Shady Grove Station Capacity Improvements

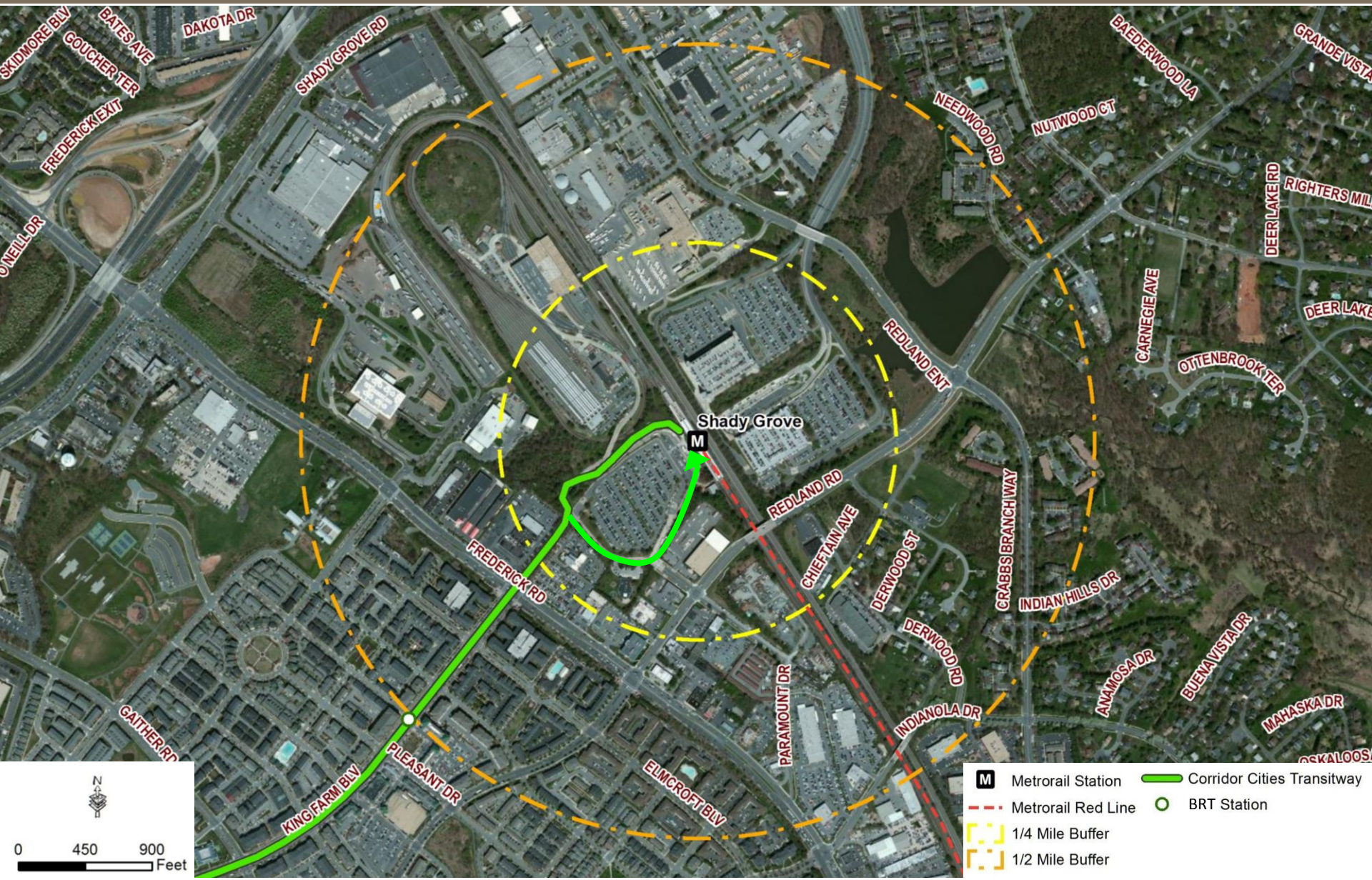
AAC 3 Meeting – June 8, 2015

Agenda

- Study Context
- Simulation of Current Passenger Flow
- Preliminary Design Alternatives
- Pedestrian Simulations of Selected Alternatives
- Cost Comparison and Recommendation

STUDY CONTEXT

Station Context



Purpose of the Study

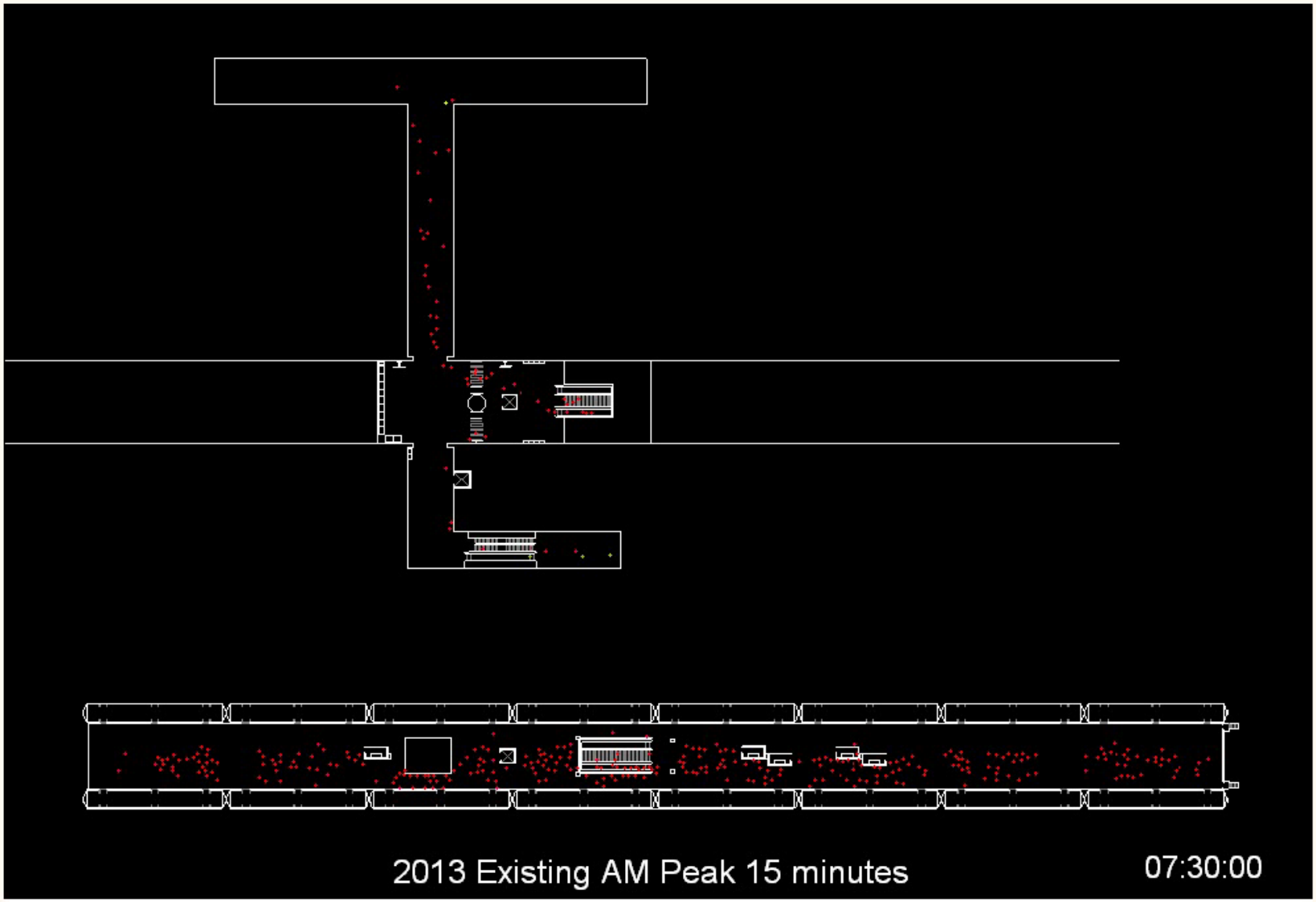
- Assess capacity constraints of station access and platform
- Assess existing and future physical and operational access needs in the context of increased ridership
  - Introduction of CCT
  - Future Joint Development
- Recommend improvements to manage crowding
  - Short-term *low-cost, low-intensity*
  - Long-term

