# Dolley Madison Boulevard Corridor Study

June 13, 2019

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Fairfax County Department of Transportation



## Agenda

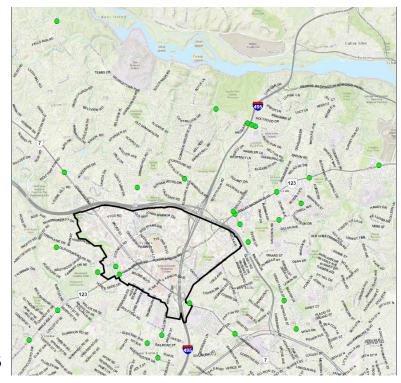
- Background (How we got here)
- Existing Conditions
- Short-Term Corridor Improvement Concepts/Analysis
- Interchange Improvement Concepts/Analysis
- Conclusions/Next Steps
- Questions/Comments





## Background

- Tysons Neighborhood Study
  - Evaluated 30 intersections in the area surrounding Tysons to provide potential future mitigations
  - Two main intersections along the Dolley Madison Corridor
    - Great Falls/Lewinsville
    - Old Dominion
  - Initial analyses showed the need for significant long-term improvements at these locations





## Background

#### Questions!

- Can we provide short-term improvements that provide benefits now and into the near future (~ 10 years in the future)?
- Do the conditions at one intersection contribute to conditions at one or more of the other locations along the corridor?
- What are the community thoughts about either providing shortterm improvements or providing longer-term interchange improvements?



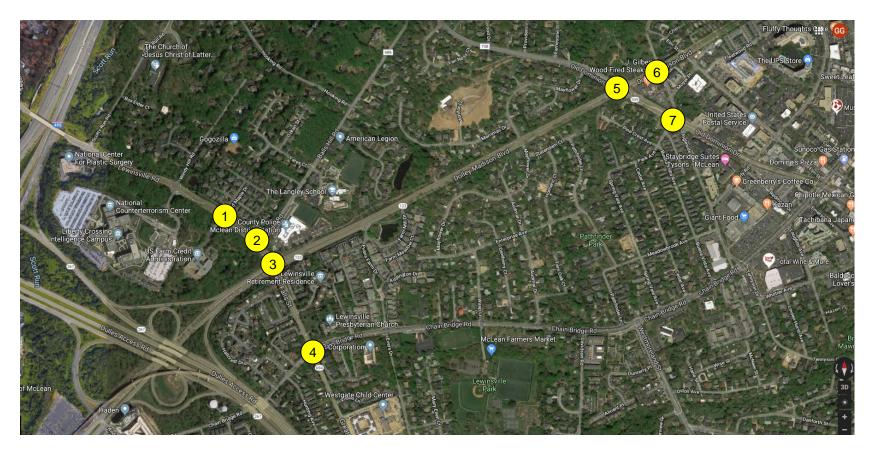
## Background

- Dolley Madison Corridor Study
  - Four Neighborhood Study Intersections
    - Dolley Madison Boulevard and Great Falls Street/Lewinsville Road
    - Dolley Madison Boulevard and Old Dominion Drive
    - Chain Bridge Road and Great Falls Street
    - Lewinsville Road and Balls Hill Road
  - Other Intersections
    - Dolley Madison Boulevard and Ingleside Avenue
    - Old Dominion Drive and Ingleside Avenue
    - Lewinsville Road and Old Maple Drive/Farm Credit Drive was later added once a concept was included that made changes to that location

Note: Dolley Madison Boulevard and Anderson Road was initially included but not studied for improvements, as it was an overlap location with the Route 123 Modified Intersection Treatment Study



# **Existing Conditions**



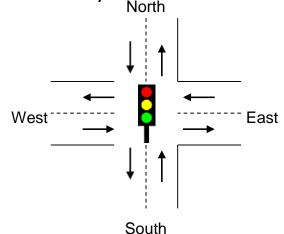


### **Existing Conditions**

#### How We Evaluate Conditions

- Level of Service and Delay
  - Level of Service (LOS) is a qualitative measure that describes how intersections operate using the familiar "school grade" designation (A through F).
  - Level of Service is based upon the average delay that vehicles experience at a given intersection (includes all movements).

Signalized Intersection Delay and LOS					
Α	≤10 sec	D	35–55 sec		
В	10–20 sec	Е	55–80 sec		
С	20–35 sec	F	>80 sec		





### **Existing Conditions**

Int. #	Intersection	Existing (AM)	Existing (PM)
1.	Lewinsville/Old Maple*	N/A	N/A
2.	Lewinsville/Balls Hill	38.6 (D)	70.5 (E)
3.	Dolley Madison/Great Falls/Lewinsville	86.7 (F)	115.3 (F)
4.	Great Falls/Chain Bridge	35.1 (D)	91.1 (F)
5.	Dolley Madison/Old Dominion	36.9 (D)	41.4 (D)
6.	Dolley Madison/Ingleside	2.0 (A)	11.0 (B)
7.	Ingleside/Old Dominion	1.2 (A)	2.6 (A)

<sup>\*</sup> Lewinsville/Old Maple was not initially part of this analysis, but because a concept required changes to the intersection, it was added for analysis under the proposed concepts.



