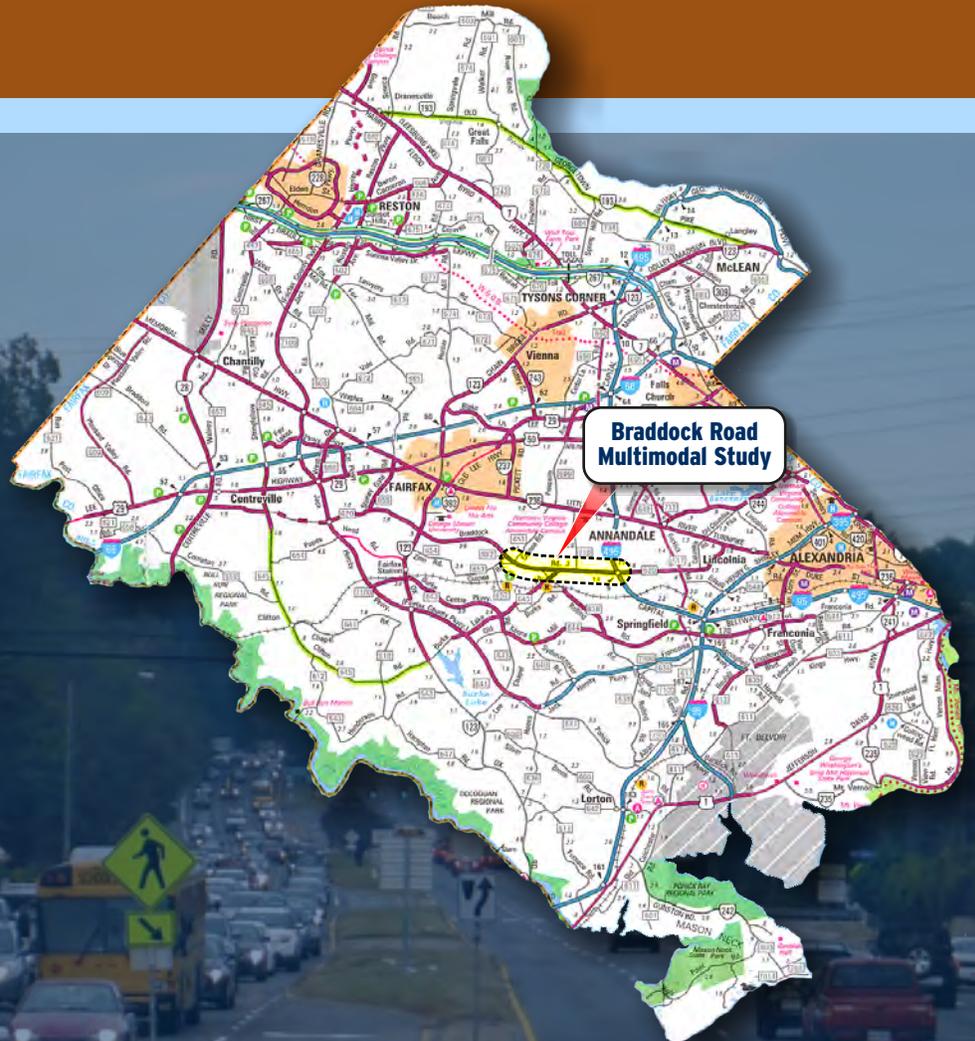




# Braddock Road Multimodal Study

County of Fairfax, Virginia

# Task Force Meeting Materials



Date: October 5, 2016



**October 5, 2016**

**Braddock Road Multimodal Study  
Fairfax County, Virginia**

**Task Force Meeting**

- I. Introduction (7:00 pm)..... Kevin Morse, Chairman
  - a. Protocol and Ground Rules review
- II. Progress Since Last Task Force Meeting (7:05 pm)..... Tad Borkowski/John McDowell
  - a. Concept adjustments and evaluations
  - b. VISSIM finalizations
  - c. Meeting with VDOT
  - d. Schedule Update
- III. Discussion Items..... Tad Borkowski/John McDowell
  - a. Access management updates (7:10 pm)
    - i. Proposed Access Management
    - ii. VDOT criteria
  - b. VISSIM update (7:40 pm)
  - c. Roadway MOE Development (7:50 pm)
    - i. Proposed changes
    - ii. Review scoring processes
    - iii. Populated tables
  - d. Planning for Community Meeting No. 3 (8:45 pm)
- IV. Activities for Following Month (8:55 pm) ..... Tad Borkowski/John McDowell
  - a. Transit Center MOE Development preparation
  - b. Develop outline for Community Meeting No. 3
- V. Adjourn Meeting (9:00 pm) ..... Kevin Morse, Chairman



*September 7, 2016*

***Braddock Road Multimodal Study  
Fairfax County, Virginia***

***Task Force Meeting Minutes***

**Action Items**

- **RK&K / FCDOT** to further refine the proposed alternatives.
- **RK&K** to refine and populate the MOE score sheet.
- **Task Force** to evaluate the weights and MOEs and provide questions to the County.

**Discussion**

The meeting began with Task Force Chair Kevin Morse welcoming all attendees back from the summer break. Michael Guarino then began by discussing the purpose of this meeting – to go over the work completed during the summer months – and then discuss the fall schedule. John McDowell then noted that the Task Force Meeting Minutes provided in the handout were updated based on some feedback from one the Task Force members.

John noted that during the summer break, two community meetings were held – one with The Elms, and one with the faith community. He then presented the concept showing The Elms neighborhood and discussed the challenges in this area:

- Compound curve along Braddock Road
- Fixing the existing “kink” along Braddock at Guinea.

He showed how the developed alignment pushes into the property in the southwest corner at Bradfield Drive and leaves 9 feet of clearance to the corner of the building. John did note that all work to date has been performed on GIS and is not as accurate as if the property lines were surveyed. He noted that the attempt was to balance the impacts on the southwest and northeast corners. Michael also noted that the widening as shown would take about two-thirds of the existing tree buffer currently in place for The Elms.

A task force member asked a question about the limits along Guinea north of Braddock, and John noted that the second northbound lane would be carried to the next intersection north. A task force member observed that the widening stopped at Guinea, and that a bottleneck might be created at Guinea as traffic continues to push westward. Michael noted that this was being taken into account and that this project stopped at Guinea and completely addressing this intersection would require something much more drastic than proposed as part of this project. A question was asked if the project now included widening Guinea across the bridge and Michael noted that this was not part of the project. Another task force member asked if that included changing the vertical grade along Guinea and John noted that was not the intention.

A task force member asked about whether the Bradfield and Red Fox left turn removals were accounted for in the plan? John noted that these reassignments have been discussed and accounted for but that internal circulation within the neighborhoods have not been looked at. Another task force member noted that the cut through traffic was already bad and this would likely make it worse. Michael noted that the reassignments were taken into account but that also with the removal of left turn access, some cut through traffic will be reduced/removed.

A task force member noted their displeasure with the rights and u-turns, while another member noted that they thought it was better than the existing condition, with a third member noting that existing residents along King David are already unhappy about u-turning traffic at this intersection. A task force member noted that with the inclusion of HAWKS and U-turns, the County should provide a re-education and enforcement campaign. Relative to the u-turning maneuver, a member asked about u-turning from inside lane to inside lane and Michael noted that would not be possible.

A task force member mentioned a desire for traffic calming and parking within the neighborhoods, noting that Kings Park solved this problem years ago with stop signs and traffic circles. It was asked why the turn restrictions were being done to accommodate traffic for only a few hours a day. They noted that one idea would be signage which would restrict turning movements during certain hours of the day. Michael noted that this would be evaluated and brought back to the task force to discuss.

John then turned to the meeting which was held with the Faith Community (three churches) and showed them Option 1 as provided in the handout – he mentioned the allowance of the lefts and the access drive from Parkwood to Woodland. A task force member noted that he was in attendance at the meeting and noted that Option 1 was not well received and that further detail needs to be provided. John responded that the input was received and that a further look would be evaluated, with Michael noting that this needed to be vetted with VDOT. A follow-up was asked about why the proposed westbound signal was not pushed further east, with Michael noting that this would make problematic the timing of the signal. Along the lines of time of day restrictions, it was asked whether the northbound approach along Burke Lake could be accommodated this way, and John answered this could be evaluated.

John then presented the conventional intersection at Wakefield Chapel / Danbury Forest and presented the concepts provided in the handout. It was noted that this provided the improvement of dual left turn lanes. John noted that one impact of this was that the alignment along Wakefield Chapel had to shift and carry two northbound lanes to Stahlway Lane. A task force member asked whether this distance was long enough and John noted that this has been evaluated briefly and appears to be long enough but would be considered in further detail. Rob Brander noted that the operations in the PM peak hour were similar but that in the AM peak hour the conventional intersection was better. To close this discussion, a task force member asked if the intersection improvements could be done without widening Braddock Road and Michael noted yes.

The presentation shifted to the VISSIM analysis results presented by Rob. He discussed the handout which was provided and noted that at a later meeting he would be able to provide more detailed statistics on the improvements as requested by the task force. A task force member asked if incorporating the Transit Center meant that two locations were still being considered and Rob noted that this only included the analysis of the Transit Center at Kings Park to analyze the impacts and potential improvements which might be required for this location. Rob noted that these are in progress

metrics and that the team is still working with VDOT to address review comments for the VISSIM models.

Rob presented the AM person throughput figure and noted that the HOV lanes were operating similarly to the GP widening. A task force member noted that this seemed to indicate that HOV would be difficult to enforce and wasn't increasing the throughput enough to make this a worthwhile option, with another noting that even I-66 is difficult to enforce with only approximately 50% caught. Task force members asked why HOV lanes were still being considered and Michael noted this wasn't the only metric but that each MOE would be considered. A task force member asked where the 4.5% increase in demand was coming from, and Michael noted that these come from Old Keene Mill and Route 236, but that this is caused by the increased capacity and that we could add person throughput to the MOEs if desired – as another task force member noted that person throughput was not currently on the list of MOEs.

Rob presented the PM person throughput, and a task force member noted that the top three categories are only a few percent difference in the future year and asked if that was taken into account, and Michael noted yes. A member of the task force noted that the growth seemed low, but as Michael noted the growth along Braddock Road is lower than other corridors within the County.

Rob presented the AM Travel Time graphics, and a question was asked about how the averages with and without HOV were computed and Rob presented that information. A task force member noted that these differences do not seem significant between the HOV lanes (particularly inside) and GP widening / intersection improvements. Michael noted that VDOT comments will be coming within the week and the MOE tables will be completed for the October meeting to compare options and that further determinations will be made later. Rob presented the remainder of the travel time figures, followed by the network performance options. A task force member asked if the network performance results showed that the intersection improvements were the best performing and Rob responded that they were all similar performing.