Existing Conditions

- **Peak hour crowding on platform and mezzanine**
- **Queueing at escalators/stairs**

SIMULATION
OF
CURRENT PASSENGER FLOW

2013 Existing AM Peak

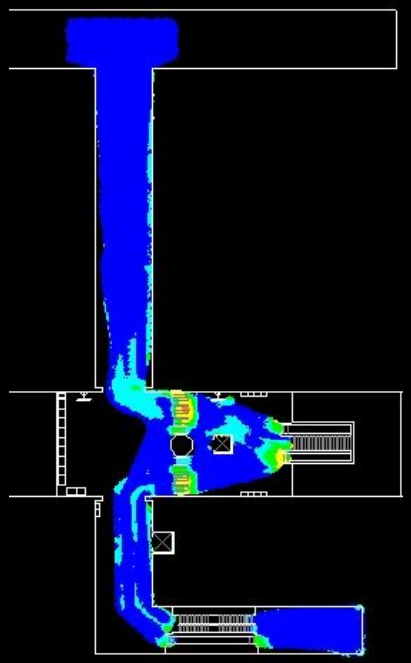


Washington Metropolitan Area Transit Authority

Shady Grove Station Capacity Improvement Study

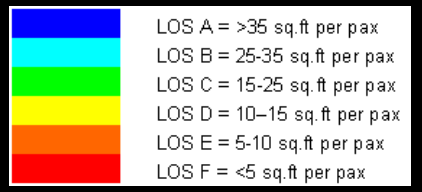
2013 Existing AM Peak

Mezzanine Level
LOS E & F – 2%

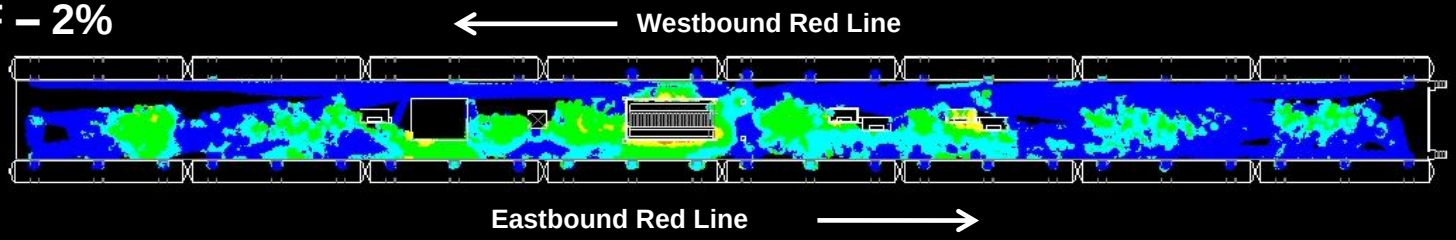


East Exit (Walk, Car & Bus)

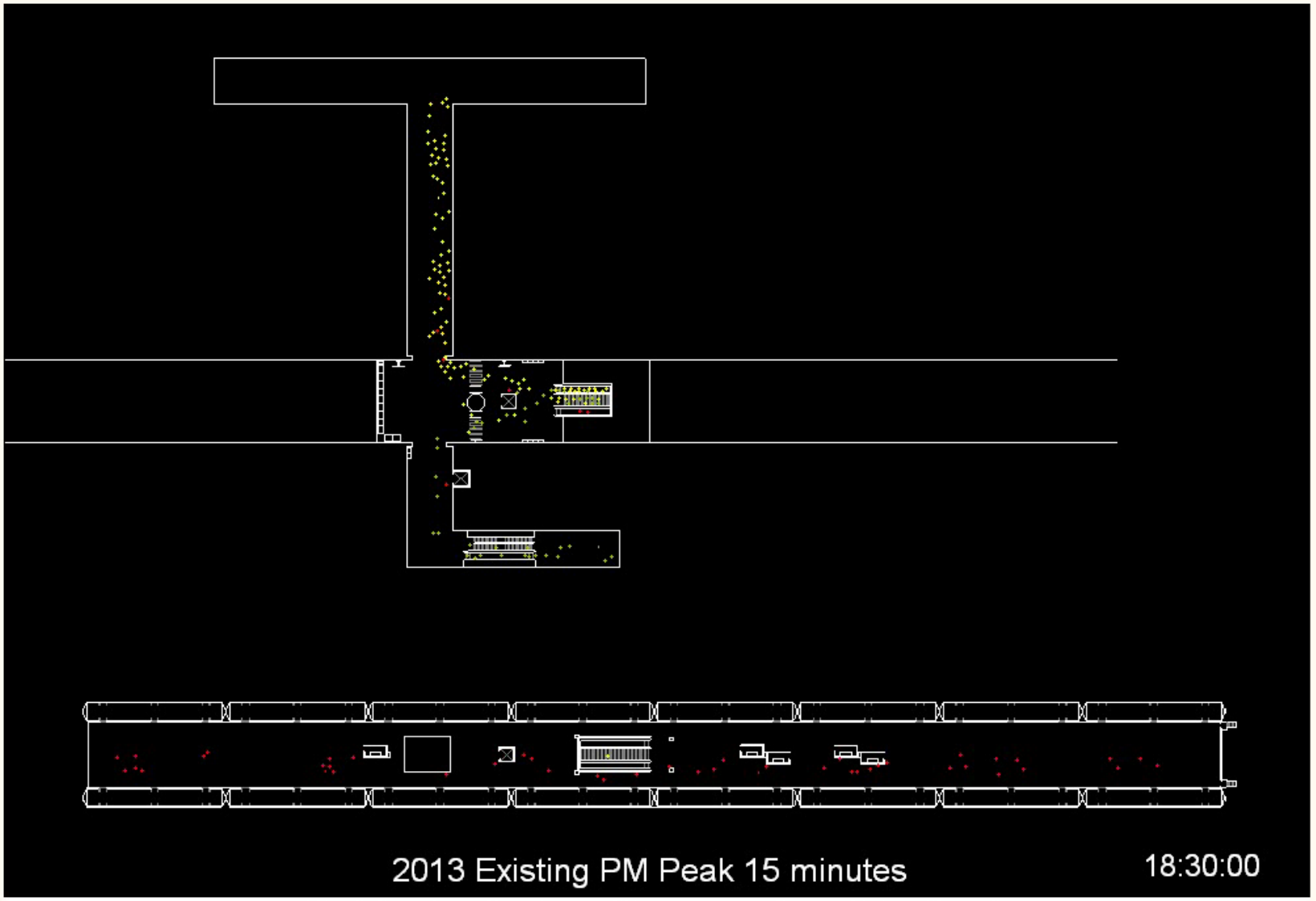
West Exit (Walk, Car & Bus)



