Virginia Department of Transportation

Route 29 Corridor Assessment Update

Development of Solution Sets

June 23, 2016

Purpose of Developing Solution Sets

- To focus on steps to implement corridor goals and objectives
- To accommodates consideration of a broad range of solution strategies and tactics for preserving corridor capacity
- With input from key stakeholders, to incorporate local land use and economic development concerns
- To identify a range of access management measures
- To identify a range of low-cost improvements
- To identify multi-modal options

Solution Sets Development Process

- Public involvement input from past studies is considered, and indicates

  1. Concern with congestion along the northern segments (approaching US 460)
  2. Safety, particularly in accessing fronting properties, is a consistent concern
  3. Access to adjacent development is disjointed
  4. Coordinate planning for land use and transportation
  5. Travel mode choice is severely limited

Route 29 Solution Sets Development Process

- Adds to what has previously been accomplished

1. Documents findings and recommendations of previous studies
2. Updates analysis of existing conditions for operations, capacity and safety
3. Expand potential solutions to consider Intelligent Transportation System (ITS) measures
4. Identifies potential funding sources for improvements, such as
   a. Highway Safety Improvement Program (HSIP)
   b. Smart Scale (formerly HB2)
   c. Revenue sharing
   d. State of good repair (state)

Summary of Findings – Previous Corridor Studies

Issues

- Unsafe roadway and intersection design
- Frequent and unsafe median crossovers without turn lanes
- Proliferation of strip development resulting in too many driveways
- Accommodating heavy trucks
- Absence of multi-modal (transit, bike and pedestrian) service

Recommendations

- Address high crash rate areas in corridor
- Closure of unsafe median crossovers
- Consider installation of frontage roads
- From Liberty Mountain Drive to Colonial Highway, limit new signal installation only to Lynbrook Drive (total of 7 signals on segment)
- Develop a network of local street connections
- Implement corridor zoning overlay district
- Apply access management principles to land development activities
- Provide for safe multi-modal access

Relationship of Goals, Objectives and Measures

Goal	Objective	Performance Measure(s)
Provide a SAFE transportation system	Reduce motor vehicle crash risk	• Crashes per mile • Number of rear-end crashes
		• Number of crashes involving vehicles entering and exiting highway • Number of stops
Provide an EFFICIENT Transportation system	Reduce delay	• Number of times peak travel time through corridor is below 20 minutes • Number of driveways per mile • Number of median crossovers per mile
	Improve travel time reliability	• Degree of variation in weekday travel speeds on a day-to-day basis

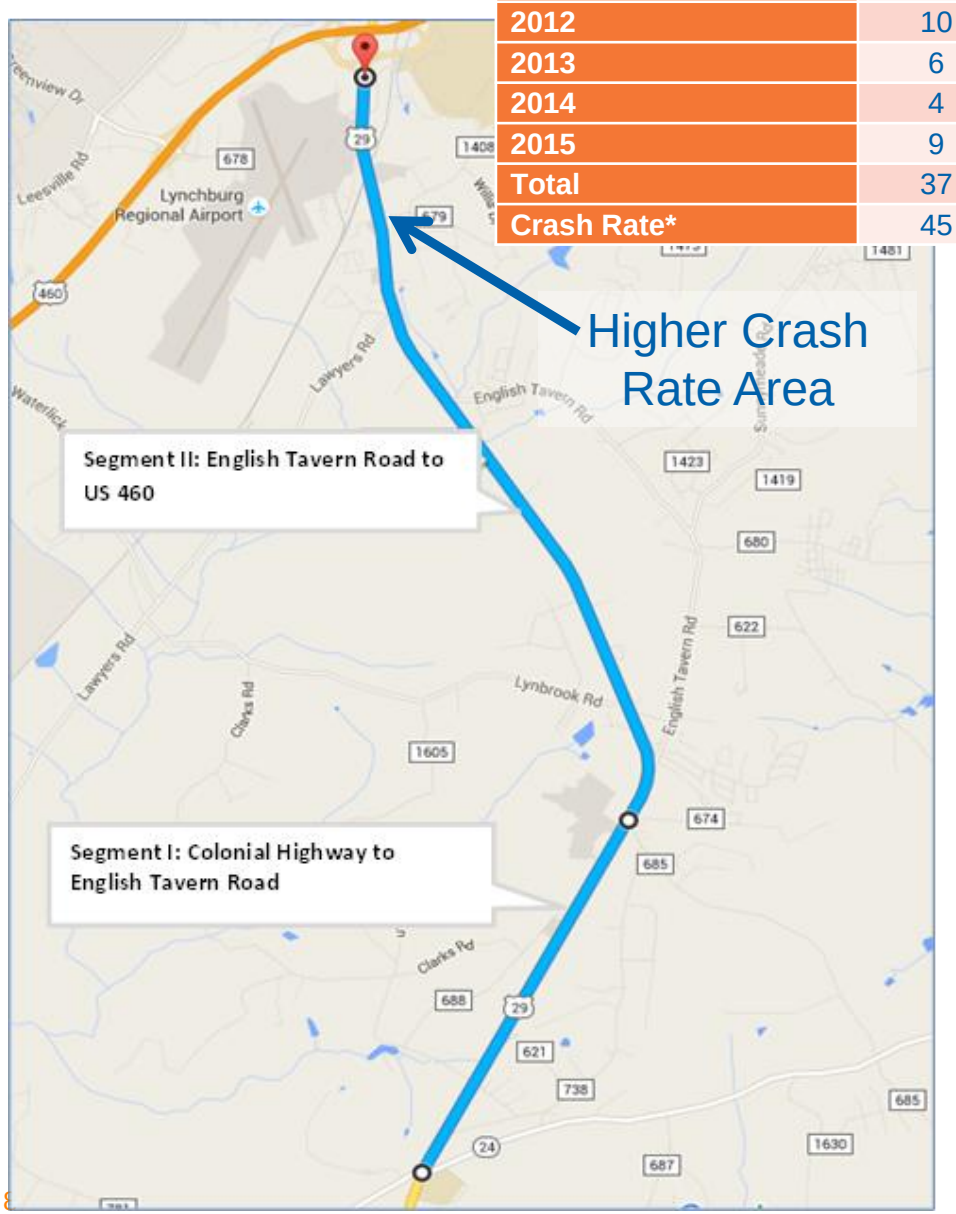
Relationship of Goals, Objectives and Measures