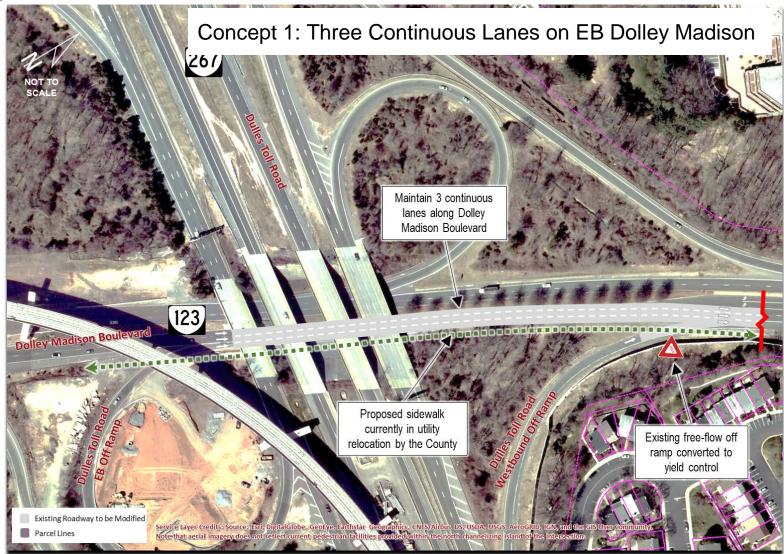
# Short-Term Corridor Improvement Concepts

- <u>Reminder</u>: Address existing conditions, but also can be helpful in the short-to-near term (10 or so years into the future)
- Focused on turn lanes, traffic signals, markings not interchange concepts – attempting to minimize private property impacts
- "Short-term" Future Conditions based on 2027 traffic forecasts (including developments in the surrounding areas)
- Five basic concepts were initially developed
  - Not all concepts need to be implemented, but the fewer concepts implemented, the less likely improved traffic conditions are to be achieved
- Each concept has benefits and drawbacks





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# Short-Term Corridor Improvement Concepts

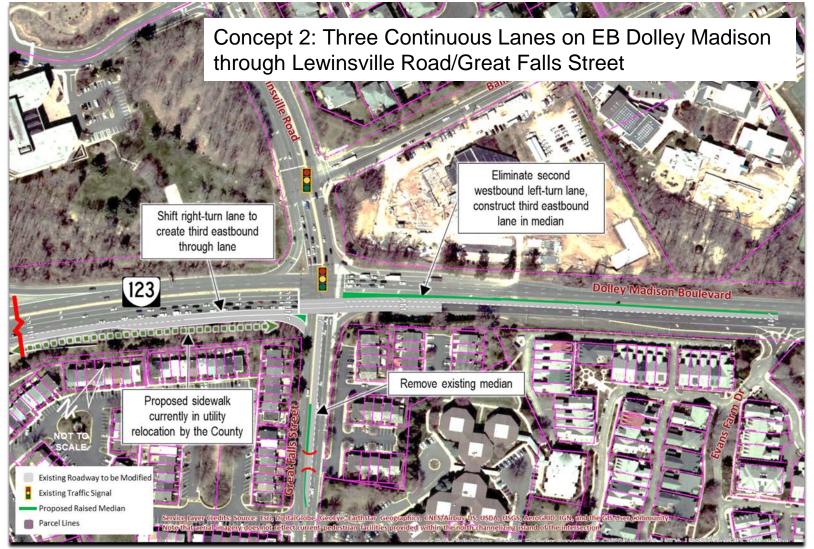
Concept 1: Three Continuous Lanes on EB Dolley Madison

- Benefits:
  - Gaining an additional eastbound through lane on Dolley Madison
  - Avoids lane merge east of EB Toll Road off ramp
- Drawbacks:
  - Trees within the median (and the median) would be removed
  - Free flow merge conditions from WB Toll Road off-ramp to NB Dolley Madison becomes a Yield condition
  - Could create traffic bottleneck around Great Falls/Lewinsville intersection





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# Short-Term Corridor Improvement Concepts

Concept 2: Three Continuous Lanes on EB Dolley Madison through Lewinsville Road/Great Falls Street

- Benefits:
  - Gaining an additional eastbound through lane on Dolley Madison through the Lewinsville/Great Falls intersection
- Drawbacks:
  - Losing the second WB left turn lane from Dolley Madison
  - Creates lane merge/potential bottleneck east of Great Falls/Lewinsville

This concept only makes sense if the previous concept (concept 1) is also implemented





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# Short-Term Corridor Improvement Concepts

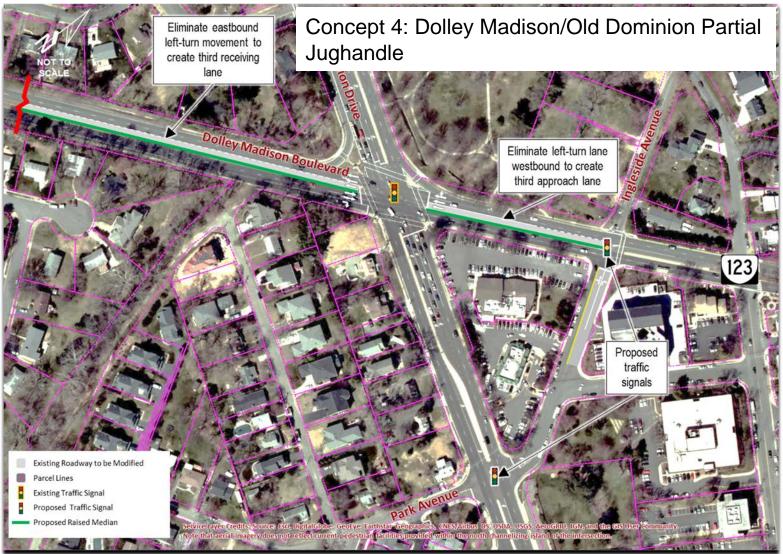
Concept 3/3a: Restricted Left Turns from Balls Hill Road and/or Additional Lanes on Lewinsville Road

- Benefits:
  - Allows for additional through lane capacity on Lewinsville Road
  - Allows for additional stacking on Lewinsville Road
  - Simplifies Balls Hill/Lewinsville intersection conflicts and spacing issues with Dolley Madison/Lewinsville
- Drawbacks:
  - Traffic rerouted out of Balls Hill
  - Removal of one of the left turn lanes into Farm Credit Drive
  - Removal of some areas of median space





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# Short-Term Corridor Improvement Concepts

Concept 4: Dolley Madison/Old Dominion Partial Jughandle (Includes Signals at Dolley Madison/Ingleside and Ingleside/Old Dominion)

