Plan & Briefing Purpose

• **Plan Purpose:**
  • Prioritize transit alternatives along I-270 Corridor
  • Develop implementation plan to realize options

• **Briefing Purpose:**
  • Process milestones
  • Transit mode attributes
  • Conceptual transit alternatives
  • Outreach strategies
Requested Guidance from Planning Board:

1. Confirm that previously excluded modes should remain outside the scope of the project.
2. Impressions on the existing Corridor Cities Transitway alignment and discussion on the study of alternate alignments.
3. Provide feedback on initial pre-screening framework.
Plan Milestones

**Spring-Early Winter 2020**
- Inventory *mode attributes*
- Develop conceptual *transit alternatives*

**Winter 2021**
- Pre-screening and refinement:
  - identify *six key alternatives*
- Develop *metrics* to compare key alternatives
- Develop and execute *methodology* to realize metrics

**Early Spring 2021**
- Prioritize alternatives based on metrics
Plan Milestones

Late Spring-Summer 2021
- Solicit feedback and solidify priorities
- Develop preliminary recommendations

Fall 2021
- Refine preliminary recommendations
- Develop implementation plan
Stop Spacing

- **Bus**: Local: 0.1 – 0.25 mi, Limited: 0.25 – 0.5 mi, Express: 0.5 – 1.0 mi
- **Streetcar**: 0.2 - 0.4 mi
- **Bus Rapid Transit (BRT)**: 0.25 - 1.0 mi
- **Urban Style Light Rail**: 0.25 – 1.0 mi
- **Light Rail Transit (LRT)**: 0.5 - 1.0 mi
- **Monorail**: 0.5 - 1.0 mi
- **Metro / Subway**: 0.5 - 1.5 mi
- **Commuter Rail**: 1.5 - 3.0 mi
Cost Factors

Capital Cost Per Mile¹

- Bus: $6k to $12k/Mi.
- Streetcar: $20M to $25M/Mi.
- Bus Rapid Transit (BRT): $2M to $5M/Mi.
- Urban Style Light Rail: $60M to $80M/Mi.
- Light Rail Transit (LRT): $200M to $300M/Mi.
- Monorail: $80M to $160M/Mi.
- Metro / Subway: $500M to $800M/Mi.
- Commuter Rail: $30M to $100M/Mi.

Operating Cost Per Mile²

- Bus: $11.82/ML
- Streetcar: $32.64/ML
- Bus Rapid Transit (BRT): $21.84/ML
- Urban Style Light Rail: $19.69/ML³
- Light Rail Transit (LRT): $19.69/ML³
- Monorail: $22.61/ML
- Metro / Subway: $13.22/ML
- Commuter Rail: $18.31/ML

Operating Cost per Passenger Mile²

- Bus: $1.31/P-ML
- Streetcar: $2.02/P-ML
- Bus Rapid Transit (BRT): $1.31/P-ML
- Urban Style Light Rail: $0.91/P-ML³
- Light Rail Transit (LRT): $0.91/P-ML³
- Monorail: $3.45/P-ML
- Metro / Subway: $0.54/P-ML
- Commuter Rail: $0.51/P-ML

¹ Capital cost data from example system
² Operating cost data from 2018 NTD reports
³ NTD definitions combine urban LRT and guideway LRT
# Implementation Factors

