



Access Management Regulations and Standards

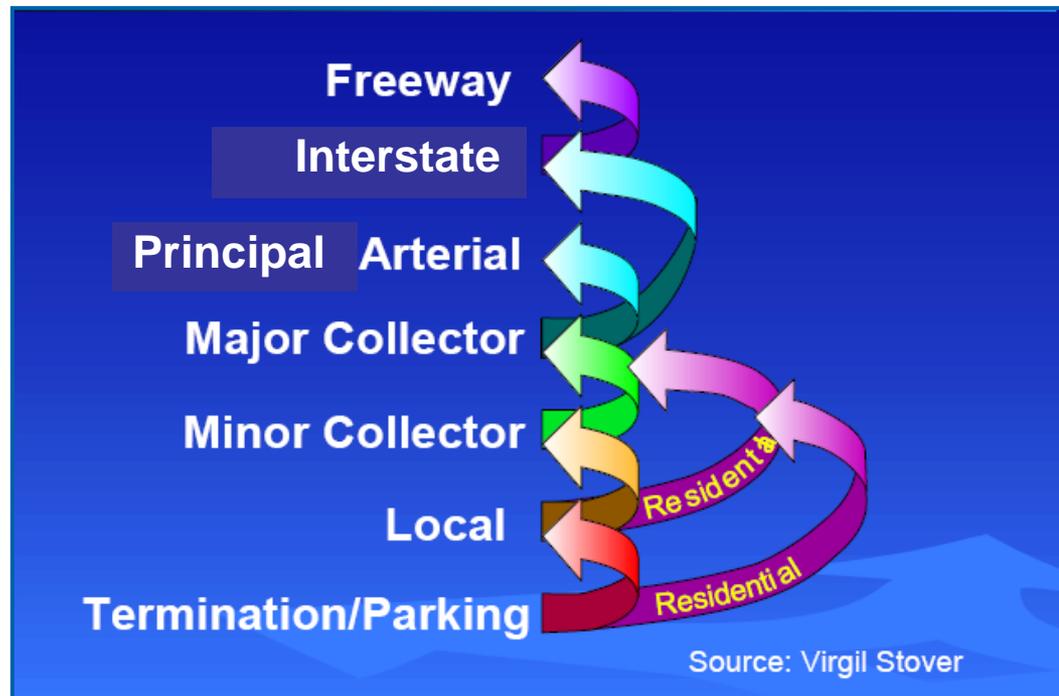


Concept of Access Management

“The way to manage access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity and speed.”

Roads Have Different Functions

- Travel involves movement of traffic through a network of roads
- A logical & efficient system for moving traffic within the network focuses on the function of roads



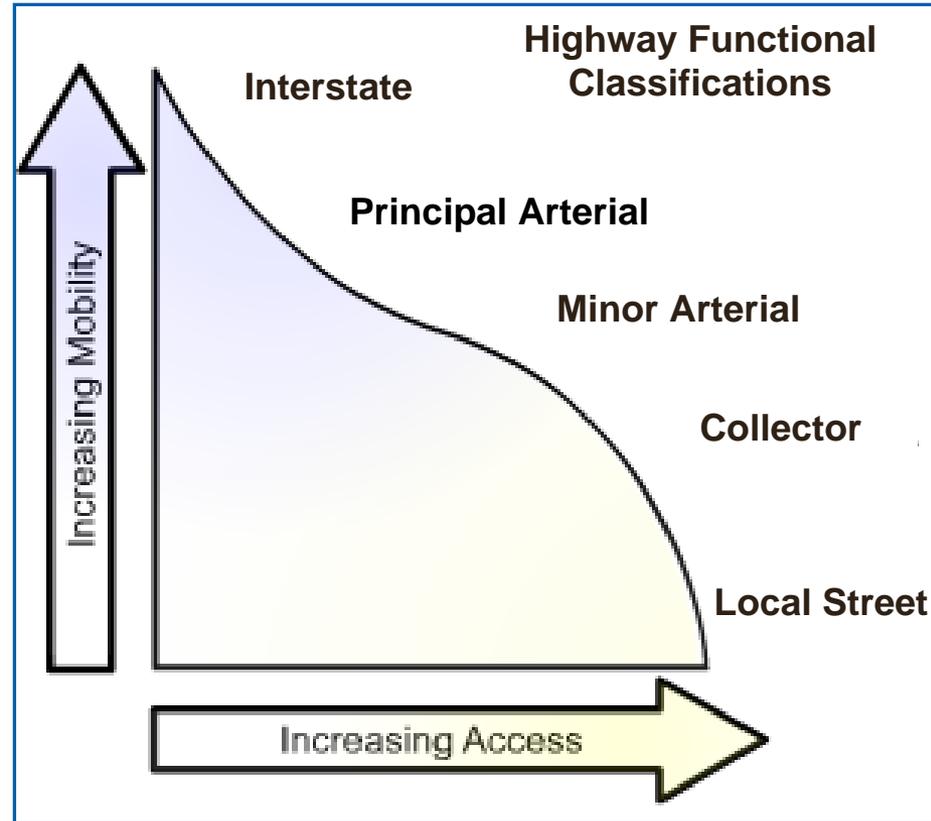
Access Management

Managing the location, number, spacing, and design of

- Commercial entrances
- Intersections/median openings
- Traffic signals
- Entrances near interchange ramps

According to the highway's functional classification

- Arterials
 - Function: Efficient movement of high traffic volumes
- Collectors
 - Function: Both traffic circulation in an area and access to property
- Local streets
 - Function: Provide access to property



Access Management: Purpose

- **Reduce traffic congestion, motorist's time waiting in traffic**
 - Stop and go traffic increases fuel consumption, vehicular emissions, and air pollution
- **Lower the number and severity of traffic crashes**
- **Preserve critical roadway capacity**
 - Reduce the need for new highways & adding lanes to highways
 - Maximize the performance of existing highways
- **Support economic development**
 - Better mobility expands the market reach of businesses and enhances the efficient movement of goods
- **Provide property owners with reasonable access to the highway**

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

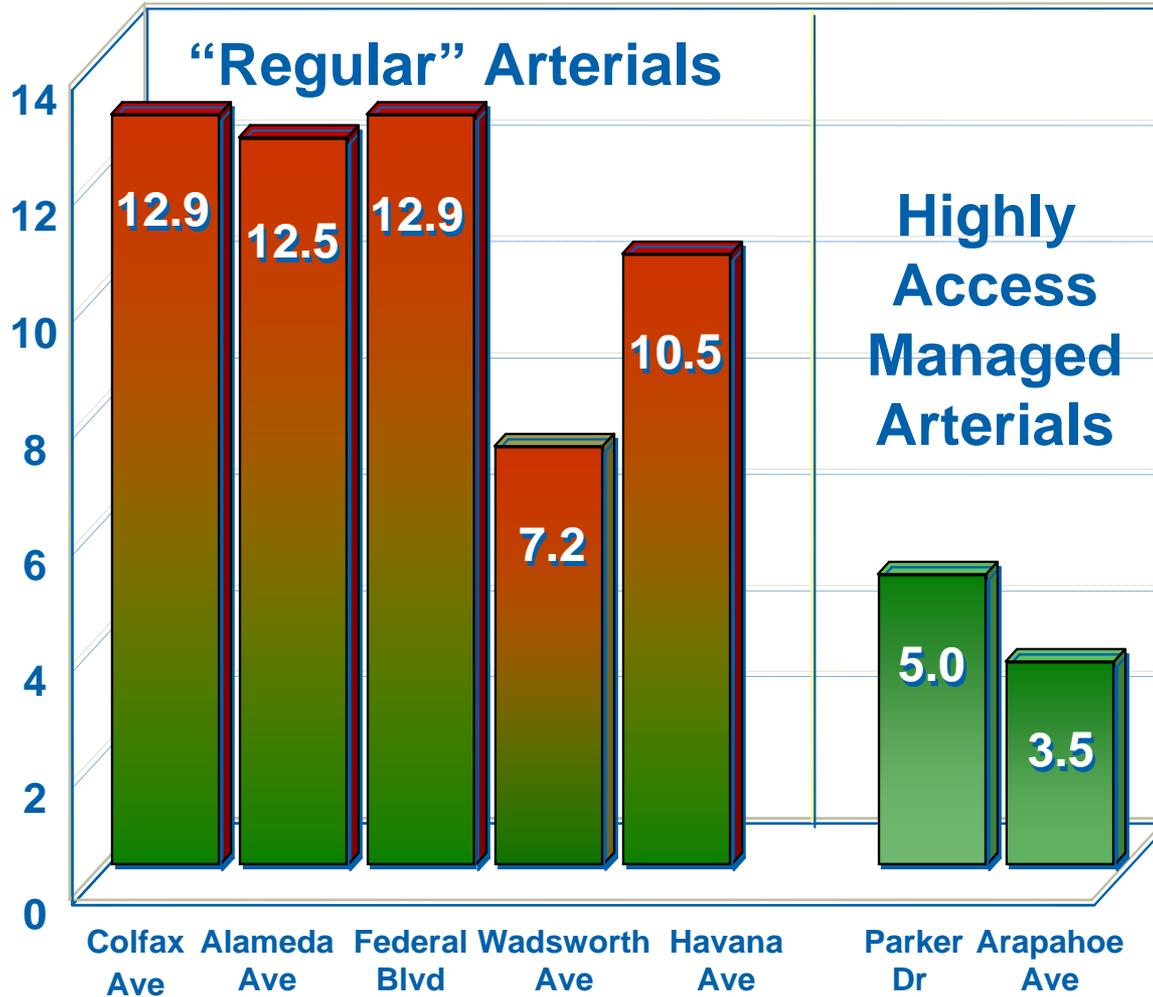
NCHRP Report 121 Protection of Highway Utility. 1971

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

International Right-of-Way Association Conference Paper, 1999.