- Benefits:
  - Number of signal phases reduced at Old Dominion/Dolley Madison;
     more green time available for other movements
  - Allows for an additional WB through lane at the intersection
- Drawbacks:
  - Aforementioned WB through lane would drop shortly after the intersection
  - Challenging access for properties on west side of Old Dominion
  - Rerouted traffic through potential unfamiliar traffic patterns





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# Short-Term Corridor Improvement Concepts

Concept 5: Exclusive Left-Turn Lanes at Lewinsville Road/Great Falls Street

- Benefits:
  - Allows for removal of "split phase," thus allowing for concurrent left turns and a more efficient traffic signal timing structure
- Drawbacks:
  - Potential ROW needs (south side of Dolley Madison)
  - Addition of median on Great Falls may be needed, which would block access to apartments



## Short-Term Improvements Analysis

- Each of the five concepts was combined into one network and analyzed based on the following criteria:
  - Level of Service
  - Delay
  - Queuing



## Short-Term Improvements Analysis

How We Evaluate Conditions (Part 2)

Queuing

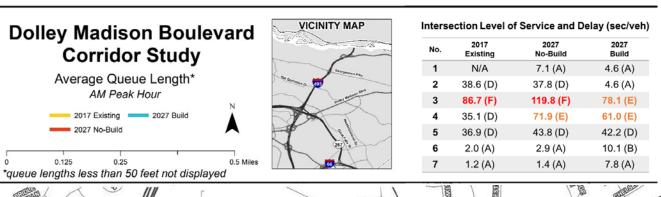
 Queuing measures the average distance (in feet) vehicles are stacked leading from an approach to an intersection over the period being

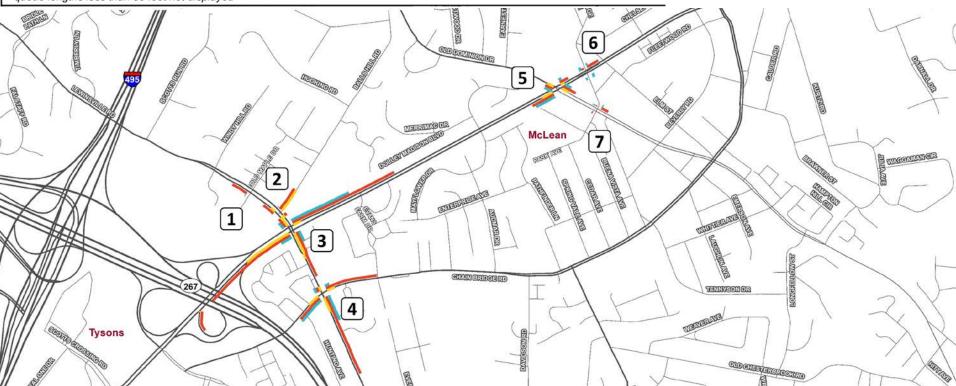
analyzed.