Goal	Objective	Performance Measure(s)
Provide a transportation system that is COMPATIBLE with land uses	Improve vehicular access to points for passenger travel	• Delay for turning left and right into certain businesses
	Improve pedestrian access along corridor	• Multi-modal connectivity index • Number of parcels with connection points for pedestrians
	Improve freight access within the corridor	• Travel time to the Norfolk Southern general freight facility
	Provide adequate parcel access	• Multi-modal service level for pedestrians and bicyclists

Crashes by Corridor Segments

	Segment I		Segment II		Total
Year	NB	SB	NB	SB	
2011	8	1	36	21	66
2012	10	3	22	29	64
2013	6	1	36	36	79
2014	4	5	29	33	71
2015	9	7	38	28	82
Total	37	17	161	147	362
Crash Rate*	45	19	81	69	65

Note: The 2014 statewide average crash rate for a Rural Principal Arterial is 73.



**Per 100 Million vehicles miles of travel.*

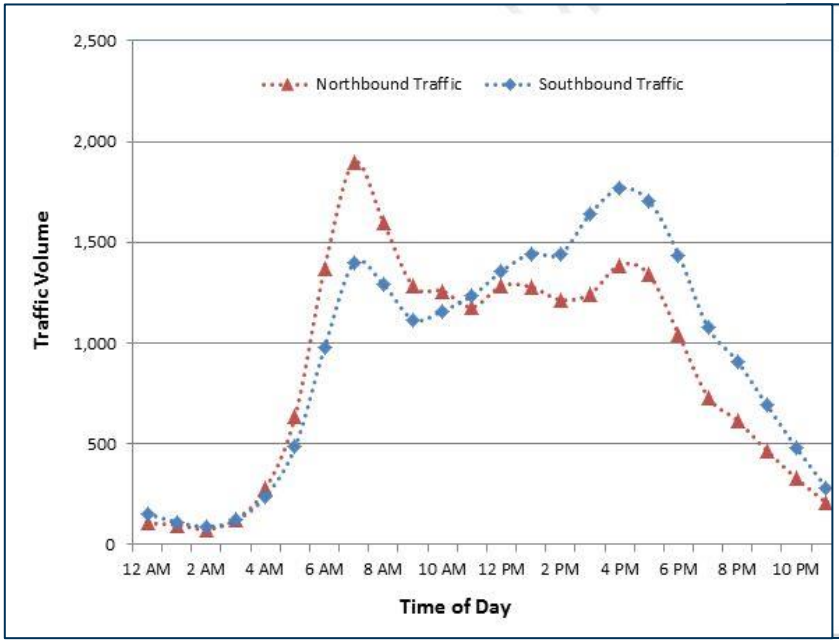
Existing Conditions Analysis Findings

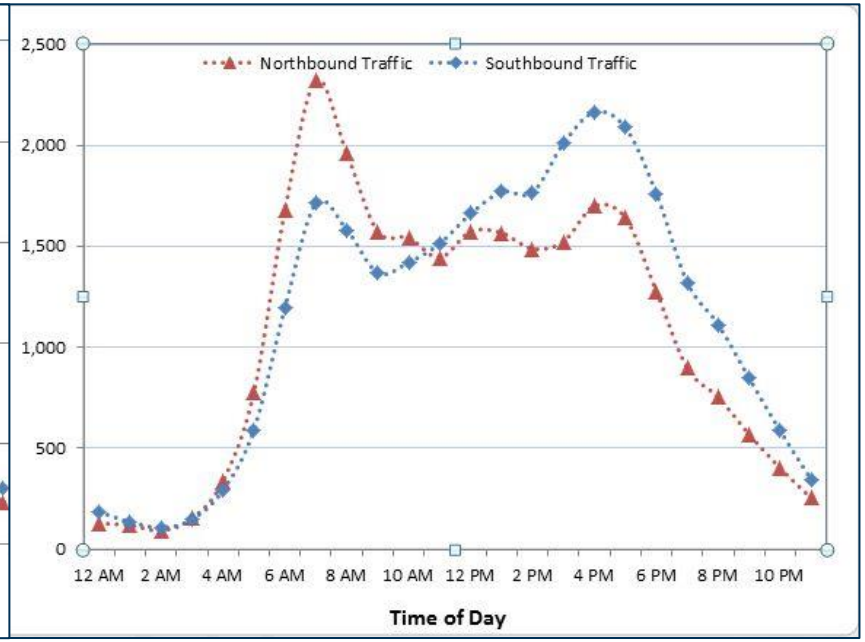
Overall Intersection Delay (LOS)					
Rt. 29 & Liberty Mountain Drive	Rt. 29 & Russell Woods Drive	Rt. 29 & Lawyers Road	Rt. 29 & English Tavern Road	Rt. 29 & Calohan Road	Rt. 29 & Colonial Highway
AM Peak Hour					
13.7 (B)	8.3 (A)	15.1 (B)	20.2 (C)	21.4(C)	21.5 (C)
PM Peak Hour					
17.8 (B)	12.6 (B)	21.9 (C)	19.0 (B)	19.1 (B)	18.0 (B)

Summary of Signalized Intersection Analysis

- ❑ **Overall arterial capacity is adequate for existing volumes**
- ❑ **Delays at several turning movements are lengthy**
- ❑ **Widening of Route 29 may not be needed to address <u>existing</u> deficiencies**

Traffic Volumes by Segment