<table>
<thead>
<tr>
<th>Mode</th>
<th>Segregation</th>
<th>Alignment Width</th>
<th>Maximum Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus</td>
<td>Mixed traffic</td>
<td>12 ft.</td>
<td>12%</td>
</tr>
<tr>
<td>Streetcar</td>
<td>Mixed traffic</td>
<td>10 ft.</td>
<td>8%</td>
</tr>
<tr>
<td>Bus Rapid Transit</td>
<td>Dedicated ROW / shoulder lane</td>
<td>12 ft.</td>
<td>12%</td>
</tr>
<tr>
<td>(BRT)</td>
<td>(within street w/signals)</td>
<td>10 ft.</td>
<td>8%</td>
</tr>
<tr>
<td>Urban Style Light Rail</td>
<td>Dedicated Right-of-way (Tunneled / Elevated)</td>
<td>12 ft.</td>
<td>6%</td>
</tr>
<tr>
<td>Light Rail Transit (LRT)</td>
<td>Grade-separated (Tunneled / Elevated)</td>
<td>10 ft.</td>
<td>6%</td>
</tr>
<tr>
<td>Monorail</td>
<td>Grade-separated (Tunneled / Elevated)</td>
<td>15 ft.</td>
<td>6%</td>
</tr>
<tr>
<td>Metro / Subway</td>
<td>Grade-separated (Tunneled / Elevated)</td>
<td>15 ft.</td>
<td>6%</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>Segregated Right-of-way (at grade)</td>
<td>15 ft.</td>
<td>2%</td>
</tr>
</tbody>
</table>
Excluded Modes

Personal Rapid Transit (PRT)

Requested Guidance:

1. Confirm that previously excluded modes should remain outside the scope of the project.
Conceptual Alternatives

- Based primarily on options in the public sphere (master plans, regional studies)
- New I-270 running options informed by:
  - origin-destination analyses
  - population and employment density
- Considered southern desire points include new transit access and logical transfers
  - New Demand: Tysons/Dunn Loring (yellow)
  - Western Corridor: Bethesda/NIH (navy)
  - Eastern Corridor: Silver Spring (red)
- Pre-screening: off-model approach to sift, refine, and eliminate lower-performing alternatives
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- New I-270 running options informed by:
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  - Western Corridor: Bethesda/NIH (navy)
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- Pre-screening: off-model approach to sift, refine, and eliminate lower-performing alternatives
Conceptual Alternatives Summary

1. MD 355 (BRT)
2. MARC Improvements (Commuter Rail)
3. Redline Extension 1 (Metrorail)
4. Redline Extension 2 (Metrorail)
5. Corridor Cities Transitway (BRT)
6. Purple Line Extension (LRT)
7. North Bethesda Transitway Extension (BRT)
8. I-270 Monorail (Monorail)
9. I-270 Managed Lanes Bus (Bus)
10. I-270 Light Rail (LRT)
11. I-270 BRT to Bethesda (BRT)
12. I-270/I-495 BRT to NoVa (BRT)
13. I-270/I-495 BRT to Silver Spring (BRT)
Alternative 1: MD 355 BRT

**Origin:** Countywide Transit Corridors Functional Master Plan (2013)

**From:** Clarksburg

**To:** Bethesda

**Context:** Based on work to date and coordination with MCDOT, this option has been excluded from further study and is assumed as background (i.e., implemented by 2045).

**Rationale:**
- Quality service along extended corridor
- Provides service to new communities
- Provides access to employment centers
- Increases transfer opportunities.
Alternative 2A: MARC Rail Station Revision


From: Frederick/Martinsburg
To: Union Station

Context: CSX policy constraints prevent new stations without the closure of existing stations along existing Brunswick Line. Option assumes new service at Shady Grove and White Flint, which would require closures of existing low-volume stations (TBD).

Rationale:
- Accepts near-term policy constraints
- Envisions more equitable service
- Supports planned growth
- Improves transfer opportunities
Alternative 2B: MARC Rail Additional Mainline Track

**Origin:** Various Master Plans, including the Countywide Transit Corridors Master Plan (2013) & Maryland Transit Administration’s (MTA) MARC Rail Cornerstone Plan (2018).

**From:** Frederick/Martinsburg

**To:** Union Station

**Context:** Additional mainline track (third track) and capacity enhancements - improves potential for two-way and all-day service.