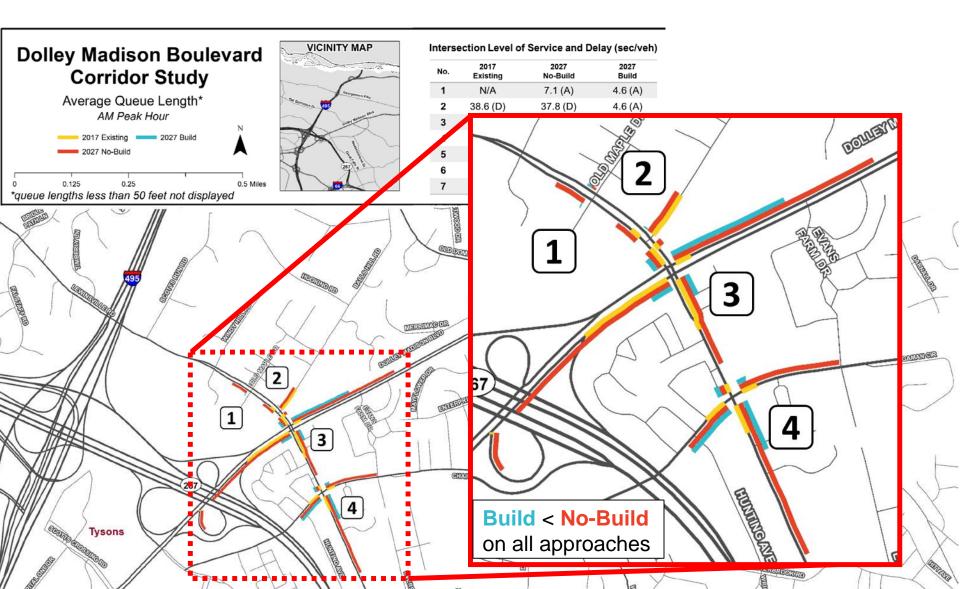


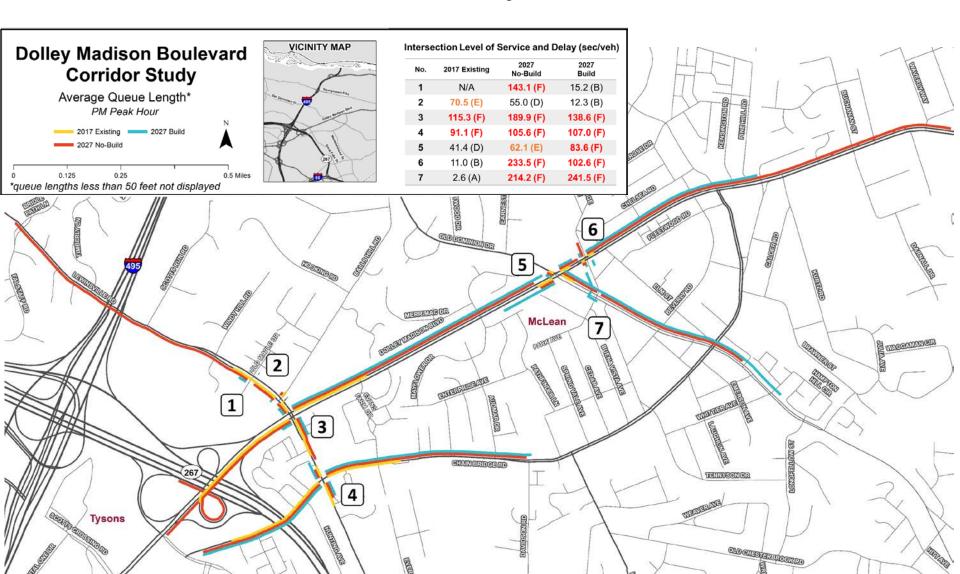


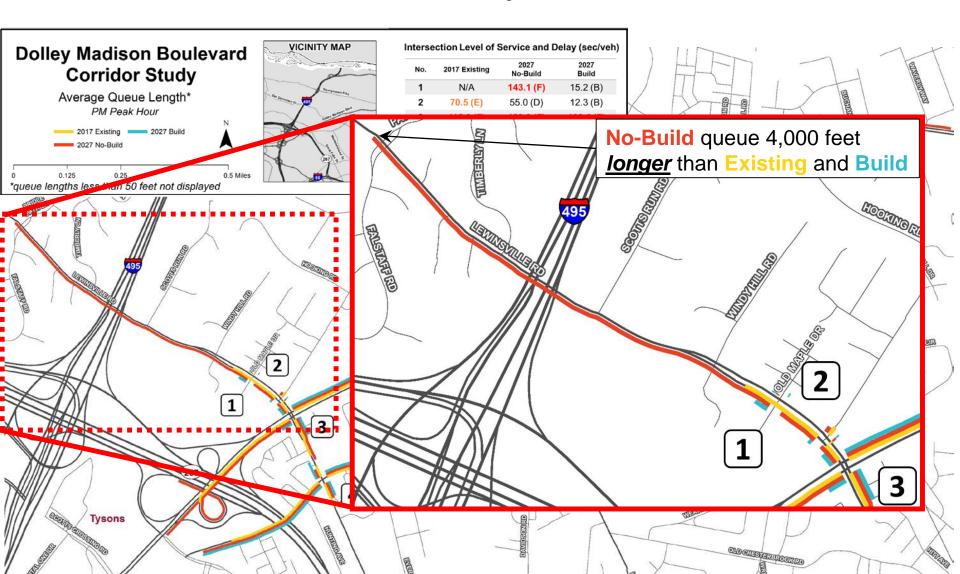




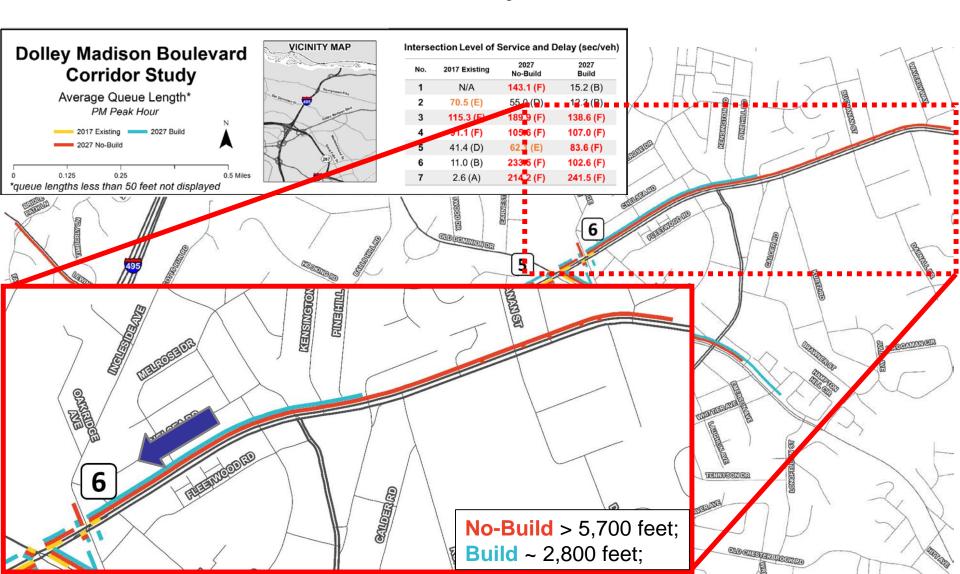








PM Peak Analysis Results Build and No-Build > 4,000 feet; Existing < 1,500 feet Intersection Level of Service and De VICINITY MAP **Dolley Madison Boulevard** usting **Corridor Study** No-Build 143.1 (F) Average Queue Length\* 70.5 (E) 55.0 (D) McLean PM Peak Hour 115.3 (F) 189.9 (F) 2017 Existing 2027 Build 91.1 (F) 105.6 (F) 41.4 (D) 62.1 (E) 11.0 (B) 233.5 (F) 0.5 Miles 2.6 (A) 214.2 (F) \*queue lengths less than 50 feet not displayed McLean-Tysons