Fewer Accidents on 'Managed' Roads

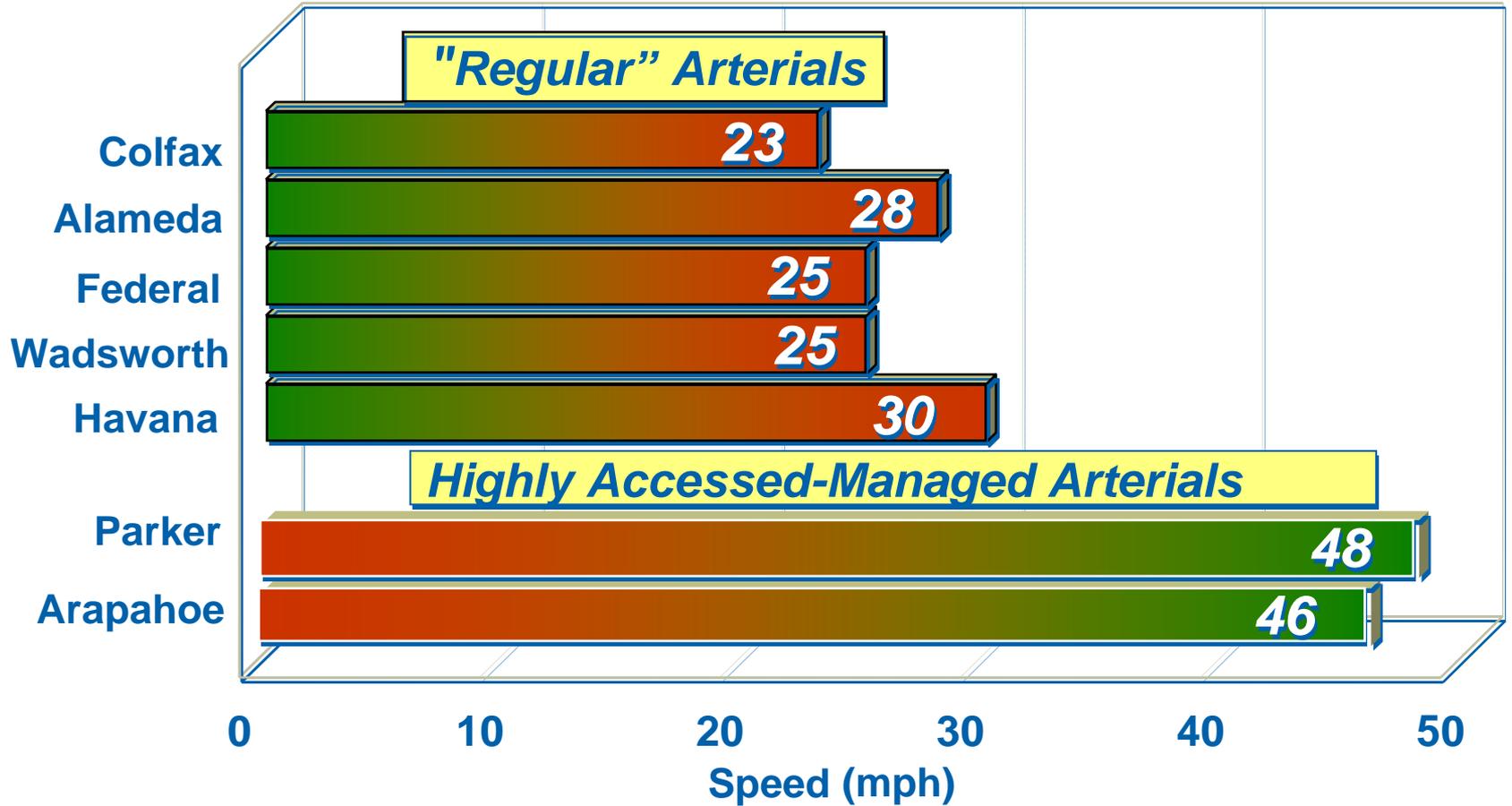
Accidents
Per Million
Miles
Traveled



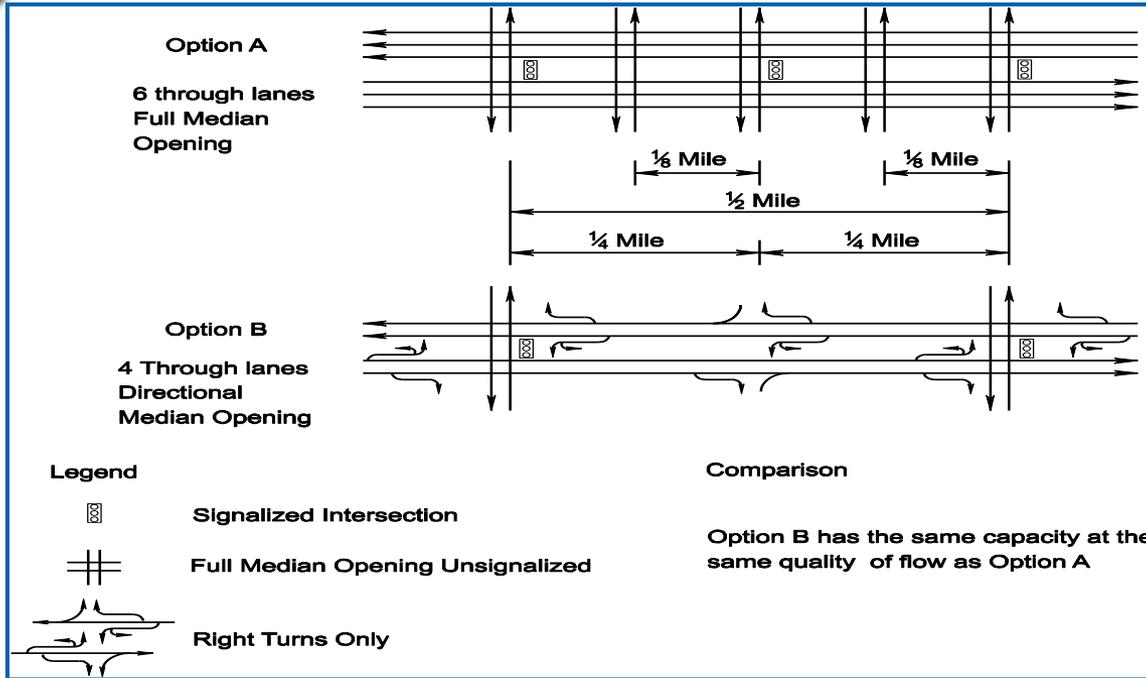
Source:
"Colorado
Access Control
Demonstration
Project"

Less Congestion on 'Managed' Roads

Effects of access management on P.M. peak hour travel speeds



Access Management: National Research Findings

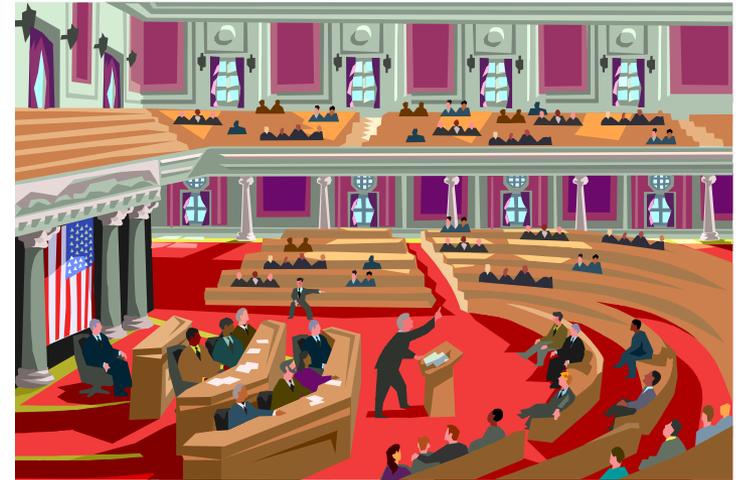


Option B four lane highway with greater intersection and entrance spacing can handle the same amount of traffic as Option A six lane highway

Source: "Colorado Access Control Demonstration Project"

§ 33.1-198.1 of the Code authorized VDOT's Commissioner to develop and implement access management regulations and standards

- Enacted and amended by 2007 and 2008 General Assemblies
- For VDOT highways
 - **Do not apply** to roads maintained by cities, certain towns and counties (Arlington, Henrico)
- For principal arterials, minor arterials, collectors, and local streets
- Solicited public comments from 2007 through 2009



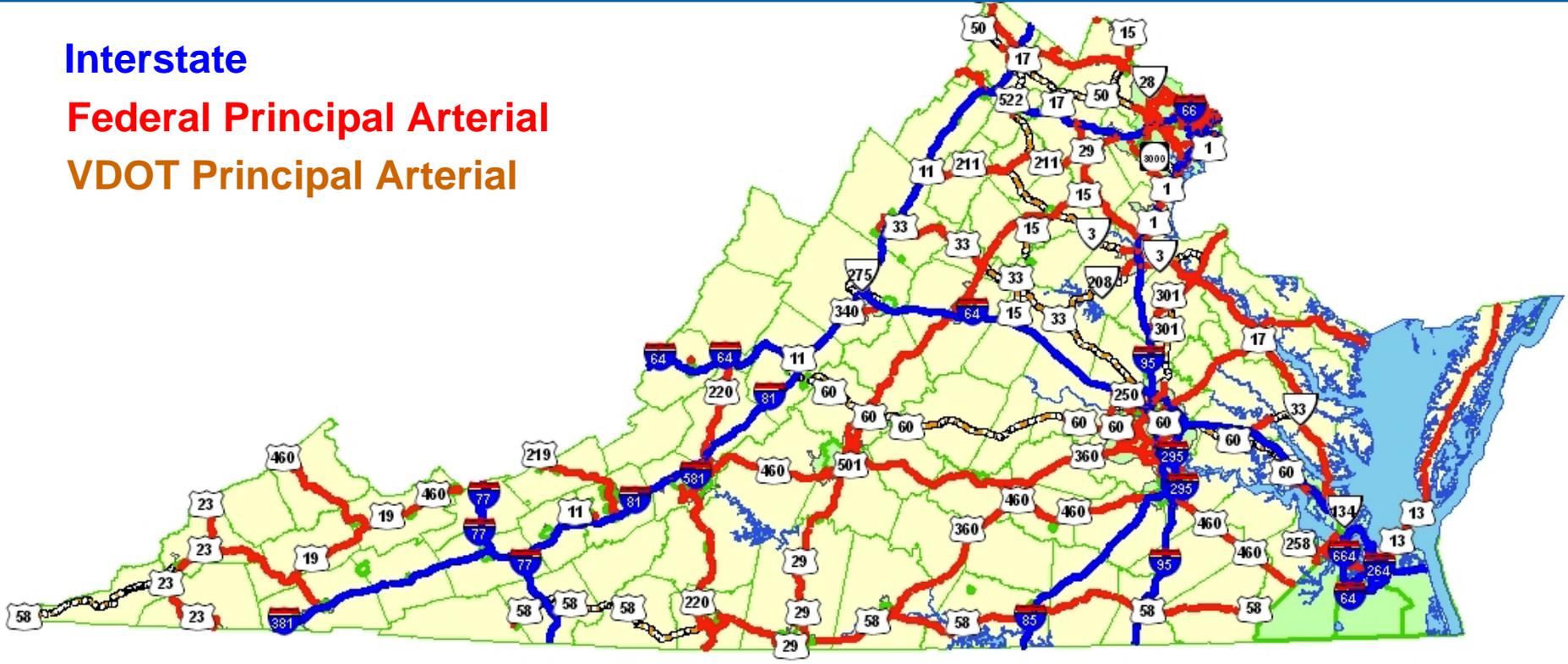
Importance of the Principal Arterial Network