**Rationale:**
- Increase utility of existing infrastructure
- Consider additional stations (see 2A)
- Consider Cornerstone Plan’s service program
- Support equity & economic health
Alternative 3A & 3B: Redline Extension to Gaithersburg

Origin: Washington Metropolitan Area Transit Authority’s (WMATA) Connecting Greater Washington Study (2016)

From: Gaithersburg
To: Shady Grove Metrorail Station

Context: Extend redline from Shady Grove to Gaithersburg via CSX Brunswick Line ROW or MD 355 ROW; consider two potential stations Downtown Gaithersburg and TBD terminus

Rationale:
• Most-requested in public forums
• Support Transit-Oriented Development
• Support equity & economic health
Alternative 4A & 4B: Redline Extension, Gaithersburg to Germantown

**Origin:** Washington Metropolitan Area Transit Authority’s (WMATA) Connecting Greater Washington Study (2016)

**From:** Germantown  
**To:** Shady Grove Metrorail Station

**Context:** Extend redline to Germantown via CSX Brunswick Line ROW or MD 355 ROW; consider three additional stations (see 3A/3B)

**Rationale:**  
- Most requested mobility improvement in public forums  
- Support Transit-Oriented Development  
- Improve equitable access
Alternative 5: Corridor Cities Transitway

Origin:
- Quality transit envisioned in various Corridor Cities plans in mid 1980s
- Additional Department Studies - 1990s
- State coordination - early 2000s through present

From: Clarksburg (Phase 2 Terminus)
Via: Metropolitan Grove (Phase 1 Terminus)
To: Shady Grove Metrorail Station (Phase 1)

Context: Phase 1 – Bus Rapid Transit connecting King Farm, Crown Farm, Life Sciences Center, Kentlands, and Metropolitan Grove includes partial 30 percent designs from MTA; no existing design work on Phase 2 (Metropolitan Grove to Clarksburg)

Rationale:
- Justified development in corridor cities
- Support economic health
- Further connectedness & complete communities
Requested Guidance:

2. Impressions on the existing Corridor Cities Transitway alignment and discussion on the study of alternate alignments.
Alternative 6: Purple Line Extension

Origin: Northern Virginia Transportation Authority’s (NVTA) TransAction 2040

From: Bethesda
To: Tysons (or potentially Dunn Loring)

Context: Light rail service between Bethesda and Tysons in Northern Virginia; Potomac crossing assumed within confines of American Legion Bridge; dropped from TransAction 2045

Rationale:
- Frequently requested in public forums
- Support access to jobs in Virginia from points east, including Prince George’s County
- Existing transit service not travel time competitive
Alternative 7: North Bethesda Transitway Extension

**Origin:** Countywide Transit Corridors Functional Master Plan Appendix (2013), NVTA’s TransAction 2045

**From:** North Bethesda (White Flint)
**To:** Tysons (or potentially Dunn Loring)

**Context:** Bus Rapid Transit Service between North Bethesda (White Flint) and NoVa; hybrid service concept with stops in White Flint and Tysons, but limited/no intermediary stops; Potomac crossing assumed within confines of American Legion Bridge

**Rationale:**
- Support economic health in White Flint and Northern Virginia
- Provide a more time-efficient transit option to points in Northern Virginia
Alternative 8: I-270 Monorail

**Origin:** I-270/US-15 Multimodal Corridor Study (2002 - not carried forward) High Road Foundation (2020), Maryland Department of Transportation Feasibility Study (forthcoming)

**From:** Frederick
**To:** Shady Grove

**Context:** Monorail service between Frederick and Shady Grove with six proposed station locations.

**Rationale:**
- Requested based on High Road Foundation’s efforts
- Improve economic potential
- Small-footprint elevated service
- Low environmental footprint
Alternative 9: Managed Lanes Enhanced Commuter Bus County Tech Corridor Extended


To: Germantown (or points north such as Clarksburg, per State work)
From: Bethesda (or points west in NoVa, per State work)

Context: Commuter bus operates in managed lanes with minimal diversions to high demand points such as Shady Grove, Rockville, and Rock Spring.