A task force member asked how to assure that what is recommended is implemented given the recent situation at Wakefield Chapel. Michael noted that this study is being run through VDOT and coordination will continue to the best extent possible to make sure that the proposed recommendation continues through detailed design and analysis and into implementation. Kiel Stone noted that these are state roads and that VDOT has the ultimate power to install what they deem fit, but that VDOT has been involved in this project much more than the previous one.

Michael noted that the MOEs will be developed and presented in October and then the Transit Center options will be reviewed at that time. John presented the upcoming schedule saying that currently Community Meeting #3 is likely in November but that could slip and would impact the Task Force Meeting agendas. He said it is assumed at this time that the 4<sup>th</sup> Community Meeting will be in Spring or early Summer of 2017. A task force member asked when VDOT gets to see the preferred alternative and Michael noted that concurrence on the design with VDOT would be preferred before Community Meeting #4.

**Planned Activities for September 2016:**

- Development of MOE values
- Further refinement of design concepts

**Upcoming Schedule:**

- The next Task Force meetings will be on October 5, 2016

Should any revisions to these meeting minutes be required, please advise Tad Borkowski at [tad.borkowski@fairfaxcounty.gov](mailto:tad.borkowski@fairfaxcounty.gov) or John McDowell, PE at [jmcdowell@rkk.com](mailto:jmcdowell@rkk.com).

**Braddock Road Multimodal Study  
Fairfax County, Virginia**

**Planning for Upcoming Meetings**

Meeting Date	Goals	Materials
<b>Task Force Meetings</b>		
<b>October 5, 2016 Task Force Meeting</b>	<ul style="list-style-type: none"> <li>• TF reviews roadway concept alternatives</li> <li>• Preliminary roadway alternatives assessments with MOEs</li> <li>• Planning for Community Meeting No. 3</li> </ul>	<ul style="list-style-type: none"> <li>• Concept plans</li> <li>• MOE tables populated</li> </ul>
<b>November 2, 2016 Task Force Meeting</b>	<ul style="list-style-type: none"> <li>• TF reviews transit center alternatives</li> <li>• Preparation for Community Meeting No. 3</li> </ul>	<ul style="list-style-type: none"> <li>• Updated Concept plans</li> <li>• Updated Transit center options</li> <li>• MOE evaluation tables updated</li> <li>• Draft exhibits for Community Meeting No. 3</li> <li>• Draft PowerPoint for Community Meeting No. 3</li> </ul>
<b>December 7, 2016 Task Force Meeting</b>	<ul style="list-style-type: none"> <li>• Review of all materials to-date</li> <li>• Community meeting discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Finalized Roadway Concepts</li> <li>• Finalized Transit Concepts</li> </ul>
<b>February 1, 2017 Task Force Meeting</b>	<ul style="list-style-type: none"> <li>• Review of Community Meeting input</li> <li>• Finalize roadway concept plans recommendations</li> <li>• Finalized transit center recommendations</li> <li>• Finalize MOE evaluations</li> </ul>	<ul style="list-style-type: none"> <li>• Preferred Alignment (draft)</li> <li>• Preferred Transit Center site (draft)</li> <li>• Cost analysis Completed</li> <li>• MOE Evaluation table completed</li> </ul>
<b>March 1, 2017 Task Force Meeting</b>	<ul style="list-style-type: none"> <li>• Finalized preferred alignment</li> <li>• Finalized preferred transit center layout</li> <li>• Cost estimated developed</li> <li>• Impacts addressed</li> <li>• MOEs finalized</li> <li>• Preparation for Community Meeting No. 4</li> </ul>	<ul style="list-style-type: none"> <li>• Preferred Alignment completed (final)</li> <li>• Preferred Transit Center site completed (final)</li> <li>• Cost analysis Completed</li> <li>• MOE Evaluation table finalized</li> </ul>
<b>May 3, 2017 Task Force Meeting</b> (date subject to change – Post Community Meeting No. 4)	<ul style="list-style-type: none"> <li>• Review of Community Meeting No. 4</li> <li>• Address final Community Input</li> </ul>	<ul style="list-style-type: none"> <li>• Summary notes from Community Meeting No. 4</li> <li>• Task Force final review of materials</li> </ul>
<b>June 7, 2017 Final Task Force Meeting</b> (date subject to change)	<ul style="list-style-type: none"> <li>• Final Recommendations and report presented to Task Force</li> <li>• Task Force goals achievement review</li> <li>• Closing items</li> </ul>	<ul style="list-style-type: none"> <li>• Draft Final Report</li> <li>• Final Roadway Alignments</li> <li>• Final Transit Center Layout</li> <li>• Final Estimates and MOE table</li> </ul>

Meeting Date	Goals	Materials
<b>Neighborhood Meetings</b>		
<b>Fall TBD, 2016 Brook Hills Neighborhood Meeting</b>	<ul style="list-style-type: none"> <li>• Follow-up from 05/10/2016 meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Ravensworth left turn lanes</li> <li>• HAWK signals along Ravensworth</li> <li>• WB Braddock at I-495 South signal reconfiguration</li> </ul>
<b>Fall TBD, 2016 Old Forge/Surrey Square Neighborhood Meeting</b>	<ul style="list-style-type: none"> <li>• Follow-up from 05/19/2016 meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Overall update</li> </ul>
<b>Fall TBD, 2016 Holy Spirit Catholic Church Meeting</b>	<ul style="list-style-type: none"> <li>• Discussion of access to church property from Braddock Road and provisions for Parkwood Baptist Church</li> </ul>	<ul style="list-style-type: none"> <li>• Church drive reconfiguration options</li> <li>• WB Braddock Road to church drive directional left turn lane</li> </ul>
<b>Fall TBD, 2016 Parkwood Baptist Church Meeting</b>	<ul style="list-style-type: none"> <li>• Discussion of access to church property, Kings Park EB left turn and provisions for Holy Spirit Catholic Church</li> </ul>	<ul style="list-style-type: none"> <li>• Church drive reconfiguration options</li> <li>• WB Braddock Road to church drive directional left turn lane</li> </ul>
<b>Fall TBD, 2016 St. Stephens United Methodist Church Meeting</b>	<ul style="list-style-type: none"> <li>• Discussion of access concerns, access management impacts to church access.</li> </ul>	<ul style="list-style-type: none"> <li>• Exhibit showing access changes and movements to/from church property.</li> </ul>
<b>Fall TBD, 2016 Faith Community Meeting</b>	<ul style="list-style-type: none"> <li>• Follow-up from 06/22/2016 meeting</li> <li>• Discussion of suggested access modifications</li> </ul>	<ul style="list-style-type: none"> <li>• Church drive reconfiguration options</li> <li>• WB Braddock Road to church drive directional left turn lane</li> <li>• Exhibit showing access changes and movements to/from St. Stephens United Methodist Church property</li> </ul>
<b>Fall TBD, 2016 The Elms Neighborhood Meeting</b>	<ul style="list-style-type: none"> <li>• Follow-up from 08/16/2016 meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Road alignment adjustment to minimize property impacts</li> <li>• Utilities accommodation</li> <li>• Potential connection to Dunleigh Drive</li> <li>• Time-of-day turn restrictions</li> </ul>

Meeting Date	Goals	Materials
<b>Community Meetings</b>		
<b>Community Meeting No. 3</b>	<ul style="list-style-type: none"> <li>• Respond to comments and concerns raised at 04/25/2016 Community Meeting</li> <li>• Draft MOE presentation</li> <li>• Obtain feedback from community</li> </ul>	<ul style="list-style-type: none"> <li>• Finalized Roadway Concepts</li> <li>• Finalized Transit Center Concepts</li> <li>• Cost and Impacts of recommended alternatives</li> <li>• Draft MOEs</li> <li>• VISSIM simulations</li> <li>• Citizens' Input and Resolution Station</li> <li>• PowerPoint presentation</li> <li>• Timeline update</li> </ul>
<b>Community Meeting No. 4</b>	<ul style="list-style-type: none"> <li>• Final Recommended Roadway Improvement Plan</li> <li>• Final Recommended Transit Center Configurations</li> <li>• Report of final MOE Evaluation</li> <li>• Report on steps forward from this meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted Roadway Alignment and Typical Sections</li> <li>• Adopted Transit Center site configuration</li> <li>• Cost and Impacts of Adopted Roadway Alignment</li> <li>• Cost and Impacts of Adopted Transit Center site</li> <li>• VISSIM simulations recommended alternative</li> <li>• Final MOE Evaluations</li> <li>• Responses to Citizens' Input and Preferences from previous meetings</li> <li>• Steps forward</li> <li>• PowerPoint Presentation</li> <li>• Timeline update</li> </ul>

### Braddock Road Multimodal Study: VISSIM Output

Scenario	Person Throughput	Person Demand	Avg EB Travel Time (min)	Avg WB Travel Time (min)	Total Network Travel Time (hr)	Total Side Street Delay (hr)	Avg Transit Travel Time	Total Pedestrians Crossing Time and Delay (min)	Avg Pedestrian end-to-end Corridor Travel Time (min)
<b>AM</b>									
2015 Existing	9,987	10,265	12.1	9.1	1,444.2	21.4	10.9	74.2	73.3
2040 No Build	8,872	12,054	28.5	19.2	3,096.3	52.1	28.5	74.2	73.3
2040 Intersection Improvements	10,885	12,351	15.7	11.6	2,223.5	42.4	14.1	74.6	71.8
2040 HOV Inside	11,403	12,598	14.2	13.2	2,428.5	62.2	14.8	75.4	67.2
2040 GP Widening w/ Transit Center	11,462	12,684	15.9	13.3	2,528.3	26.8	15.1	75.4	67.2
<b>PM</b>									
2015 Existing	9,903	10,111	11.0	13.6	1,533.1	18.6	11.7	74.2	73.3
2040 No Build	9,969	11,465	11.0	22.6	2,271.6	67.0	18.1	74.2	73.3
2040 Intersection Improvements	11,440	12,083	11.7	14.2	1,778.5	32.9	12.9	74.6	71.8
2040 HOV Inside	12,584	13,441	10.4	14.4	2,009.8	28.4	12.6	75.4	67.2
2040 GP Widening w/ Transit Center	12,389	13,092	10.2	14.2	1,919.6	31.6	12.3	75.4	67.2

(September 29, 2016)

