SUBJECT: REPORT ON FEASIBILITY OF GATE LATCHING ON EXPO PHASE 1 & 2, FOOTHILL GOLD LINE EXTENSION PHASE 2A, AND CRENSHAW/LAX

ACTION: RECEIVE AND FILE

RECOMMENDATION

In response to the Motion by Directors Yaroslavsky, O'Connor, and Najarian Amendment to Item 35, "Gate Latching Schedule dated July 25, 2013 (Attachment A)." Metro staff is reporting back on criteria for designing at-grade stations with gates and the feasibility of implementing gate latching at all stations, including at-grade stations:

1. Expo Phase 1: Perform detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for eight at-grade stations. Metro has provided a cost estimate of $90,000 to complete the study.

2. Expo Phase 1: Implement fare gates at three aerial stations. Metro has provided a Rough Order of Magnitude Estimate (ROM) of $4.6 to $4.7 million.

3. Expo Phase 2: Perform detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for three at-grade stations. The Expo Construction Authority has provided a ROM estimate of $75,000 to complete the analysis.

4. Expo Phase 2: A separate Board Action will be submitted in January February 2014 requesting authorization to implement fare gates at the 4th Street Terminus Station in Downtown Santa Monica.

5. Foothill Gold Line Extension Phase 2A: Perform detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for six at-grade stations. The Foothill Construction Authority has provided a ROM estimate of $70,000 to complete the analysis.
6. Crenshaw/LAX: Complete a detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for four at-grade stations.

7. Crenshaw/LAX: A separate Board Action will be submitted during February 2014 requesting authorization to implement fare gates at at-grade stations.

8. Board motion to authorize Metro to fund and/or perform a detailed engineering analysis for Expo Phase 1, Expo Phase 2, and Foothill Gold Line Extension Phase 2A.

ISSUE

The Board requested staff report back on criteria for designing at-grade stations with gates and the feasibility of implementing fare/security gate latching at all stations, including at-grade stations. Hereafter fare/security gates will be referred to as fare gates. The Board also requested a funding/expenditure plan to implement gates on Expo Phase 1.

DISCUSSION

Expo Phase 1

The Expo Phase 1 light rail project consists of 11 stations. Of these 11 stations, three are aerial and eight are at-grade. The three aerial stations include La Brea, La Cienega, and Culver City. The at-grade stations include Pico, 23rd Street, Jefferson/USC, Exposition Park/USC, Exposition/Vermont, Exposition/Western, Crenshaw/MLK and Farmdale.

A detailed engineering analysis was performed on the three aerial stations. The analysis revealed each station had sufficient space to accommodate fare gates and satisfy Fire Life Safety and National Fire Protection Association (NFPA) 130 requirements. Metro has prepared a ROM estimate of $4.6 to $4.7 million to implement fare gates at these locations. The ROM estimate includes construction, equipment, and installation NOT costs associated with electrical and communication runs, operations time, project management time or maintenance.

The detailed engineering analysis revealed the need to increase the number of fare gates, emergency swing gates and perform additional design and construction work, which increased the original ROM estimate of $3.5 million, provided in the Receive and File dated September 19, 2013, by approximately $1.2 million.

A preliminary engineering analysis (site survey, preliminary equipment needs, conceptual drawings, and ROM estimates for implementation of fare gates) was performed on the eight at-grade stations. Metro's Transit Access Pass (TAP) Department led an interdepartmental working group to determine the feasibility of implementing gate latching at all stations, including at-grade stations. The Working
Group identified a number of constraints and risks; however, preliminary findings indicate at-grade stations could accommodate fare gates with conditions. The analysis is ongoing and will be finalized after complete review of exit calculations to ensure that Fire Life Safety and NFPA 130 requirements can be met.