- Travel throughout the state
- Transporting of goods
- Commuting to work
- Economic Development
- Emergency routes to safety

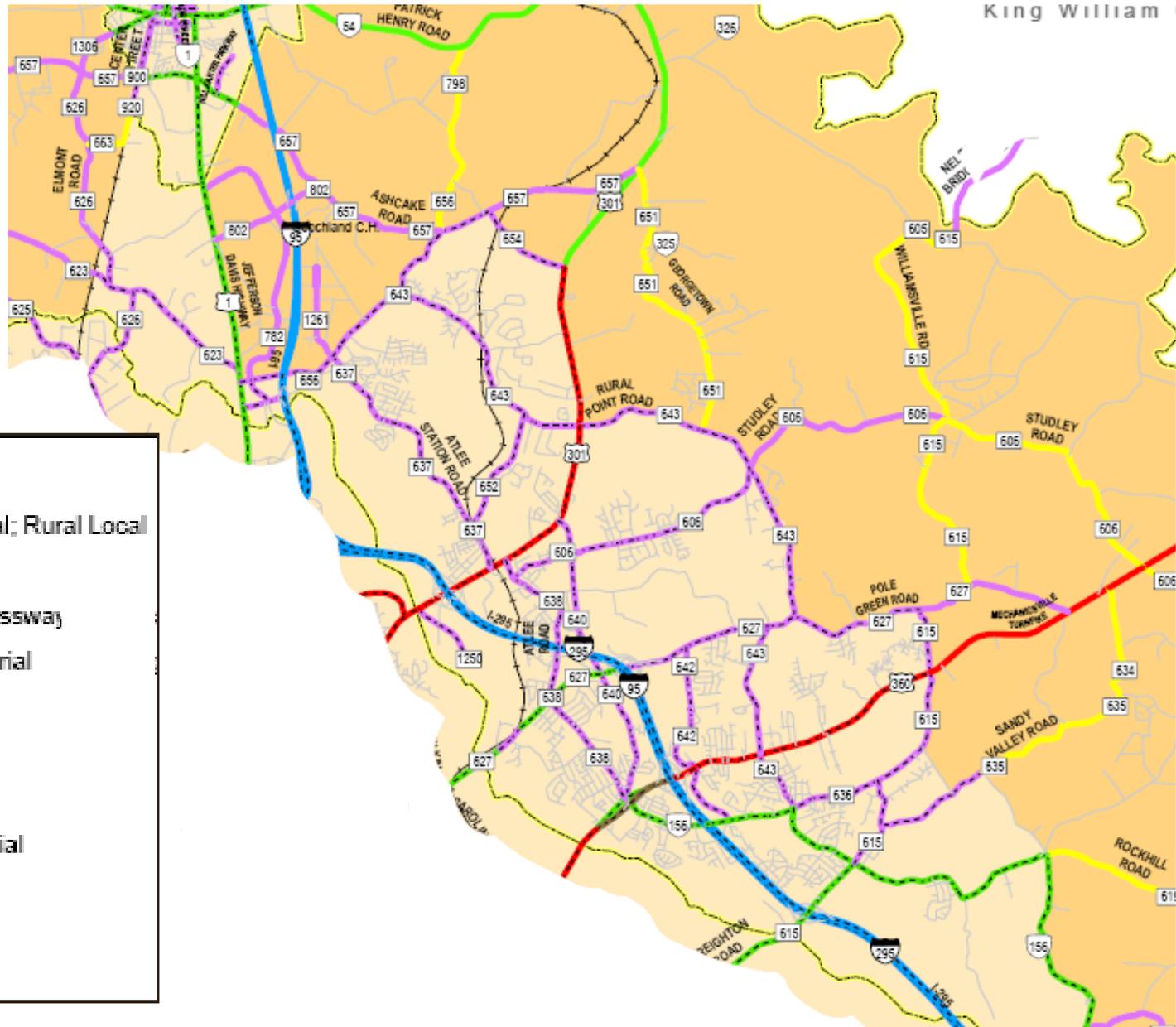
Interstate

Federal Principal Arterial

VDOT Principal Arterial



Example of Principal & Minor Arterial, Collector, Local Street Network



King William

Legend

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

Policy Committee reviewed and refined drafts during 2007

- Virginia Association of Counties
- Virginia Home Builders Association
- Piedmont Environmental Council
- Virginia Commercial Real Estate Association
- Virginia Section, Institute of Transportation Engineers

Public comments: 2007 - 2009

- Five public hearings throughout the state
- Over 450 comments received
- Regulations/standards significantly revised based on public comments

Training/Information Sessions: 2008 - 2009

- Nine sessions; one in each VDOT District
- Over 600 people attended

Access Management - Implementation

Phase 1: Principal Arterials

- Regulations and standards effective on July 1, 2008
 - 24VAC30-72 Regulations
 - New Appendix F Design Standards in VDOT Road Design Manual

Phase 2: Minor Arterials, Collectors, and Local Streets

- Regulations and standards effective on October 14, 2009
 - 24VAC30-73 Regulations
 - New Appendix G Standards in VDOT Road Design Manual

Phase 3: Appendix F and G consolidated into Appendix F

- Effective January 1, 2010
 - Applies to all highway functional classifications
 - More user friendly by providing one source for standards

Access Management Regulations

Principal Arterials 24 VAC 30-72

Minor Arterials, Collectors, and Local Streets 24 VAC 30-73

Access Management Design Standards for Entrances & Intersections

Appendix F

in the

VDOT Road Design Manual

Commercial Entrances

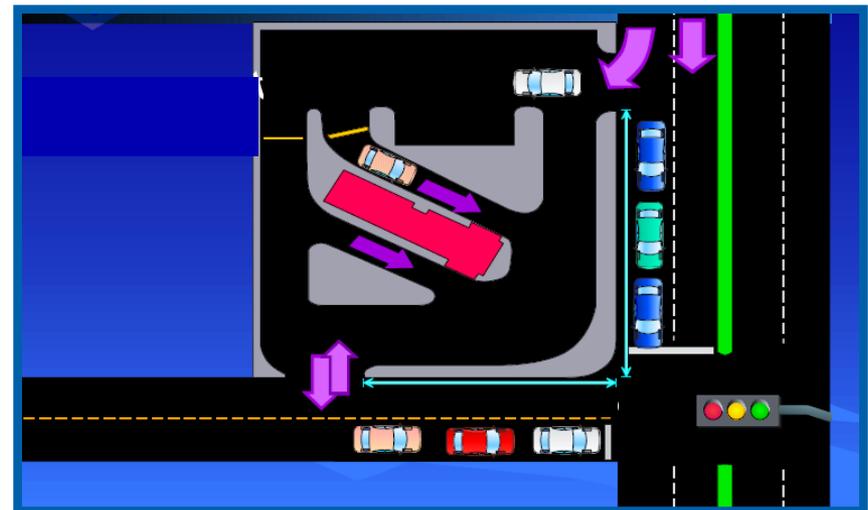
Not retroactive, applies to new entrances

VDOT will permit reasonably convenient access to parcels

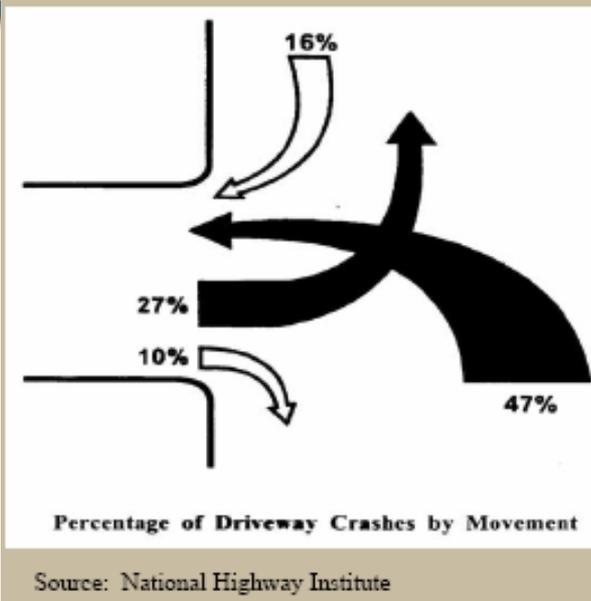
- Property owner not denied access
- Fewest number of entrances to reduce turning movements
- Focus on side streets
- Use of **right-in/right-out entrance design**
- Applicant to demonstrate safety of proposed entrance & its impact
- Applicant to mitigate any impacts on highway operation and safety