September 13, 2016

**Braddock Road Multimodal Study  
Fairfax County, Virginia**

**Proposed Improvements**

**Proposed Intersection Improvements:**

- **Braddock Road at Guinea Road:**
  - NB approach converted to left-turn, through, through-right, right-turn lanes (no additional pavement)
  - Extend two-lane NB section north of intersection to Burnetta Drive
  - Add right turn lane to WB Braddock Road turning on to NB Guinea Road
- **Braddock Road from Guinea Road to Rolling Road:**
  - Restrict Bradfield Drive intersection to right in/right out both directions with channelized WB left-turn lane to Bradfield SB.
  - Restrict Red Fox Drive (western connection) to right in/right out with channelized EB left-turn lane
- **Braddock Road at Dunleigh Drive/King David Blvd**
  - No Changes
- **Burke Lake Road at Grantham Street:**
  - Restrict Grantham Street to right in/right out
  - Restrict shopping center drive to right in/right out/left in
  - Add HAWK signal for pedestrian crossing across Burke Lake Road
- **Braddock Road at Burke Lake Road:**
  - Convert NB approach to triple right-turn only
  - NB through traffic routed to Rolling Road NB → Braddock Road EB → Left turn at Woodland Way
  - NB Right-Turn-On-Red prohibited
  - Extend WB dual left turns on Braddock Road
- **Braddock Road at Kings Park Drive:**
  - Restrict Kings Park Drive to right in/right out with additional median on Braddock Road
  - Restrict the Parkwood Baptist Church access to right in/right out with additional median on Braddock Road
- **Braddock Road at Stone Haven Drive:**
  - Restrict Stone Haven Drive to right in/right out with additional median on Braddock Road
- **Braddock Road at Southampton Drive**
  - Add additional right turn lane to Southampton NB turning on to EB Braddock Road
- **Braddock Road at Danbury Forest Drive/Wakefield Chapel Road:**

Jug Handle Alternative:

  - Realign Danbury Forest Drive to meet Wakefield Chapel Road
  - Left turns along Braddock Road at Wakefield Chapel Road/Danbury Forest Drive prohibited.

- Signal phasing will be three phase
- Preserve existing Danbury Forest Drive as a jug handle
  - Braddock Road WB left turns use jug handle
  - Braddock Road EB left turns use jug handle

Conventional Intersection Alternative:

- Realign Danbury Forest Drive to meet Wakefield Chapel Road
- Convert the EB and WB left turn movements on Braddock Road to dual left-turn lanes
- Extend a second travel lane along Wakefield Chapel Road NB up to Stahlway Lane
- Danbury Forest Drive will be a four lane roadway until tying into the existing roadway
- **Braddock Road at Glen Park Road:**
  - Restrict Glen Park Road to right in/right out with additional median on Braddock Road
- **Braddock Road at Inverchapel Road:**
  - Restrict Inverchapel Road to right in/right out with additional median on Braddock Road
- **Braddock Road at Queensbury Avenue:**
  - No Changes
- **Braddock Road at Port Royal Road/I-495 SB to WB exit ramp:**
  - Eliminate movement from SB I-495 ramp to Port Royal Road
  - SB I-495 Ramp to Port Royal Road traffic routed to SW quadrant with new left-turn ramp at Braddock Road, then left-turn from WB Braddock Road to Port Royal Road
- **Braddock Road at I-495 NB to EB Exit Ramp:**
  - Adjust ramp to create more perpendicular intersection, creating additional storage distance to Ravensworth Road.
- **Braddock Road at Ravensworth Road:**
  - Convert EB approach to dual left-turn lanes
  - Create NB dual lanes along Ravensworth Road which will merge together before Heritage Drive
- **SB I-495 Ramp from Braddock Road:**
  - Extend dual lane ramp to bridge at Heming Avenue

**General Purpose Widening Improvements:**

- Add one additional through lane along both directions of Braddock Road:
  - From Guinea Road to Burke Lake Road the current two lane section, in each direction (EB & WB), will be widened to three lanes, in each direction (EB & WB).
  - From Burke Lake Road to I-495 the current three lane section along EB Braddock Road will be widened to four lanes
  - From Burke Lake Road to I-495 the current three lane section along WB Braddock Road will be widened to four lanes, where applicable. (Currently from Wakefield Chapel Road to I-495 Braddock Road WB is four lanes, no through lanes will be added along this section of Braddock Road WB)
- Widening Improvements will also include all the Intersection Improvements listed above.

### **HOV Widening Inside Improvements:**

- Add one additional through lane along both directions of Braddock Road:
  - From Guinea Road to Burke Lake Road the current two lane section, in each direction (EB & WB), will be widened to three lanes, in each direction (EB & WB).
  - From Burke Lake Road to I-495 the current three lane section along EB Braddock Road will be widened to four lanes
  - From Burke Lake Road to I-495 the current three lane section along WB Braddock Road will be widened to four lanes, where applicable. (Currently from Wakefield Chapel Road to I-495 Braddock Road WB is four lanes, no through lanes will be added along this section of Braddock Road WB)
- The inside through lane from Burke Lake Road to I-495 will be designated as an HOV lane.
- Widening Improvements will also include all the Intersection Improvements listed above.

### **HOV Widening Outside Improvements:**

- Add one additional through lane along both directions of Braddock Road:
  - From Guinea Road to Burke Lake Road the current two lane section, in each direction (EB & WB), will be widened to three lanes, in each direction (EB & WB).
  - From Burke Lake Road to I-495 the current three lane section along EB Braddock Road will be widened to four lanes
  - From Burke Lake Road to I-495 the current three lane section along WB Braddock Road will be widened to four lanes, where applicable. (Currently from Wakefield Chapel Road to I-495 Braddock Road WB is four lanes, no through lanes will be added along this section of Braddock Road WB)
- The outside through lane from Burke Lake Road to I-495 will be designated as an HOV lane.
- Widening Improvements will also include all the Intersection Improvements listed above.

# Access Management Principles

# What is “Managing Access”?

Managing and Planning the Spacing and Design of:

Driveways



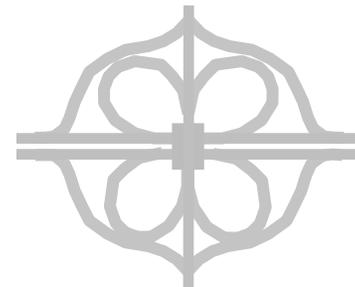
Median Openings



Traffic Signals



Interchanges

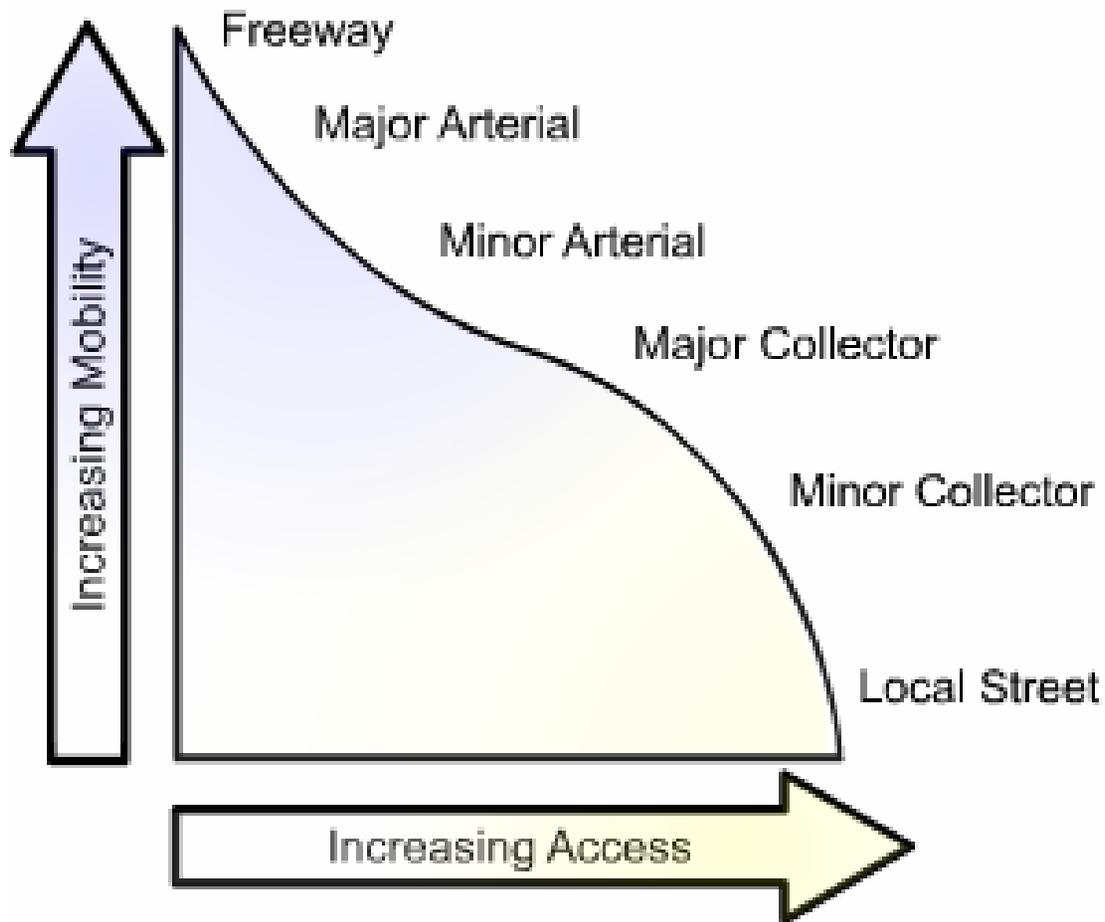


# Definition of Access Management

Access management is the programmatic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway.