Segment 1: Colonial Highway to English Tavern Road

Segment 2: English Tavern Road to US 460

Solution Sets Development Process

- **Emphasis Themes**

  1. **Arterial Capacity and Throughput**
  2. **Safety**
  3. **Economic Development**
  4. **Multi-modal service**
  5. **Smart Scale funding potential**

Access Management Refresher

Purpose of Access Management

- Reduce traffic congestion, motorist's time waiting in traffic
- Lower the number and severity of traffic crashes
- Preserve critical roadway capacity
  - Maximize the performance of existing highways, reducing the need for new highways & adding lanes to highways
  - Protect taxpayer investment in highways
- Support economic development
  - Better mobility expands the market reach of businesses and lowers the cost of transporting goods
- Provide property owners with reasonable access to the highway

VDOT

Access Management Refresher

VDOT will permit reasonably convenient access to the highway

- Fewest number of entrances to reduce turning movements
- Focus on side streets
- Use of right-in/right-out entrance design
- Demonstrate safety of proposed entrance & its impact
- Mitigate any impacts on highway operation and safety.

Too many entrances can lead to a reduction in the flow of traffic and potential collisions

Access Management Refresher

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. Provide connections to property line for vehicular and pedestrian circulation between land uses
4. Control traffic movements at entrances
5. Comply with spacing standards to separate signals, intersections, median openings, and commercial entrances

Exceptions to the requirements are referenced in the Regulations.