With regard to conditions, any station in non-compliance with the Americans with Disabilities Act (ADA) must be brought into compliance before fare gates can be implemented. The following Expo Phase 1 stations are not in compliance with ADA: Pico (North Platform), 23rd Street (South Entrance), and Exposition/Vermont (East Platform). The ADA requires that in stations designed or built since 2006 at least 60 percent of entrances must be accessible. At Pico and Vermont East only 50 percent of the entrances are currently accessible. The modifications to bring these stations into compliance are precedent tasks and will be completed regardless of the Gate Latching Project. Due to spatial limitations, a number of stations would require a staggered fare gate configuration. Other stations would require land or lane takes to expand stations to accommodate fare gates. Existing equipment and utilities would require relocation as well.

Risks were also identified. In most instances, a larger bi-parting Emergency Swing Gate (ESG) of three different dimensions would have to be implemented to satisfy Fire Life Safety and NFPA 130 requirements. These ESG would require custom design and manufacturing. Emergency exits would also need to be modified to prevent unauthorized entry. Lastly, construction work would likely hinder rail operations and introduce new obstacles for passengers.

For stations having too many conditions/risks, the Working Group recommends the installation of Stand Alone Validators (SAV) in a “virtual gate” configuration at station entrances. The deployment of “virtual gates” has proven to be successful. For example, introducing “virtual gates” at the 7th St/Metro Center Red/Purple Line to Blue Line transfer area resulted in a 48% increase in SAV usage.

Metro has also provided a preliminary ROM estimate of $7 to $7.1 million to implement fare gates at the eight at-grade stations. The preliminary ROM includes construction, equipment, and installation NOT costs associated with land takes, lane takes, operations time, project management time or maintenance. A detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) needs to be performed on the eight at-grade stations. Metro has provided a ROM estimate of $90,000 to complete the analysis. Final ROM estimates for implementation of fare gates would be derived from the analysis. Metro estimates the analysis could be completed by February 2014.

The total ROM estimate for the three aerial stations, eight at-grade stations, and the detailed engineering analysis is $11,890,000.

**Expo Phase 2**

The Expo Phase 2 light rail project consists of seven stations. Of these seven stations, three are aerial and four are at-grade. The three aerial stations include Palms,
Expo/Sepulveda and Expo/Bundy. The four at-grade stations include Westwood/Rancho Park, 26th Street/Bergamot, 17th Street/SMC and Downtown Santa Monica.

The three aerial stations have been designed with fare gates.

Downtown Santa Monica has been studied for fare gates. Through a separate Board motion by Directors Yaroslavsky, O’Conner, and Bonin, Item 72: “Gating 4th Street Terminus Expo Line” dated October 24, 2013, approval was granted in the amount of $380,000 to procure fare gate and emergency swing gates. A separate Board Action will be submitted during January February 2014 requesting authorization to implement fare gates.

A detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) needs to be performed on the remaining three at-grade stations to determine which stations can be gated and develop a financial plan to implement fare gates at these locations. The Expo Construction Authority has provided a ROM estimate of $75,000 to complete the analysis. Metro estimates the analysis could be completed by March 2014.

Foothill Gold Line Extension Phase 2A
The Foothill Gold Line Extension Phase 2A light rail project consists of six at-grade stations. These stations include Arcadia, Monrovia, Duarte, Irwindale, Downtown Azusa and Citrus College.

A detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) needs to be performed on the six at-grade stations to determine which stations can be gated and develop a financial plan to implement fare gates at these locations. The Foothill Construction Authority has provided a ROM estimate of $70,000 to complete the analysis. Metro estimates the analysis could be completed by March 2014.

Crenshaw/LAX
The Crenshaw/LAX light rail project consists of eight stations. Of these eight stations, one is aerial, three are underground, and four are at-grade. The aerial station is Aviation/Century Station. The underground stations include Crenshaw/Vernon, Crenshaw/MLK, and Crenshaw/Exposition. The at-grade stations include Florence/Hindry, Florence/La Brea, Florence/West Station, and Crenshaw/Slauson.

The one aerial station has been designed with fare gates.

The three underground stations have been designed with fare gates.

