Los Angeles County
Metropolitan Transportation
Authority
One Gateway Plaza
3rd Floor Board Room
Los Angeles, CA

Metro

Board Report

File #: 2017-0407, **File Type:** Informational Report **Agenda Number:** 32

SYSTEM SAFETY, SECURITY & OPERATIONS COMITTEE
JULY 20, 2017

SUBJECT: METRO BLUE LINE SHORT AND LONG TERM IMPROVEMENTS

ACTION: RECEIVE AND FILE MOTION RESPONSE

RECOMMENDATION

RECEIVE AND FILE response to Motion 37 (February 2017) on Blue Line Improvements.

ISSUE

At the February 2017 Planning and Programming and Construction Committee Meetings, Metro's CEO was asked to provide an update in July 2017 in response to Motion 37 regarding the evaluation of short-term and long-term Metro Blue Line (MBL) improvements, graffiti deterrence program, last MBL stop re-imagination efforts, and the MBL Express concept.

DISCUSSION

Improving the speed and reliability of the Blue Line requires a multi-pronged approach. Currently, travel time through the Flower Street and Washington Boulevard corridors are governed by traffic signals at intersections that are synchronized to allow trains to operate non-stop between stations. However, this is only achievable if the trains can maintain the design speeds along each corridor and an even spacing based on the scheduled headway (6 minute on both the Blue and Expo Lines). At the Washington/Flower junction (Wye), the Blue Line speed is also restricted by the tight curvature of the track which limits operating to no more than 10 miles/hour southbound and 5 miles/hour northbound. In addition, with a combined headway of 3 minutes between the Blue and Expo Lines, the terminal operations at 7th/Metro Center requires that arriving trains alight customers, reposition to the departing track, load passengers, and depart within three minutes of the preceding train.

In an ideal operating environment, trains would consistently run at the maximum designed speed, evenly spaced, without delay. However, operating issues (e.g. operational delays and vehicle reliability), and at-grade street issues (e.g. illegal left turns by motorists in front of trains and pedestrians violating traffic signals across tracks in downtown Los Angeles and Long Beach), all contribute to a real life scenario where any one of these issues can cause a delay. One delayed train causes a domino effect on all subsequent trains, resulting in inconsistent service along the entire line.

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A. Evaluate and Implement Short-term Blue Line and Expo Line Improvements

To address the operating issues impacting speed and reliability on the Blue and Expo Lines, staff has implemented a series of short range operational improvements, including:

- Ensure On-Time Train Arrivals/Departures at Terminals - Rail Operations and Security staff have been assigned to the Blue and Expo Line platforms at 7th/Metro Center to ensure that trains arrive and depart within the 3 minute combined headways. Task Force responsibilities include monitoring train movements, managing personnel, expediting passenger boarding and alighting, providing customer announcements, and restoring service when a delay occurs.

- Install Safety Gate at 18th St On-Ramp to I-10 - Vehicles accessing eastbound I-10 freeway at 18th St from southbound Flower St. must make a left turn across the Metro rail tracks. Although this movement is protected by a dedicated left turn lane with signals and active 'train approaching' warning signs, there have been several incidences where vehicles cross the tracks illegally in front of oncoming trains. To avoid collisions, Operators are required to make a safety stop prior to the on-ramp before proceeding. This delay results in trains missing the green signal to proceed through the Washington/Flower junction. To address this safety concern, a gate arm is currently being installed, as part of a pilot project, at the vehicular left turn pocket lane to prevent illegal left turns. Should this improvement prove successful in reducing accidents, the positive (safety) stop order will be lifted allowing trains to operate through the junction without delay.

- Qualify All Blue and Expo Line Operators to Work Both Lines - Previously, Blue and Expo Line operators were only trained to work the line they were assigned to. This practice does not allow the flexibility to re-route a train to either line to restore service when trains arrived at 7th /Metro Center out of sequence. As of June 2017, all Blue and Expo Line operators have been qualified to work both lines providing the opportunity to dynamically re-route trains to either destination when needed.