## Purpose: Balance Mobility vs. Access

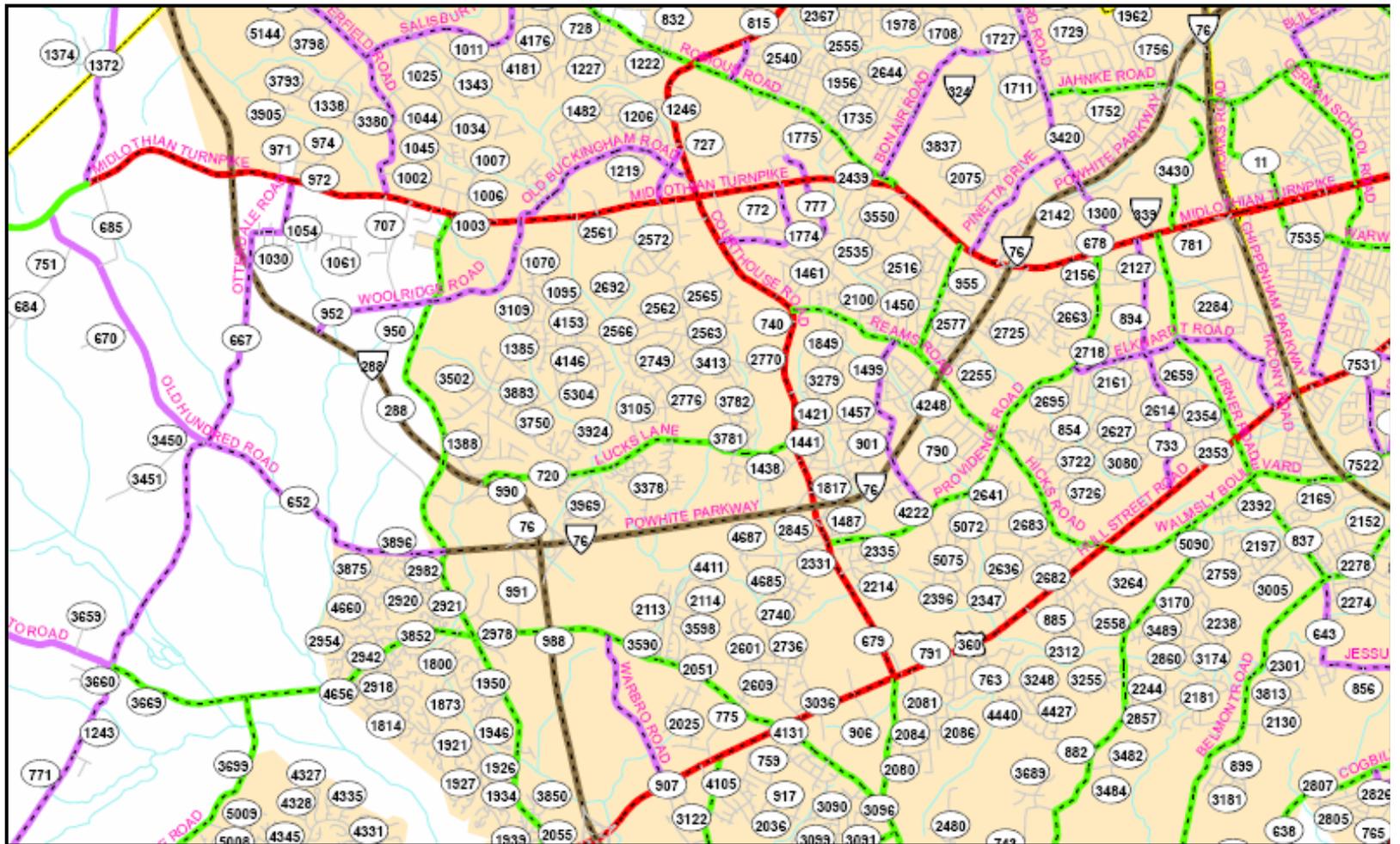
The federal functional classification of highways



# Examples of Highway Functional Classifications

## Legend

- Not Classified; Urban Local; Rural Local
- Urban Interstate
- Urban Freeway and Expressway Connecting Links of Rural Principal Arterial
- Urban Other Principal Arterial Connecting Links of Other Rural Principal Arterial
- Urban Minor Arterial
- Urban Collector
- Rural Interstate
- Rural Other Principal Arterial
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector



# A Brief History of Access Management

National standards for individual driveway design were developed in 1960 – AASHO “An Informational Guide for Preparing Private Driveway Regulations for Major Highways”

NCHRP Report 121 (1971) “Protection of Highway Utility” stands as one of the earliest, most recognized discussions of access control

Beginning of Modern Access Management – credited to Colorado, 1979, the 1<sup>st</sup> state to adopt comprehensive access management regulations and standards

## Colorado, 1979

“The lack of adequate access management on the highway system and the *proliferation of driveways* and other access approaches is a major contributor to highway accidents and the greatest single factor behind the functional deterioration of highways in this state. As new accesses are constructed and signals erected, the speeds and capacity of the roadways decrease, and congestion challenges to the motorist increase.”

-- *Colorado State Highway Access Code*

## National Perspective

- “The lack of access control along arterial highways has been the largest single factor contributing to the obsolescence of highway facilities”

*NCHRP Report 121 Protection of Highway Utility*

- “Every study since the 1940’s has indicated a direct and significant link between access frequency and accidents”

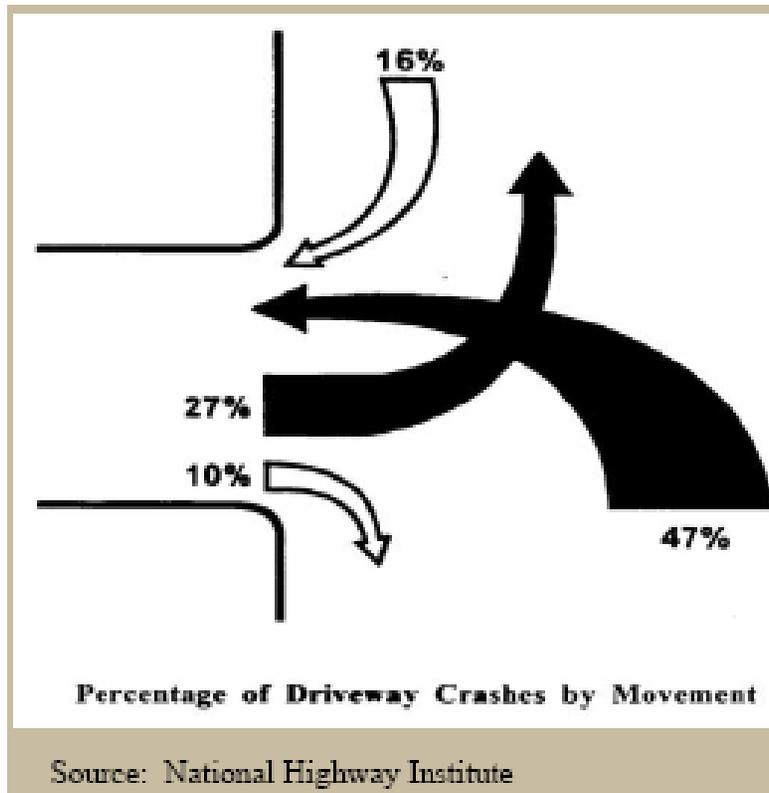
*International R/W Assoc. conference paper, 1999*

# Benefits and Consequences

## Benefits of AM

- Preserve integrity of the roadway system
- **Improve safety** and capacity
- Preserve public investment in infrastructure
- Preserve private investment in properties
- Provide a **more efficient** (and predictable) motorist experience
- Improve “thru” times through a corridor

## % of Driveway Crashes by Movement



The majority of access-related crashes involve **Left Turns** (74%)

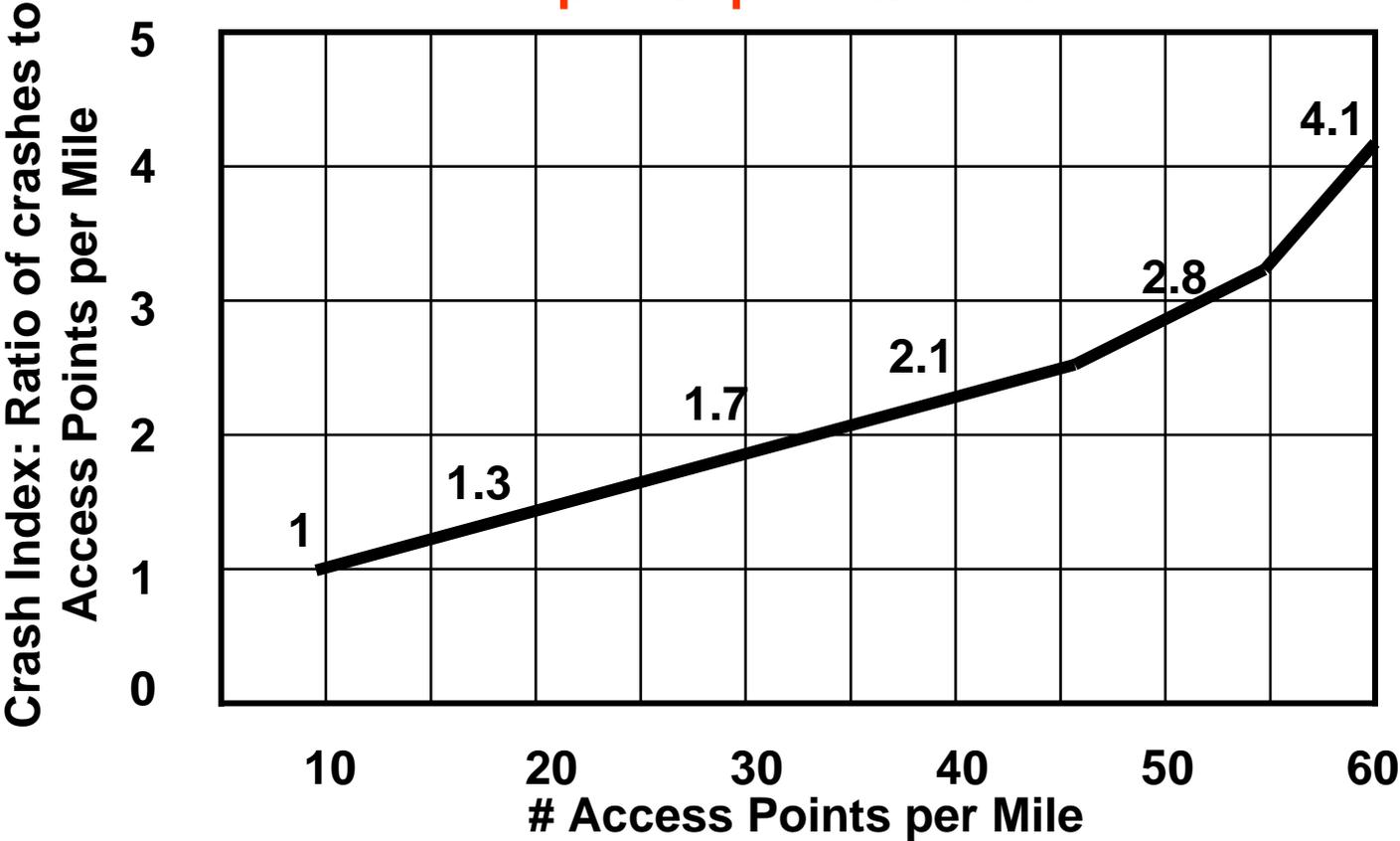


Entrances are inevitable and necessary but as their numbers go up, so too does the propensity for accidents in the corridor.