Property with 5 entrances



Right-In/Right-Out Entrance Design

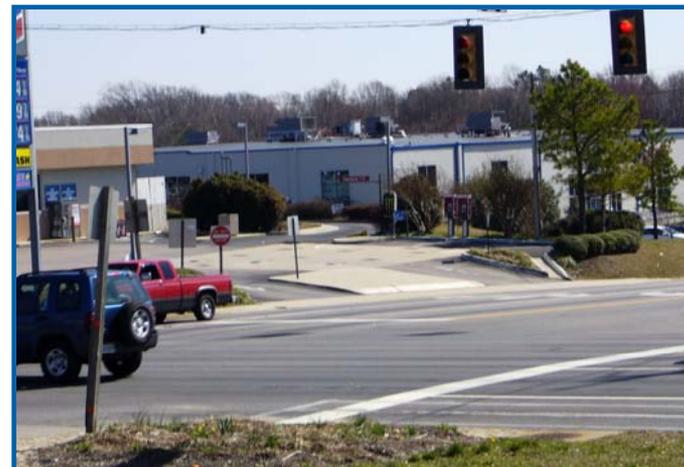


74% of Crashes Involve Left Turns



Median to Prevent Left Turns

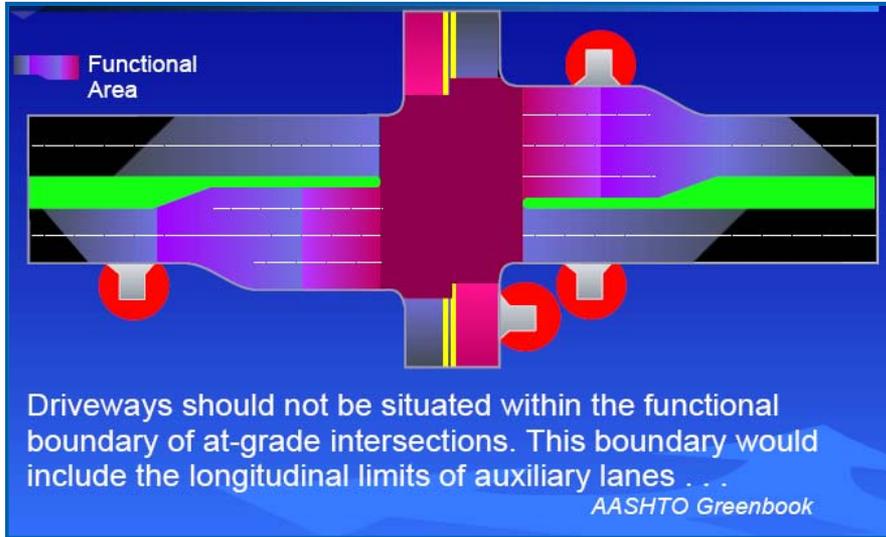
Entrance Island to Prevent Left Turns



Access Management Requirements

1. Keep entrances out of the **functional area of intersections** and away from interchange ramps.
2. **Share the entrance** with adjoining property owner
3. Comply with the **entrance/intersection spacing standards** in Appendix F
4. Provide connections to property line for **vehicular and pedestrian circulation**
5. **Traffic signal spacing**
6. **Limiting traffic movements at entrances**

Commercial Entrances Not Allowed in Functional Area of Intersections



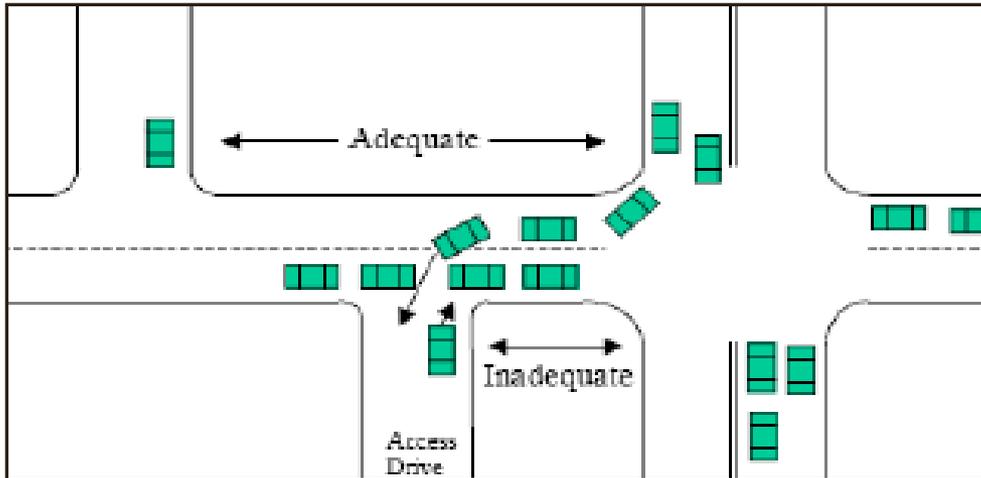
Five Entrances Within the Right Turn Lane



EXCEPTION: Approval of a traffic engineering study documenting that the entrance will not affect highway operation and safety.

Functional Area of Intersections

Corner Clearance on Minor Side Street



Keep entrances away from intersection: Reduce congestion, enhance safety, prevent vehicles backing up on to the highway

See Figure 4-4, Appendix F, Road Design Manual

Shared Entrances Required

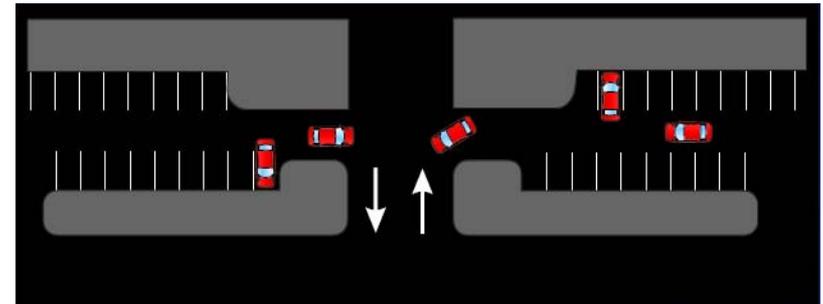
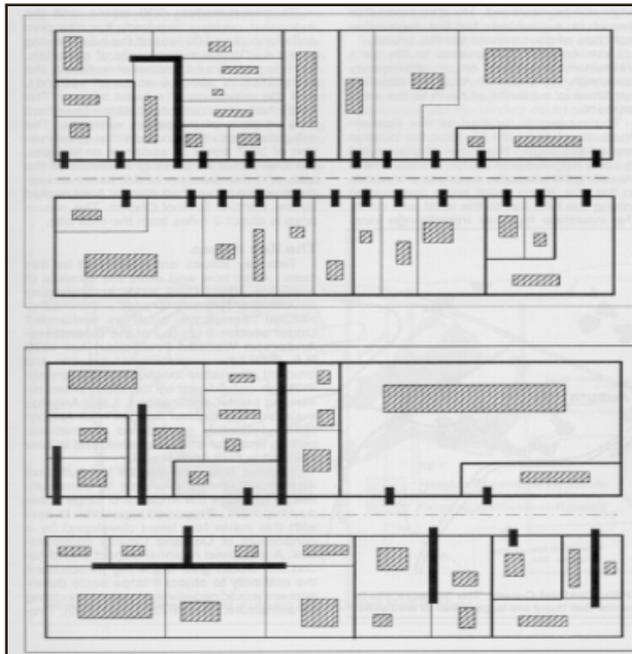
Shared Entrance Reduce the Number of Entrances on Highways

- Allows businesses to share (gain) customers; share construction cost
- Property owners' recorded agreement to share use and maintain the entrance submitted with permit application
- Show shared entrance on site plan or subdivision plat

Top Right:
23 entrances,
28 parcels



Bottom Right:
10 entrances,
29 parcels



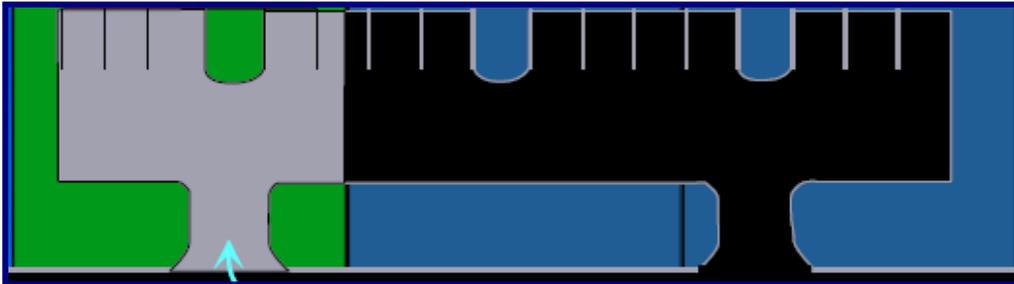
EXCEPTIONS

Physical constraints such as topography,
environmental, hazardous land uses

If adjoining property owner will not agree –
provide written evidence

Vehicular and Pedestrian Circulation between Adjoining Properties

Fewer trips, less traffic on the highway
Facilitate customer circulation between businesses



- Record access easement/construct connection to the boundary with adjoining undeveloped parcel
- A condition of entrance permit issuance for adjoining property will be to extend the connection
- Alternative: Entrance restricted to right-in/right-out movements



EXCEPTION: Documentation of physical constraints to the connection such as topography, environmentally sensitive areas, adjacent hazardous land use

Separation between Traffic Signals

To maintain road's traffic carrying capacity and operational safety

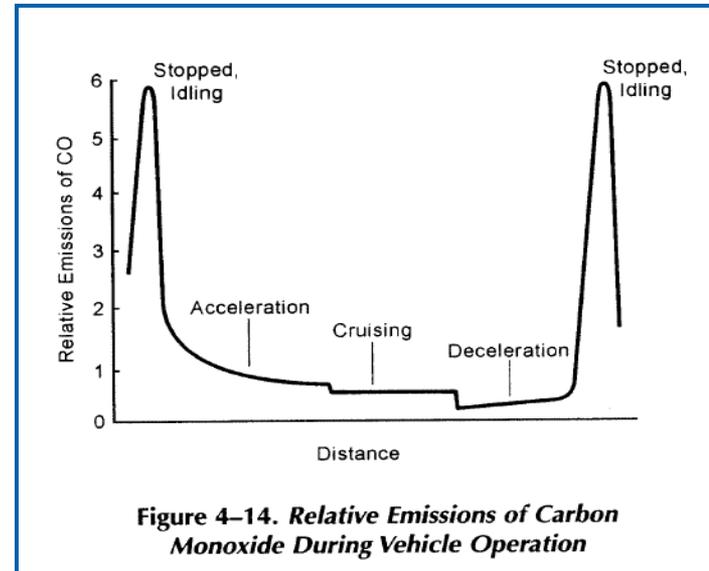
- Fewer signals allows vehicles to maintain a more constant speed, reducing delay.
- Reduces fuel consumption and vehicle emissions
- Expands the traffic carrying capacity of the road



EXCEPTION: Submit a traffic engineering study that: (i) Evaluates suitability of the location for design as a roundabout and (ii) Documents impact on highway operation and safety.