- Deploy Blue Line Security Surge - Starting March 20, 2017, additional Security staff was assigned to patrol Blue Line trains and Blue Line stations. This "security surge" is focused on monitoring and reducing several common customer conduct issues, including harassment, loud music, and vendors. The added security presence has been well received, and is currently being deployed throughout the rest of the rail network.

- New Cars on Blue Line - As of June 1, 2017, 9 Kinkisharyo P3010 rail cars have been assigned to the Blue Line. As more of these new cars are in service along the line, fleet reliability, one of the major causes of delay, is expected to improve Blue Line service as well as the customer experience. Vehicle maintenance issues currently account for about 35% of lost revenue service hours on the Blue Line.

After implementing these operational improvements, Blue Line train speeds and travel time have improved between Washington Station and 7th/Metro Center. From January to April 2017, average peak hour speeds increased as much as 11%, depending on the time of day and direction of travel, which results in an actual travel time savings of up to 1.7 min along the segment.

In order to achieve greater improvements in speed and reliability along the entire Blue Line, staff has engaged with the cities of Los Angeles and Long Beach to evaluate and implement short term signal, street, and intersection improvements along at-grade street running segments. Metro and Los Angeles Department of Transportation (LADOT) staff met in early May 2017 to discuss opportunities to increase speeds and reduce delays along Washington Bl., Flower St., and through the Washington/Flower junction by considering various short, mid and long term signal and street improvements. For the short term, both agencies agreed to develop and evaluate scenarios for signal timing, priority and pre-emption, select street closures, restrict left turns at selected intersections that improve rail operations and minimize impacts to vehicular and pedestrian circulation and delays. These scenarios will also consider access to and from new developments along Flower St. and future rail operating scenarios post-Regional Connector implementation.

Metro is also coordinating with the City of Long Beach on its Traffic Signal Synchronization Project (TSSP) which is scheduled to begin construction in fall 2017 and will be completed by the end of the calendar year. When completed, the TSSP is anticipated to reduce travel time and delay along Long Beach Bl. through downtown Long Beach.

B. Study Long-Term Blue Line Improvements, including but not limited to:

1. Creating Blue Line Express Service during peak hours
   a. Current Freight Usage along the ROW
   b. Preliminary Estimate on Upgrading the ROW to Light Rail Transit Standards
   c. Operations Plan to Accommodate Express Service
   d. Quantify Travel Time Savings for Peak Hour Trains

In May 2017, Metro staff met with Union Pacific (UP) to assess the feasibility of running express service between DTLA and Long Beach. It was determined that running light rail express service along the UP tracks would require access to the Right of Way (ROW) when UP trains are not running, substantial upgrades and costs to the ROW as well as light rail vehicles to adhere to Federal Railroad Administration (FRA) safety regulations and Metro design standards The following are the requirements needed to establish safe and efficient Blue Line Express service:

- A formal agreement between Metro and UP would be required for Metro to utilize UP tracks
- A waiver from the FRA would be required to share the corridor between light rail rains and freight trains, as the location of this service is under the FRA's jurisdiction
- Significant and costly redesign and/or upgrades of the existing infrastructure for track work, train control, TPSS, and OCS would be required to ensure the reliability of the Metro Blue Line Express service including, but not limited to:
  - Trackwork - Trackwork will need to be upgraded to Metro safety standards and to serve intermittent stations such as Willowbrook/Rosa Parks
  - Train Control - Metro LRT vehicles and UP signals will require modifications to ensure LRVs can operate safely under both UP Positive Train Control (PTC) and Metro's Automatic Train Protection (ATP) systems.
  - Traction Power - Power systems along the Blue Line will require upgrades to ensure sufficient power is available to operate both local and express trains through

the corridor.

