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OUT OF YOUR CAR AND ONTO THE METRO

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OUT OF YOUR CAR AND ONTO METRO – CAN FIRST/LAST MILE HELP?

This investigative report supports the County of Los Angeles Board of Supervisors Strategic Plan: Make Environmental Sustainability Our Daily Reality: and Metro Mission: "Metro is responsible for the continuous improvement of an efficient and effective transportation system for Los Angeles County."

I SUMMARY

The primary objective of Los Angeles County Metropolitan Transit Authority (Metro) is the reduction of citizens' time spent in transit due to excessive automobile traffic congestion. A second objective is to reduce transit's impact on the environment. In pursuit of these, Metro is in a long-term expansion process to provide a dense, efficient, sustainable, affordable, and attractive public transit option for county residents. Metro has realized that success will depend not only on the actual transit systems but the supporting infrastructure necessary to encourage ridership. A significant part of the infrastructure is called "First/Last Mile," which represents the initial and final legs of any trip taken via the Metro system. This investigation examines the current state of First/Last Mile implementations in light of the current Metro's Strategic Plans, as well as practical considerations from a user's-experience viewpoint. We found both outstanding examples as well as cases that need improvement.

Metro has recently accepted more responsibility for First/Last Mile implementations as well as acquiring a stable revenue stream (Measure M). However, it has generally allocated a lower percentage of funds to First/Last Mile than other metropolitan transit systems. More inclusion of safety features is needed to guide First/Last Mile design and construction, including retrofits of existing implementations. A fundamental issue is whether Southern Californians can be lured out of their cars and off the freeways and surface streets to realize the benefits from the Metro expansion.

II BACKGROUND

Defining First/Last Mile

As a user of the Metro system you have a First/Last mile experience every time you take a Metro trip. This will consist of your personal active movement from your point of origin to the local transit terminal at the beginning of the trip and from the closest transit terminal to your final destination at the end of a trip. There may also be intermediate steps between Metro parts of the journey. Your personal active movement may consist of walking, bicycling, or personal support devices (e.g. skateboards, scooters, or wheelchairs).

Within the dense public transit system that Metro aspires to become, there will always be parts of every journey that depend on active personal movement that are not provided by the transit system itself. The totality of personal active movement for a trip is called the First/Last Mile.[1] Personal active movement has substantial public health benefits. Increasing net personal active

[1]Metro 2014 Strategic Plan for First/Last Mile

movement is a strategic objective for the County of Los Angeles. Metro has recognized that the designs of Metro terminals and their surroundings can enhance the personal active movement experience, increasing ridership. The characteristics of a good terminal design are defined by Metro's First/Last Mile Strategic Plan.

Historical Background

Modern Metro train-based transit, which began in Los Angeles with the opening of the Blue Line light rail in 1990, created the need to concentrate passenger boarding and exiting at various stops – the terminals.[2] In order to fully benefit from the investment in new rail, passenger flow into and out of terminals needed to be higher than was common at bus stops. The Los Angeles solutions were initially "Park and Ride" facilities, with passengers driving their cars a short distance to a large parking lot before boarding the train.[3] However, the highest priority areas to serve with light rail and subways are those with high population density. These urban areas are not conducive to large "Park and Ride" facilities because of land costs.[4] Therefore, personal active movement is essential to make best use of the train transit system. Terminal design, placement, and the surrounding features could encourage, or conversely, discourage, personal active movement.[5]

This fact was made explicit in Metro's planning in 2014 with the publication of their First/Last Mile Strategic Plan.[6] This plan prescribes a consistent good approach to designing a terminal and its surroundings to support personal active movement. However, the plan was too late to affect Metro Rail developments before the Gold Line and Expo Line extensions of 2016. Also, realizations of the plan depended on the collaboration and funding of local governments for implementing features beyond the rail right-of-way; Metro had neither authority nor allocated funds to control these critical developments.[7]

In 2016, Metro's Board of Directors expanded Metro's First/Last Mile responsibilities for new projects and agreed to refurbishing existing terminals on a prioritized basis.[8] An expanded outreach program to local governments included the offer of interactive training for First/Last Mile design and aid in procuring funding grants for local projects.[9] The passage of Measure M in November 2016 assured a continuous funding source for future Metro expansion including First/Last Mile.[10] (Measure M adds $0.005 sales tax to finance Metro expansion with no end date.)