Proposed signaled entrance will not be allowed if spacing standard can't be met

- Entrance limited to right-in/right-out movements



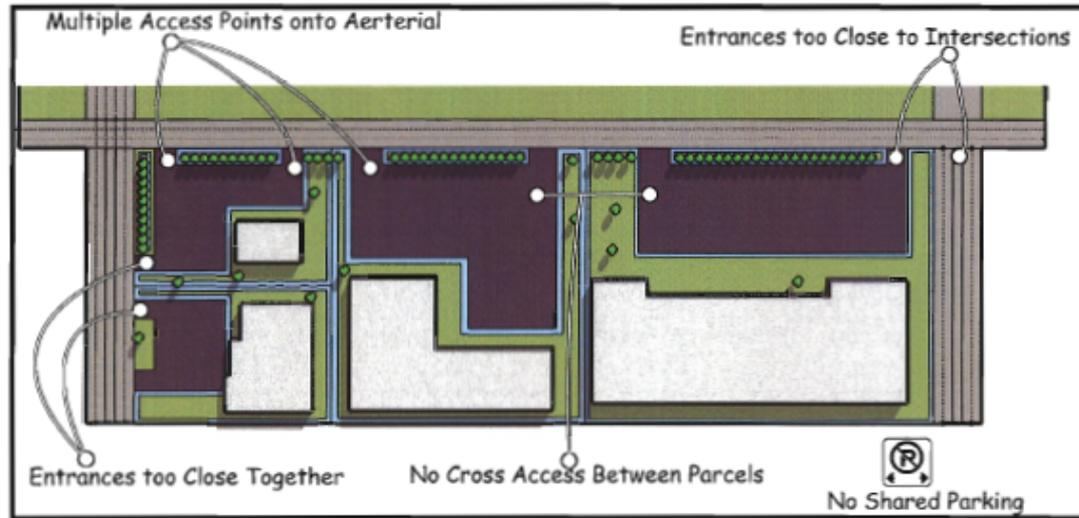
Examples

Three **red** entrances too close to intersection.
Blue entrance away from intersection area.

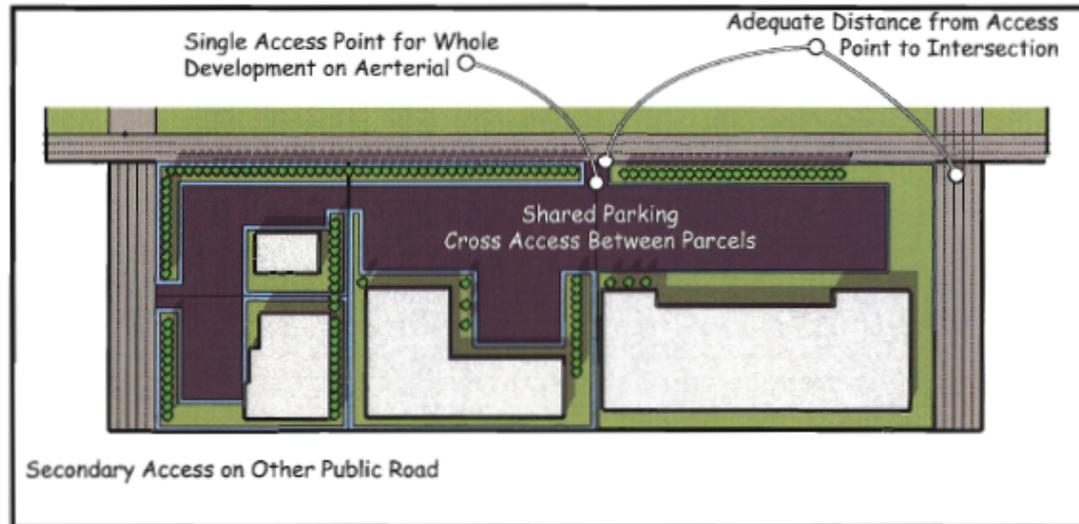
Blue shared entrance instead of two **red** entrances.
Blue connection to allow vehicle & pedestrian circulation between businesses.



Examples



Little or No Access Management

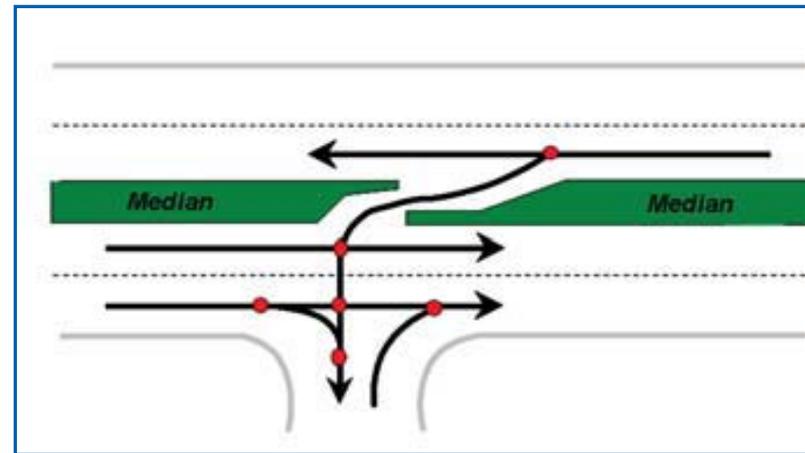
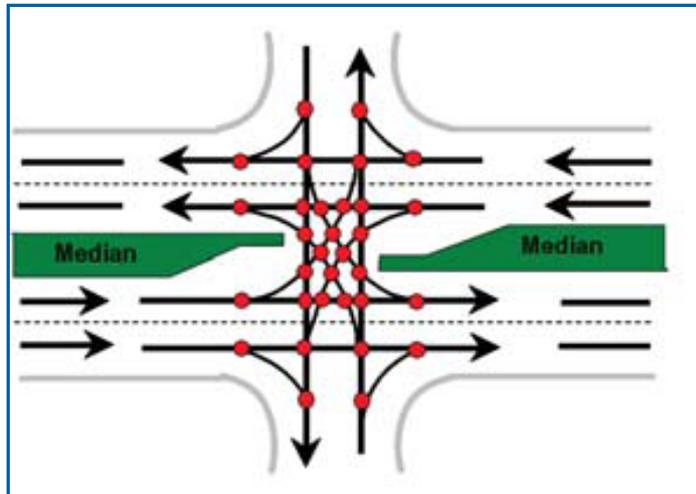


Effective Access Management

Access Management: Entrance/Intersection Spacing

As the number of turning movements and traffic conflict points* increase, congestion and traffic crashes increase

32 conflict points
Greater spacing is needed



6 conflict points
Less spacing is needed

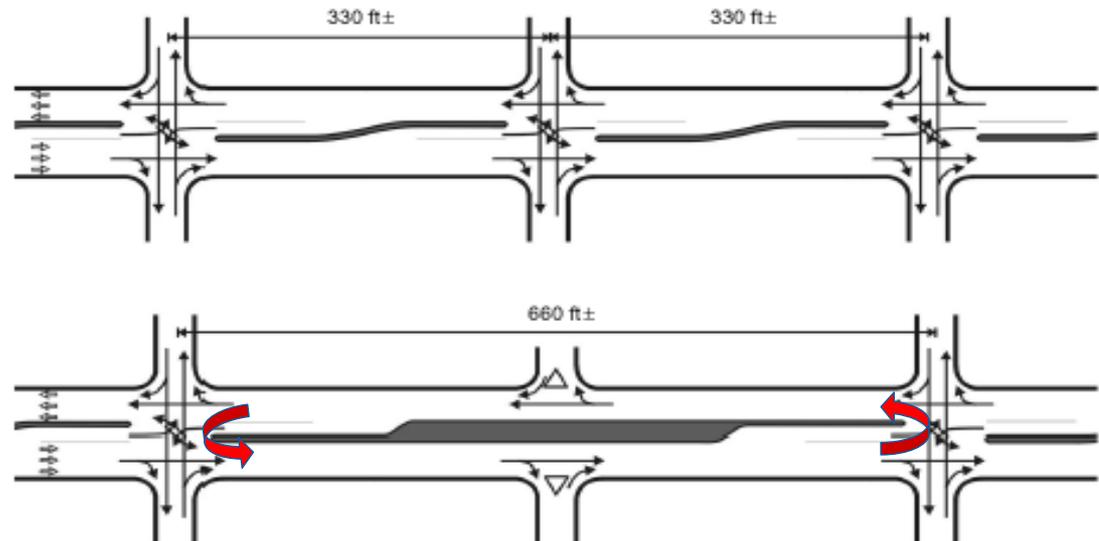
* Traffic conflicts occur where vehicle paths intersect. Each conflict point is the location of a potential collision.