A detailed engineering analysis is being performed on the four at-grade stations to determine which stations can be gated and develop a financial plan to implement fare gates at these locations. Similar to Expo Phase 1, the Crenshaw/LAX project has
identified constraints and risks but determined at-grade stations could accommodate fare gates with conditions. For instance, due to physical constraints at Florence/Hindry Station, there is insufficient space to widen the platforms without acquiring additional right-of-way. Preliminary findings indicate that implementing fare gates using existing Metro right-of-way and current planned platform widths may be feasible. The analysis is ongoing and will be finalized after complete review of exit calculations to ensure that Fire Life Safety and NFPA 130 requirements can be satisfied.

The Crenshaw Project has provided a ROM estimate of $4 million to implement fare gates at these four locations. A separate Board Action will be submitted during February 2014 requesting authorization to implement fare gates at at-grade stations. Metro estimates the implementation of fare gates could be completed by September 2018.

**Blue Line**

The Blue Line consists of 22 stations. Of these stations, three are aerial, one is underground, and 18 are at-grade. The three aerial stations include Del Lamo, Slauson, and Firestone. The underground station is 7th St/Metro Center. The 18 at-grade stations include Pico, Grand, San Pedro, Washington, Vernon, Florence, 103rd St/Watts Towers, Willowbrook, Compton, Artesia, Wardlow, Willow, Pacific Coast Highway, Anaheim, 5th St, 1st St, Transit Mall, and Pacific.

The three aerial stations have implemented fare gates and are latched.

The underground station has a “virtual gate” at the Red Line to Blue Line transfer area.

Two at-grade stations (Compton, Artesia) have implemented fare gates and are latched.

A detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) needs to be performed on the remaining 17 at-grade stations. Metro has provided a cost estimate of $185,000 to complete the study.

**Gold Line**

The Gold Line consists of 21 stations. Of these stations, seven are aerial, two are underground, and 12 are at-grade. The one aerial station is Chinatown. The two underground stations are Mariachi Plaza and Soto. The six grade-separated stations include Sierra Madre Villa, Allen, Lake, Memorial Park, Lincoln/Cypress, and Union Station. The 12 at-grade stations include Del Mar, Fillmore, South Pasadena, Highland Park, Southwest Museum, Heritage Square, Little Tokyo/Arts District, Pico/Aliso, Indiana, Maravilla, East LA Civic Center and Atlantic.

Three grade-separated stations (Sierra Madre Villa, Allen, and Lake) have implemented fare gates and are latched.
The two underground stations have implemented fare gates and are latched.

A detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) needs to be performed on the remaining 16 stations. Metro has provided a ROM estimate of $175,000 to complete the analysis.

**Systems Consistency**

Metro has prepared Architectural Directive AD-105 for fare gate arrangements at at-grade center platform and side platform stations.

1. Center Platform 16'-2" wide will accommodate (20" turnstile), (36" ADA Aisle) and (55" double swing gates)
2. Side Platform 12'-0" wide will accommodate (20" turnstile), (36" ADA Aisle) and (36" single swing gates) requiring 10" extension

The drawings will serve as a model for implementation of fare gates to ensure consistency at all stations, including at-grade stations. The use of AD-105 for fare gate arrangements is subject to validation of exit calculations at each proposed station. Metro Rail Design Criteria Sections six and nine are updated to reflect fare gate requirements for new rail stations.

Metro engineers and estimators have worked collaboratively with the Expo Phase 1 and Crenshaw/LAX projects to help achieve uniformity. Metro has facilitated information sharing meetings with Expo Phase 1, Expo Phase 2, Foothill Gold Line Extension Phase 2A, and Crenshaw/LAX projects to discuss constraints/risks and strategies to overcome these challenges. Strategies include using the AD-105 as a baseline for station modifications, widening station platform entrances, developing a conceptual design for larger Emergency Swing Gates, developing a conceptual design for staggered fare gate configurations, and relocating station equipment (TVMs, Map Cases, Customer Telephones, etc...) to off-site plazas. Best practices and lessons learned have been shared accordingly.