Rationale:
• Low-cost option, if managed lanes are constructed
Alternative 10: I-270 Light Rail
County Tech Corridor

**Origin**: New I-270 Running Option

**From**: Gaithersburg (or Germantown)

**To**: Bethesda

**Context**: Light rail transit running as separated or elevated service in I-270 or MD-355 ROW

**Rationale**: Improve access to jobs and services in Bethesda, as well as transfer opportunities to different markets.
Alternative 11: I-270 Bus Rapid Transit
County Tech Corridor

Origin: New I-270 Running Option

From: Gaithersburg (or Germantown)
To: Bethesda

Context: Bus rapid transit service running as separated or elevated service in I-270 ROW

Rationale:
• Improve access to jobs and services in Bethesda, as well as transfer opportunities to different markets.
Montgomery County Planning Department

Alternative 12: I-270/I-495 Bus Rapid Transit
Northern Virginia

**Origin:** New I-270/I-495 Running Option

**From:** Frederick
**To:** Tysons (or Dunn Loring)

**Context:** Bus rapid transit service running as separated or elevated service in I-270/I-495 ROW

**Rationale:**
- Improve access to jobs and services downcounty (Bethesda, NIH) as well as Northern Virginia. Provides transfer opportunities to different markets.
Silver Spring

**Origin:** New I-270/I-495 Running Option

**From:** Frederick  
**To:** Silver Spring

**Context:** Bus rapid transit service running as separated or elevated service in I-270/I-495 ROW

**Rationale:**
- Improve access to jobs and services in Silver Spring, as well as transfer opportunities to different markets on the eastern side of the County and WMATA’s Metrorail Red Line.
### Pre-Screening

**Pre-Screening Steps:**
1. Organize projects by cost and geography
2. Analyze performance
3. Evaluate and refine options
4. Select six high-performing options for robust comparative analysis

**Requested Guidance:**
3. Provide feedback on initial pre-screening framework.

#### Step 2: Sample Pre-Screening Metrics

<table>
<thead>
<tr>
<th>Plan Value</th>
<th>Steps: Sample Pre-Screening Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Connections</strong></td>
<td>travel time between key destinations</td>
</tr>
<tr>
<td></td>
<td>population within walking distance of anticipated station locations</td>
</tr>
<tr>
<td><strong>Economic Health</strong></td>
<td>jobs within walking access of anticipated station locations</td>
</tr>
<tr>
<td></td>
<td>density of connected activity centers</td>
</tr>
<tr>
<td></td>
<td>adjacency of master-planned development</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>equity emphasis/focus areas served</td>
</tr>
<tr>
<td></td>
<td>number of lower income people within walking access of assumed stations</td>
</tr>
</tbody>
</table>
Pre-Screening Steps:
1. Organize projects by cost and geography
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Community Outreach

- September 30th Public Kick-Off
- Stakeholder Meeting
- Educational Videos
- Infographic
- Interactive Web Map
- Transit Values Questionnaire
- Upcoming Outreach
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• Citizen Transportation Boards
• Transportation Management Districts
• City of Rockville
• City of Gaithersburg
• Montgomery County Economic Development Corporation
• Maryland Building Industry Association
• Action Committee for Transit
• Coalition for Smarter Growth
• Community Action Board
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Transit Characteristics

- **Reliability**: 45%
- **High Ridership**: 39%
- **Frequency**: 23%
- **Ease of Implementation**: 16%

% who select this characteristic as their top priority
Community Outreach

- September 30th Public Kick-Off
- Stakeholder Meetings
- Educational Videos
- Infographic
- Interactive Web Map
- Transit Values Questionnaire
- Upcoming Outreach

Goal: Solicit feedback from current transit users and populations residing in equity focus areas

Strategies:
- Interior bus signage study area routes
- Mailers to targeted communities
Next Steps - Winter 2021
• Pre-screening and refinement:
  • identify six key alternatives
• Develop metrics to compare six key alternatives
• Develop and execute methodology to realize metrics

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