## Short-Term Improvements Analysis

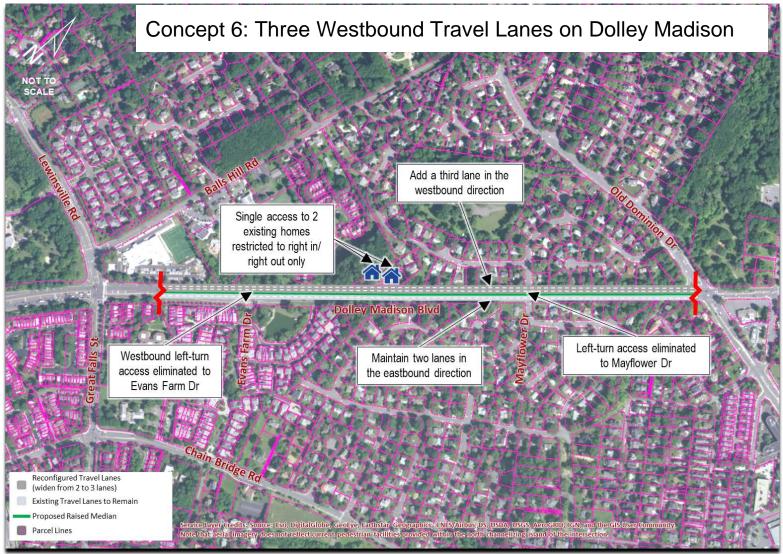
#### **Observations**

- AM Peak conditions can be mitigated to LOS E queues can be generally minimized on most or all approaches.
- PM Peak conditions have a number of concerns, even when all scenarios are implemented.
  - Poor levels of service and heavy queuing at a number of locations
  - 2027 PM Peak operations indicate significant queues occur westbound along Dolley Madison, even with all scenarios included
    - Those queues create "spillback" and can cause queuing even at other intersections
    - An additional concept was considered to mitigate these operational issues





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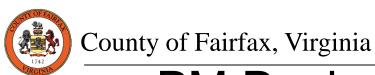


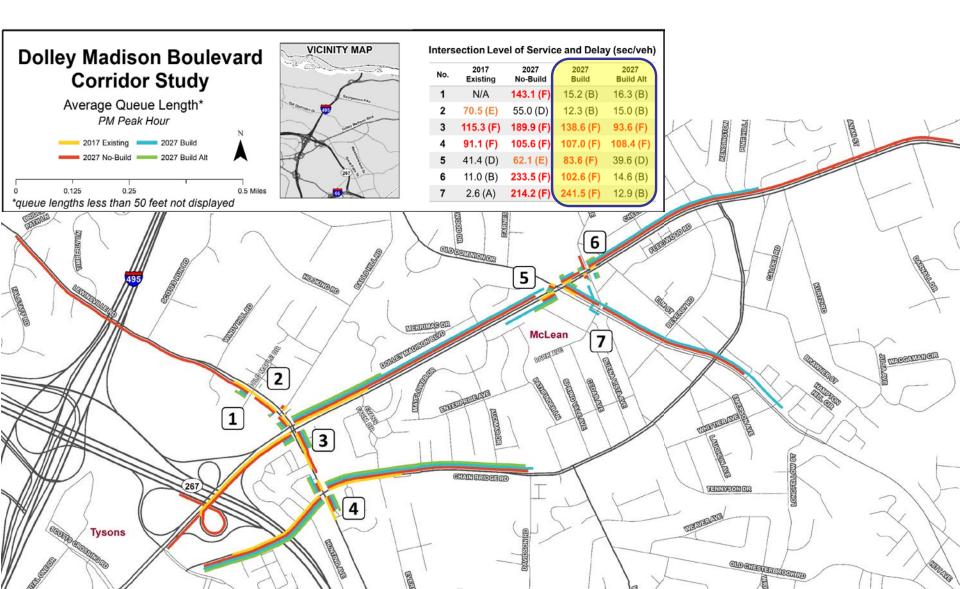
# Short-Term Corridor Improvement Concepts

Concept 6: Three Westbound Travel Lanes on Route 123

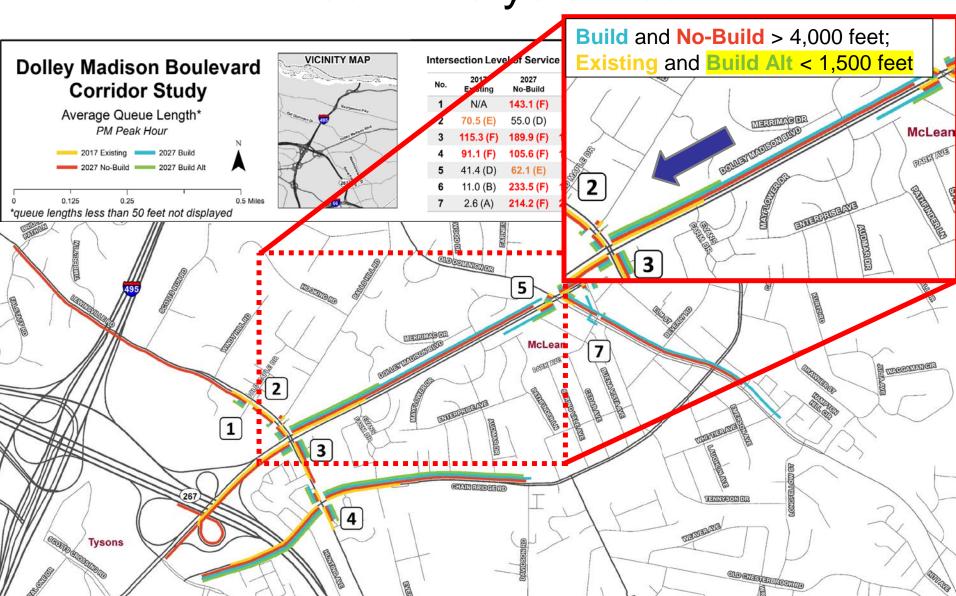
- Benefits:
  - Additional through lane for westbound Dolley Madison
  - Significantly reduces queues and delays
- Drawbacks:
  - Restricted left access (no lefts in or out) for a number of locations