**DETERMINATION OF SAFETY IMPACT**

The detailed engineering analysis including exit calculations should identify the safety impacts associated with implementing fare gates at all stations. The primary safety consideration is whether sufficient exiting capacity is provided to allow passengers to evacuate safely from the station in a timely manner during an emergency. This is a Fire Life Safety matter and a pre-requisite for fare gate implementation. Established safety standards apply and compliance with said standards must be demonstrated.

For the three aerial stations on Expo Phase 1, the results of the detailed engineering analysis confirmed fare gates could be implemented at these locations. Fire Life Safety and NFPA 130 requirements were satisfied.
For the eight at-grade stations on Expo Phase 1, detailed engineering analysis results including exit calculations and safety impacts connected to construction must be considered. The construction phase of fare gate implementation at side and split platform stations with only one paid entrance will likely cause operational challenges and introduce new obstacles for customers. For example, during construction it will be difficult to provide customers with convenient access to fare equipment and station entrances and maintain existing service levels at these stations.

**FINANCIAL IMPACT**

**Expo Phase 1**

Metro has prepared a ROM estimate of $4.6 to $4.7 million to implement fare gates at three aerial stations. The cost for General/Civil and Electrical/Systems work is $700,000, which includes modification of existing stations and equipment relocation such as TVMs, CCTV cameras, Map cases, lighting necessary to provide fare gating at station entrances, and upgrades of station ADA accessibility etc. The cost of fare gate equipment is $4 million. The ROM estimate includes construction, equipment, and installation NOT costs associated with electrical and communications runs, operations time, project management time or maintenance. A potential funding source for implementation of fare gates at these locations would be Measure R2% with other alternate local fund sources to be identified under a new gate latching capital project.

Metro has prepared a ROM estimate of $90,000 to complete a detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) on eight at-grade stations. A prospective funding source for this analysis would be Measure R - Admin. Final ROM estimates for implementing fare gates at these locations would be determined by the results of the detailed engineering analysis.

Metro has also provided a preliminary ROM estimate of $7 to $7.1 million to implement fare gates at the eight at-grade stations. The cost for General/Civil and Electrical/Systems work is $3.7 million, which includes modification of existing stations and equipment relocation such as TVMs, CCTV cameras, Map cases, lighting necessary to provide fare gating at station entrances, and upgrades of station ADA accessibility etc. The cost of fare gate equipment is $3.4 million. The preliminary ROM includes construction, equipment, and installation NOT costs associated with property acquisition, easements, lane takes, operations time, project management time or maintenance. For instance, property would need to be acquired or an easement would be needed to relocate station equipment at Exposition Park/USC due to spatial constraints. Similarly, widening entrances at the following stations would encroach on traffic lanes: Jefferson/USC, Exposition Park/USC, Exposition/Vermont, Exposition/Western, and Exposition/Crenshaw. A potential funding source for implementation of fare gates at these locations would be Measure R 2% with other alternate local fund sources to be identified under a new gate latching capital project. Final ROM estimates for implementing fare gates at these locations would be determined by the results of the detailed engineering analysis.
The payback period for gating the Expo Phase 1 aerial and at-grade stations is expected to be between eight and 14 years. Sales revenue for Expo Phase 1 totalled $7.1M for fiscal year 2013. By comparing the number of boardings to the number of riders who tapped, estimates for fare evasion rates were created. Based on ridership in fiscal years 2013 and 2014, these evasion rates were used to create estimated increases in revenue that would be expected from latching Expo Phase 1. The projected annual revenue increase ranges from $850,000 - $1.5 million for the 11 stations along Expo Phase 1. This is consistent with observed increases in revenue along the Red and Purple Lines following gate latching. This estimate does not account for the anticipated increase in ridership along Expo Phase 1 nor does it take into account annual maintenance costs.

Concerning the implementation of fare gates at at-grade stations on Expo Phase 1, Metro expects that during construction and installation, access to these stations and fare collection capabilities will be reduced. Revenue loss should be anticipated throughout the installation process. Stations with a single paid entrance at one end of the platform and an emergency exit at the other will pose fare collection and operational challenges.