A Promising and Difficult Situation

This is the best of times and the worst of times for Metro!

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[2] https://en.wikipedia.org/wiki/Los_Angeles_Metro_Rail
[3] http://www.latimes.com/local/california/la-me-california-commute-20141021-story.html
[4] Ibid
[5] https://www.metro.net/projects/active-transportation/
[6] http://media.metro.net/docs/sustainability_path_design_guidelines.pdf
[7] Interview with representatives of Metro Sustainability Office.
[8] Interview with representative from Metro Sustainability Office
[9] Ibid
[10] Ibid

It is the "best of times" because Metro has succeeded in obtaining the trust of the citizens of the County as evidenced by the 71.15% approving vote for Measure M.[11] [12]The public wants Metro to succeed in their primary goals-reduced congestion and lower environmental impact-and is willing to invest toward that success. The public's support arises from the fact that Los Angeles suffers from the world's worst traffic congestion.[13] The average rush hour commuter in Los Angeles spent 104 hours in congestion in 2016.[14]

It is the "worst of times" because despite the public's ongoing support of Metro, actual ridership is declining, down 5.7% from 2015 to 2016.[15] Automobile congestion has gotten worse.[16] Pedestrian and bicycle accidents have increased. In the City of Los Angeles they were up 43% in 2016 despite the City's Vision Zero initiative to reduce these accidents.[17]

Measure M is the most recent of the public's authorizations to Metro to ease traffic congestion. Measure R, which narrowly passed in 2008, targeting subway and light rail expansion.[18] Thus, Metro has had 8 years to demonstrate some easing of congestion.

Many studies that have focused on the Los Angeles congestion problem have disagreed with the effectiveness of Metro's public transportation-based approach.[19] In particular, a phenomena called "triple convergence" could quickly overwhelm any traffic decongestion achieved through enhanced public transit.[20] ("Triple convergence" describes a mechanism by which a potential reduction in congestion is met with higher traffic density in response to the apparent reduced congestion. The result is "conservation of congestion.")

Metro is in a difficult situation: it has public support and funding of a plan to ease traffic congestion that may be inherently ineffective because of "triple convergence."

In this difficult context, Metro demonstrates extreme competence in executing their plans if they are to reward the trust of the public. This includes providing excellent First/Last Mile facilities throughout the Metro system.

First/Last Mile for the Existing System

The existing Metro rail/busway system is shown in Figure 1. (Not shown is the capillary system of Metro and other traditional bus routes that are interlaced and interconnected with the major

[11] http://theplan.metro.net/
[12] Note: Measure M raises sales tax in the County of Los Angeles by $0.005 over an indefinite period to pay for Metro expansions and other traffic decongestion improvements..
[13] http://www.latimes.com/local/lanow/la-me-traffic-los-angeles-20170220-story.html
[14] http://www.newser.com/story/238609/la-drivers-waste-crazy-number-of-hours-in-traffic.html
[15] http://isotp.metro.net/MetroRidership/Index.aspx
[16] http://www.latimes.com/local/lanow/la-me-traffic-los-angeles-20170220-story.html
[17] http://www.latimes.com/local/lanow/la-me-ln-2016-traffic-deaths-20170403-story.html
[18] https://en.wikipedia.org/wiki/Measure_R
[19] http://www.newgeography.com/content/001318-reducing-traffic-congestion-and-improving-travel-options-los-angeles
[20] http://www.rand.org/content/dam/rand/pubs/research_briefs/2008/RAND_RB9385.pdf

transit network shown. This investigation did not evaluate First/Last Mile facilities associated with the bus networks.)

