance (Agrawal et al., 2013). Sydney’s early days of bus lanes in 2002 were transit lanes meant for carpoolers and buses. Sydney’s transit lanes were often even slower than normal traffic lanes, as certain lanes were seeing travel times of up to two minutes longer than normal lanes (Sydney Morning Herald, 2002). In 2005, the transit lanes were so difficult to enforce that highway patrol officers were calling for

the end of transit lanes and a move to dedicated bus lanes (Pedestrian Council of Australia, 2005). However there is a gap in available sources on how effective Sydney's automated enforcement has been. When asked about enforcement, my interviewees offered that Australians are generally pretty compliant when it comes to bus lanes (G. Hunter, personal communication, March, 9, 2023).

Figure 14: Sydney Bus Lane Camera Sign

Source: Stop the Sydney Metram

Case study cities are grappling with patrolled and automated enforcement, while also incorporating passive "self-enforcing" strategies such as bus lanes that are offset from the curb to provide space for temporary vehicle parking (M. Hounsell, personal communication, February 15, 2023). While this type of bus lane design does not prevent moving vehicles from using the lane, ultimately the biggest hurdle for bus lanes are impediments along the lane that stop flow (Higashide, 2019). Center bus lanes and the contraflow lanes are self-enforcing designs that manage unpermitted uses better, but are most costly to install. Automated enforcement can supplement self-enforcing design, theoretically deterring unpermitted uses.

Seattle has struggled with enforcement, as evidenced by its own bus riders going out to act as vigilante bus lane enforcers (Groover, 2019). Seattle responded with automated enforcement that has resulted in over 110,000 recorded violations (Santos, 2023). Data regarding the effectiveness of automated enforcement as a deterrent should be published by 2025. According to SDOT, the cameras will only photograph license plates and not drivers (Bancroft, 2022), but privacy concerns still persist. There are many concerns over automated enforcement in the United States, as some scholars are concerned about the automated enforcement impacts on communities that are disproportionately burdened with travel corridors; if more bus lanes are implemented in low-income communities of color, then they are more likely to be targets of automated enforcement (Fegan, 2021). The discourse on automated enforcement will be one to watch in the coming years as automated enforcement evaluation needs to be researched further.

Discussion

The way that Boston and Chicago used pilot projects to build support for future permanent bus lanes shows that tactical projects can move government agencies and political players towards supporting and adopting bus lanes. In parallel, Sydney's re-prioritizing of performance evaluation metrics shows that when governments prioritize cars over bus riders, bus lane implementation becomes difficult to justify. When advocates made recommendations to municipalities and transit agencies based on data and public input, they obtained wins in the form of bus lanes. In the case study cities, public support and travel time data were compelling enough to get municipalities to move on bus lanes projects. Input from tactical pilots give advocates and municipalities a chance to test out things like designs and usage exclusivity while also gathering data about their effectiveness. Support from bus riders and business community leaders all helped get these projects across the line, convincing decision makers to implement bus lanes permanently.

The considerations discussed above are also important in deciding on which type of bus lane to implement. The case study cities show that the design and usage exclusivity need to consider the physical and political contexts of the corridor. Decisions about typology have to consider cost, enforcement, and usage exclusivity, as well as juggle finite capital, political will, and public support. In particular, enforcement considerations need to be taken into account when deciding on which type of bus lane to implement. While results on effectiveness are mixed, Seattle and Sydney are using automated enforcement to ensure bus lanes are unblocked for buses.

When it comes to enforcement, the case study cities used one of three options: active enforcement (police patrol), automated enforcement (on-bus cameras, stationary cameras), and self-enforcing design. Active enforcement is most pervasively used, but with the high costs of policing and growing awareness around police violence in America, automated enforcement seems to be gaining traction. Additional surveillance on city streets can be concerning, and aforementioned inequities around both automated or patrolled enforcement, make bus lane enforcement a hairy but necessary issue to resolve. Ideally bus lanes are designed to be self-enforcing, but not every corridor or project budget can accommodate a self-enforcing design, and some designs will still require some form of enforcement. With limited data on the effectiveness on automated enforcement, more research is needed to develop a safe and effective automated enforcement strategy. Data coming soon out of Seattle could be useful, as well cities not studied here such as New York, San Francisco, and Washington D.C.