**Expo Phase 2**

The Expo Construction Authority has provided a ROM estimate of $75,000 to complete the detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for three at-grade stations. A potential funding source for this analysis would be Measure R. Final ROM estimates for implementing fare gates at these locations would be determined by the results of the detailed engineering analysis.

With regard to the 4th Street Terminus Station in Downtown Santa Monica, the ROM estimates for implementing fare gates are: $423,683 for design and construction, $250,000 for power upgrades, and $380,000 for fare gate equipment. The total ROM estimate is $1,053,683. Through a separate board motion by Directors Yaroslavsky, O’conner, and Bonin, Item 72: “Gating 4th Street Terminus Expo Line” dated October 24, 2013, approval was granted in the amount of $380,000 to procure fare gate and emergency swing gates. Funding up to $1 million has been identified through a Prop 1B Security Grant for costs incurred through March 2014 under a new gate latching capital project. The Life of Project (LOP) for the Expo Phase 2 Project will not be impacted.

A separate Board Action will be submitted during January **February** 2014 requesting authorization to implement fare gates at this location under a new gate latching capital project.

**Metro Gold Line Foothill Extension Phase 2A**

The Foothill Construction Authority has provided a ROM estimate of $70,000 to complete the detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for six at-grade stations. A potential funding source for this analysis would be Measure R - Admin. Final ROM estimates for
implementing fare gates at these locations would be determined by the results of the detailed engineering analysis.

Crenshaw/LAX
The Crenshaw Project has provided a preliminary ROM estimate of $4 million to implement fare gates at four at-grade stations. The preliminary ROM includes construction, equipment, and installation NOT costs associated with land takes, lane takes or maintenance. A potential funding source for implementation of fare gates at these locations would be Measure R 2% with other alternate local funding sources to be identified under a new gate latching capital project. The LOP for the Crenshaw/LAX Project will not be impacted.

Final ROM estimates for implementing fare gates at these locations will be determined by the results of the detailed engineering analysis including exit calculations. Once the analysis is complete, the Crenshaw Project will finalize costs for final design, construction, and maintenance as well as the payback period.

A separate Board Action will be submitted during February 2014 requesting authorization to implement fare gates at at-grade stations.

NEXT STEPS

1. Expo Phase 1: Upon Board motion, perform detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for eight at-grade stations. Update the Board during the April 2014 Board meeting.

2. Expo Phase 1: Upon Board motion, initiate design, construction, and implementation of fare gates at three aerial stations. Update the Board during the April 2014 Board meeting.

3. Expo Phase 2: Upon Board motion, initiate detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for three at-grade stations. Update the Board during the April 2014 Board meeting.

4. Expo Phase 2: Submit a separate Board Action in January February 2014 requesting authorization to implement fare gates at the 4th Street Terminus Station in Downtown Santa Monica.

5. Foothill Extension: Upon Board motion, initiate detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for eight at-grade stations. Update the Board during the April 2014 Board meeting.
6. Crenshaw/LAX: Complete a detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for four at-grade stations.

7. Crenshaw/LAX: Submit a separate Board Action during February 2014 requesting authorization to implement fare gates at at-grade stations. Update the Board during the April 2014 Board meeting.

8. Blue Line: Upon Board motion, initiate detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for 17 stations. Update the Board during the June 2014 Board meeting.

9. Gold Line: Upon Board motion, initiate detailed engineering analysis (Physical Layout, Quantities Analysis, Queuing Analysis, and Exit Calculations) for 16 stations. Update the Board during the June 2014 Board meeting.