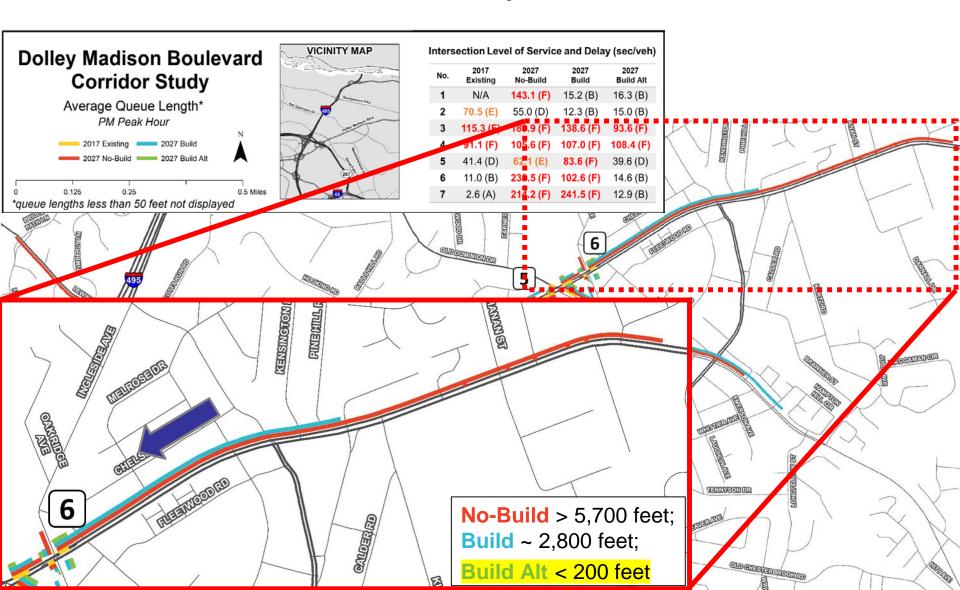












#### Interchange Improvement Concepts

- Short-term improvement concepts mitigate many operational challenges (when implemented together)
- Significant delays will remain at Dolley Madison and Lewinsville Road/Great Falls Street (PM Peak)
- Analysis considered 2027 forecasts (short-term); growth beyond 2027 could worsen delays and congestion
- For comparison purposes, interchange concepts were evaluated at two locations:
  - Dolley Madison and Lewinsville Road/Great Falls Street
  - Dolley Madison and Old Dominion Drive



#### Interchange Improvement Concepts

- For this Exercise: Interchanges are Interchangeable
  - There are many types of interchanges, but this analysis was designed just to analyze the idea of one, not identify a specific concept

 If an interchange is desired, there would be specific studies to decide what type of interchange would be constructed

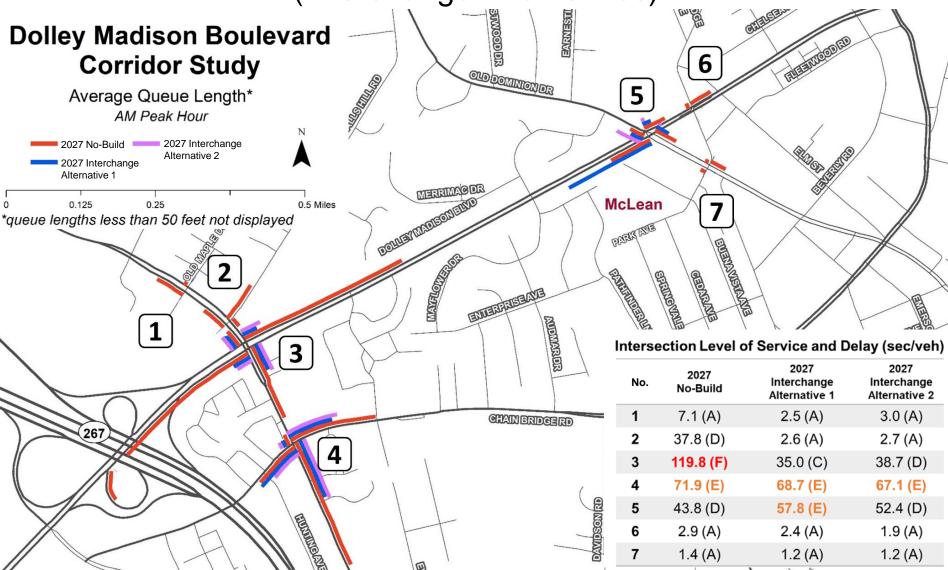


#### Interchange Improvement Concepts

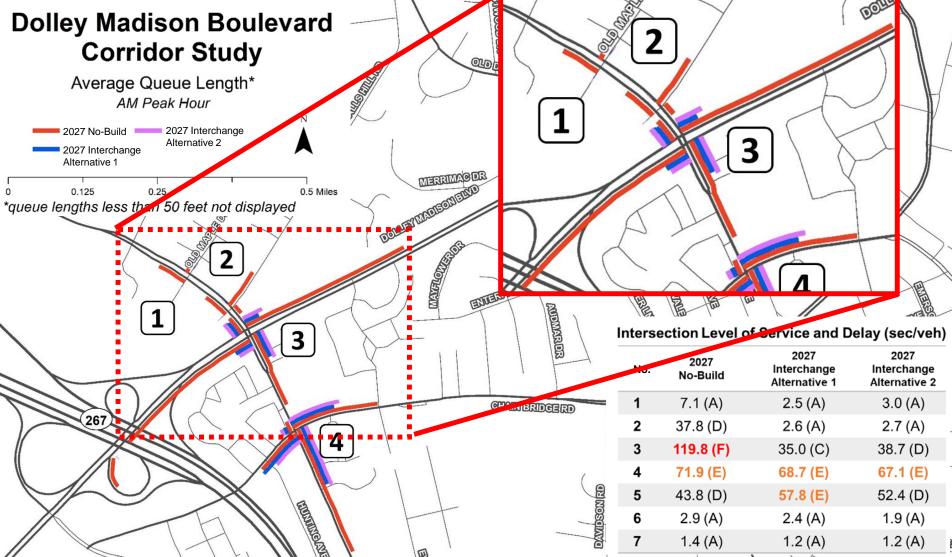
- Comparison of three scenarios:
  - No-Build (No changes at either intersection)
  - Alternative 1 (Interchange at Lewinsville/Great Falls with No-Build at Old Dominion)
  - Alternative 2 (Interchanges at both locations)