Figure 1: Metro 2016

[21]

[21] http://media.metro.net/projects_studies/call_projects/images/map_railsystem_fy2016.pdf

First/Last Mile facilities are evaluated on a per-terminal basis. The criteria for facility quality are based on Metro's First/Last Mile Strategic Plan document. Observations made by the CGJ, from a user's viewpoint, are also included in the following evaluations.[22]

As might be expected, newer First/Last Mile facilities are improved over earlier examples.

The best example as nominated by Metro and verified by the CGJ was the Downtown Santa Monica Expo Terminal, the last terminal of the latest light rail extension. Essentially, every feature recommended in the Strategic Plan was evidenced at this terminal: attractive approaches with full ADA support, protective pedestrian and bicycle lanes, "scramble" pedestrian crosswalks, clear signage, out-of-traffic pickup areas, and a full service bicycle shop. The bike shop featured a secure bike-parking facility and showers. Motivation for such an exemplary terminal comes from the fact that it has become Santa Monica's "front door" for visitors to this beach community. The City has obviously heavily invested in the facility.

The worst facility inspected was the Blue Line Slausen terminal, identified as such by Metro. This was one of the earliest terminals on the first light rail line. Its location was in an industrial area some distance from any residential neighborhood. Most problematic was that there was no protected crossing of Slausen Avenue near the terminal. This missing crossing encourages dangerous jaywalking across a busy four lane thoroughfare. Slausen does not have designated bike lanes so the lack of bicycle lockers at the terminal is unfortunately expected and consistent. The "back" stairway to the elevated platform, which looked as if it were intended to be blocked off, was not. Near its top there was another unlocked gate which actually opened onto the tracks. This is dangerous! (We have pointed this out to Metro.)

Other light rail terminals inspected fall between these two examples in judged quality. Here are a few specific observations.

Sierra Madre Villa on the Gold Line – The terminal and light rail right-of-way are in the center of the 210 Freeway so access was by a bridge to a large Park and Ride structure. The platform and bridge were excessively noisy and the bridge complicated disabled access. This large Park and Ride was built when this terminal was at the end of the Gold Line. Thus, it accommodated passengers from further east before the Gold Line was extended eastward.

Mariachi Plaza on the Gold Line – This subterranean terminal connects to a very beautifully designed intermediate underground area before rising to the plaza itself. The intermediate area is so pleasant and spacious it could be used for other public purposes as well.

Chinatown on Gold Line – This was a delightfully designed terminal with a Chinese motif. It was difficult to find the Tap Card readers to pay for a ride.

Expo Line – Along much of the Expo Line there is a combination of bike and pedestrian paths that provides both First/Last Mile support to and from terminals and as well as an extended parallel bike path. This path "reuses" the rail right-of-way. There are specific traffic signals to

[22] All evaluations contained herein are based on Civil Grand Jury field trips to the facilities.

protect pedestrians and bicyclists at street crossings. The Civil Grand Jury has inspected subway terminals as well. There is a great consistency in all the underground structures and facilities of these terminals, which is reassuring to passengers. At street level each subway terminal is unique. Because riders are rising up from the possibly disorienting underground, they would be helped with explicit signage making street level directions explicit.

One issue seen at many terminals is the difficulty of accessibility caused by neighboring streets, other railways, or the light rail itself. An example is the Florence terminal on the Crenshaw Line, which is under construction. Here the elevated railway crosses over nearby La Brea Boulevard. The terminal will be fairly accessible from Florence on the South. But from the North one has to pass under the railway on La Brea and then walk east on Florence to the terminal, making it much more difficult to access the Crenshaw Line from the north.

In summary, the current First/Last Mile implementations span a wide spectrum of quality. Refurbishment of older terminals in line with the current Strategic Plan would benefit users. However, refurbishments could be difficult given the pre-existing conditions.

Future Plans and Approach

Metro Expansion

Figure 2 shows the growth anticipated for the overall Metro arterial system by 2040. Given the experience Metro has gained to date, its high quality strategic plans, its new level of responsibility, and a steady stream of funding from Measure M, every new terminal can provide excellent support of First/Last Mile. The only potential problem in achieving this level of quality may be the actual funding available for facilities. There will be a continuing mix of Metro and local city funding which are likely to be unpredictably variable over time. There is evidence that other public transit systems allocate a higher percentage of funds to First/ Last mile.[23]

Refurbishments

Metro has proposed a prioritized list of existing terminals for refurbishments under Measure M funding.[24] Although it is unlikely that these can be brought to a quality level expected in new terminals because of the existing hard physical limitations, significant problems identified by actual use can be corrected. Safety of use can be expected to be the highest priority in refurbishment plans.