ATTACHMENT

A. Motion by Directors Yaroslavsky, O'Connor, and Najarian Amendment to Item 35, "Gate Latching Schedule dated July 25, 2013."
B. Expo Phase 1: At-Grade Station Table
C. Expo Phase 1: Station Drawings (center platform, side platform, split platform, and aerial platform)
D. Crenshaw/LAX: At-Grade Station Proposed Fare Gate Implementation Discussion
E. Metro Engineering: Architectural Directive Drawings to accommodate fare gates for at-grade center platform and side platform configurations
F. Expo Phase 1: Station Pictures (center platform, side platform, split platform, and aerial platform)

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Motion by Directors Yaroslavsky, O’Connor, and Najarian

Amendment to Item 35

Gate Latching Schedule

July 25, 2013

In addition to providing the public with better communication on the timeline to latch our stations that have gates, it is also important that we provide gates to as many stations as possible. Currently, Expo Phase I does not have gates and Expo Phase II will only have gates at those stations that are elevated; due to current standards of design that do not permit gating at stations that are at-grade.

As we’ve seen since we implemented gate latching in late June, the system is working smoothly and without incident. Moreover, revenues are up and we are now able to obtain true ridership numbers, where people are going, and where people are coming from, etc.

Our system needs consistency and it’s important that all stations, including at-grade stations, be designed to accommodate gates.

WE, THEREFORE, MOVE that staff report back in 60 days on which Expo Phase I stations can be gated and a financial plan to implement installation of gates at those stations; and

WE FURTHER MOVE that staff also report back on criteria for designing at-grade stations to accommodate gates, and what can be modified or changed in our existing criteria so that we can incorporate gates at all at-grade stations currently under design or in the planning stages.
**Expo Phase 1: At-Grade Station Table**

<table>
<thead>
<tr>
<th>Station</th>
<th>Entrance</th>
<th>Fare Gate Location</th>
<th>Number of Fare Gate Aisles*</th>
<th>Fare gate layout</th>
<th>Impacts City ROW</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pico</td>
<td>North</td>
<td>Bottom of entrance stairs</td>
<td>1</td>
<td>In-line</td>
<td>No</td>
<td>Can only be gated if entrance itself is modified to satisfy ADA requirements</td>
</tr>
<tr>
<td>Pico</td>
<td>South</td>
<td>Top of ramp prior to paid area</td>
<td>2</td>
<td>In-line</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>23rd Street</td>
<td>North</td>
<td>Along entrance area at current location of TVM's</td>
<td>3</td>
<td>Staggered</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>23rd Street</td>
<td>South</td>
<td>Bottom of entrance stairs</td>
<td>2</td>
<td>Staggered</td>
<td>No</td>
<td>Can only be gated if entrance itself is modified to satisfy ADA requirements</td>
</tr>
<tr>
<td>Jefferson</td>
<td>WB Platform</td>
<td>Top of ramp prior to paid area</td>
<td>2</td>
<td>Staggered</td>
<td>Yes</td>
<td>Widening of entrance will encroach into adjacent left turn lane</td>
</tr>
<tr>
<td>Jefferson</td>
<td>EB Platform</td>
<td>Bottom of ramp at current location of TVMs</td>
<td>2</td>
<td>In-line</td>
<td>Yes</td>
<td>Widening of entrance will encroach into Caltrans ROW adjacent I-110 sound wall</td>
</tr>
<tr>
<td>USC/Expo</td>
<td>WB Platform</td>
<td>Along entrance area at current location of TVM's</td>
<td>3</td>
<td>Staggered</td>
<td>Yes</td>
<td>1. Widening of entrance will encroach into lane of adjacent street 2. Property/ Easement required to place TVMs on North Side of street</td>
</tr>
<tr>
<td>USC/Expo</td>
<td>EB Platform</td>
<td>Along entrance area at current location of TVM's</td>
<td>3</td>
<td>Staggered</td>
<td>Yes</td>
<td>1. Widening of entrance will encroach into lane of adjacent street 2. Property/ Easement required to place TVMs on South Side of street</td>
</tr>
<tr>
<td>Vermont</td>
<td>WB Platform</td>
<td>Bottom of ramp at current location of TVMs</td>
<td>3</td>
<td>Staggered</td>
<td>Yes</td>
<td>Widening of entrance will encroach into lane of adjacent street</td>
</tr>
<tr>
<td>Vermont</td>
<td>EB Platform, West End</td>
<td>Top of ramp prior to paid area</td>
<td>2</td>
<td>Staggered</td>
<td>Yes</td>
<td>Widening of entrance will encroach into lane of adjacent street</td>
</tr>
<tr>
<td>Vermont</td>
<td>EB Platform, East End</td>
<td>Top of stairs at entry to paid area</td>
<td>1</td>
<td>Staggered</td>
<td>No</td>
<td>Can only be gated if entrance itself is modified to satisfy ADA requirements</td>
</tr>
<tr>
<td>Western</td>
<td>WB Platform</td>
<td>Bottom of ramp at current location of TVMs</td>
<td>2</td>
<td>In-line</td>
<td>No</td>
<td>Widening of entrance will encroach into lane of adjacent street</td>
</tr>
<tr>
<td>Western</td>
<td>EB Platform</td>
<td>Top of ramp at current location of TVMs</td>
<td>2</td>
<td>In-line</td>
<td>Yes</td>
<td>Widening of entrance will encroach into lane of adjacent street</td>
</tr>
<tr>
<td>Crenshaw</td>
<td>WB Platform</td>
<td>Along entrance area at current location of TVM's</td>
<td>2</td>
<td>In-line</td>
<td>Yes</td>
<td>Widening of entrance will encroach into lane of adjacent street</td>
</tr>
<tr>
<td>Crenshaw</td>
<td>EB Platform</td>
<td>Along entrance area at current location of TVM's</td>
<td>2</td>
<td>In-line</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Farmdale</td>
<td>WB Platform</td>
<td>Bottom of ramp and stairs</td>
<td>2</td>
<td>In-line</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Farmdale</td>
<td>EB Platform</td>
<td>Plaza area between ramp and TVMs</td>
<td>2</td>
<td>In-line</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
ATTACHMENT D. Crenshaw/LAX: At-Grade Station Proposed Fare Gate Implementation Discussion