**Five entrances on highway: multiple points where right & left turning movements will overlap**

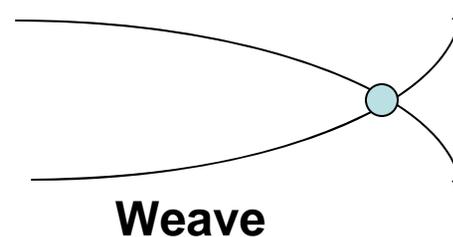
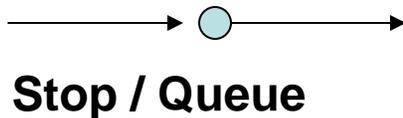
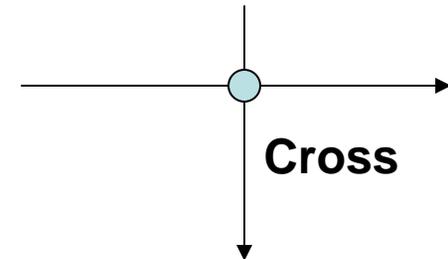
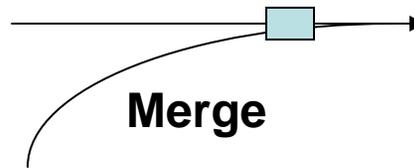
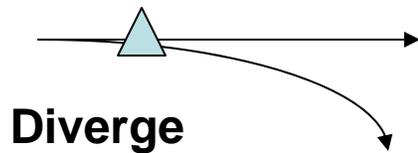
# Composite Crash Rate Indices

Crash rate indices increase as # of access points per mile increases

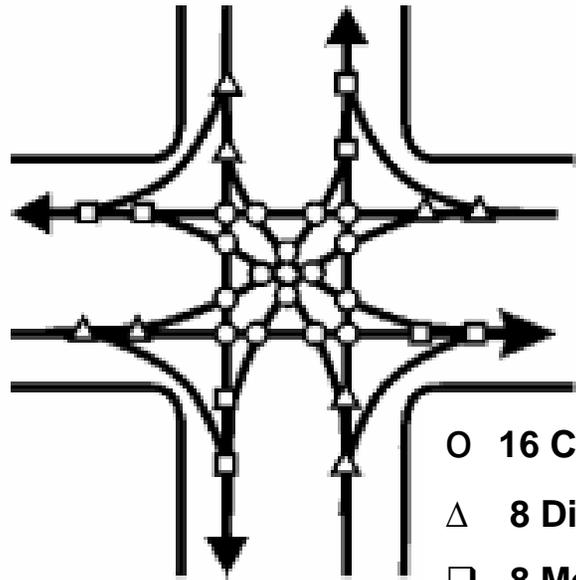


# Conflict Points: Where Traffic Crashes Occur

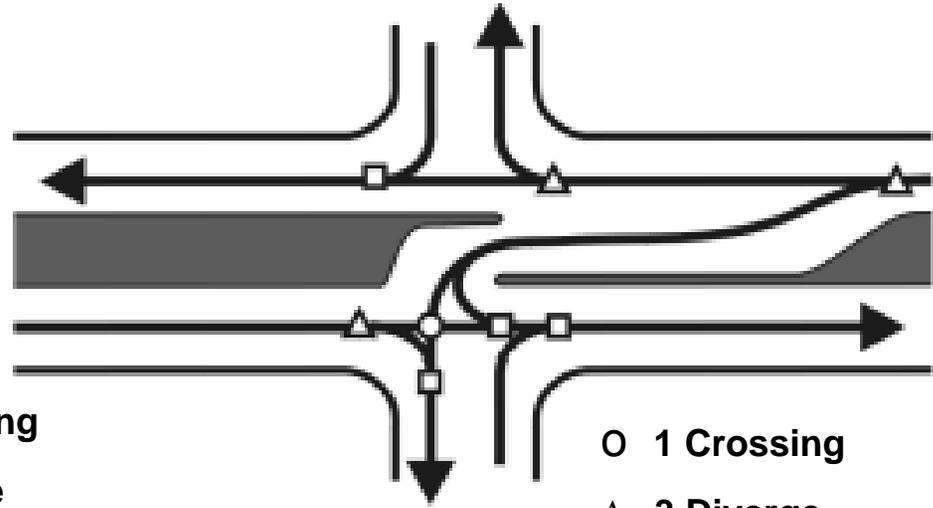
Each access point creates potential conflicts between through traffic and turning traffic.



# Conflicts



- 16 Crossing
  - △ 8 Diverge
  - 8 Merge
- 32 TOTAL**



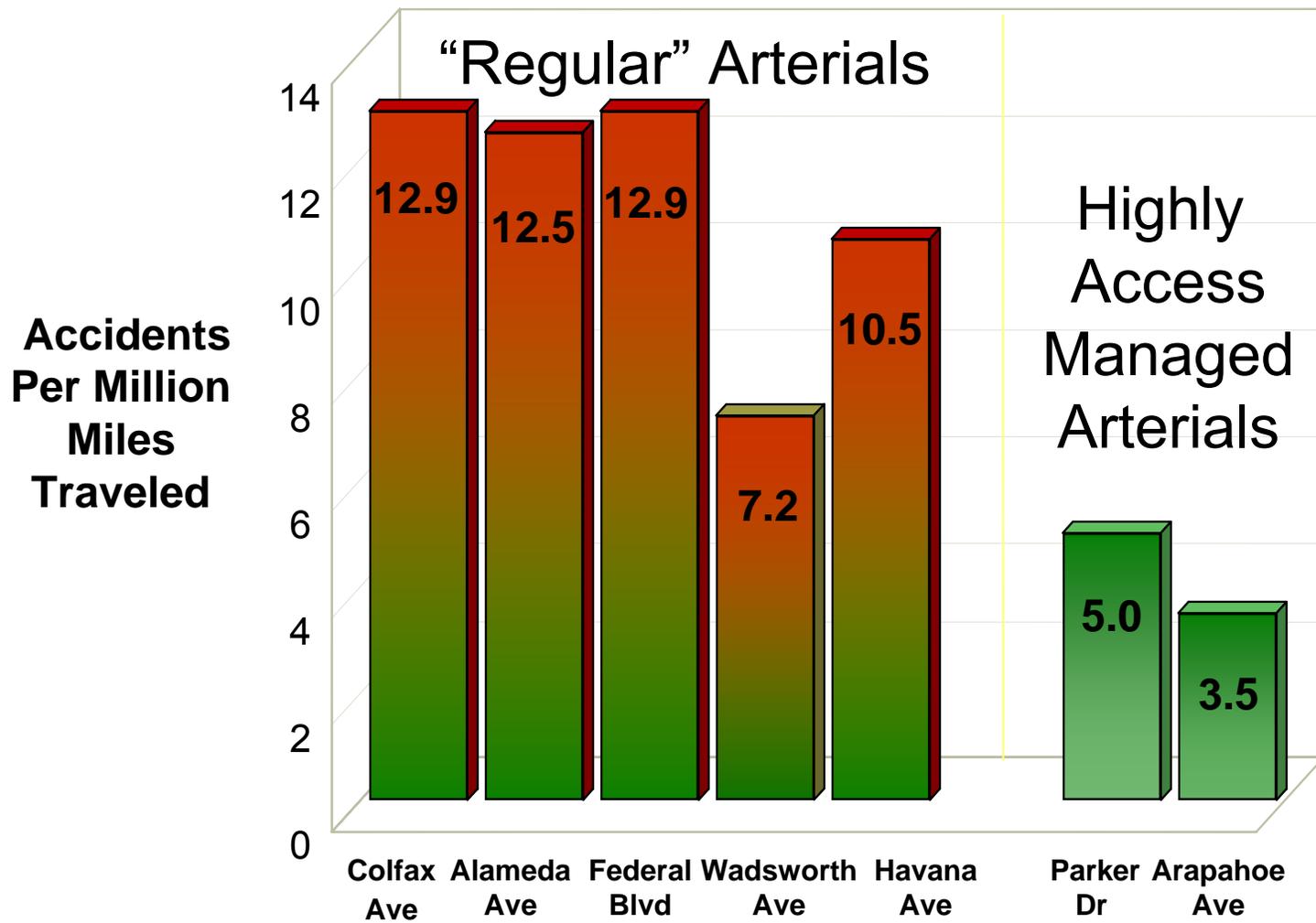
- 1 Crossing
  - △ 3 Diverge
  - 4 Merge
- 8 TOTAL**

# Consequences of Poor Access Management

- Increase in crashes and crash rates
- Poor capacity throughout
- Increased delays
- Reduced roadway efficiency

# Access Management in Practice

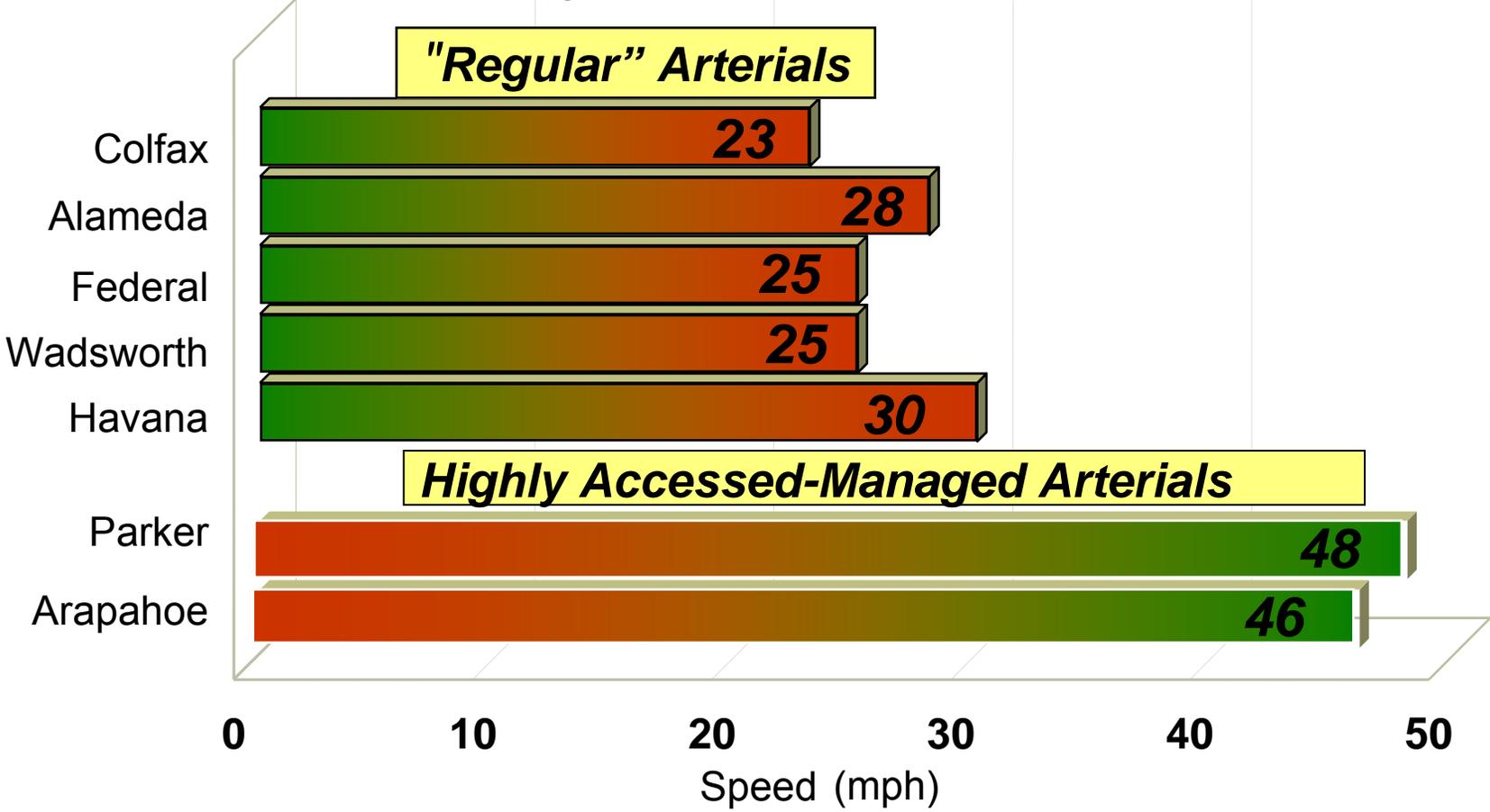
# Results— Fewer accidents on ‘Managed’ roads