WMATA Red Line Platform
LOS E & F – 2%



2013 Existing PM Peak

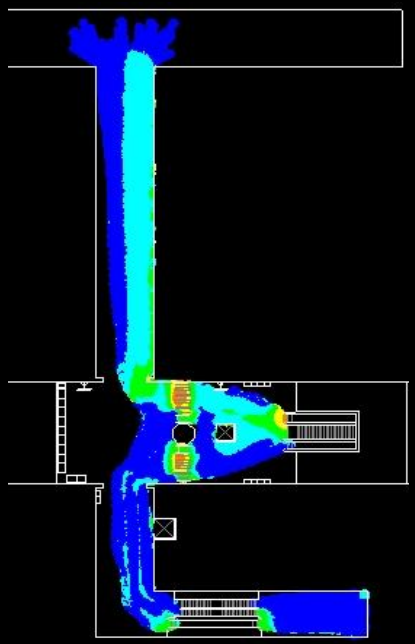


Washington Metropolitan Area Transit Authority

Shady Grove Station Capacity Improvement Study

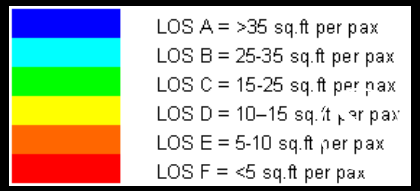
2013 Existing PM Peak

Mezzanine Level
LOS E & F – 2%



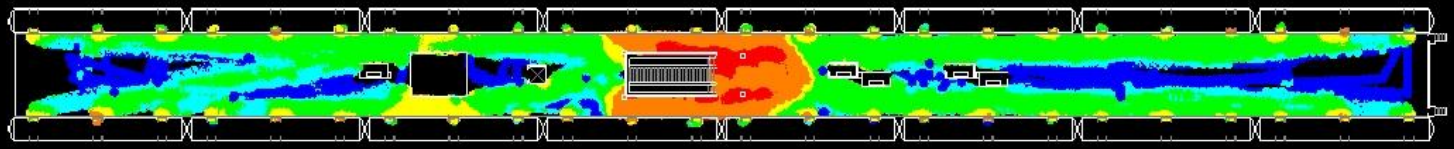
East Exit (Walk, Car & Bus)

West Exit (Walk, Car & Bus)



WMATA Red Line Platform
LOS E & F – 52%

Westbound Red Line



Eastbound Red Line

PRELIMINARY
DESIGN ALTERNATIVES

Concept Development Considerations

Implementation Timeframe

- Achievable short-term
- Longer term

Effectiveness

- Alleviate platform/mezzanine crowding
- Improve vertical circulation capacity

Impacts and Constraints

- Station operations
- Constructability
- Coordination with CSX, etc.

Cost

- Lower cost
- Higher cost

Preliminary Alternatives

ALTERNATIVE 1: Additional Circulation at Current Entrance

- **1A: Open-well staircase**
- 1B: Extend underground mezzanine to the south
- 1C: New mezzanine to the north

ALTERNATIVE 2: New South Entrance with an Underground Mezzanine

- **2A: East and west connections**
- **2B: West connection only**

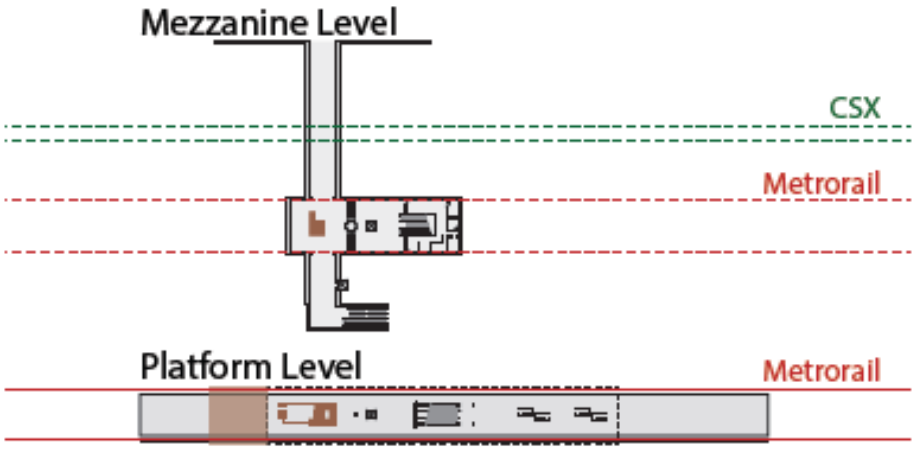
ALTERNATIVE 3: New South Entrance with an Upper Level Mezzanine

- 3A: East and west connections
- 3B: West connection only (modified to 3C)
- **3C: West connection only**

Preliminary Alternatives

Alternative 1A (Short Term)

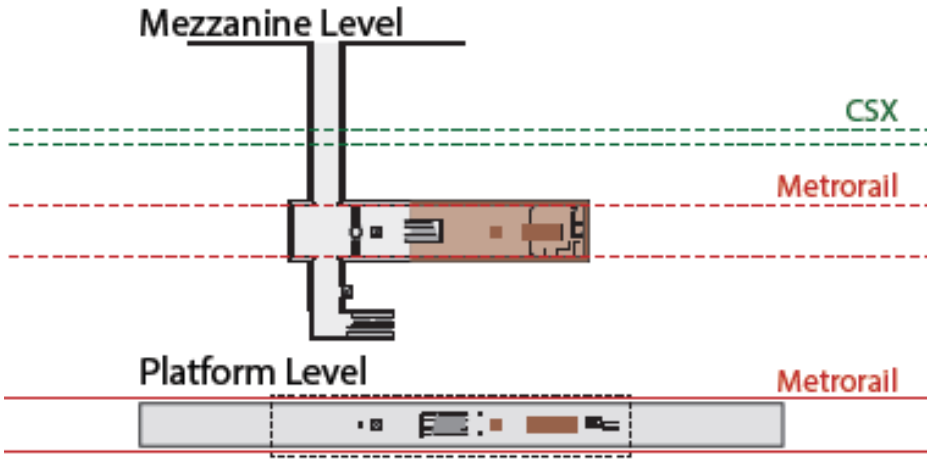
Open-Well Staircase



Platform/Mezzanine Crowding	✓
VCE Capacity	✓
Station Operations	–
Constructability	–

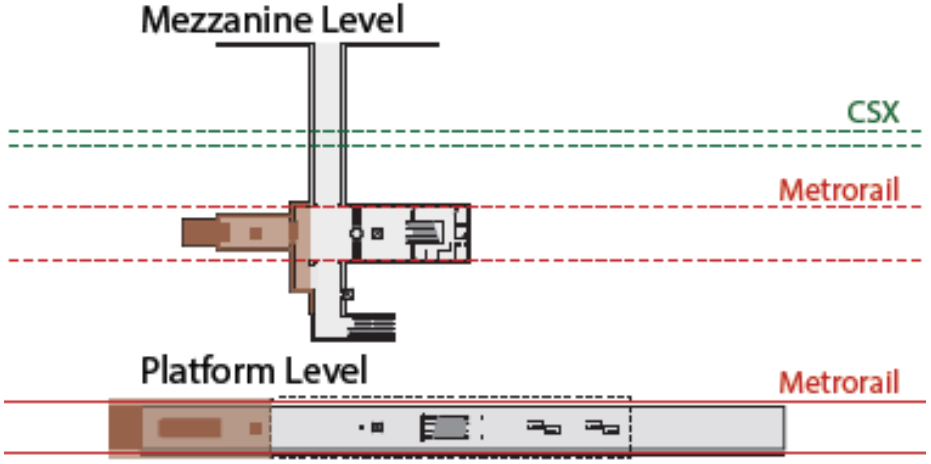
Preliminary Alternatives

✗ Alternative 1B (Short Term)
Extended Mezzanine South



Platform/Mezzanine Crowding	✗
VCE Capacity	✓
Station Operations	✓
Constructability	–