Fewer Intersections; More U-Turns



Making a U-Turn at an Intersection is 25% Safer than a Left Turn Across Highway Lanes*

* 2001 University of South Florida Study



Entrance/Intersection Spacing Standards National Research

VA Tech 2007 Access Spacing Study

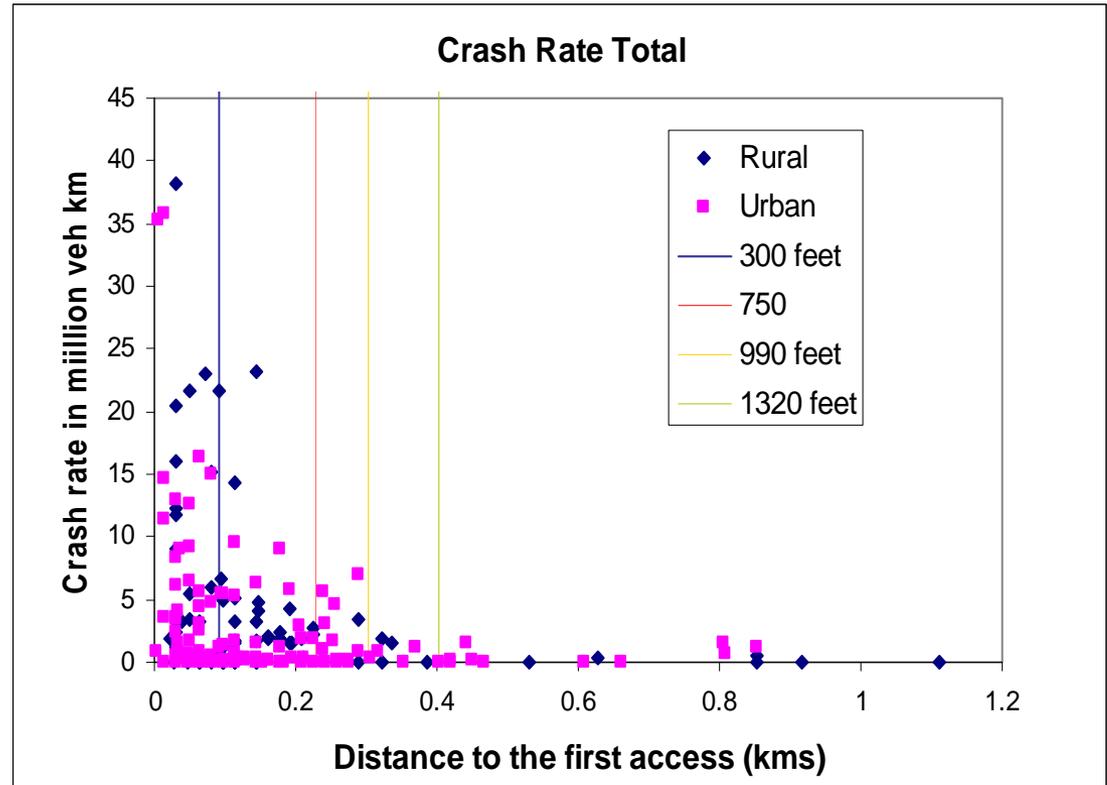
- Analyze crash data at 186 intersections over 5 years: 2001 - 2005
- 2,277 accidents



National Research Study: 1999

Crash rate average for entrance spacing of:

- 150 ft was 1.6 times greater than for 265 ft spacing
- 150 ft was 2.5 times greater than for 550 ft spacing



Research Findings

Greater spacing reduces the crash rate resulting in fewer fatalities, injuries, and property damage.

Appendix F Criteria for Spacing Standards

Functional classification of highway

Mobility vs. access to property

Highway speed limit

Higher speed - longer distance to slow down for vehicles turning into or out of an entrance or at an intersection

Traffic signal

Separation of signals for efficient traffic progression

Type of entrance

More turning movements, more conflict points

Rural vs. urban areas

Rural: Greater spacing due to lower density, larger parcels, higher speed limits

Urban: Shorter spacing due to higher land use density, smaller parcels with less road frontage, slower traffic speed, pedestrians/bicyclists

Principal Arterial Spacing Standards

Appendix F, Table 2-2

Principal Arterial Spacing Standards for Commercial Entrances, Intersections, and Crossovers				
Highway Functional Classification	Legal Speed Limit (mph)	Centerline to Centerline Spacing in Feet		
		Signalized Intersection/ Crossover	Unsignalized Intersection/ Crossover & Full Access Entrances	Partial Access One or Two Way Entrance ¹
Urban Principal Arterial	≤ 30 mph	1,760	1,050	270
	35 – 45 mph	2,640	1,320	325
	≥ 50 mph	2,640	1,320	510
Rural Principal Arterial	≤ 30 mph	2,640	1,320	270
	35 – 45 mph	2,640	1,320	440
	≥ 50 mph	2,640	1,760	585

¹ Length of right turn lane by speed (AASHTO)

Minor Arterial, Collector, Local Street Spacing Standards

Appendix F, Table 2-2

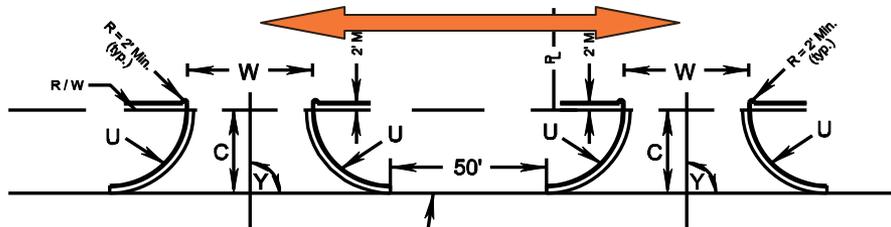
Spacing Standards for Commercial Entrances, Intersections, and Crossovers						
Highway Functional Classification	Legal Speed Limit (mph)	Centerline to Centerline Spacing in Feet				
		Signalized Intersections/ Crossovers		Unsignalized Intersection/Crossover & Full Access Entrances		Partial Access One or Two Way Entrances
Urban Minor Arterial	≤ 30 mph	880		660		270
	35 to 45 mph	1,050		660		305
	≥ 50 mph	1,320		1,050		425
Urban Collector	≤ 30 mph	<u>DIVIDED</u>	<u>UNDIVIDED</u>	<u>DIVIDED</u>	<u>UNDIVIDED</u>	155
	35 to 45 mph	660	425	440	200	250
	≥ 50 mph	660	425	440	305	360
Rural Minor Arterial	≤ 30 mph	1,050		880		270
	35 to 45 mph	1,320		1,050		360
	≥ 50 mph	1,760		1,320		495
Rural Collector	≤ 30 mph	<u>DIVIDED</u>	<u>UNDIVIDED</u>	<u>DIVIDED</u>	<u>UNDIVIDED</u>	200
	35 to 45 mph	880	570	660	305	305
	≥ 50 mph	1,050	570	660	425	425
Local Street	≤ 30 mph	<u>DIVIDED</u>	<u>UNDIVIDED</u>	<u>DIVIDED</u>	<u>UNDIVIDED</u>	200
	35 to 45 mph	880	570	660	305	305
	≥ 50 mph	1,050	570	660	425	425
Local Street		Commercial entrance spacing: See Figure 4-11.				

Appendix F, Figure 4-11 Commercial Entrance Spacing along Local Streets

COMMERCIAL ENTRANCE DESIGN ALONG LOCAL STREETS WITH CURB AND GUTTER OR SHOULDERS

SINGLE TWO - WAY ENTRANCE

200' between subdivision street connections to a local street



50' Commercial Entrance Spacing

Notes:

Entrance details shown on this sheet may be modified to meet specific site requirements as directed or approved by the Engineer at the Residency or District, when based on sound engineering principles.

If an Accessible route as defined in Section 15.2-2021 in the Code of Va. is present, curb ramps in accordance with St'd. CG-12 will be provided.

Curb and Gutter or Curbing may be deleted on low intensity uses if approved by Residency or District Administrator.

When curbing is used on a street with shoulders, the curbing shall be set back a minimum of 4' from the edge of pavement.