Recommendations

Based on the above findings and discussion, I suggest that advocates and transit agency staff consider the following recommendations when implementing a bus lane in Los Angeles:

Planning and Strategy

The low cost and public-input-centered methodology of tactical bus lanes can yield permanent bus lanes when planned and strategized properly. Tactical campaigns in LA should incorporate longer term strategies to turn pilot projects into permanent lanes through advocacy and political pressure. Implementers should consider accompanying interventions in service such as signal priority and all-door boarding, but also higher level interventions such as shifting performance evaluation metrics. Specifically, agencies should be prioritizing person throughput over vehicle throughput in order to make bus improvements more attractive.

Governance & Political Considerations

Political factors can block projects, so understanding transit agency goals and political landscapes can lead to more effective strategy. Advocates should thoroughly understand the policy goals of their local transit agency and find where interests converge. Advocates should also understand what moves their local agencies to act. Tactical projects move quickly in getting cones or paint on pavement which can cut down on the red tape associated with a more traditionally designed and planned bus lane. Piloting a bus lane and implementing improvements along the way can demonstrate proof of concept, in turn convincing transit agencies to adopt more bus lane projects.

Tailoring the Bus Lane to the Corridor

When chosen properly, the type of bus lane used should respond to the existing problems along the given corridor. Some corridors require spot treatments to reduce bus bunching, and others could benefit more from a dedicated bus lane. Cost, enforceability, and public support should all be considered when selecting bus lane typology as well. There is no one size fits all solution, and the selected solution has to fit the corridor's physical and political contexts.

Enforcement

Bus lane benefits cannot be realized without enforcement. Red paint fill and pavement markings can limit improper usage of the bus lane, but without enforcement bus lanes are susceptible to being commandeered by normal vehicle traffic. Automated enforcement saves money and reduces police-public interactions, but racial disparities as a result of automated enforcement presents problems for advocates. Aside from patrolled or automated enforcement, self-enforcing designs like center running and offset curb lanes can also deter bus lane violations. More data about bus lane enforcement is needed, as some US cities are just now starting to try automated enforcement.

Limitations & Conclusions

Bus riders are the backbone of transit ridership in Los Angeles. To ensure they can reliably access opportunities, bus riders deserve better service. Bus lanes offer a tangible way to improve service quality amidst an operator shortage and increasing car ownership trends. Bus lanes require enforcement though, and this study was not able to establish a firm recommendation on choosing between patrolled or automated enforcement. More research needs to be conducted on the effectiveness of automated enforcement, particularly in racially diverse American cities that are interested in reducing confrontations with police. Seattle, New York, and San Francisco are cities to watch as they continue to utilize automated enforcement for bus lanes.

LA outpaced all of the case study cities in bus ridership, yet LA's bus service hours and quality have been in steady decline. Bus riders deserve more for staying resilient through a financial crisis and a global pandemic. As LA navigates its transit future, bus riders should be rewarded for their resiliency with fast, frequent, and reliable service. Bus lanes might not win over choice riders from driving their cars, but they do prioritize bus riders, which can boost loyalty and retain ridership. The working class, immigrant, and BIPOC bus riders of LA should be prioritized in transit projects as they are the lifeblood of the system.

Image: Kevin Liu | Investing in Place

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Appendix A - Interview Guide

Transit Agency Staff

1. What is your role at your agency? I'm particularly interested in knowing about how your role interacts with bus operations and planning
2. Starting with the big picture of bus operations, how would you describe the strengths and shortcomings of your city's bus service and how this has changed over recent history?
3. I'm particularly interested in your agency's involvement with bus lanes of any type. Can you share about your agency's bus lane experience? Have you been involved or who is at your agency or partner agencies?
4. What kind of problem were bus lanes trying to solve and how has the bus lane experience gone overall? Are there future plans for more or different types?
5. If I were to look for data about bus lanes, or buses in general, in your city, where should I look?
6. Is there anything else that I should know about your city's bus lanes? Anything I may have missed? Is there anyone who you think it'd be good for me to interview/connect with on this?

Transit Advocacy Organization Staff

1. What is your role at your org? I'm particularly interested in knowing about how your role interacts with bus operations and planning How does that role interact with buses?
2. From you or your organization's perspective, what are the strengths and shortcomings of your city's bus service and how have these changed over recent history?
3. I'm particularly interested in your organization's involvement with bus lanes advocacy or organizing. Can you share about your organization's bus lane experience? Is this something you are personally involved with or who at your organization is involved?
4. Who are other partners that you have been working with on bus lane or other transit service improvements?
5. What are the reasons why your organization or others chose to get involved with bus lane advocacy? What kinds of problems were you trying to solve?
6. How has your organization measured the success of bus lanes or transit improvements? Is this work ongoing or what is the future of transit advocacy for your organization?
7. Is there anything else that I should know about your city's bus lanes? Anything I may have missed or other key people you think I should connect with?