- Overhead catenary System (OCS) - UP standards require structures and facilities to be located at least 23 feet above the rail, which is at the maximum height of the LRV pantograph (23 feet 6 inches), resulting in reliability issues. Bridges and structures will also need to be rebuilt to accommodate the OCS.

Further evaluation of the cost/benefit of the rail improvements including those identified above, along with improvements to at grade street crossings and intermittent station platforms will be required before express operating scenarios and travel time benefits can be developed.

2. Optimize the Washington Blvd. Wye by grade separating the Blue Line on Washington Blvd. and the Expo Line on Flower Street, including a full grade separation of Pico Station.

Metro Engineering developed conceptual grade separation layouts for the Washington/Flower junction and Pico Station. Staff considered seven alternatives for the Wye and identified three for further evaluation:

- W1 - Aerial separate northbound Expo track
- W4 - Underground both northbound and southbound Expo tracks
- W7 - Fully grade separate both Blue and Expo Lines by undergrounding both southbound tracks and aerial separating both northbound tracks

Two of three alternatives for grade separating Pico Station were identified for further consideration, including:

- P1 - Aerial separate both northbound and southbound platforms
- P3 - Underground southbound platform

The Wye and Pico Station alternatives were combined into three concepts described below and summarized in Attachment B. Consultant support will be used for preliminary engineering (PE) and cost estimates for these alternatives; however no funding has been identified for construction.

Alternative WP1: Aerial Northbound Expo Track and Pico Station

This alternative combines W1 and P1 which elevates the Expo northbound track and both platforms at Pico Station. By widening the platforms and constructing two sidings around the platforms it also increases station capacity and eliminates at-grade tracks and street crossing for access to the station platforms. Should the impacts of these aerial structures not be acceptable to the businesses and communities, the same concept can be designed by undergrounding instead of elevating the Expo northbound track and Pico Station.

Alternative WP2: Underground Expo and Stacked Platform at Pico Station

This alternative combines W4 and P3 with both northbound and southbound Expo trains running underground along Flower St. between 7th/Metro Center and 23rd St. Expo trains would serve an underground Pico Station while Blue Line trains would continue to operate on

existing at-grade tracks and serve an expanded at-grade Pico Station. This alternative eliminates the conflict between Blue and Expo trains, and expands the Pico Station platforms to accommodate larger crowds during special events.

Alternative WP3: Double Level Fully Grade Separated Junction and Stacked Platform at Pico Station

This alternative combines WP7 and P3 which fully grade separates the Blue and Expo Lines, eliminating all conflicts at the Wye. Northbound service would be elevated through the Wye and touch down south of I-10 to serve the existing at-grade Pico Station. Southbound trains would run underground between 7th/Metro Center and 23rd St. and serve an underground station at Pico. Northbound and southbound Pico Station platforms would be widened to accommodate larger crowds during special events.

3. Explore the feasibility for a full grade separation and/or station relocation including additional parking at Wardlow Station

In May 2017, Metro issued a Task Order to AECOM through an RFP that was issued to all members of an existing Countywide Planning Bench Contract, to conduct a safety and traffic analysis for the Wardlow intersection and to recommend any needed improvements. AECOM's task also includes using Metro's adopted grade crossing policy to prioritize each of the 27 gated crossings for grade separation including providing a detailed report identifying the methodology, assumptions, and data that supports the prioritization. These three tasks responded to a May 2016 Board motion, and are scheduled to be completed by the end of August 2017. It should be noted, however, that AECOM's current scope does not include any studies for additional parking at Wardlow station.