Florence/Hindry Station – At-Grade, Side Platform

The Florence/Hindry station is a side platform station located between Florence Blvd to the south and a privately owned business to the north. Upon review of the updated draft Metro Rail Design Criteria and updated Architectural Directive Drawings, it appears the side platforms would need to be widened. Due to physical constraints, there is insufficient area to widen the platforms without acquiring additional right-of-way. Feasibility to install fare gates using the existing platform width, which includes a single leaf Emergency Swing Gate (ESG) is being studied. The evaluation to install fare gates using the existing right-of-way is ongoing and will be finalized after completing the analysis including exit calculations to ensure that Fire Life Safety and NFPA 130 requirements are satisfied.

Florence/La Brea – At-Grade, Center Platform with Plaza

The Florence/La Brea station is a center platform station located north of Florence Blvd and adjacent to a plaza. The current design locates Ticket Vending Machines (TVM) at the plaza, located between the platform and Florence Blvd. It was determined that there is sufficient space at the plaza to locate fare gate equipment near the TVMs at plaza level, which will allow additional fare gates to be installed. The evaluation is ongoing and will be finalized after completing the analysis including exit calculations to ensure that Fire Life Safety and NFPA 130 requirements are satisfied.

Florence/West Station – At-Grade, Center Platform

The Florence/West station is currently configured as a center platform and within Metro right-of-way. Upon review of revised draft Metro Rail Design Criteria and updated Architectural Directive Drawings, it appears there is sufficient space to implement fare gates, which will provide system continuity. The evaluation is ongoing and will be finalized after completing the analysis including exit calculations to ensure that Fire Life Safety and NFPA 130 requirements are satisfied.