Source:  
"Colorado  
Access Control  
Demonstration  
Project" - 1985

# Results— *Higher 'thru' speeds on 'Managed' roads*

Effects of Access Management on travel speeds in the *P.M.* peak hour



# What methods are used?

- Medians
- Right and left turn lanes
- Signals and signal spacing
- Entrance location, spacing, and design
- Corner clearance
- Cross property access
- Shared use entrances
- Frontage roads and connectors



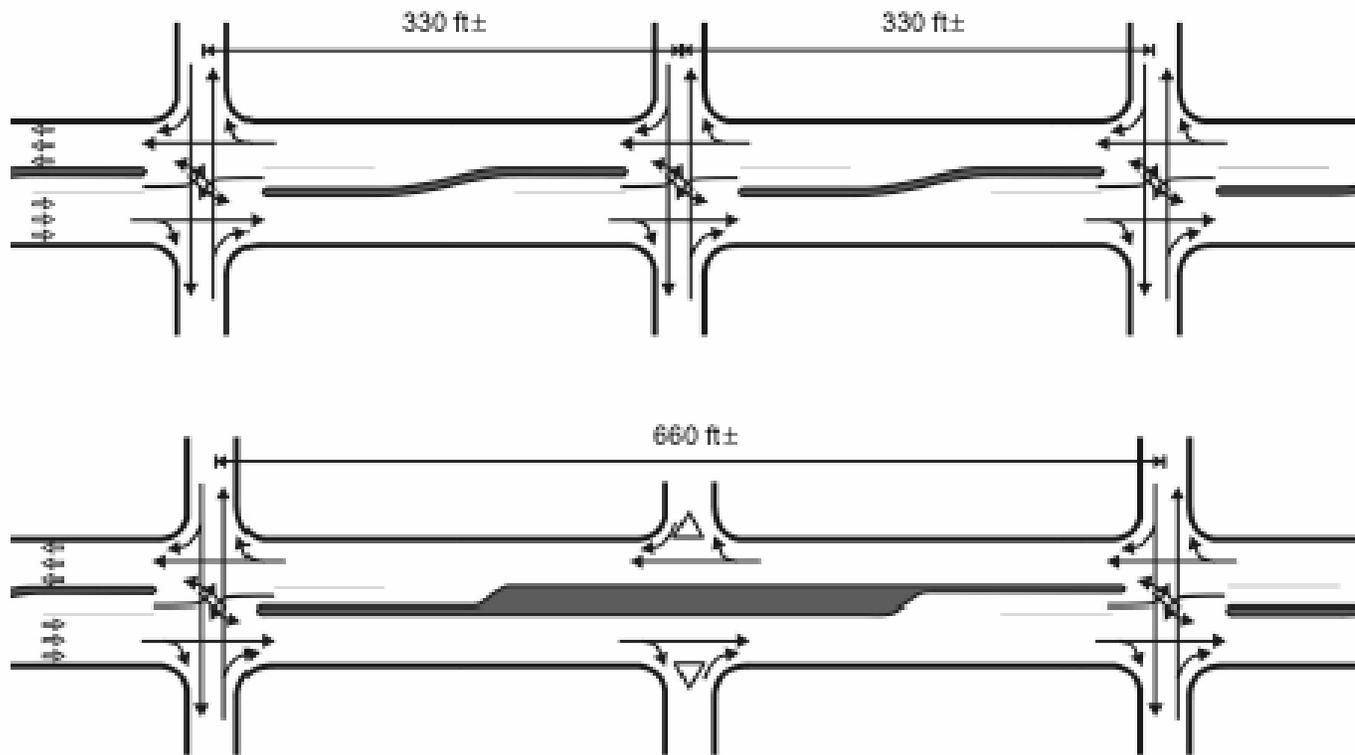
Use non-traversable medians to separate traffic and direct motorists where to access properties.

Use turn lanes to queue separate movements and to “free up” through movements

# Median Redesign

## Note:

- 1) Increased separation between intersections
- 2) Introduction of U-turns to replace former movements



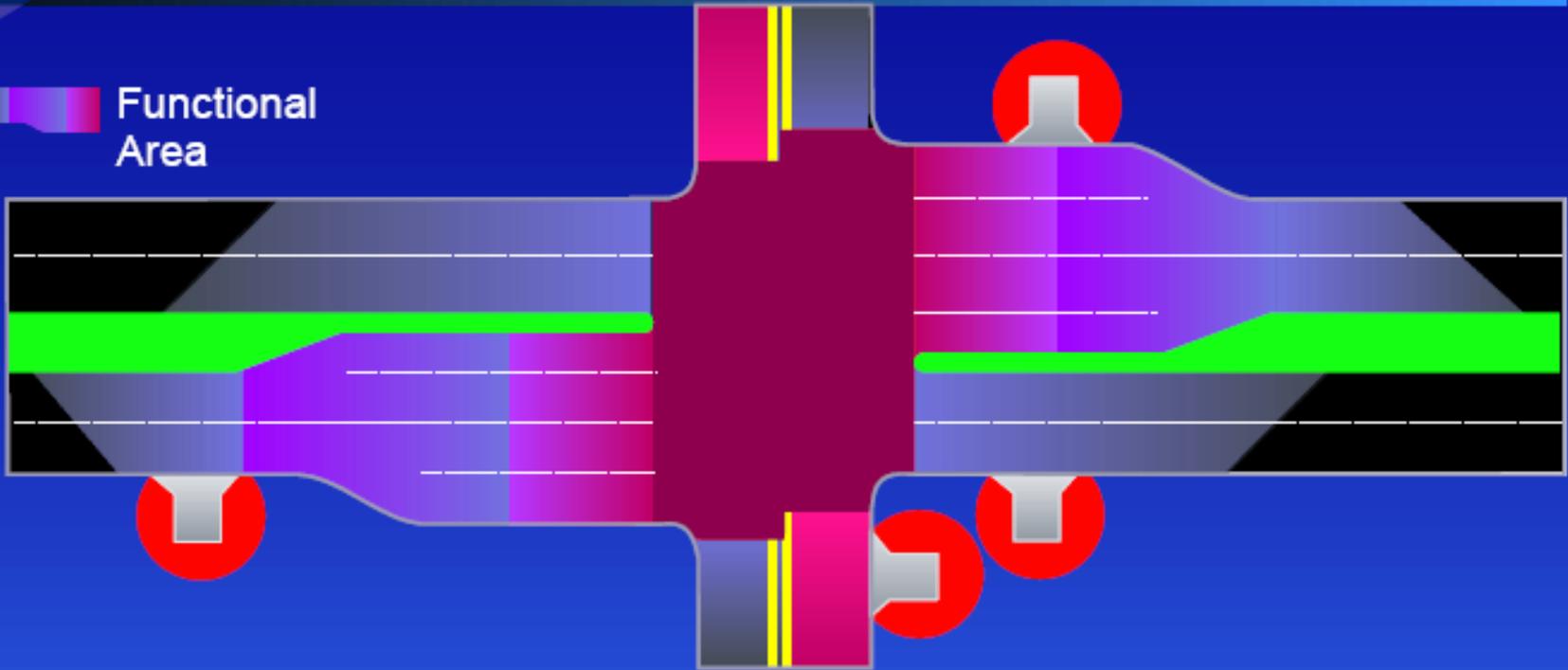




# Where driveways should not be



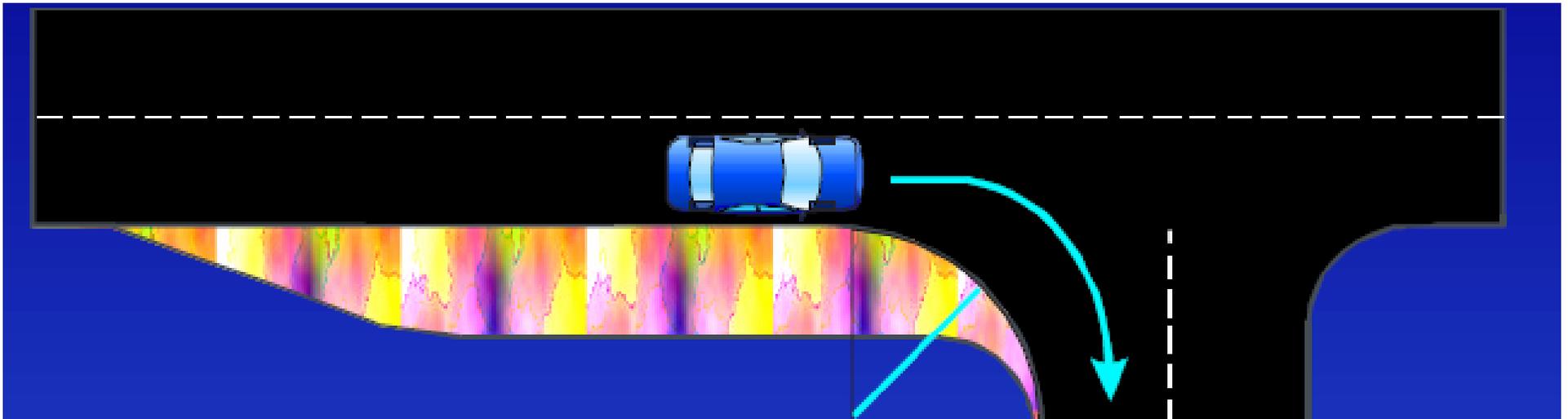
Functional Area



Driveways should not be situated within the functional boundary of at-grade intersections. This boundary would include the longitudinal limits of auxiliary lanes . . .