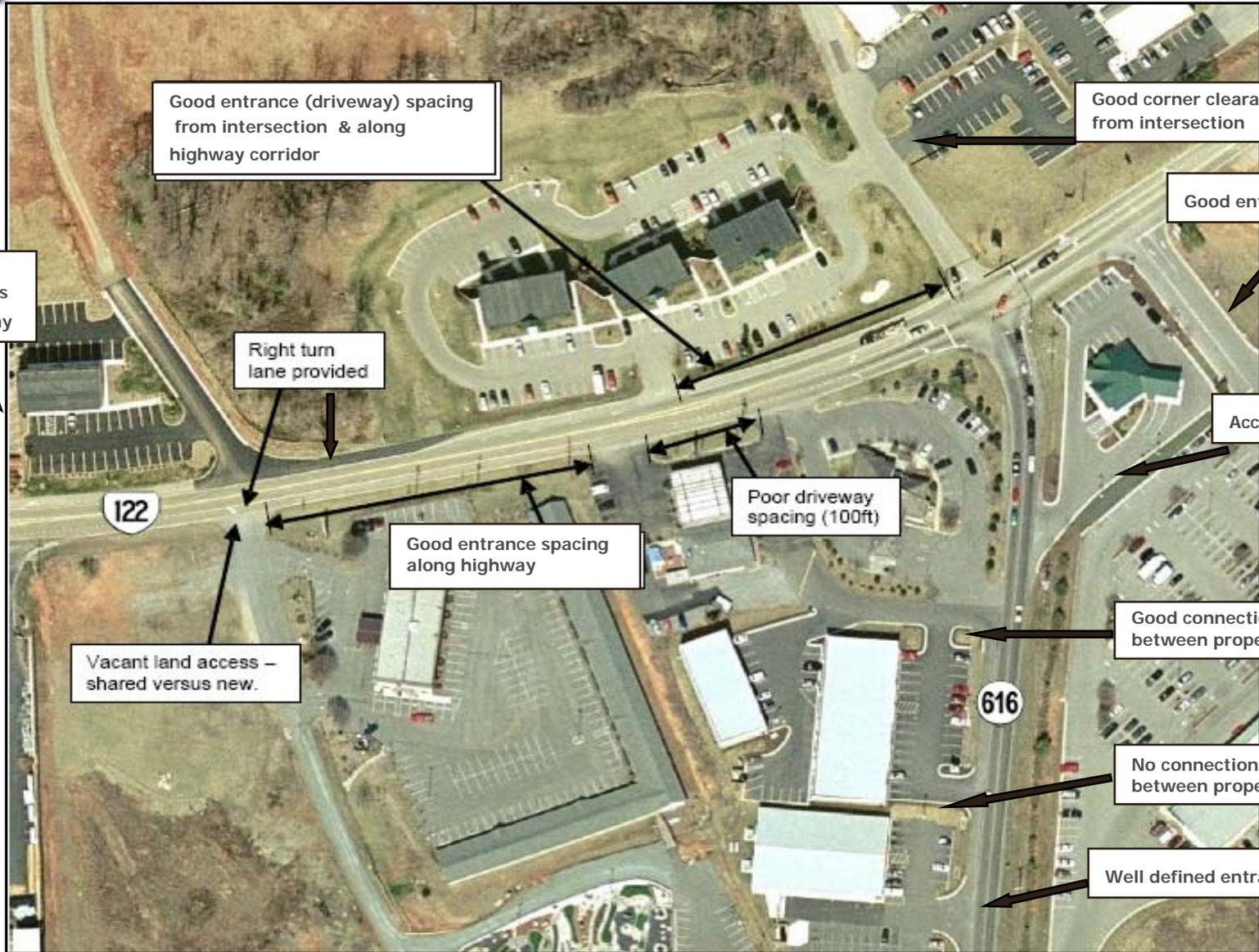
LETTER SYMBOL

DIMENSIONS

C	See Entrance Throat Table 4-2 and Corner Clearance Figure 4-3.
U *	25' - 50' radii, Curb and Gutter or Curbing. The selected shall accommodate the anticipated type of vehicle usage. Larger radii should be considered by the designer or may be required by the Engineer if larger vehicles are anticipated; however, in no case shall radius be less than 25'.
W *	24' Minimum
Y *	90° Preferred 60° Minimum

* For Subdivision Street and Alley connections, radii, width, angle and spacing should be in accordance with Subdivision Street Design Guide in the Road Design Manual, Appendix B(1).

Examples of Concepts



Spacing of Entrances & Intersections Near Interchange Ramps

Good separation of entrances and intersections from interchange ramps

- Prevents traffic backups onto ramps
- Reduces crash potential near the ramps

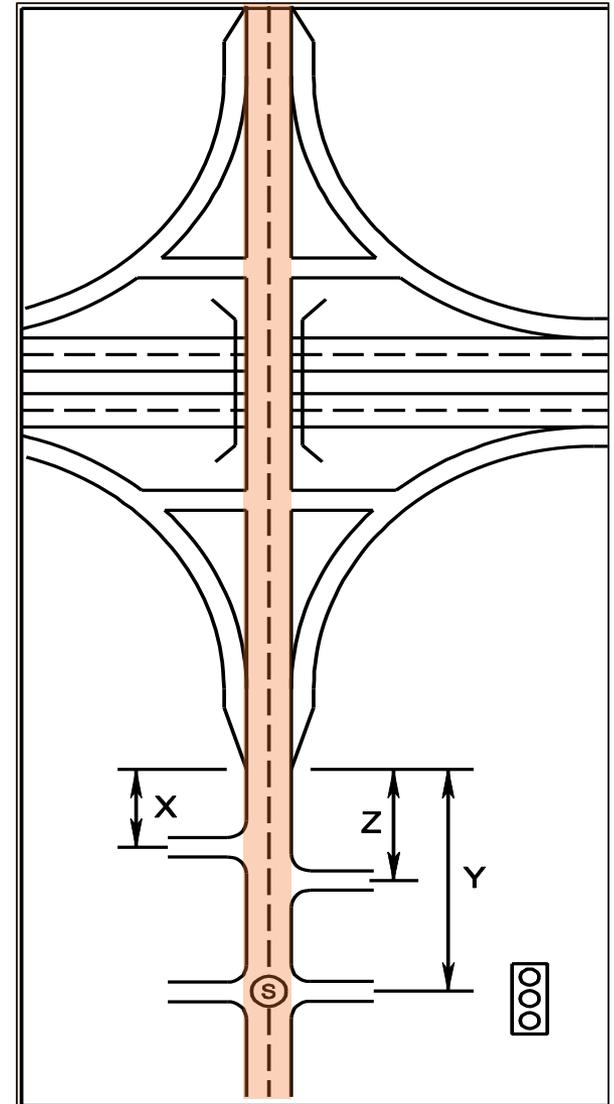


Appendix F Spacing of Entrances & Intersections Near Interchange Ramps

Spacing Standards: Two Lane Crossroad

- Distance from ramp to entrance (X) and
- Distance between last entrance to start of ramp (Z):
 - 750 ft urban area
 - 1,320 ft rural area
- Distance to first full access intersection (Y):
 - 1,320 ft urban and rural areas

Source: NCHRP Report 420, NCHRP Synthesis 332
(NCHRP – National Cooperative Highway Research Program)



Examine Land Development Proposals

- **Local governments and VDOT should assure compliance with the access management requirements when reviewing rezoning applications, site plans, subdivision plats**
- **VDOT shall include comments on a development's compliance with the access management requirements when reviewing the development's traffic impact study***

***Submitted pursuant to the Chapter 527 Traffic Impact Analysis Regulations**

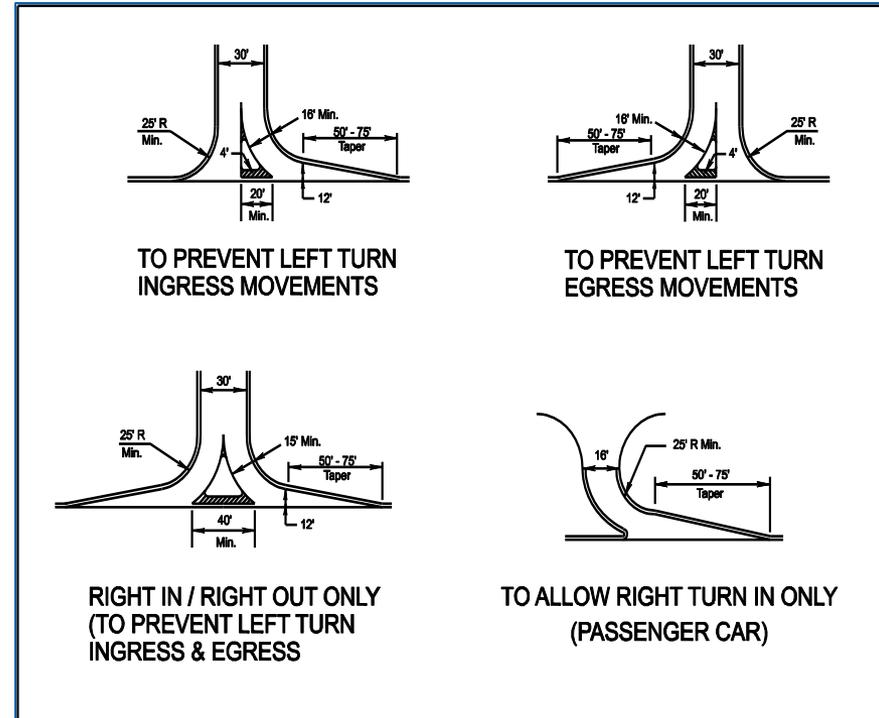
Access Management Regulations Exceptions to the Spacing Standards

When a parcel has insufficient frontage on a highway to meet the spacing standards due to:

- Property dimensions, or
- Physical constraints
 - Wetlands, streams, topography

The entrance will be physically restricted to **right-in/right-out** movements

- To protect and preserve public interest in a safe and uncongested flow of traffic.



EXCEPTION: To request approval of a **full access entrance**, submit a traffic engineering study that shows how highway operation and safety will not be impacted.

Exceptions to the Spacing Standards

Vested Property Rights Respected

For a proposed entrance/intersection when its specific location is identified in

- A proffered rezoning condition or a plan of development:
 - Approved by the locality prior to the effective date of the regulation
 - The location is specified: such as distance from property lines
- A site plan, subdivision plat:
 - Principal arterial: Approved by the locality prior to October 14, 2009
 - Minor arterial/collector/local street: Submitted by a locality to & received by VDOT prior to October 14, 2009

On Older, Established Business Corridors

- For a proposed entrance/intersection on such a highway corridor
 - Where the existing spacing didn't meet the standards on the effective date of the regulations →

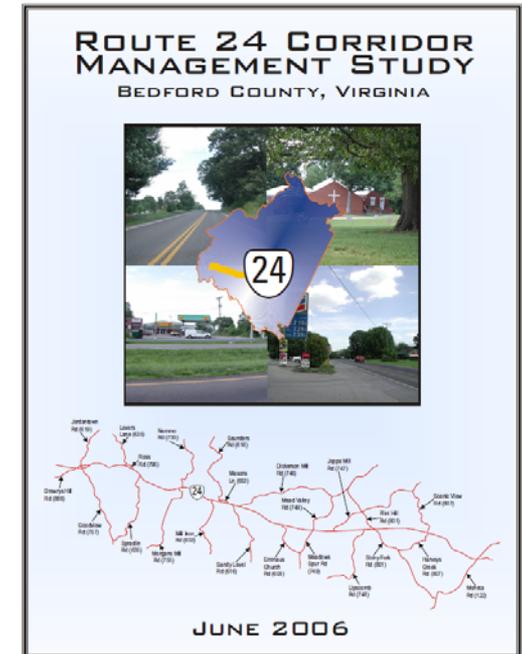


Exceptions to the Spacing Standards

Proposed entrance/intersection

- Will be a VDOT required second entrance to a subdivision that can not meet spacing standards
 - VDOT may grant exception to spacing standard or waive state requirement
- To be located within the limits of a VDOT approved locality access management corridor plan with lower spacing standards