Crenshaw/Slauson Station – At-Grade, Center Platform

The Crenshaw/Slauson station is currently configured as a center platform in the median of Crenshaw Blvd between Slauson and 59th. Upon review of the revised draft Metro Rail Design Criteria and updated Architectural Directive Drawings, it appears that there is sufficient space to implement fare gates, which will provide system continuity. The evaluation is ongoing and will be finalized after completing the analysis including exit calculations to ensure that Fire Life Safety and NFPA 130 requirements are satisfied.
ATTACHMENT E

NOTES:
1. VANS, FIRE GATES AND EMERGENCY SWING GATES ARE M.I.C.
2. USE SLOPING-WALLED (9% MAX) AT MAIN ENTRANCE. USE SLOPING ADA RAMP (3.2% MAX) AT THE SECONDARY ENTRANCE AND MAINTAIN TRACK CLEARANCE REQUIREMENT.
3. THE USE OF ADA-615 FOR FIRE GATES ARRANGEMENTS IS SUBJECT TO VALIDATION OF ENTRANCE CALCULATION PER EACH NEW STATION AND SITE CONDITIONS.

AT GRADE CENTER PLATFORM CONFIGURATION AT ENTRY END

AT GRADE SIDE PLATFORM CONFIGURATION AT ENTRY END

DRAFT 12-05-13
Expo Phase 1: Station pictures (center platform, side platform, split platform, and aerial platform) 23rd ST. - Typical At-Grade Center Platform Station (3 Photos Below)

- Limited width to place fare gates at south entrance—will require staggered fare gate configuration
- Entrance Elements (TVMs/Map Cases/PTELs/Phone) need to be relocated to provide space for fare gate equipment
- One of two entrances to platform

- Limited width to place fare gates at north entrance—will require staggering fare gate configuration
- Track centers and required clearances preclude widening of entrance area
- Entrance Elements (TVMs/Map Cases/PTELs/Phone) need to be relocated to provide space for fare gate array
- One of two entrances to platform

- South entrance needs to comply with ADA before fare gates can be implemented
- Additional space will be used for ADA ramp or elevator
- Track centers and required clearances preclude widening of entrance area
Widening of westbound platform entrance is required to provide space for fare gate array—will intrude into traffic lane.
Widening of entrance is required to support staggered fare gate configuration.
Only entrance to platform.
Property acquisition/easement needed to relocate TVMs/Map Cases across street (North Side) to remote plaza similar to Expo/Vermont Station.

Widening of Eastbound Platform entrance is required to provide space for fare gate array and will incur into traffic lane.
Widening of entrance is required to support staggered fare array.
Only entrance to platform.
Property acquisition/easement needed to relocate TVMs/Map Cases across street (South Side) to remote ticketing plaza similar to Expo Vermont station.
• Widening of westbound platform entrance required to provide space for fare gate array—will intrude into planter area and possibly traffic lane
  Entrance Elements (TVMs/Map Cases/PTELs/Phone) need to be relocated to provide space for fare gate array—Space to do so on a level area at bottom of ramp is limited and is also adjacent to street crosswalk
  Only entrance to platform

• Widening of eastbound platform entrance is required to provide space for fare gate array—will intrude into traffic lane
  Entrance Elements (TVMs/Map Cases/PTELs/Phone) need to be relocated to provide space for fare gate array—Space to do so on a level area at top of ramp is limited by ramp run and street crosswalk location
  Only entrance to platform
Adequate space exists on east plaza to install fare gate arrays and fencing between stairs and elevator
Map Cases will need to be relocated to provide queuing space on non-paid side of fare gate array
Light, speaker, bollards and floor lights in area of fare gate arrays will need to be removed
One of three entrances to platform

Adequate space exists on west plaza to install fare gate arrays and fencing
Bike racks will need to be relocated to provide queuing space on non-paid side of fare gate array
Light, speaker, bollards and floor lights in area of fare gate arrays will need to be removed

Adequate space exists on east plaza to install fare gate arrays and fencing forward off far end stairs on east plaza
One of three entrances to platform

Adequate space exists on east plaza to install fare gate arrays

Adequate space exists on west plaza to install fare gate arrays and fencing
- Adequate space exists on west plaza to install fare gate arrays and fencing
- Trash receptacle and possibly TVMs will need to be relocated to provide queuing space on non-paid side of fare gate array
- Light, speaker, bollards and floor lights in area of fare gate arrays will need to be removed
- One of three entrances to platform