Parking at Wardlow Station Update

Between August 2016 and May 2017, Metro staff held on site meetings and communicated with both the City of Long Beach and Long Beach Transit, to discuss a comprehensive approach to managing parking at the Wardlow Station. In addition, through the development of the Supportive Transit Parking Plan (STPP) and a more robust parking demand model, the Parking Management Unit is able to determine and manage parking demand at high-demand stations. The Wardlow station currently offers 119 parking spaces and experiences excess parking demand that results in spillover parking into the adjacent neighborhoods. With the implementation of the Parking Guidance System this past year, Metro is working to redirect some of this parking demand to the neighboring Willow station, which has at least 100 parking spaces available daily. Over the next 6 months, with the completion of the STPP, staff will recommend to the Board implementing the Parking Management Pilot Program at the Wardlow Station. Assuming a daily parking rate of $3.00, the demand for parking is estimated at 209 spaces. As a result, there will be a 90 space shortage, which can be addressed in two ways: (1) using the Parking Guidance System (signage and app) to direct parking traffic to Willow Station, which has at least 100 available spaces daily and (2) through ongoing work with the City of Long Beach in their efforts to pursue an upgrade to the transit plaza that would include a re-striping plan that will install on-street metered parking that will both mitigate traffic speeds and increase the on-street parking inventory. The additional on-

street meters will allow for both transit commuter parking as well as time limits to allow for more local/transient use.

4. Study of additional grade separations along the entire Blue Line alignment that would improve service reliability and schedule adherence

In February 2017, a second Board motion was approved that directed the CEO, among other issues, to study grade separations on the entire MBL, including all the non-gated rail intersections and the junction of the MBL and Expo lines (Wye) as a long term enhancement. This latest motion also directed evaluations be undertaken of short-term improvements described above that both Metro and LADOT staff agreed to pursue. In order to provide a level-playing field and from a cost advantage perspective, staff decided to initiate an expedited procurement for a new contract for the additional tasks & discipline through the same planning bench to encourage competition. Staff anticipates issuing a Task Order for the additional work by October 2017.

C. Motion Amendments

1. MBL Graffiti Deterrence Program

The February 2017 graffiti deterrence pilot program included the installation of artificial ivy at the Metro Gold Line Lincoln Cypress Station. In April 2017, the pilot program was expanded to Slauson Station along the Blue Line where artificial ivy was installed, partially wrapping a column that supports the platform. Product effectiveness and cost benefit analysis are being evaluated for the Gold Line and Blue Line stations that are a part of the pilot program.

2. Reimagine the last stop on the MBL and consider adding a second stop closer to the water

Downtown Long Beach is currently served by three Blue Line stations. The southernmost station ("Downtown Long Beach Station") is located on West 1st Street between Pine Ave and Pacific Ave, two blocks north of the Long Beach Convention Center and approximately 1/3 mile north of Shoreline Dr, which is the primary roadway servicing waterfront uses including the Aquarium of the Pacific and Shoreline Village. Because the distance from the Downtown Long Beach Station to the uses along Shoreline is less than one mile, Metro staff will meet with City of Long Beach staff to better understand the connectivity issues related to providing better transit connections to these uses. Part of this work will involve First/Last Mile Connectivity options, in conjunction with First/Last Mile Planning activities described below:

Blue Line First/Last Mile Planning
Through an effort funded by a Cycle I ATP Grant, Metro is currently preparing plans for all 22 Blue Line Stations. These plans will consist of recommendations for access, safety and other improvements for each station, with an emphasis on creating better linkages to key destinations within the stations areas. The project also includes innovative community engagement, testing a variety of techniques to gather input from community residents and stakeholders outside of the context of standard public meetings.

3. Ensure that the Eco-Rapid Transit Line project studies incorporates the MBL Express concept;

so the MBL could ultimately run directly to Union Station

Environmental studies for the West Santa Ana Branch Rail Transit Project are being initiated with Scoping Meetings scheduled in June 2017. These studies will include travel demand modeling for that project in the context of the Measure M transit network. Because two options for the West Santa Ana Branch Northern Alignment would run adjacent to the Metro Blue Line between Slauson and Washington Stations, interlining Blue Line trains onto West Santa Ana Branch tracks might be possible. As a part of the West Santa Ana Branch Travel Demand Forecasting, such an operating plan will be modeled and evaluated.