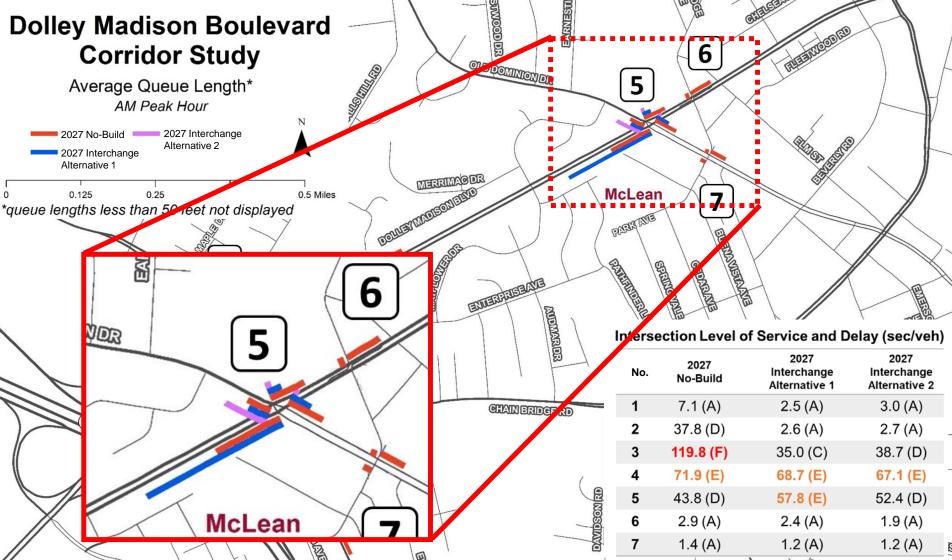
AM Peak Analysis Results (Interchange Alternatives)



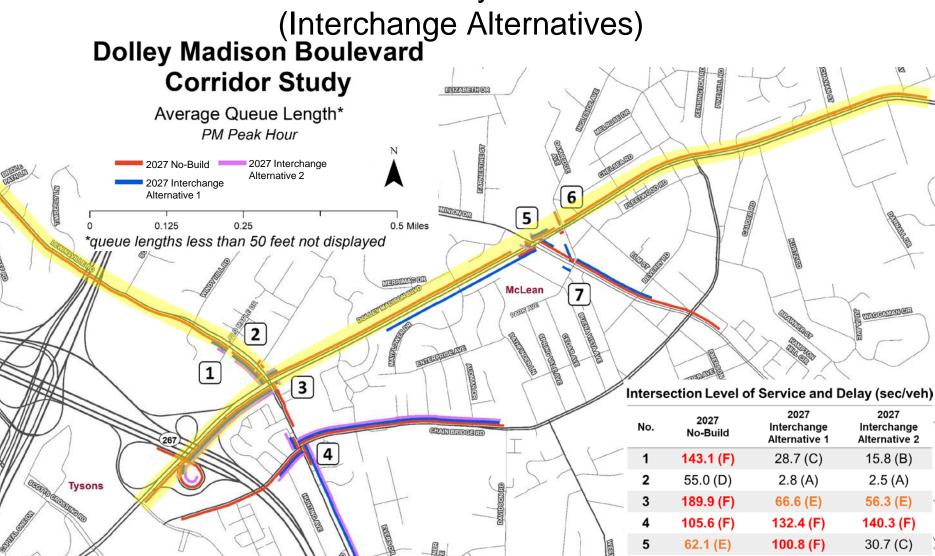
AM Peak Analysis Results (Interchange Alternatives)



AM Peak Analysis Results
(Interchange Alternatives)
vard



PM Peak Analysis Results
(Interchange Alternatives)



233.5 (F)

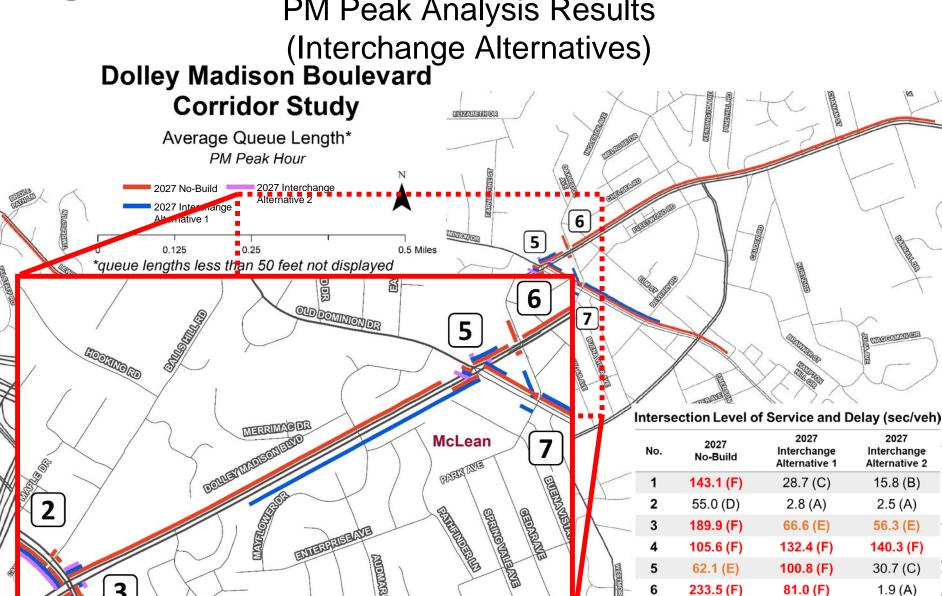
214.2 (F)

1.9 (A)

2.0 (A)

81.0 (F)

2.9 (A)



233.5 (F)