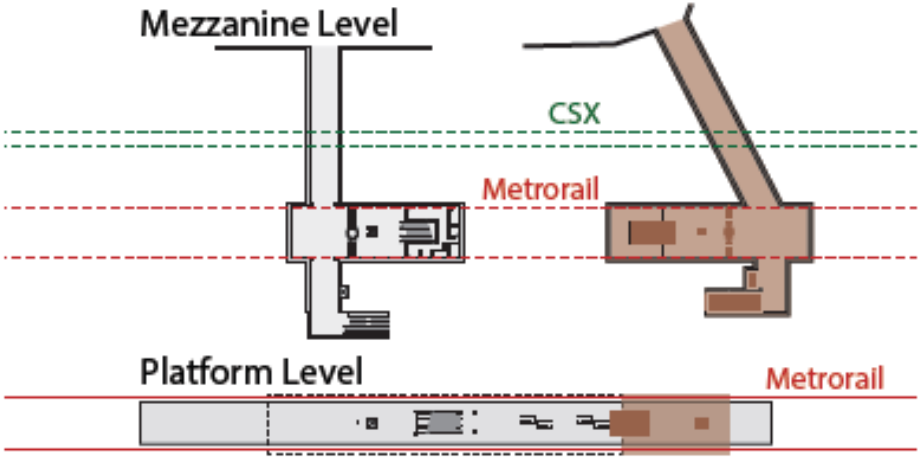
✗ Alternative 1C (Short Term)
Extended Mezzanine North



Platform/Mezzanine Crowding	✗
VCE Capacity	✓
Station Operations	✓
Constructability	–

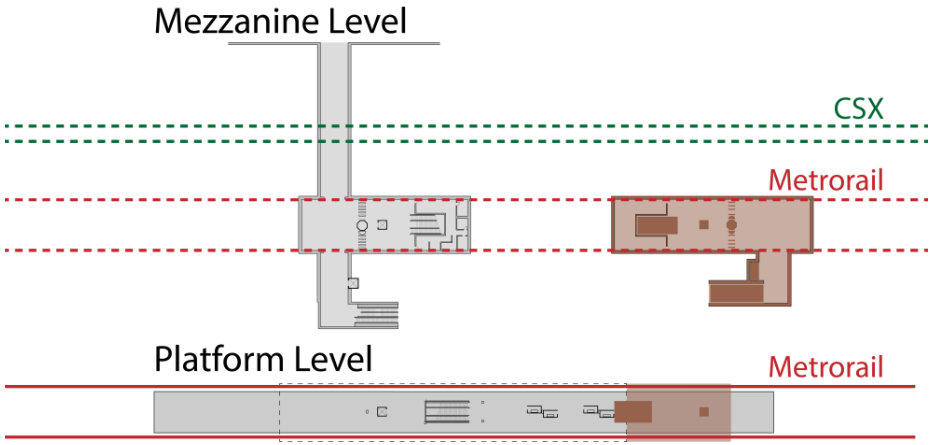
Preliminary Alternatives

Alternative 2A (Long Term)
Underground Mezzanine



Platform/Mezzanine Crowding	✓
VCE Capacity	✓
Station Operations	✓
Constructability	–

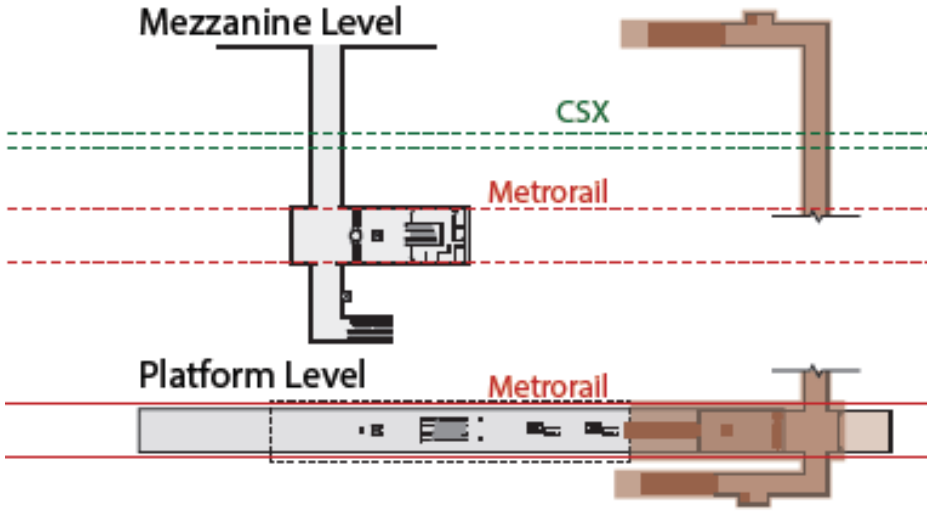
Alternative 2B (Long Term)
Underground Mezzanine



Platform/Mezzanine Crowding	✓
VCE Capacity	✓
Station Operations	✓
Constructability	–

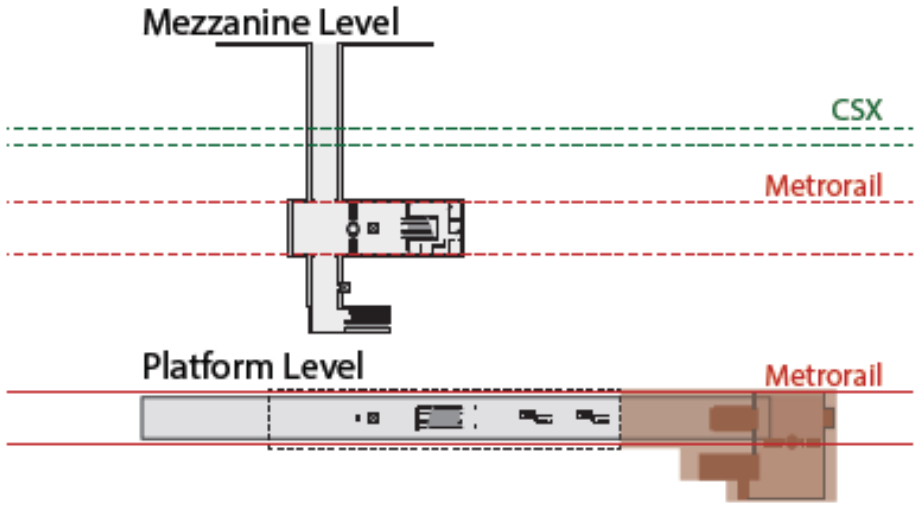
Preliminary Alternatives

Alternative 3A (Long Term)
Upper Level Mezzanine



Platform/Mezzanine Crowding	✓
VCE Capacity	✓
Station Operations	✓
Constructability	✗

Alternative 3C (Long Term)
Upper Level Mezzanine



Platform/Mezzanine Crowding	✓
VCE Capacity	✓
Station Operations	✓
Constructability	✓

PEDESTRIAN SIMULATIONS
OF
SELECTED ALTERNATIVES

Alternatives Simulated

- Alternative 1A (Short Term): Open-Well Staircase
- Alternative 2A (Long Term): New South Entrance with Underground Mezzanine (East and West Connections)
- Alternative 2B (Long Term): New South Entrance with Underground Mezzanine (West Connection Only)

Alternative 1A (Short Term)