DETERMINATION OF SAFETY IMPACT

Approval of this receive and file item on Metro Blue Line improvements will have a positive impact on the safety of our customers and employees.

FINANCIAL IMPACT

There is no financial impact imparted by approving the recommended action.

NEXT STEPS

With regards to the short-term Blue and Expo Line improvements, Metro staff will continue to engage the Cities of Los Angeles and Long Beach to identify and evaluate signal and intersection modifications to improve travel times and reduce delays. Operational improvements will continue to be monitored and adjusted to improve the reliability of train service along the line. With regard to the Washington/Flower junction (Wye) and Pico Station grade separation alternatives, Metro's Program Management department will continue to advance engineering and develop cost estimates for preferred alternatives, considering Right of Way (ROW) issues, street traffic impacts including street closures, and permanent acquisition of traffic lanes. As mentioned previously, a study of grade separations on the entire MBL, will be completed via an expedited procurement of a task order through the Countywide Planning bench. While at this point, there is no impact to the budget, depending on the final negotiated amount for the additional tasks that will be included in the RFP through the Countywide Planning Bench, staff may have to return to the Board for authorization. In terms of parking at Wardlow station, Metro's Parking Management Unit will coordinate with other Metro departments and consultants regarding potential reconfiguration or relocation of stations to ensure that parking needs are met and managed appropriately. Also, Blue Line First/Last Mile Planning is scheduled to be completed by the end of 2017, and staff will provide a full briefing to the Board on results at that time.

Staff will return to the Board upon conclusion of the many ongoing assessments of MBL short, medium and long term capital and operational betterments. Staff will prioritize these betterments based on the safety, reliability, traffic impacts and end-to-end speed improvements along the MBL per dollar of ROM cost for each.

ATTACHMENTS

Attachment A - Board Motion February 2017
Attachment B - MBL Long Term Alternatives Summary Matrix

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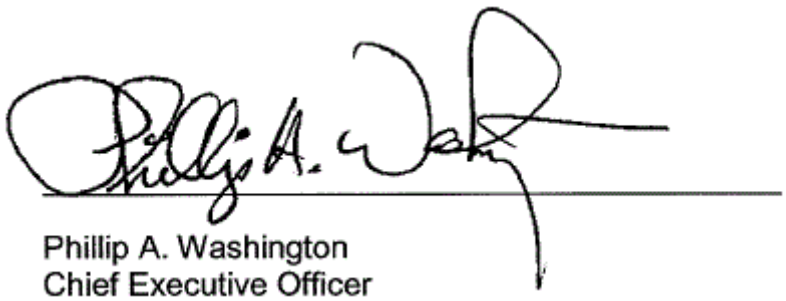

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Metro

Board Report

File #:2017-0091, **File Type:**Motion / Motion Response

Agenda Number:37.

REVISED
PLANNING AND PROGRAMMING COMMITTEE
FEBRUARY 15, 2017
CONSTRUCTION COMMITTEE
FEBRUARY 16, 2017

Motion by:

MAYOR ERIC GARCETTI, SUPERVISOR JANICE HAHN, MAYOR ROBERT GARCIA, AND DIRECTOR JACQUELYN DUPONT-WALKER

Item 37: Blue Line Improvements

With 80,000 average weekday boardings, the Blue Line is MTA's highest ridership light rail line and is the highest ridership modern light rail line in the United States. During 2016, the Blue Line saw nearly 25 million total boardings and over 186 million total passenger miles.

Currently, the Blue Line is undergoing a $1.2 billion state-of-good repair overhaul, including over $860 million in new and refurbished light rail vehicles. This project seeks to restore the Blue Line to a like-new state of operation.

However, a more comprehensive evaluation of improving service and reliability on the Blue Line is required. Customer satisfaction on the Blue Line has fallen nearly ten percent since 2013, while the Blue Line complaint rate has nearly doubled over the same time period.