VDOT

Access Management Refresher

Rev. 7/14

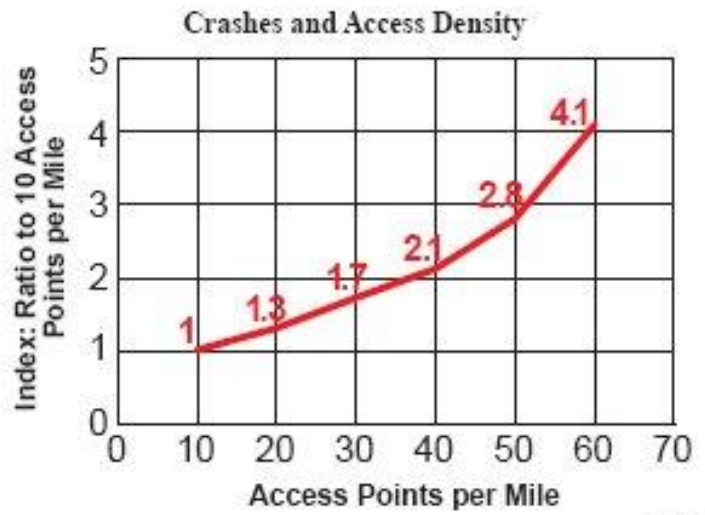
VDOT Spacing Standards

Highway Functional Classification	Legal Speed Limit (mph)①	Minimum Centerline to Centerline Spacing (Distance) in Feet			
		Spacing from Signalized Intersections to Other Signalized Intersections	Spacing from Unsignalized Intersections & Full Median* Crossovers to Signalized or Unsignalized Intersections& Full Median Crossovers	Spacing from Full Access Entrances & Directional Median to Other Full Access Entrances and Any Intersection or Median Crossover	Spacing from Partial Access One or Two Way Entrances to Any Type of Entrance, Intersection or Median Crossover
Principal Arterial	≤ 30 mph	1,050	880	440	250
	35 to 45 mph	1,320	1,050	565	305
	≥ 50 mph	2,640	1,320	750	495
Minor Arterial	≤ 30 mph	880	660	355	200
	35 to 45 mph	1,050	660	470	250
	≥ 50 mph	1,320	1,050	555	425
Collector	≤ 30 mph	660	440	225	200
	35 to 45 mph	660	440	335	250
	≥ 50 mph	1,050	660	445	360
Local Street	Commercial entrance spacing: See Figure 4-11.				

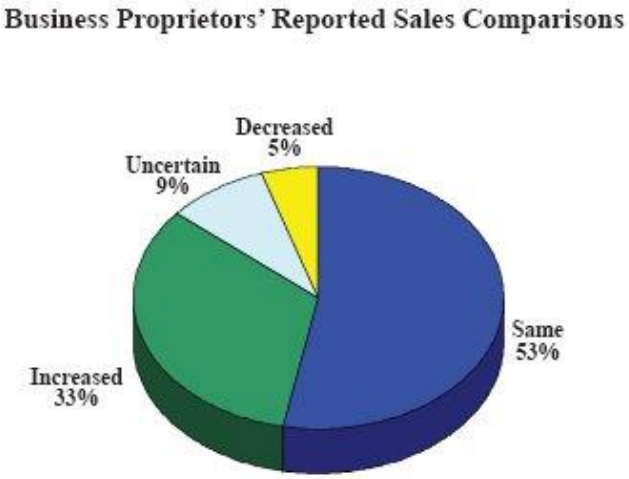
See Appendix F, Table 2-2, VDOT Road Design Manual

Access Management Benefits

- Improved Capacity
- Improved Safety
- Good for Business



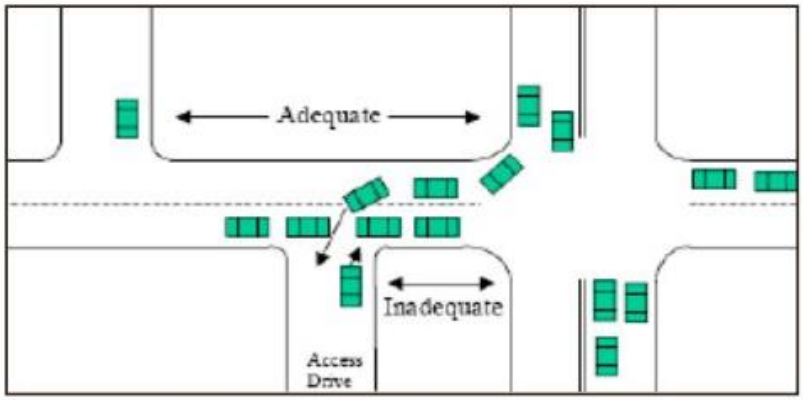
Transportation Research Board, Access Management Manual 2003



Examples of Access Management Tools

Protect Traffic Movements at Intersections

Motorists stopping to turn at entrances too close to an intersection can cause crashes, congestion, vehicles backing up on to main highway.