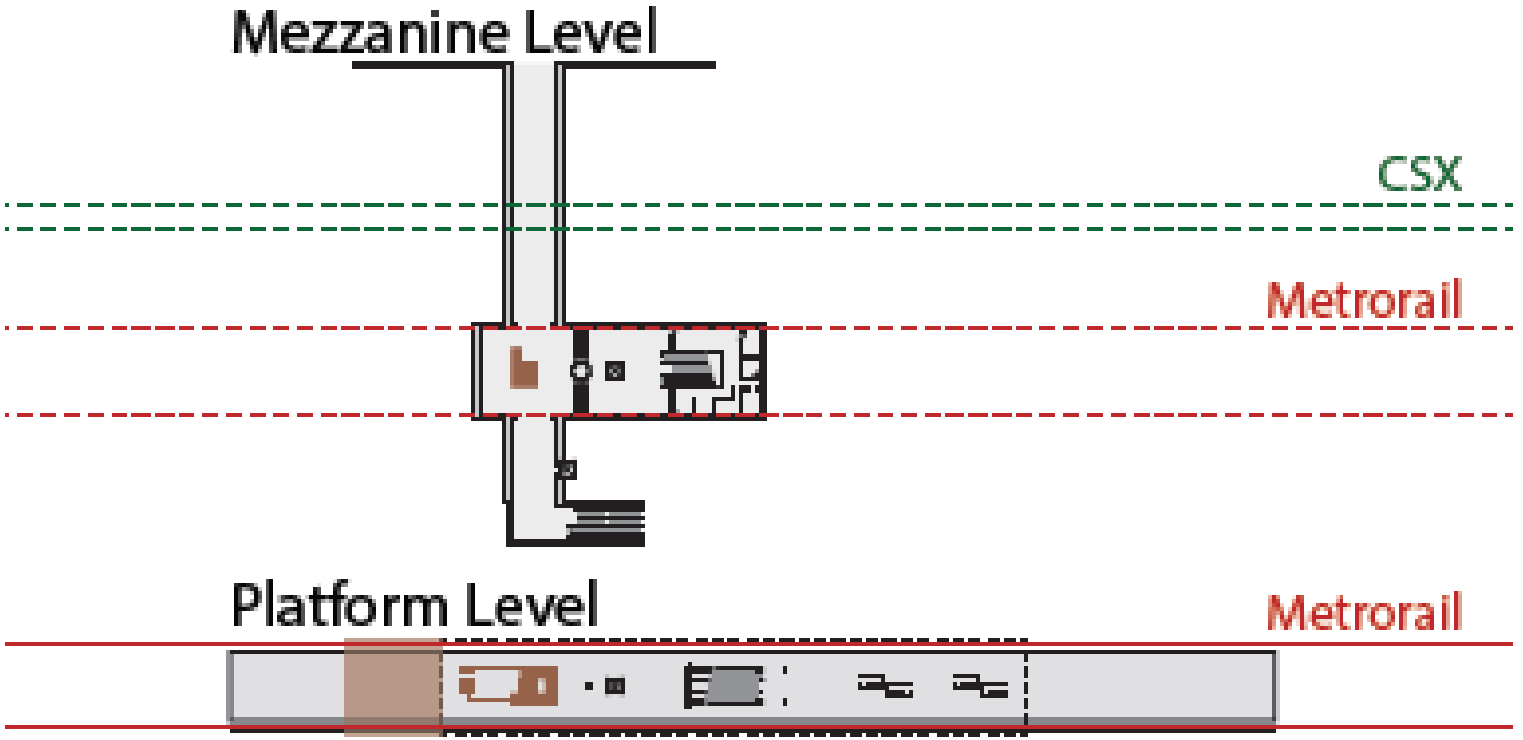
Open-well Staircase

Mezzanine Level

- New Stair to Platform

Platform Level

- New Faregates
- New Canopy Extension



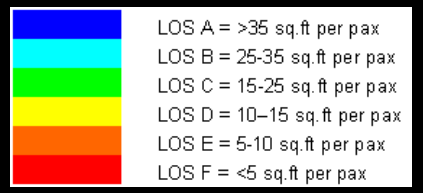
2020 Short Term Alternative AM Peak (15 Minutes)

Mezzanine Level
LOS E & F – 19%

2020 With CCT (LOS E & F – 17%)

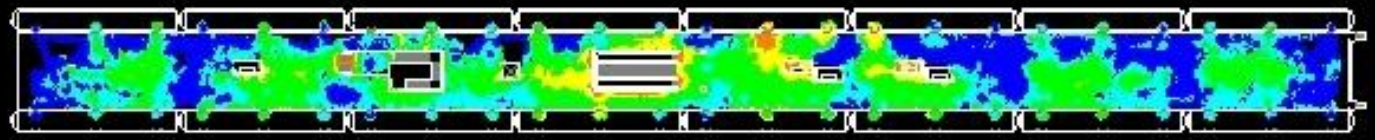
East Exit (Walk, Car & Bus)

West Exit (Walk, Car, Bus & CCT)

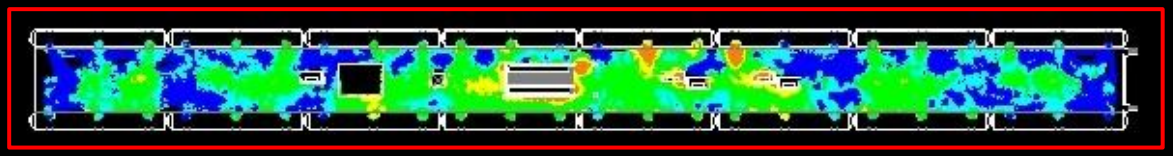


WMATA Red Line Platform
LOS E & F – 7%

Westbound Red Line



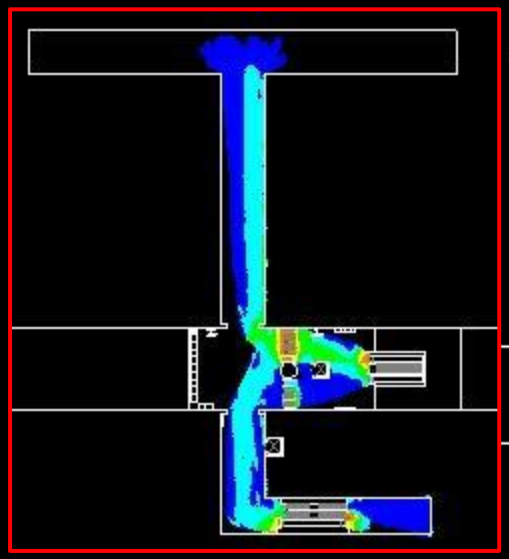
Eastbound Red Line



2020 With CCT (LOS E & F – 9%)

2020 Short Term Option PM Peak (15 Minutes)

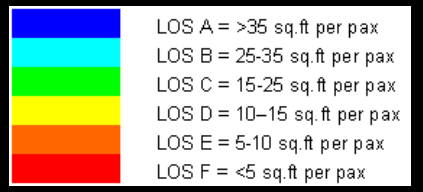
Mezzanine Level
LOS E & F – 4%



2020 With CCT (LOS E & F – 12%)

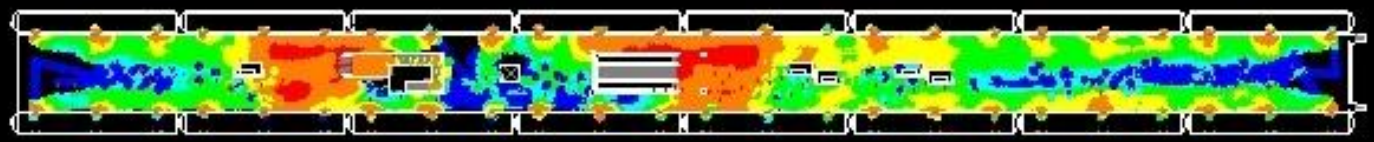
East Exit (Walk, Car & Bus)

West Exit (Walk, Car, Bus & CCT)