There are many opportunities for improvement throughout the length of the Blue Line.

In Downtown Los Angeles, for example, a bottleneck exists at Washington Boulevard, where the Blue Line and Expo Line join in a wye. Recently, MTA increased the frequency of Expo Line trains to every six minutes during peak hours, matching the frequency of Blue Line trains. As a result, a total of 40 trains per hour are passing through the wye, approaching the limits of the wye's capacity.

Both Blue Line and Expo Line depend on this single track segment, any collision or mechanical failure within the segment could significantly delay both rail lines. Grade separating this portion of the Blue and Expo Lines could dramatically improve service

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reliability, increase capacity, provide better schedule adherence, and facilitate other opportunities, such as undergrounding Pico Station.

Additionally, an opportunity exists to create Blue Line Express service between Long Beach and Downtown Los Angeles. Roughly between the I-710 freeway and Washington Boulevard, extra right-of-way exists which could be used to construct a third track required for express operation.

APPROVE **Motion by Garcetti, Hahn, Garcia and Dupont-Walker** that the MTA Board direct the CEO to:

A. evaluate and implement short-term Blue Line and Expo Line improvements, especially service reliability and schedule adherence improvements on at-grade sections of Washington Boulevard, Flower Street, and the downtown wye, including but not limited to signal optimization, signal priority, signal preemption, and consideration of street closures;

B. study long-term Blue Line improvements, including but not limited to:

1. creating Blue Line Express service between Long Beach and Downtown Los Angeles during peak hours, including:

    a. provide information on current freight usage along the right-of-way,

    b. provide a preliminary estimate on upgrading the right-of-way to light trail transit standards,

    c. provide an operations plan to accommodate express service,

    d. quantify travel time savings for peak hour trains;

2. optimizing the Washington Boulevard wye by grade separating the Blue Line on Washington Boulevard and the Expo Line on Flower Street, including a full grade separation of Pico Station;

3. explore the feasibility for a full grade separation and/or station relocation including additional parking at Wardlow Station;

4. study of additional grade separations along the entire Blue Line alignment that would improve service reliability and schedule adherence; and

C. report back on all the above to the Construction Committee during the July 2017 Board

cycle.

DUPONT-WALKER AMENDMENT: to extend to the Blue Line the graffiti deterrence program currently in effect on the Gold Line.

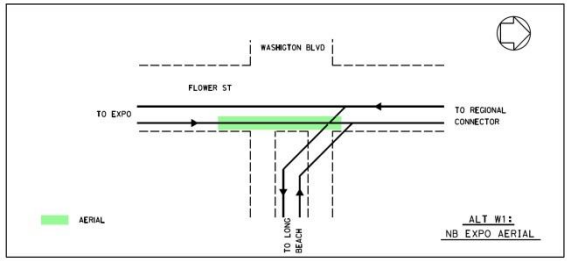
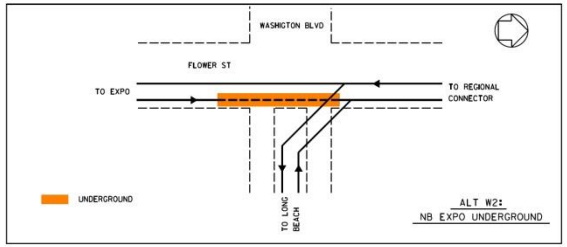
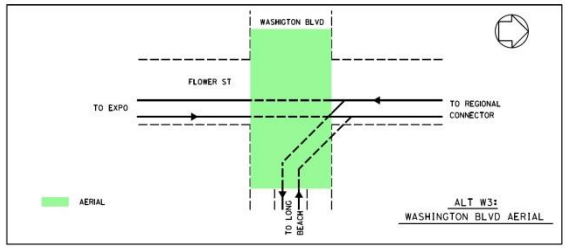
GARCIA AMENDMENT: to work with the City of Long Beach to reimagine the last stop on the Blue Line.