Corner Clearance on Minor Side Street: Locate entrances away from Intersections

Examples of Access Management Tools

Keep Entrances & Intersections Away From Interchange Ramps

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

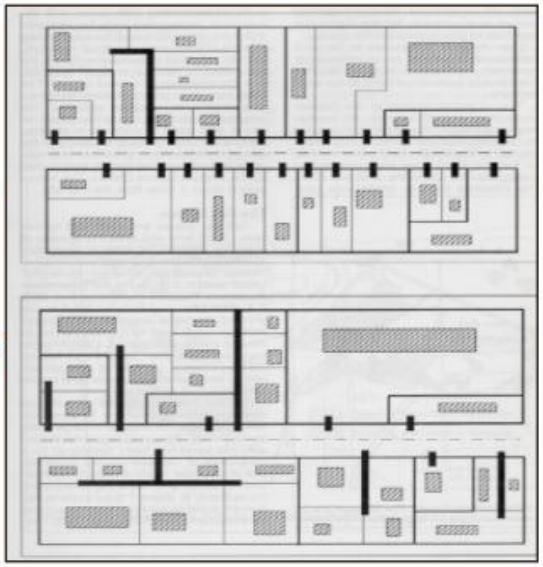
Examples of Access Management Tools

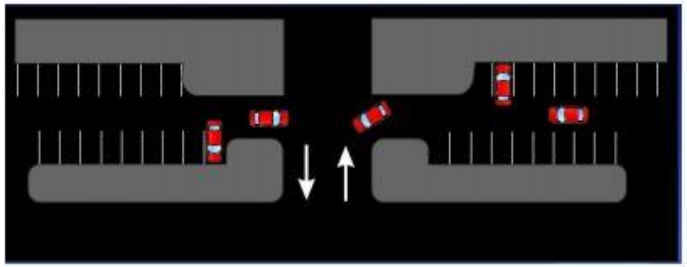
Share Entrances

- Reduces the number of entrance/exit points along the highway
- Businesses can share (gain) customers; share construction cost
- Record agreement for joint use and maintenance of the entrance

Top Right:
23 entrances,
28 parcels

Bottom Right:
10 entrances,
29 parcels





EXCEPTIONS

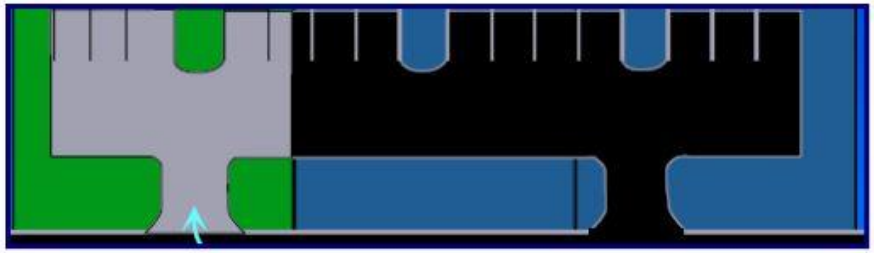
- Physical constraints such as topography, environmental, hazardous land uses
- Adjoining property owner will not agree to share entrance