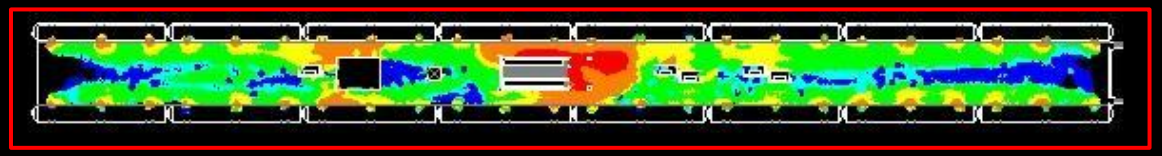


WMATA Red Line Platform
LOS E & F – 64%

Westbound Red Line



Eastbound Red Line



2020 With CCT (LOS E & F – 67%)

Alternative 2A (Long Term)

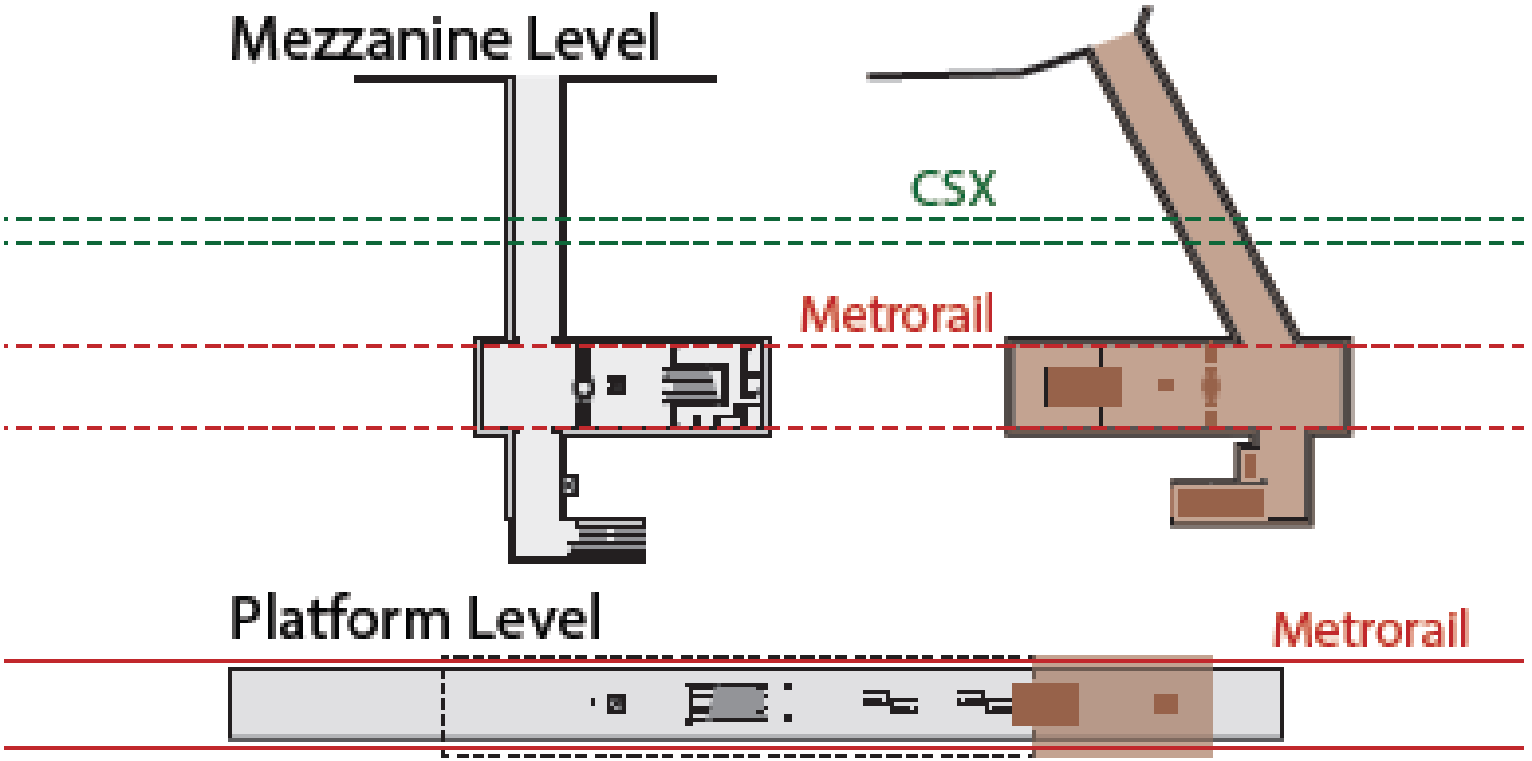
New South Entrance with Underground Mezzanine (East and West Connections)

Mezzanine Level:

- Entirely new underground mezzanine with all required services and amenities
- East and West Connections

Platform Level:

- New Stairs/ Escalator
- New Elevator
- New Canopy Extension

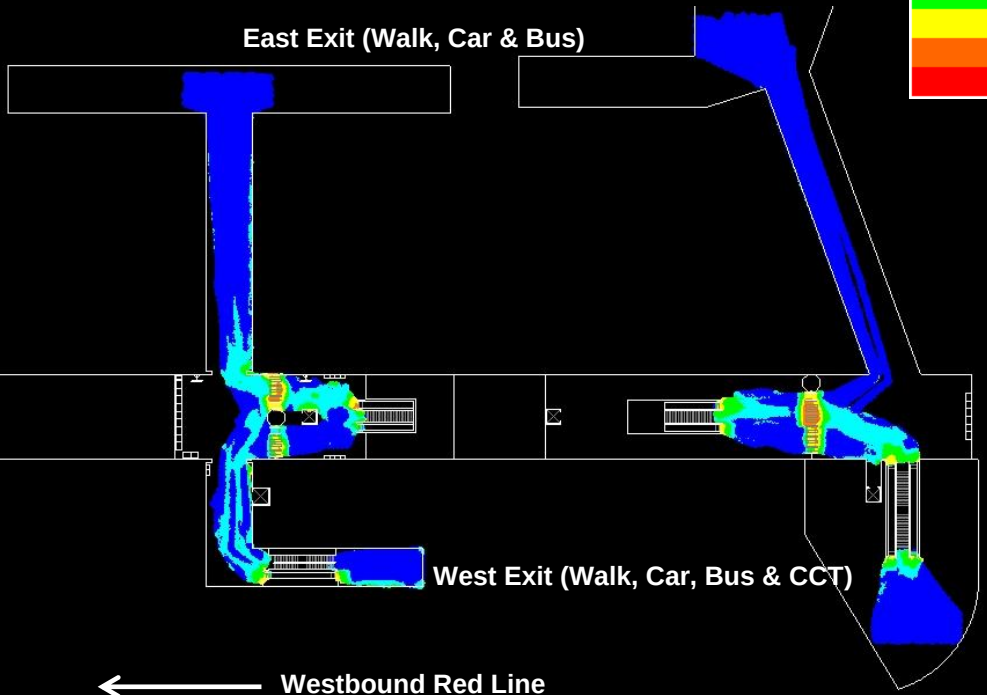


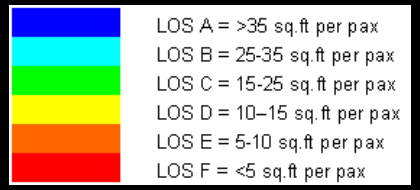
2030 Build Alternative 2A AM Peak (15 Minutes)