GARCETTI AMENDMENT: that the Eco-Rapid Transit Line Project studies incorporate the Blue Line Express concept, so the Blue Line could ultimately run directly to Union Station.

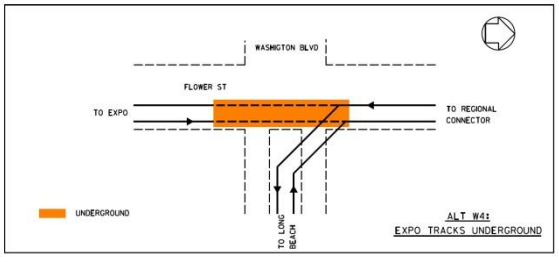
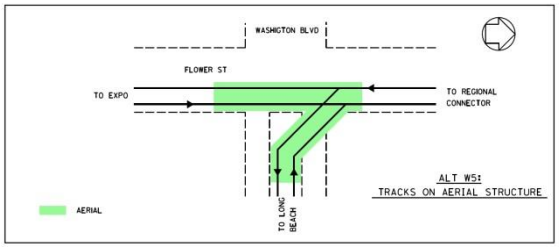
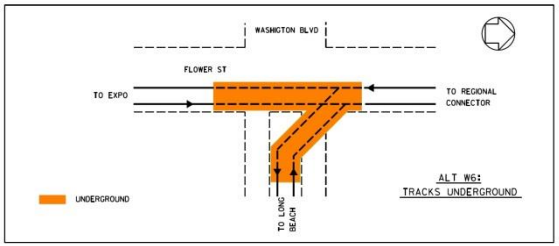
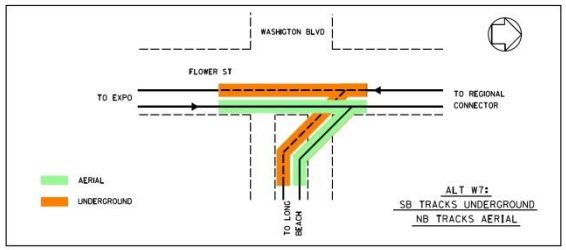
ATTACHMENT B

Metro Blue Line Long Term Improvements Summary Matrix

Washington Wye Grade Separation Alternatives

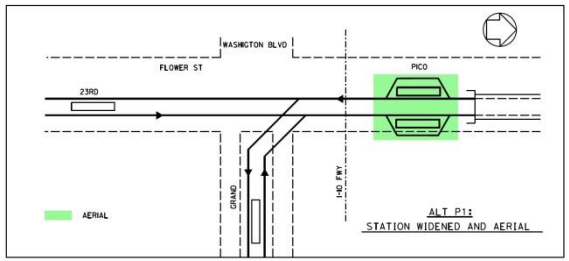
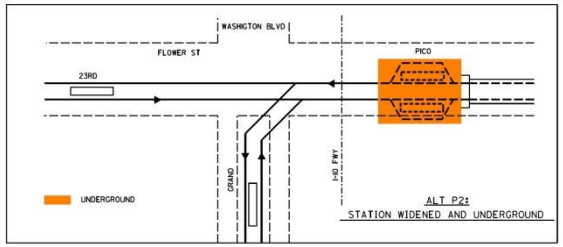
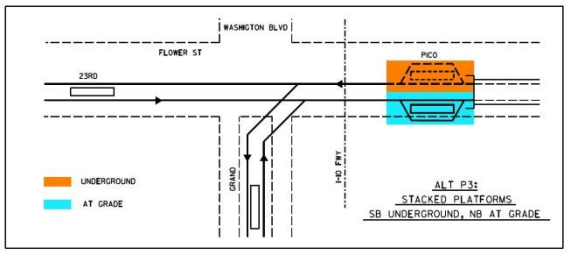
Layout Alternative			Key Features				
Name	**Description**	**Schematics**	**Eliminates conflict point**	**Eliminates impact from street traffic**	**Increases station capacity**	**Improves patrons safety**	**Construction Cost 2017 ($M)**
W1	NB Expo aerial		Yes	No	n/a	n/a	90
W2	NB Expo underground		Yes	No	n/a	n/a	Not done
W3	Washington Blvd aerial		No	Yes	n/a	n/a	Not done