Examples of Access Management Tools

Vehicular Circulation between Adjoining Properties

Vehicles travel on site; less traffic on the highway

Facilitate customer circulation between businesses

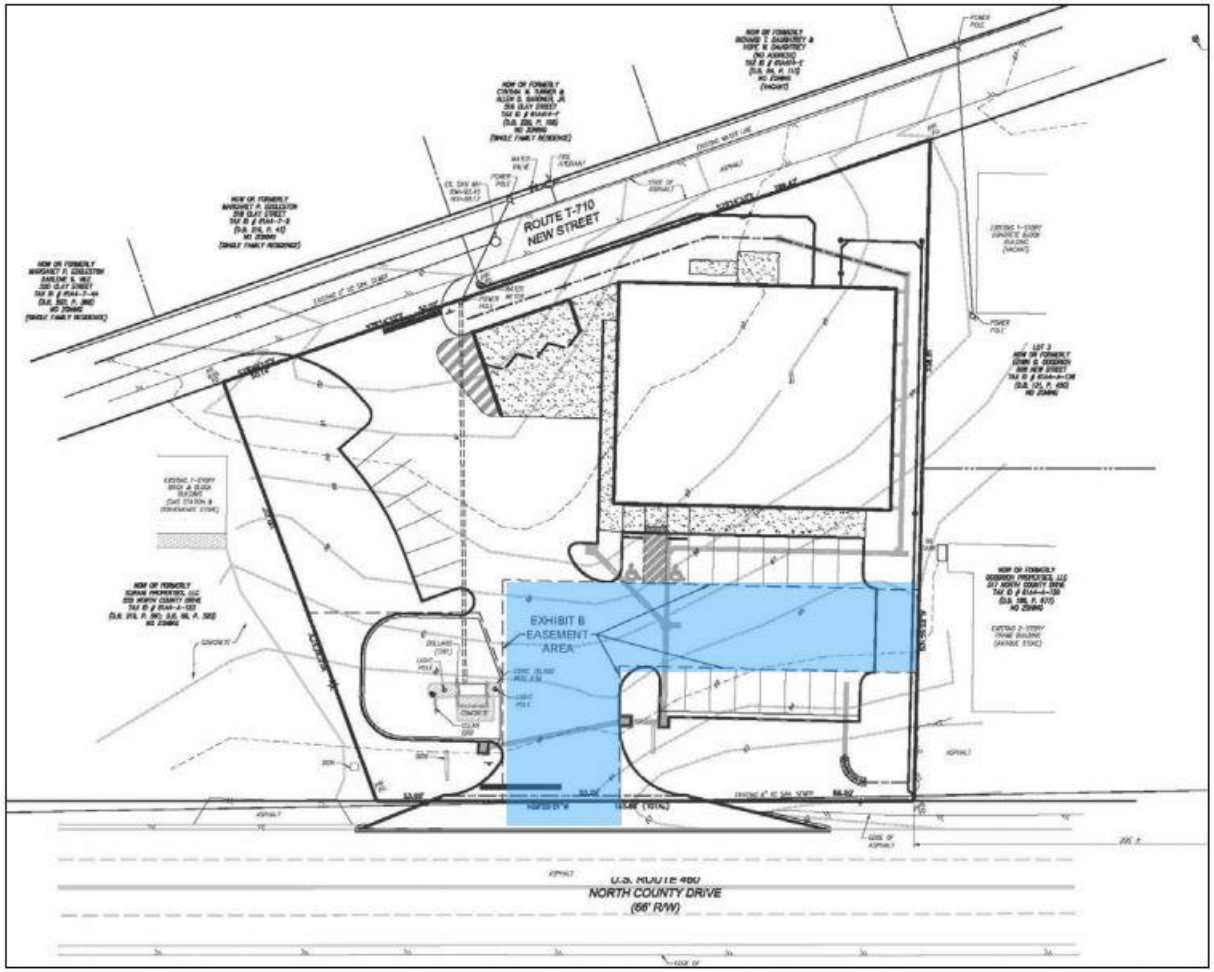


- Record access easement, construct connection to adjoining undeveloped parcel boundary
- Adjoining parcel connects when developed