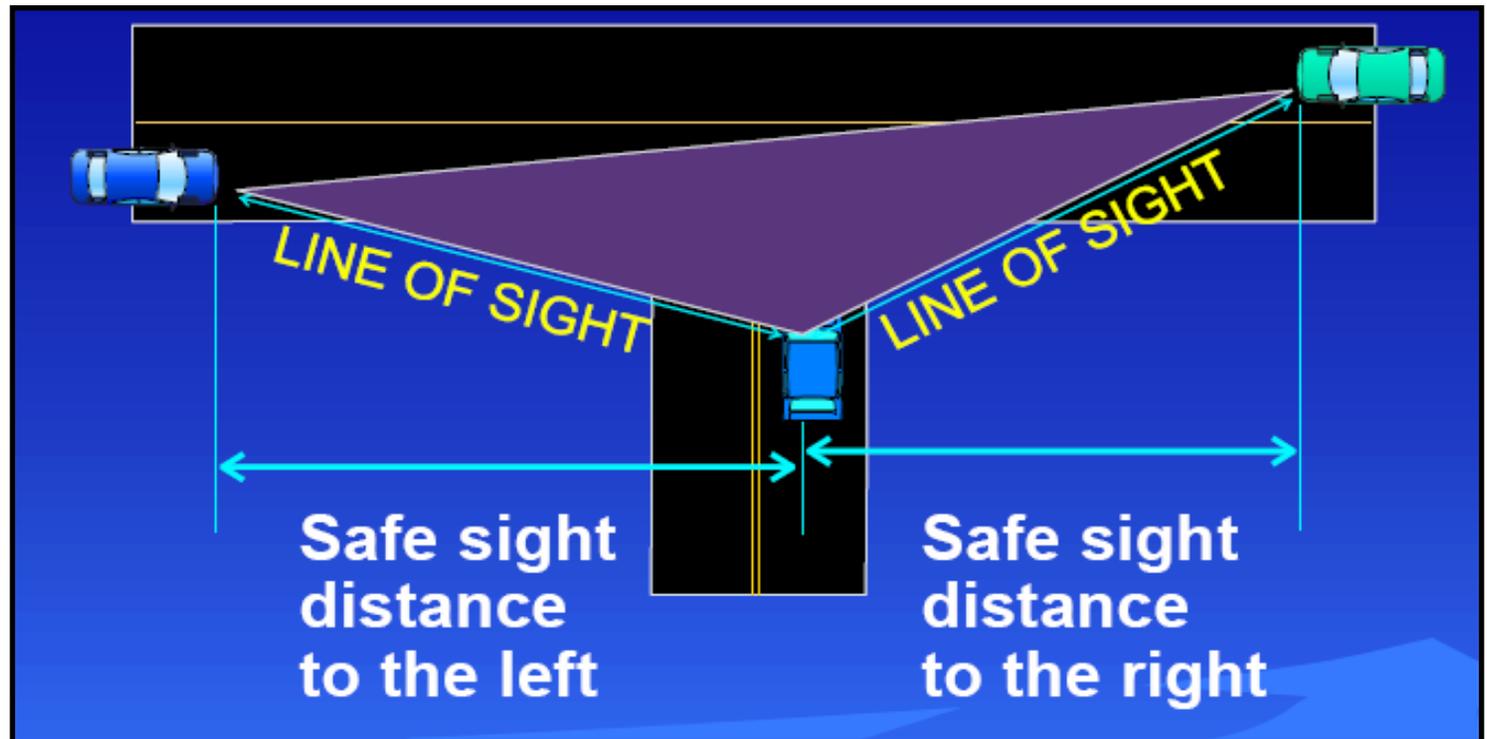
*AASHTO Greenbook*

## Entrance should not be allowed in the functional area of adjacent entrances



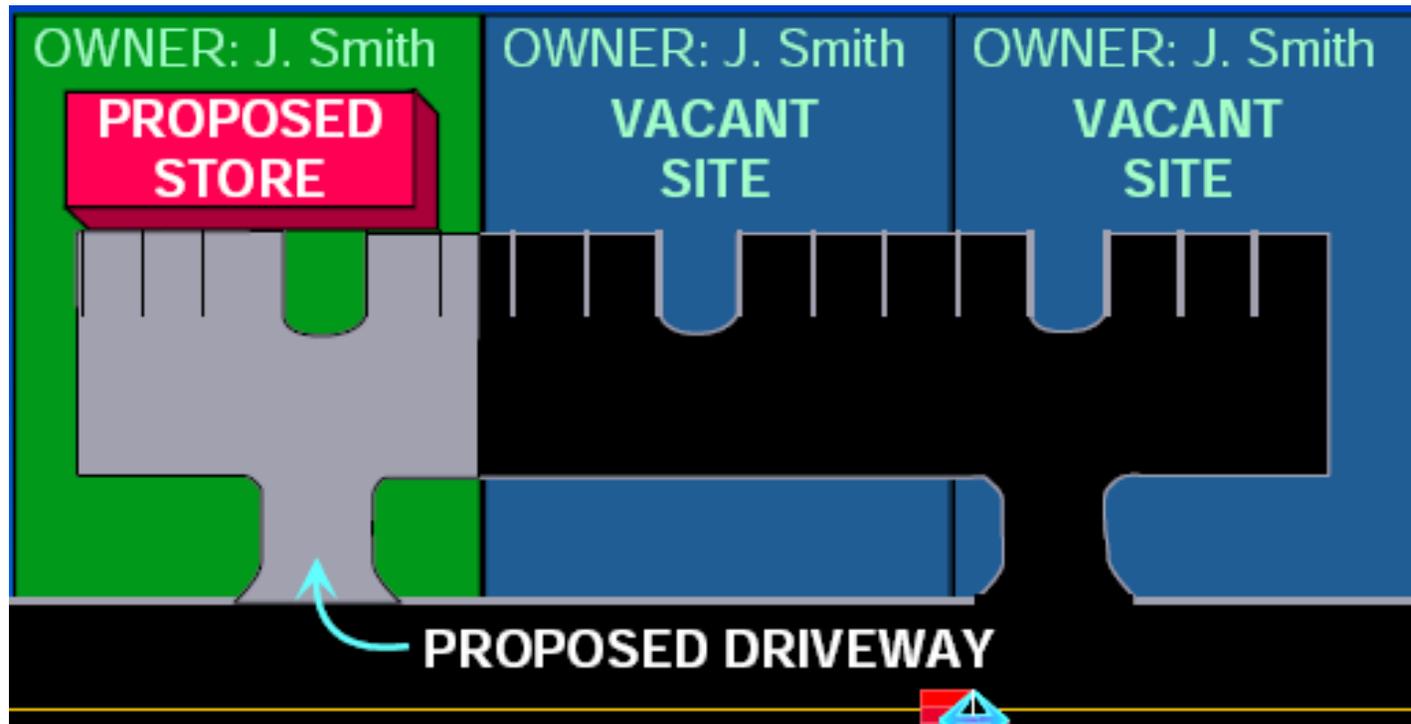


## Sufficient Sight Distance at Entrance Reduces Crashes

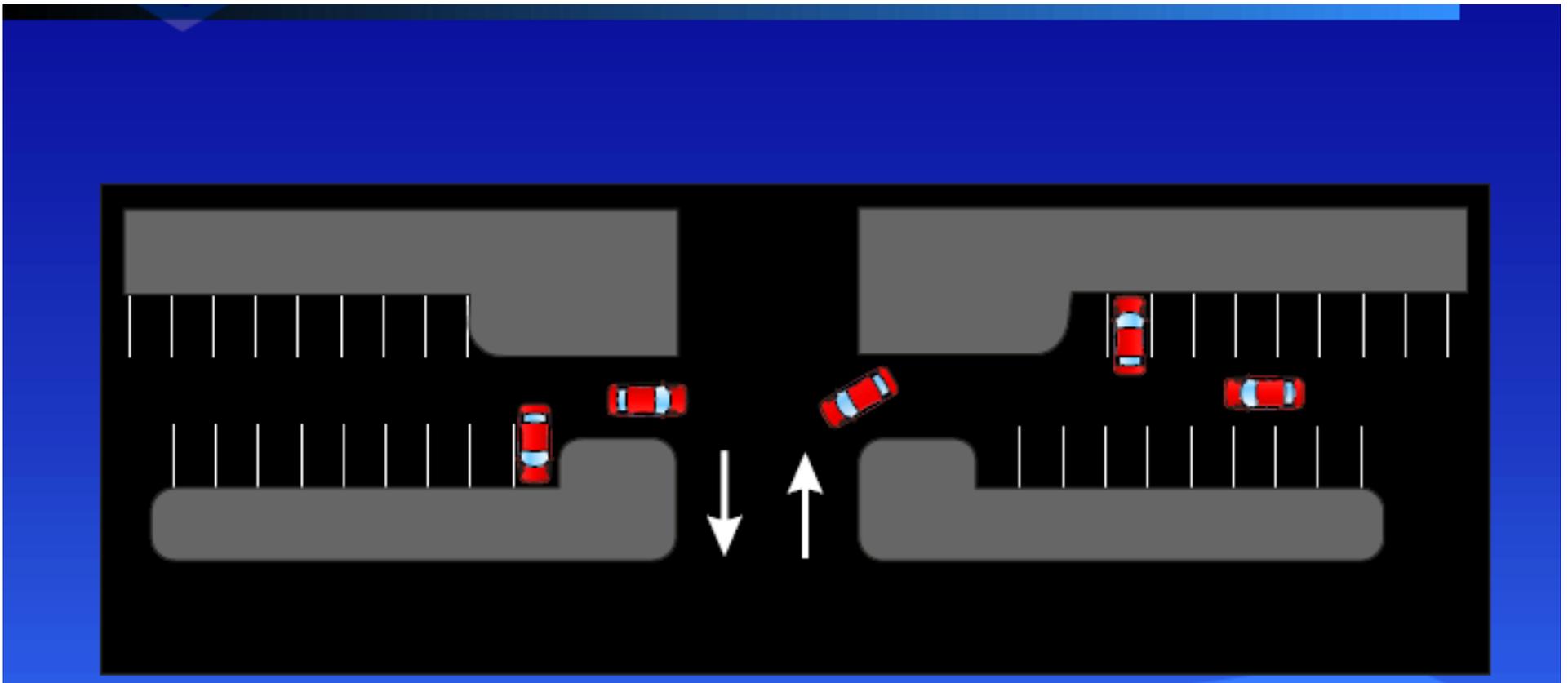


## Vehicular/pedestrian circulation between adjacent properties

- Reduce number of entrances
- Reduce use of the arterial highway to get to adj. business



**“Provide for joint use of the desired entrance with adjacent property owners or provide evidence of such efforts” § 33.1-198 of the Code of Virginia**



# Access Management Goal

Property owners have a right to reasonable access to the highways. In conjunction, roadway users have the right to freedom of movement, safety, and efficient expenditure of public funds.