- Located within a new urbanism, neighborhood design development



Exceptions to the Access Management Requirements

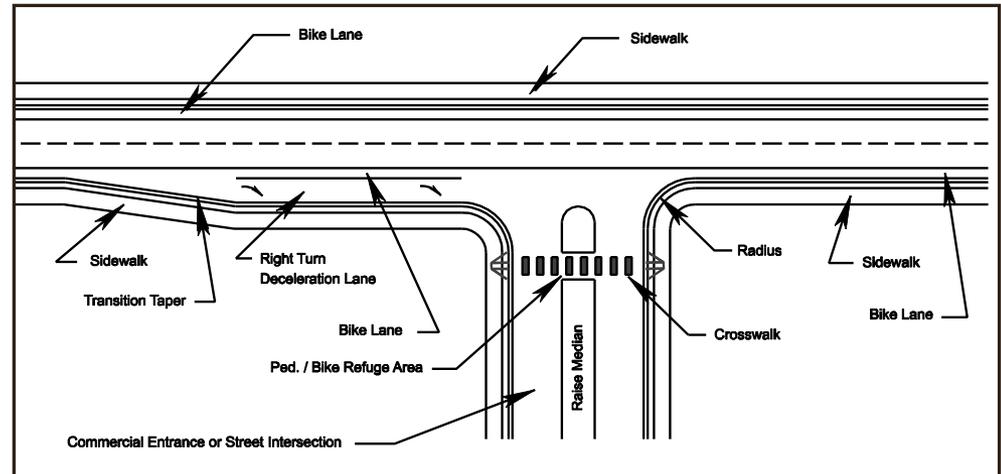
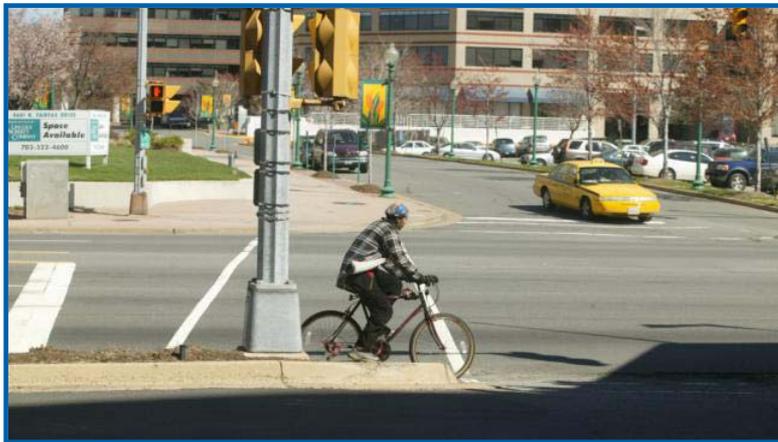
Rules and Procedures to Request an Exception

- Submit in writing to VDOT District/Residency Office using the Exception Request Forms*
- The request shall
 - Identify the type of exception (e.g. shared entrance, spacing, interparcel connection)
 - Describe reasons for the request
 - Include all required documentation (e.g. evidence of a wetland, new urbanism dev. design plan, traffic engineering study)
 - Applicant will receive a decision on the request within 30 calendar days (up to 60 days for principal arterials) depending on the type of exception
- District Administrator's decision may be appealed to the Commissioner



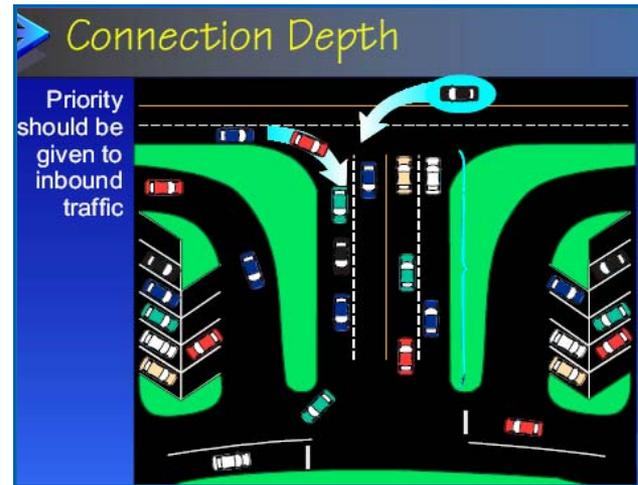
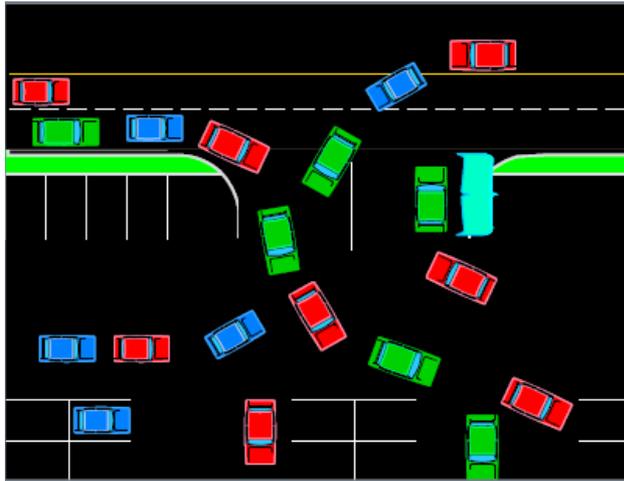
* Available on VDOT access management web site

- Entrance design/construction to accommodate pedestrians & bicyclists
- Fewer entrances improve safety by reducing pedestrian and bicyclist vehicle conflicts
- VDOT policies, design criteria for sidewalks, crosswalks, and bicycle lanes presented in Appendix F



Entrance Throat Prevents Vehicles from Backing Up on to the Highway

Summary of Entrance Throats: Appendix F	
Number of Egress Lanes (left, thru and right)	Minimum Throat Length
	Feet
1	30
2	75
3	200
4	300



Reduce Construction Costs for Small Businesses

LOW VOLUME COMMERCIAL ENTRANCE DESIGN ALONG HIGHWAYS WITH SHOULDERS

Site Requirements For This Design

Maximum Highway VPD : 5,000
 Maximum Entrance VPD : 200
 Maximum Entrance VPD
 Truck Trips : 10%

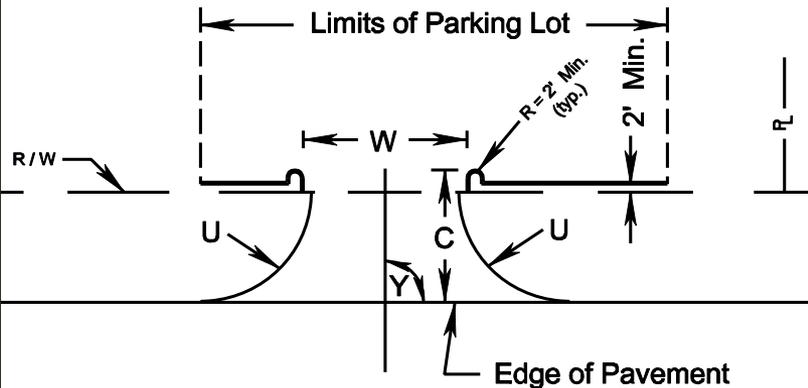
LETTER SYMBOL	DIMENSIONS
C	25' Minimum
U *	25' Minimum. Curb and Gutter or Curbing is not required.
W *	18' Minimum 30' Maximum
Y *	90° Preferred 60° Minimum

* For Subdivision Streets and Alleys, radii, width and angle should be in accordance with Subdivision Street Design Guide in the Road Design Manual, Appendix B.

Regular Standard

30'
 Curb/Gutter
 30' Minimum

SINGLE TWO - WAY ENTRANCE

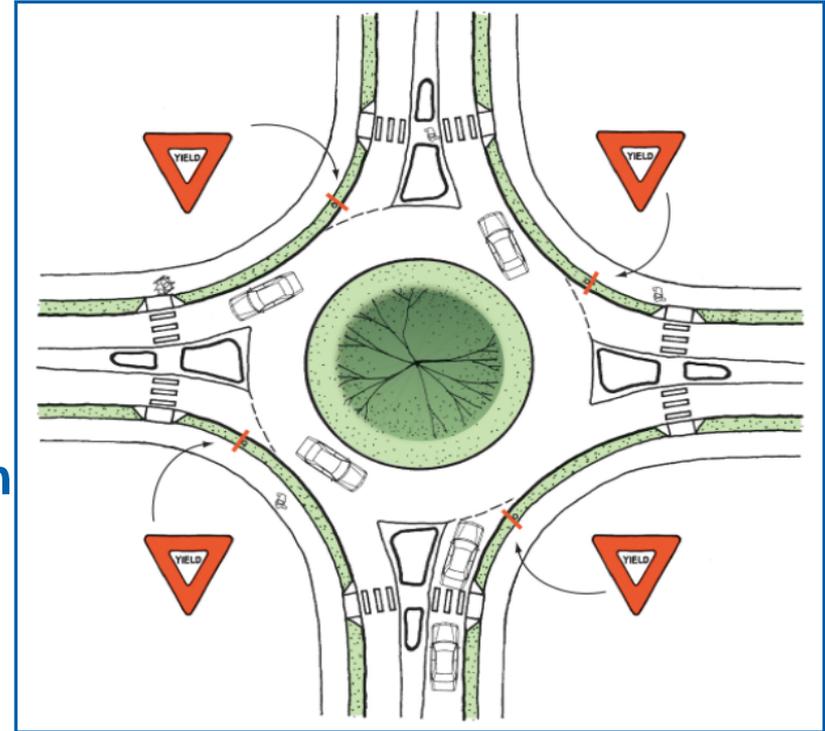


Notes:

Entrance details shown on this sheet may be modified to meet specific site requirements as directed or approved by the Engineer at the Residency or District, when based on sound engineering principles.

Roundabout

- Converts movements to right turns
- Yield control of entering traffic
- Slower vehicular speeds
 - 20 - 25 mph
- Less severe & frequent crashes
- A less costly, more attractive alternative to a signalized intersection
 - No turn lane construction & r-o-w
 - No signals and related equipment
 - Reduced spacing



VDOT policies, design criteria, and approval process for roundabouts are presented in Appendix F

Summary

Property owners have a right to reasonable access to the highways.

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**



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