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

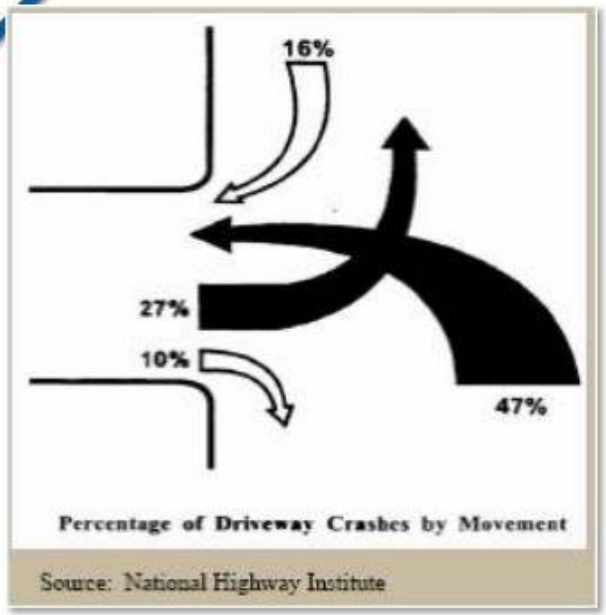
Examples of Access Management Tools

Cross Access Interparcel Easement

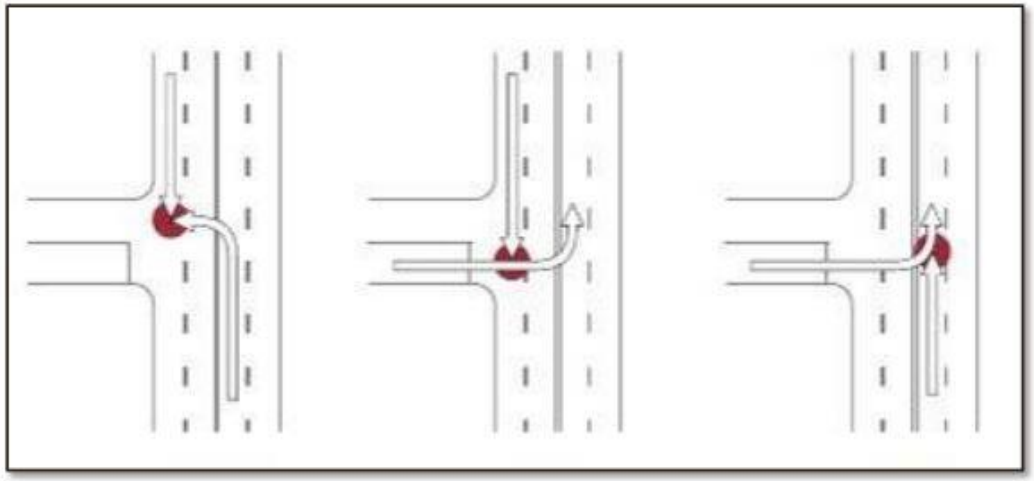


Examples of Access Management Tools

Control Turning Movements at Entrances



74% of Crashes at Entrances Involve Left Turns



Examples of Access Management Tools

Separation between Traffic Signals

- More efficient traffic progression
- Reduces stop & go delay
- Simplifies signal synchronization
- Use less gas; less vehicle emissions

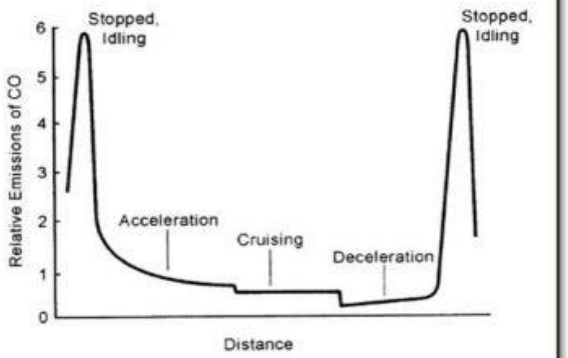
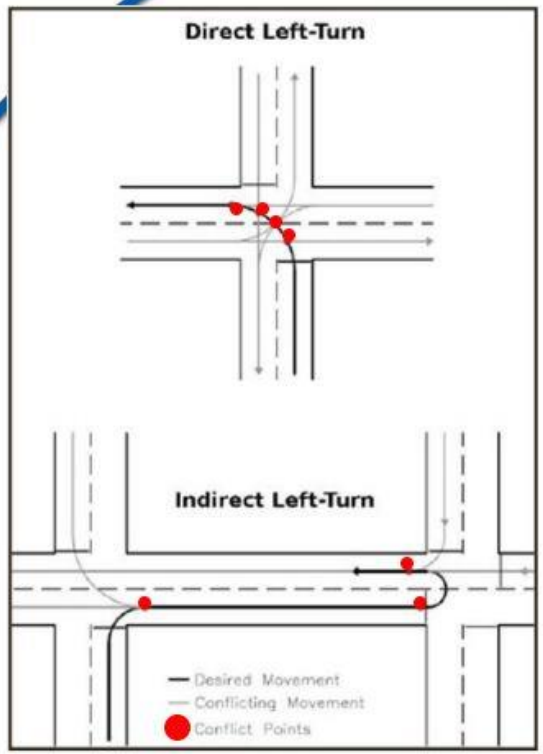
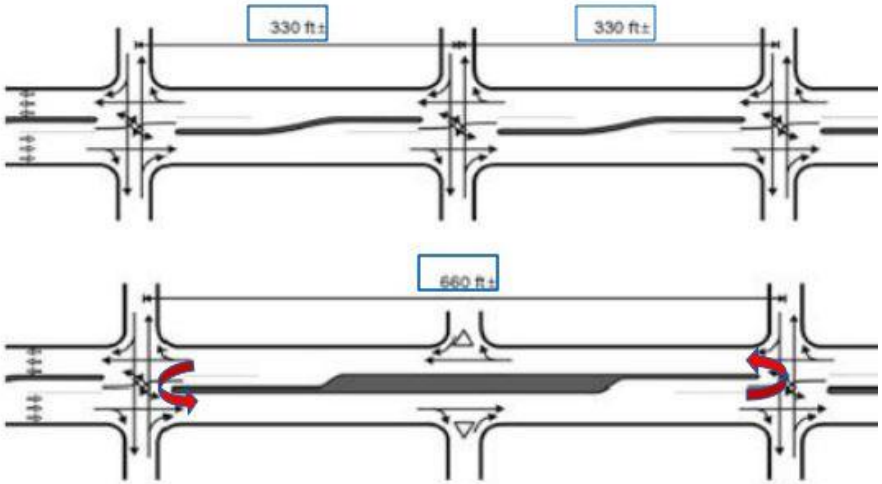