Balancing these interests is the goal of access management.

October 3, 2016

**Braddock Road Multimodal Study, Fairfax County, Virginia**  
**Roadway Measures of Effectiveness (MOE)**  
**Scoring Scenario**

Scoring
<p>Compared to the “No-Build” scenario, is this element for the subject alternative:</p> <ul style="list-style-type: none"> <li>• Much worse → insert -2</li> <li>• Worse → insert -1</li> <li>• No change → insert 0</li> <li>• Better → insert 1</li> <li>• Much Better → insert 2</li> </ul>

Definitions and Acronyms
<ul style="list-style-type: none"> <li>• GHG: Greenhouse Gas</li> <li>• TNM: Traffic Noise Model</li> <li>• WSDOT: Washington State Department of Transportation</li> <li>• EB: Eastbound</li> <li>• WB: Westbound</li> </ul>

What you care about/MOE	Description of MOE	Performance Measures - Metrics
<b>Environment</b>	Availability for screening or landscaping enhancements	Area available for tree planting minus area of tree removal (square feet). A negative number means that there is a net loss of plantable area.
	Will alternative provide additional opportunities for bike/ pedestrian travel?	Linear feet of additional paths and number of crosswalks, crosswalk signals or pedestrian overpasses (length in feet). Considering this project is intended to provide additional access by all travel modes, a positive number means more bike/pedestrian path opportunities are available
	Park Land Impacts	Amount of land taken from parks for road (acres). This is a measure of the area of land taken from parks for the road improvements. The evaluation should consider the area taken related to the overall park area and the potential loss of amenities due to the loss of area.
	Does the alternative improve or degrade the noise levels experienced by those adjacent to the corridor?	Noise levels as measured by traffic models (decibels average) <sup>1</sup> . Evaluation should consider where a change becomes noticeable, where it becomes painful and where it becomes damaging.
	Does the alternative improve or degrade the air quality experienced by those adjacent to the corridor?	Air quality levels as measured by traffic models (Pounds of GHG emissions average <sup>2</sup> ). Evaluation should consider where a change becomes noticeable, where it becomes unhealthy.

<sup>1</sup> Based on average AM / PM TNM Lookup values.

<sup>2</sup> Sum of AM / PM peak based on WSDOT corridor planning values.

<b>Mobility</b>	Does the alternative facilitate community access to Braddock Road?	Overall travel time for vehicles in the system to and from the neighborhoods (hours) <sup>3</sup> . This is an indication of how long it will take to get into and out of the neighborhoods adjacent to the study corridor.
	Does the alternative facilitate traffic through the corridor?	<del>Total travel time in network (hours)</del> <b>Person throughput</b> * (number of person trips processed through the corridor) <sup>3</sup> . This is a measure of how well the option processes person trips through the network.
	Will the alternative provide better access and circulation for pedestrians and bicycles?	<b>Net change in the</b> number of new access points to neighborhoods (number). <b>Net change in length of paths based on the option (linear feet)</b> . This is a measure of how the option provides connectivity of paths to and between the neighborhoods along the study corridor.
<b>Safety</b>	Is it likely that existing conflict areas are improved?	Number of corridor-wide conflict points (number). This is a count of the number of conflict points along the corridor. A reduction in the number of conflict points is considered to improve safety.
	Is it likely that the suggested improvements will lower or increase potential crashes?	Highway Safety Manual Computed Expected Crash Rate (crashes/year) <sup>4</sup> . This is a computation of the anticipated number of crashes along the corridor, based on the proposed characteristics of the corridor. An improvement is the reduction in the number of crashes computed.
	Are safe movements provided for pedestrians and bicycles?	Number of signal-protected crossings and number of grade separated crossings. A higher number is considered better for pedestrian and bicycle access
<b>Travel Time</b>	Option that creates the least aggregate travel time <sup>5</sup>	Vehicular travel time (hours). Lowering the travel time improves network traffic flow as well as travel time within the community
	Travel time represented by critical movements	Average Travel time (minutes) <sup>6</sup> . Lowering the travel time improves person throughput through the corridor
	Pedestrian/Bicycle travel time	Pedestrian/bicycle Travel time (minutes) <sup>5</sup> . Lowering the pedestrian/bicycle travel time improves the desirability of the corridor for pedestrian and bicycle trips.
<b>Right-of-Way Impacts</b>	Total area of right-of-way taken (fee R/W)	Area of right-of-way taken (square feet or acres). Total area of right-of-way taken is land permanently taken from the adjacent property for the corridor improvements. The area taken does not necessarily mean that the use of the properties impacted is reduced in any way.
	Number of parcels impacted ( <b>including temporary and permanent easements</b> )	Number of impacted parcels (each). This is the total number of parcels where some sort of right-of-way or easements will be required, based on the conceptual plans developed.

<sup>3</sup> Sum of AM and PM peaks

<sup>4</sup> Current value is approximately 150

<sup>5</sup> "Aggregate travel time" is for the entire network and critical movements for EB and WB traffic along Braddock Road

<sup>6</sup> Average of EB / WB travel time and average of AM / PM peak values

\* Propose changing value to “Person Throughput” to represent number of person trips generated by the alternative, a more predictive value of the performance of the differing roadway types.



September 30, 2016

**Braddock Road Multimodal Study  
Fairfax County, Virginia**

**IN PROGRESS**

**Roadway MOE Measurements**

What you care about/MOE	Description of MOE	Performance Measures - Metrics	No-Build	Intersection Improvements	HOV2 Inside	HOV2 Outside	General Use Lane Addition
<b>Environment</b>	Availability for screening or landscaping enhancements	Square Feet	0	-24,500	-489,000	-489,000	-489,000
	Will alternative provide additional opportunities for bike/pedestrian travel?	Length in Feet	0	23,680 feet 6-8 Crossings	23,680 feet 6-8 Crossings	23,680 feet 6-8 Crossings	23,680 feet 6-8 Crossings
	Park Land Impacts	Acres	0	0.73	2.71	2.71	2.71
	Does the alternative improve or degrade the noise levels experienced by those adjacent to the corridor?	Decibels Average	67.0	66.3	66.6	66.4	66.6
	Does the alternative improve or degrade the air quality experienced by those adjacent to the corridor?	Pounds of GHG Emissions Average	5,943,167	5,816,042	6,249,021	5,920,509	6,213,590
<b>Mobility</b>	Does the alternative facilitate community access to Braddock Road?	Hours	119	75	91	52	58
	Does the alternative facilitate traffic through the corridor?	Number of Person Trips Processed through the Corridor	18,840	22,326	23,988	22,726	23,851
	Will the alternative provide better access and circulation for pedestrians and bicycles?	Number	0	1 new access point	24,500 feet 1 new access point	24,500 feet 1 new access point	24,500 feet 1 new access point
<b>Safety</b>	Is it likely that existing conflict areas are improved?	Number	597	510	480	480	480
	Is it likely that the suggested improvements will lower or increase potential crashes?	Crashes per Year	345	275	253	253	253
	Are safe movements provided for pedestrians and bicycles?	Number	7 signal-protected crossings 1 grade separated crossing	7 signal-protected crossings 2 grade separated crossings			
<b>Travel Time</b>	Option that creates the least aggregate travel time	Hours	5,368	4,002	4,438	4,811	4,448
	Travel time represented by critical movements	Minutes	20.3	13.3	13.1	15.8	13.4
	Pedestrian/Bicycle travel time	Minutes	73.3	71.8	67.2	67.2	67.2
<b>Right-of-Way Impacts</b>	Total area of right-of-way taken (fee R/W)	Acres	0	0.73 Acres	3.50 Acres	3.50 Acres	3.50 Acres
	Number of parcels impacted (including temporary and permanent easements)	Each	0	2	22	22	22



October 5, 2016  
 Braddock Road Multimodal Study  
 Fairfax County, Virginia



Roadway MOE Measurements

What you care about/ MOE	Description of MOE	Task Force Weights	No-Build		Intersection Improvements		HOV2 Inside		HOV2 Outside		General Use Lane Addition	
			Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score
Environment	Availability for screening or landscaping enhancements	4.5	0	0	(24,500.00)		(489,000.00)		(489,000.00)		(489,000.00)	
	Will alternative provide additional opportunities for bike/pedestrian travel?		0	0	23680 ft 6-8 crossings		23680 ft 6-8 crossings		23680 ft 6-8 crossings		23680 ft 6-8 crossings	
	Park Land Impacts		0	0	0.73		2.71		2.71		2.71	
	Does the alternative improve or degrade the noise levels experienced by those adjacent to the corridor?		67.0	0	66.3		66.6		66.4		66.6	
	Does the alternative improve or degrade the air quality experienced by those adjacent to the corridor?		5,943,167	0	5,816,042		6,249,021		5,920,509		6,213,590	
Mobility	Does the alternative facilitate community access to Braddock Road?	4.7	119	0	75		91		52		58	
	Does the alternative facilitate traffic through the corridor?		18,840	0	22,326		23,988		22,726		23,851	
	Will the alternative provide better access and circulation for pedestrians and bicycles?		0	0	1 new access point		24,500 feet 1 new access point		24,500 feet 1 new access point		24,500 feet 1 new access point	
Safety	Is it likely that existing conflict areas are improved?	4.7	597	0	510		480		480		480	
	Is it likely that the suggested improvements will lower or increase potential crashes?		345	0	275		253		253		253	
	Are safe movements provided for pedestrians and bicycles?		7 signal 1 grade sep	0	7 signal 2 grade sep		7 signal 2 grade sep		7 signal 2 grade sep		7 signal 2 grade sep	
Travel Time	Option that creates the least aggregate travel time	2.6	5368	0	4002		4438		4811		4448	
	Travel time represented by critical movements		20.3	0	13.3		13.1		15.8		13.4	
	Pedestrian/Bicycle travel time		73.3	0	71.8		67.2		67.2		67.2	
ROW Impacts	Total area of right-of-way taken (fee R/W - acres)	3	0.00	0	0.73		3.50		3.50		3.50	
	Number of parcels impacted (including temporary and permanent easements)		0	0	2		22		22		22	



## County of Fairfax, Virginia



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