[23] Interview with Bicycle/Pedestrian Safe Design Standards Consultant.
[24] Interview with representative of Metro Sustainability Office

Bicycle Use

The CGJ has observed an underdeveloped policy with respect to bicycle usage on Metro. We were told that initially bicycles were not allowed on trains. Later they were allowed.[25] Currently a passenger hears the announcement that bicycles should only use doors marked by "yellow decals".[26] However, identifying and then moving to the "bicycle doors" as a train comes to a stop and within the time allowed for boarding while other passengers are exiting and entering all around the cyclist is challenging.[27] In most cases, bicyclists get on at the closest train door, decal or no. Non-cycling passengers seem to feel no obligation to avoid either doors or spaces that bicyclists are supposed to use. The "bicycle doors" on trains are aligned with spaces inside trains where spaces are provided for bicycles. This design seems inefficient and confusing. There are many bicyclists on trains and at terminals despite this awkwardness.

Secure bicycle lockers are not available at all terminals.[28] A Metro staffer has stated that the lockers that are available are consistently oversubscribed. Perhaps a denser bike locker design would help. Rentable bicycles may or may not be present near Metro terminals.[29]

Bicycle policy is unclear and, to encourage personal active movement by bicycle, it could be better defined and implemented.

Ideally, Metro could consistently support the use of bicycles both as transit to/from terminals as well as on trains/busways. Easily accessible, universal, affordable, secure bicycle storage quickly reserved by smartphone and universal, affordable, rentable bicycles would support the terminal access. Bicycles on-train usage could be enhanced by reserving specific, well-defined doors on trains aligned with boarding points at terminals for bicyclists that were aligned for every arrival of every train, limiting the forced mixing of pedestrian and bicycle traffic at boarding times. Is this feasible? Train interiors for bicycle-specific usage might be equipped with hanger sections that better secure bikes while using less space. These same cars would contain proper passenger spaces for the dismounted bicyclists.

Incorporating New Personal Transit Technologies

Metro needs to accommodate personal transit assists that do not yet exist. As an example, there are now miniature, foldable, battery-power-assisted bicycles costing $900.[30] These provide ranges of about 20 miles per charge at up to 16 mph, and weigh about 35 pounds. These would seem to be the ideal First/Last Mile personal transit appliances. More mundane is the current wide usage of rolling carts to increase a pedestrian's load-carrying capacity. Baby strollers are also common on Metro; they need to be systematically accommodated. It would be appropriate

[25] http://www.discoverlosangeles.com/blog/bike-metro
[26] CGJ observation from riding Metro trains.
[27] Note: Purposely long sentence attempts to simulate for the reader the time-critical complex problem a bicyclist faces in trying to honor the "use the doors marked with yellow decals" imperative! As does the current overlong footnote.
[28] https://www.metro.net/riding/bikes/
[29] https://www.metro.net/riding/bikes/
[30] https://shop.urb-e.com/collections/all

for Metro to pre-plan accommodations for whatever (reasonable) accessories passengers might bring to support their First/Last Mile trips.

Figure 2: Metro 2040 [31]

[31] http://www.scpr.org/blogs/news/2014/02/18/15879/a-potential-2040-los-angeles-metro-subway-system-m/

Taxis/Uber/Lyft/Autonomous Cars (A-Cars)

Taxis were common. Driver-equipped Uber and Lyft services are now common. There are a few Metro terminals which provide suitable "ports" for pickup or drop-off from these services. These ports are best located safely out of the local traffic flow. The services are a tiny fraction of the current First/Last mile solutions used. But to their credit, these services do not require long-term parking, may be requested by smartphone, and may avoid the expense of a personal car. As they become more affordable, Uber/Lyft could be attractive for the First/Last Mile.