Figure 4–14. *Relative Emissions of Carbon Monoxide During Vehicle Operation*

Examples of Access Management Tools

Fewer Intersections: U-Turns vs. Left Turns



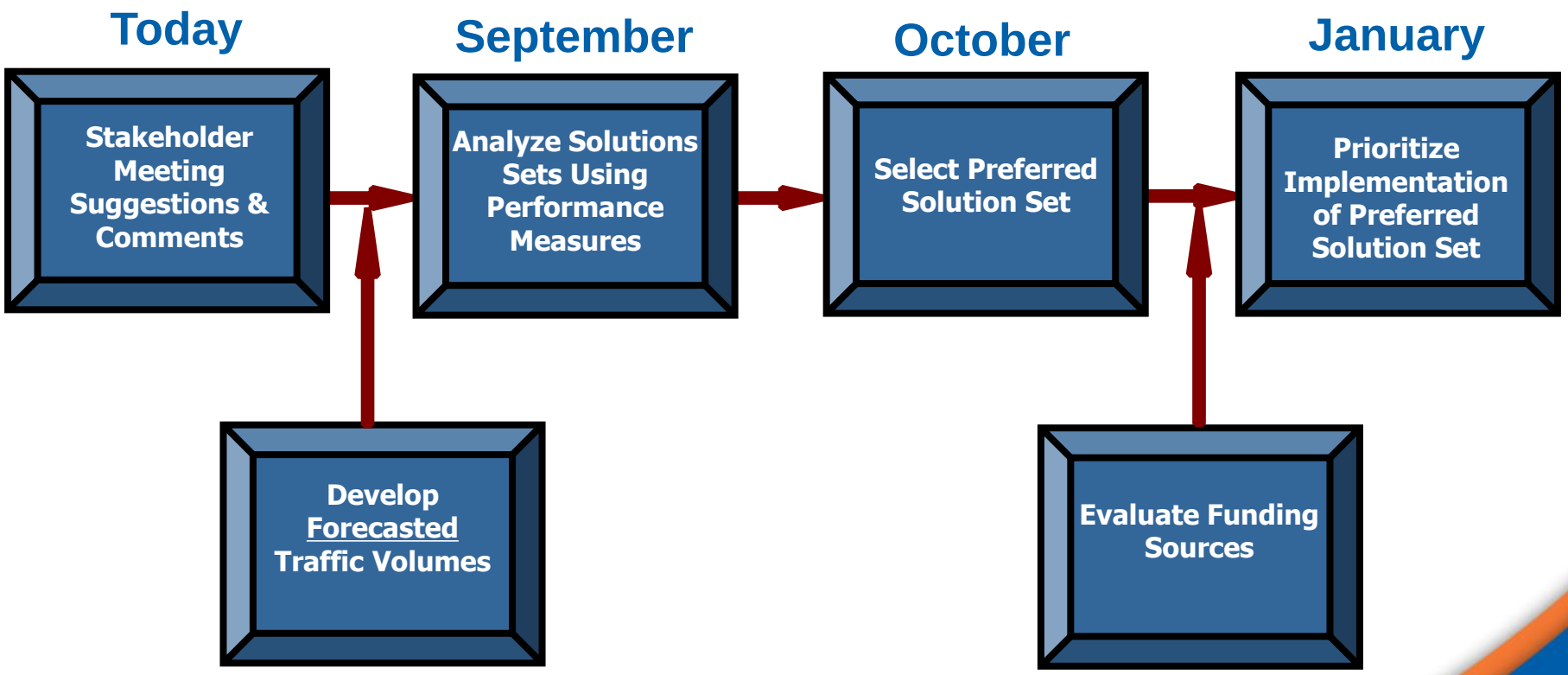


Making a U-Turn at an Intersection is <u>25% Safer</u> than a Left Turn Across Highway Lanes*

* 2001 Research Study for Florida Dept of Transportation

Where do we go from here?

Process For Development and Implementation of Corridor Solution Sets



Virginia Department of Transportation

Route 29 Assessment Update
Public Meeting 2

QUESTIONS AND COMMENTS

June 23, 2016