ATTACHMENT B

Layout Alternative			Key Features				
Name	**Description**	**Schematics**	**Eliminates conflict point**	**Eliminates impact from street traffic**	**Increases station capacity**	**Improves patrons safety**	**Construction Cost 2017 ($M)**
W4	Expo underground		No	Yes (for Expo only)	n/a	n/a	680
W5	Flat aerial junction		No	Yes	n/a	n/a	Not done
W6	Flat underground junction		No	Yes	n/a	n/a	Not done
W7	Full grade separation - aerial and underground		Yes	Yes	n/a	n/a	460

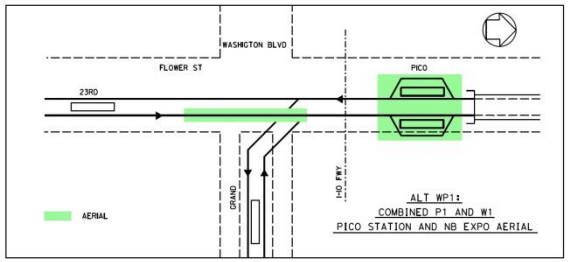
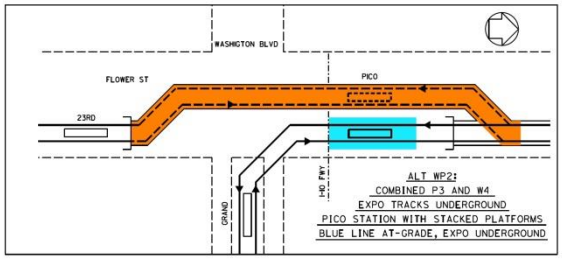
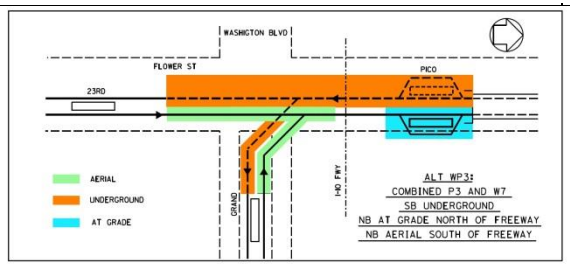
ATTACHMENT B

Pico Station Alternatives

Layout Alternative			Key Features				
Name	**Description**	**Schematics**	**Eliminates conflict point**	**Eliminates impact from street traffic**	**Increases station capacity**	**Improves patrons safety**	**Cost**
P1	Aerial with two platforms and four tracks		n/a	n/a	Yes	Yes	240
P2	Underground with two platforms and four tracks		n/a	n/a	Yes	Yes	360
P3	Stacked platforms – at-grade for SB and underground for NB		n/a	n/a	Yes	Yes	290

ATTACHMENT B

Combined Washington Wye and Pico Station Alternatives

Layout Alternative			Key Features				
Name	**Description**	**Schematics**	**Eliminates conflict point**	**Eliminates impact from street traffic**	**Increases station capacity**	**Improves patrons safety**	**Cost**
WP1 (W1+P1)	Aerial NB Expo and Pico Station		Yes	No	Yes	Yes	330
WP2 (WP4+P3)	Underground Expo and stacked platform Pico Station		No	Yes (for Expo only)	Yes	Yes	680
WP3 (WP7+P3)	Double level fully grade separated junction and stacked platform Pico Station		Yes	Yes	Yes	Yes	840