Coming in the near future is the driverless versions of these services with the development of the autonomous car (A-Car). Will the A-Car be a significant part of the First/Last Mile solution? Many people believe this will be the case.[32] A-Car ports at terminals would be basically identical to the Uber/Lyft facilities. The common thread is the universal provision of safe, out-of-the-flow-of-traffic ports.

Improving Safety

Unfortunately, if Metro succeeds in increasing ridership and with it the personal active movement volume, the opportunities for pedestrian and bicycle accidents will almost certainly increase. A quantum improvement in safety surrounding Metro terminals seems necessary to avoid this. Currently, programs to decrease such accidents have absolutely failed in the City of Los Angeles.[33] This implies that the priority of safety features in First/Last terminal design must be increased.

Two clear approaches to improve safety around Metro terminals are (1) restricting the density of car traffic and (2) reducing speeds of traffic. Reduced traffic density reduces the number of car/pedestrian interactions. Some of these interactions cause injuries. Severity of pedestrian injury rises spectacularly with car speed at impact.[34] The risk of pedestrian fatality is 10% at 23 mph and rises to 90% at 58 mph.[35]

Metro success at supplying an attractive public option for efficient transit can decrease automotive congestion. Lower traffic density improves safety. However, if lower congestion is "exploited" by drivers to increases their speeds, any potential safety improvement may be wiped out.

III METHODOLOGY

Document Reviews

In support of this investigation, the CGJ reviewed a number of documents relevant to First/Last Mile. Most of these were supplied by Metro and were of high quality:

[32] https://www.bloomberg.com/news/features/2016-08-18/uber-s-first-self-driving-fleet-arrives-in-pittsburgh-this-month-is06r7on
[33] http://www.latimes.com/local/lanow/la-me-ln-2016-traffic-deaths-20170403-story.html
[34] https://www.aaafoundation.org/sites/default/files/2011PedestrianRiskVsSpeed.pdf
[35] https://www.aaafoundation.org/sites/default/files/2011PedestrianRiskVsSpeed.pdf

Metro First/Last Mile Strategic Plan
Metro Active Transportation Strategic Plan (ATSP)
Metro ATSP Case Studies
Metro: The First, Last, and Toughest Mile: First/Last Mile Training Workbook
Metro Countywide Sustainability Annual Report – April 2015
Various Metro Board Minutes and Memos
Viewgraphs Presentation – Metro© Board Motions on First / Last Mile
Los Angeles City Vision Zero Plan and Reports
Measure M Advocacy Material

Interviews

The CGJ conducted in person interviews and/or attended meetings with many informed sources of First/Last Mile knowledge:

Bicycle/Pedestrian Safe Design Standards Consultant
Metro System Overview to the Civil Grand Jury
Los Angeles County Board of Supervisors Meeting – Placing Proposition M on Ballot
Metro First/Last Mile Planning Team, Sustainability Office

Tours

The Civil Grand Jury (CGJ) determined that inspections of a sampling of Metro terminals would make First/Last Mile issues clearer. We prepared for these inspections by reviewing the Metro's First/Last Mile Strategic Plan. We asked Metro representatives to escort us to best and not-the-best examples. Metro showed us the Santa Monica Expo terminal as the best example and the Expo Palms terminal as more problematic. The Metro representatives nominated the Blue Line Slauson terminal as the actual worst case example. With this background, the CGJ performed the following terminal inspections:

26TH Street/Bergamot Expo Terminal
7th Street Transit Center
Blue Line/Expo Line Terminal
Red Line and Purple Line Terminal
Culver City Expo Terminal
Santa Monica Expo Terminal
Palms Expo Terminal
Union Station Red Line and Purple Line Terminal
Slauson Blue Line Terminal
Wardlow Blue Line Terminal
Florence/LaBrea Terminal on Crenshaw Line (under construction)
Gold Line Terminals –selected from end-to-end
Purple Line Terminals – McArthur Park and Western terminals

IV FINDINGS

1. Metro system transit has not captured enough riders to reach its sustainability and traffic decongestion goals. First/Last Mile implementations shares in the responsibility for this.