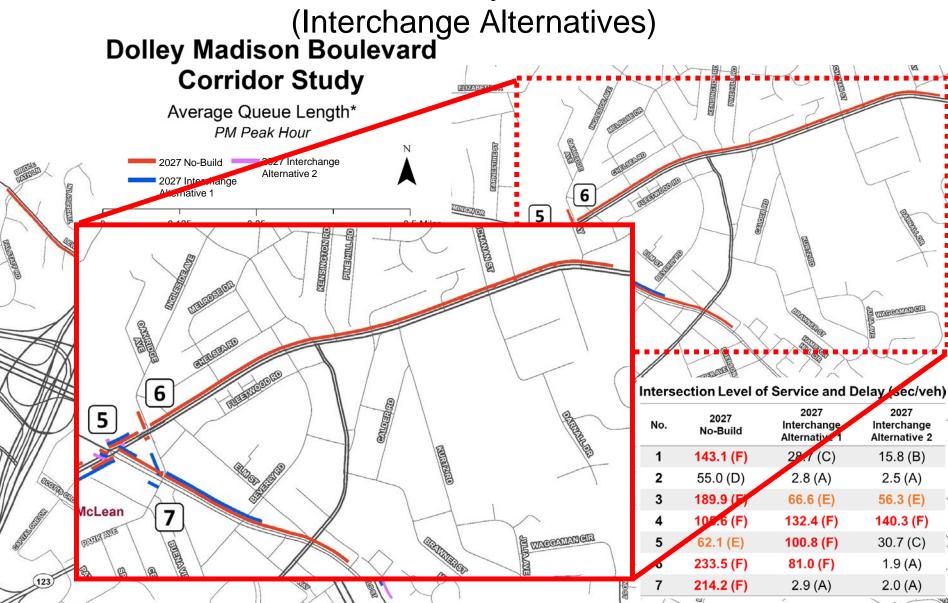
214.2 (F)

81.0 (F)

2.9 (A)

2.0 (A)





## Conclusions (AM Peak)

Int. #	Intersection	Existing	No-Build	Short- Term Build	Interchange Alt. 1	Interchange Alt. 2
1.	Lewinsville/Old Maple*	N/A	7.1 (A)	4.6 (A)	2.5 (A)	3.0 (A)
2.	Lewinsville/Balls Hill	38.6 (D)	37.8 (D)	4.6 (A)	2.6 (A)	2.7 (A)
3.	Dolley Madison/Great Falls/Lewinsville	86.7 (F)	119.8 (F)	78.1 (E)	35.0 (C)	38.7 (D)
4.	Great Falls/Chain Bridge	35.1 (D)	71.9 (E)	61.0 (E)	68.7 (E)	67.1 (E)
5.	Dolley Madison/Old Dominion	36.9 (D)	43.8 (D)	42.2 (D)	57.8 (E)	52.4 (D)
6.	Dolley Madison/Ingleside	2.0 (A)	2.9 (A)	10.1 (B)	2.4 (A)	1.9 (A)
7.	Ingleside/Old Dominion	1.2 (A)	1.4 (A)	7.8 (A)	1.2 (A)	1.2 (A)

<sup>\*</sup> Lewinsville/Old Maple was not initially part of this analysis, but because a concept required changes to the intersection, it was added for analysis under the proposed concepts.



# Conclusions (PM Peak)

Int. #	Intersection	Existing	No-Build	Short- Term Build	Short- Term Build Alt.	Interchange Alt. 1	Interchange Alt. 2
1.	Lewinsville/Old Maple*	N/A	143.1 (F)	15.2 (B)	16.3 (B)	28.7 (C)	15.8 (B)
2.	Lewinsville/Balls Hill	70.5 (E)	55.0 (D)	12.3 (B)	15.0 (B)	2.8 (A)	2.5 (A)
3.	Dolley Madison/Great Falls/Lewinsville	115.3 (F)	189.3 (F)	138.6 (F)	93.6 (F)	66.6 (E)	56.3 (E)
4.	Great Falls/Chain Bridge	91.1 (F)	105.6 (F)	107.0 (F)	108.4 (F)	132.4 (F)	140.3 (F)
5.	Dolley Madison/Old Dominion	41.4 (D)	62.1 (E)	83.6 (F)	39.6 (D)	100.8 (F)	30.7 (C)
6.	Dolley Madison/Ingleside	11.0 (B)	233.5 (F)	102.6 (F)	14.6 (B)	81.0 (F)	1.9 (A)
7.	Ingleside/Old Dominion	2.6 (A)	214.2 (F)	241.5 (F)	12.9 (B)	2.9 (A)	2.0 (A)

<sup>\*</sup> Lewinsville/Old Maple was not initially part of this analysis, but because a concept required changes to the intersection, it was added for analysis under the proposed concepts.



#### Conclusions/Next Steps

- Short-term improvements do create benefits when provided together
  - AM Peak conditions are generally mitigated and can sustain a 10 year horizon
  - However, PM Peak conditions still have numerous concerns
  - PM Peak conditions can be substantially improved with additional westbound through lane on Dolley Madison (although impacts to median breaks would create rerouting of traffic)
- Interchange concepts improve conditions along Dolley Madison above the short-term improvements
  - AM Peak conditions are not substantially improved, because they were not that bad with the short-term improvements
  - PM Peak conditions; however, are significantly improved more interchanges, higher benefit, but also higher impacts
- We need to continue to look at Great Falls/Chain Bridge intersection



#### Next Steps

- Solicit feedback from the community (Survey: Responses by July 15th)
  - Short-term improvements or interchange improvements?
  - Which short-term improvements are you comfortable with and which are unacceptable?
- Take feedback and generate a "recommended" short-term solution to test
  - Does that recommended solution provide enough benefit?
- Community meeting fall/winter (tentative)
- Decide upon a direction (short-term or interchange solutions) for further evaluation (feasibility)



#### **Questions/Comments**

Visit Our Webpage – Please Provide Feedback

https://www.fairfaxcounty.gov/transportation/study/dolley-madison-corridor

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