Mezzanine Level

LOS E & F – North 2%; South 2%

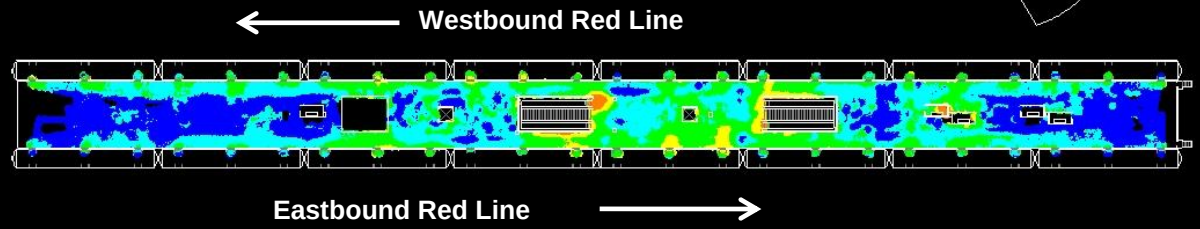
2030 No Build (LOS E & F – 91%)





WMATA Red Line Pl

LOS E & F – 8%



2030 No Build (LOS E & F – 28%)

2030 Build Alternative 2A PM Peak (15 Minutes)

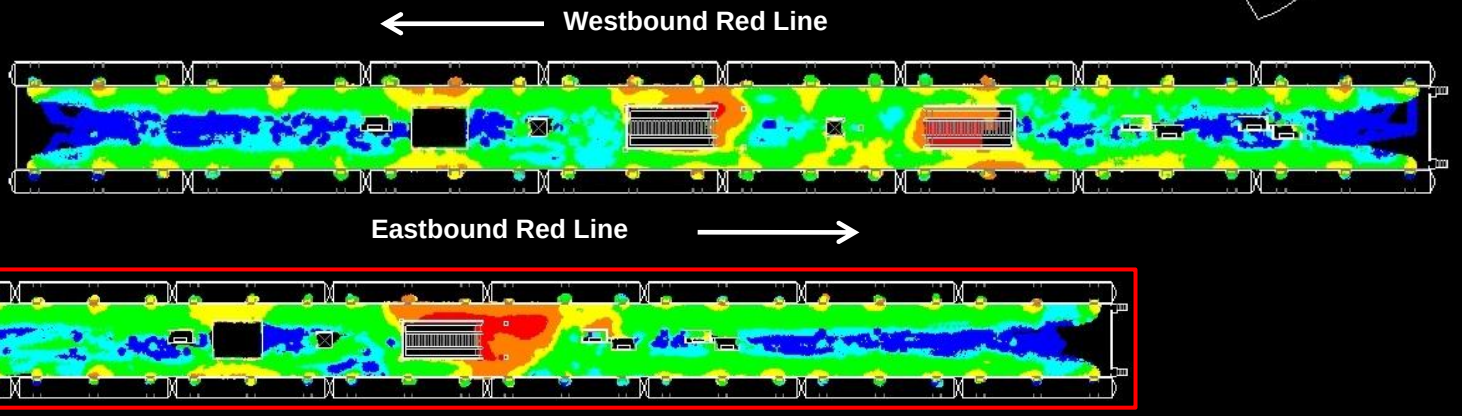
Mezzanine Level

LOS E & F – North 36%; South 5%

2030 No Build (LOS E & F – 51%)

WMATA Red Line Platform

LOS E & F – 18%



2030 No Build (LOS E & F – 50%)

Alternative 2B (Long Term)

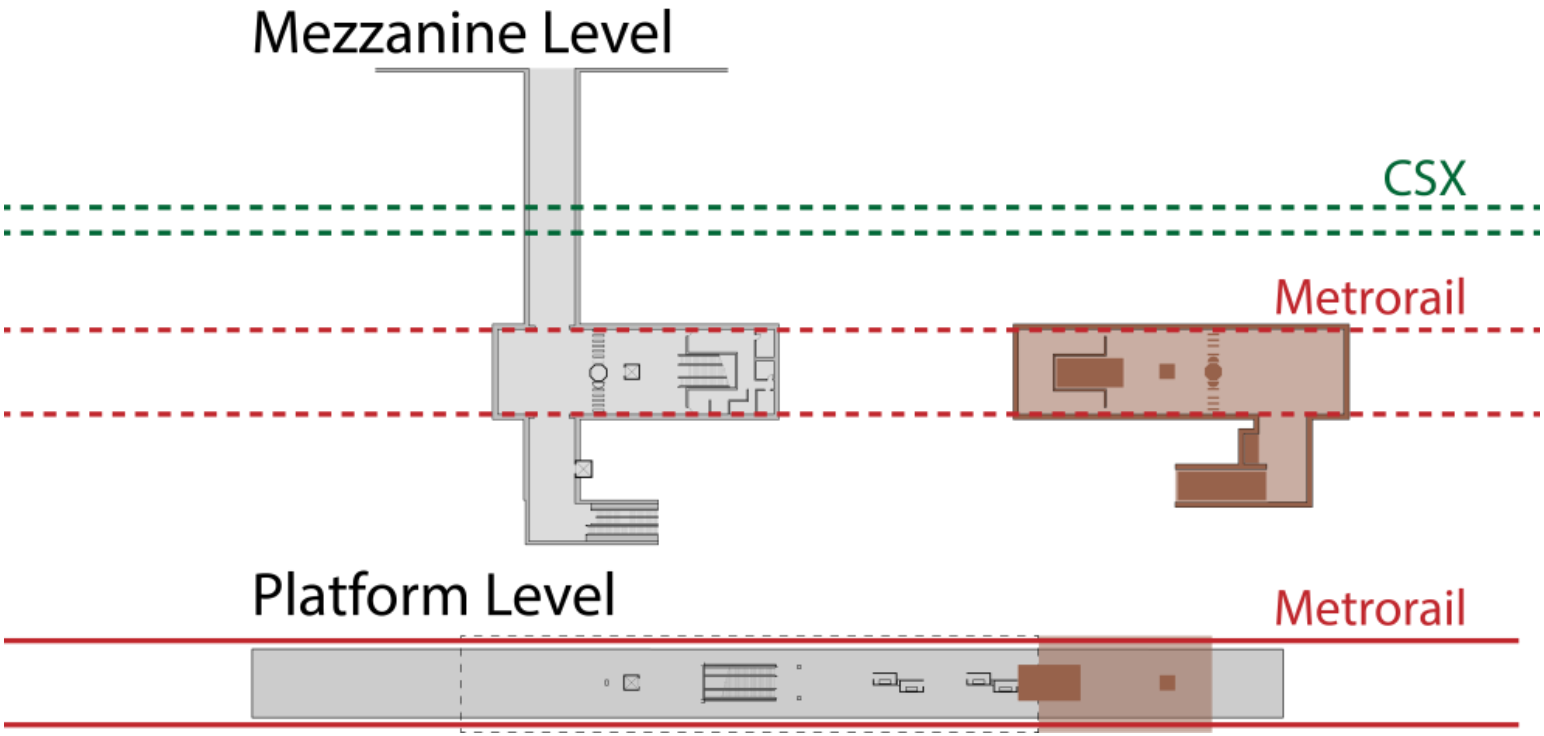
New South Entrance with Underground Mezzanine (West Connection Only)

Mezzanine Level:

- Entirely new underground mezzanine with all required services and amenities
- West Connection Only

Platform Level:

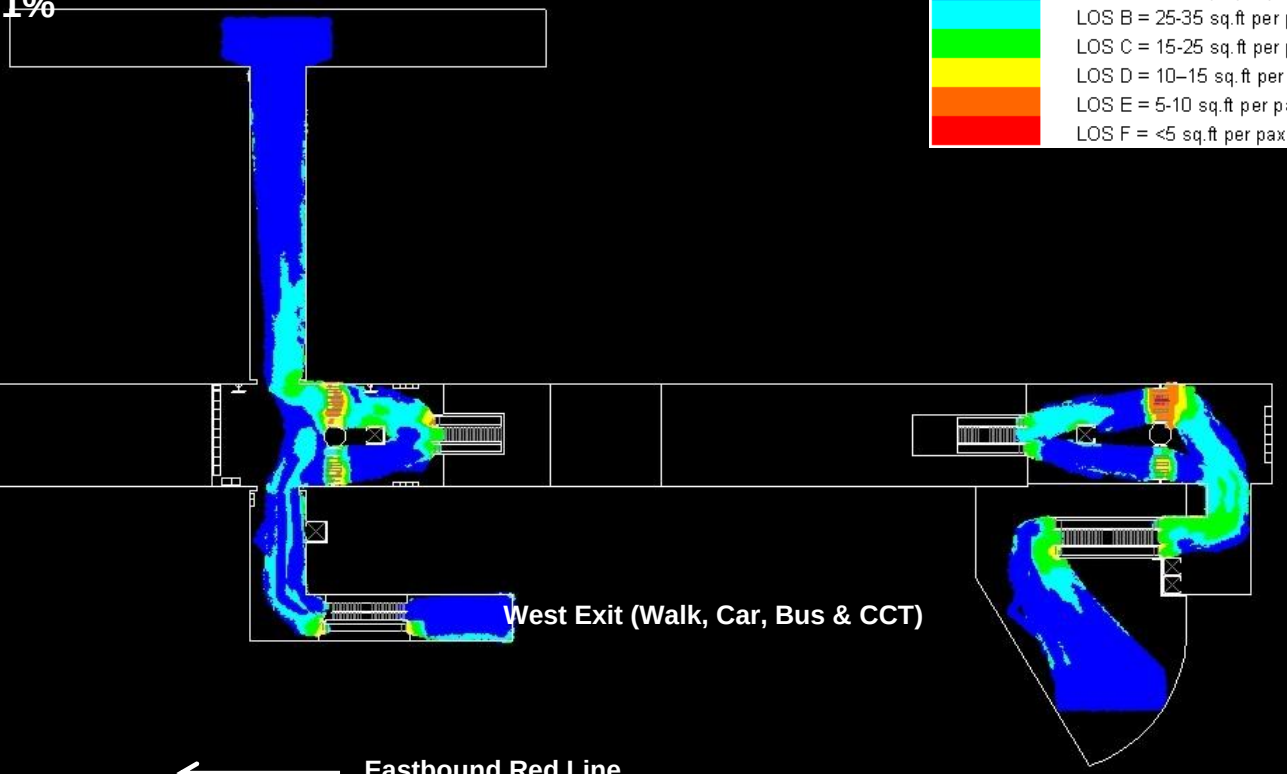
- New Stairs/ Escalator
- New Elevator
- New Canopy Extension



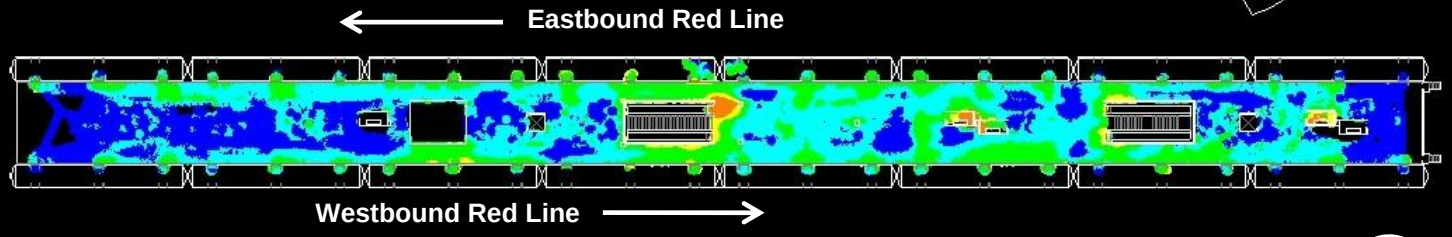
2030 Build Alternative 2B AM Peak (15 Minutes)

Mezzanine Level
LOS E & F – North 3%; South 1%

2030 No Build (LOS E & F – 91%)



WMATA Red Line Platform
LOS E & F – 7%



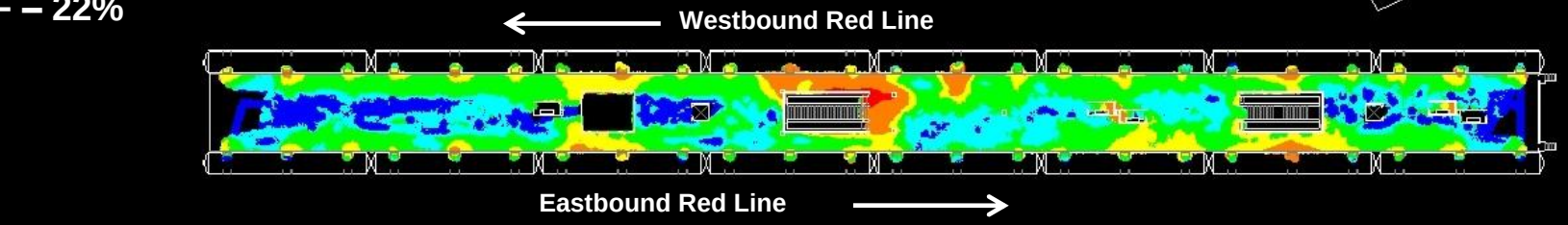
2030 No Build (LOS E & F – 28%)

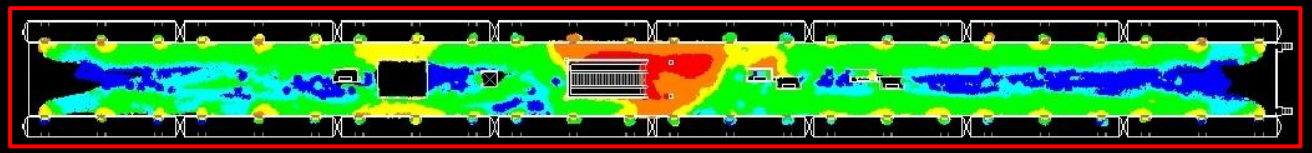
2030 Build Alternative 2B PM Peak (15 Minutes)

Mezzanine Level
LOS E & F – North 34%; South 1%

2030 No Build (LOS E & F – 51%)

WMATA Red Line Platform
LOS E & F – 22%





2030 No Build (LOS E & F – 50%)

COST COMPARISON
AND
RECOMMENDATION

Cost Comparison

Assumptions

- Reflects probable construction costs in the area in 2013
- Labor rates applicable to similar projects
- Alternative 1A built in 2017; Alternatives 2A, 2B or 3C built by 2025

	Alternative 1A	Alternative 2A	Alternative 2B	Alternative 3C
Construction	$571,100	$19,918,400	$17,217,400	$14,645,900
Contingencies	$182,800	$6,373,900	$5,509,600	$4,159,400
Escalation	$82,300	$11,757,900	$10,163,500	$7,225,000
Design, Engineering, Management	$250,900	$11,415,100	$9,867,100	$7,809,100
Construction Support	$167,200	$7,610,100	$6,578,100	$5,206,100
Total	**$1,254,300**	**$57,075,400**	**$49,335,700**	**$39,045,500**

Recommendation

Alternative 3C (Long Term)

New South Entrance with Upper Level Mezzanine (West Connection Only)

- Provides same benefits in terms of reducing crowding as 2B
- Easy to construct – no conflicts with tracks or underground utilities
- More cost effective compared to 2B because above ground (Approx. $39MM vs. $49.3MM for 2B)

Alternative 3C (Long Term)

New South Entrance with Upper Level Mezzanine (West Connection Only)

Mezzanine Level:

- Entirely new upper level mezzanine with all required services and amenities
- West Connection only

Platform Level:

- New Stairs/Escalator up to the mezzanine
- New Elevator
- New Canopy Extension