2. The so-called "triple-convergence" phenomena (see "A Promising and Difficult Situation" in section II, above) may be contributing to decreasing ridership.

3. Metro's First/Last Mile Strategic Plan and various associated planning documents are of high quality.

4. Treatment of some specific site details is missing from First/Last Mile Strategic plan.

5. Historically, First/Last Mile implementations have depended upon cooperation of local governmental entities and local funding. This has resulted in some sub-optimum results.

6. Metro's new policy assuming more responsibility for First/Last Mile implementations is a better approach toward high quality First/Last Mile implementations.

7. Metro has made a smaller relative investment in First /Last Mile implementations than other comparable systems in other California metropolitan areas.

8. Current First/Last Mile implementations show a wide spectrum of quality.

9. Existing First/Last Mile implementations have shown improvement based on experience gained from previous implementations.

10. Exactly how First/Last Mile designs interact with the prime railway design is unclear.

11. Proposed First/Last Mile implementations/improvements are not reviewed by actual users.

12. Safety statistics for existing terminals are critical for their refurbishment.

13. Pedestrian and bicycle safety has deteriorated recently in the County of Los Angeles; First/Last Mile bears some responsibility for this.

14. Policy for bicycle usage to/on/from Metro is not completely developed.

15. Automotive interactions with pedestrians and bicyclists within First/Last Mile zones are not well controlled.

16. New passenger accessories and assists will affect First/Last Mile planning and implementations.

17. Uber/Lyft/autonomous car support is not included in First/Last Mile plans to date.

V RECOMMENDATIONS

1. Metro should consider strategies that are effective against "triple-convergence" in support of its ridership goals.

2. Metro should continue producing high-quality First/Last Mile planning documents.

3. Metro should take responsibility for the quality of the resulting (from 2. above) First/Last Mile implementations.

4. Metro should deal with more site-specific design problems in their First/Last Mile planning documents.

5. Metro should further extend its influence over communities for First/Last Mile implementations with more extensive collaboration and funding.

6. Metro should budget more of its funding stream to First/Last Mile implementation (see 5, above).

7. Metro should explicitly include First/Last Mile design considerations beginning at the earliest stage of its system expansion designs.

8. Metro should formalize actual user reviews for refurbishments and new developments.

9. Metro should use safety data from existing terminals as the highest priority consideration for refurbishments.

10. Metro should expand and make consistent the pedestrian and bicycle facilities at each terminal.

11. Metro should encourage or require First/Last Mile designs that constrain automobile speeds and maximally separate vehicle routes and pedestrian and bicycle paths in terminal footprint areas.

12. Metro should further develop bicycle usage policies to/on/from Metro and First/Last Mile support for bicyclists.

13. Metro should explicitly provide for the use of accessory items on trains – rolling carts, baby carriages, etc.

14. Metro should anticipate the development of potential new accessories and assists within First/Last Mile plans and implementations.

15. Metro should plan for Uber/Lyft/A-Car ports at Metro terminal.

VI RESPONSES REQUESTED

California Penal Code Sections 933(c) and 933.05 require a written response to all recommendations contained in this report. Responses shall be made no later than ninety (90) days after the Civil Grand Jury publishes its report and files it with the Clerk of the Court. Responses shall be made in accord with Penal Code Sections 933.05 (a) and (b).

All responses to the recommendations of the 2016-2017 Civil Grand Jury must be submitted on or before September 30, 2017, to:

Presiding Judge
Los Angeles County Superior Court
Clara Shortridge Foltz Criminal Justice Center
210 West Temple Street
Eleventh Floor-Room 11-506
Los Angeles, CA 90012

Responses are required from:

Responding Agency	Recommendations
Metro	7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10, 7.11, 7.12, 7.13, 7.14, 7.15.

VII ACRONYMS

A-Car Autonomous Car
ADA Americans with Disabilities Act
ATSP Active Transit Strategic Plan
CGJ 2016-2017 Los Angeles County Civil Grand Jury

VIII COMMITTEE MEMBERS

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