Design Issues/ADA
Breakout Session #4

September 20, 2018
Winky Chenault
Retired Federal Funding Programs Section Manager
Local Assistance Division
General Design Requirements for Locally Administered Projects

Heather M. Ham, P.E., DBIA
Virginia Transportation Division Manager
Pennoni Associates
Agenda

• Strategies for Effective Management of Locally Administered Projects

• Who is Responsible for What

• Getting to a Successful Project
Strategies for Effective Management of Locally Administered Projects

• Communication Plan

• Scope/Schedule/Budget

• Understanding the VDOT LAP Plan Development Process
Communication Plan

• Clearly identified chain of communication

• Establish consistent check in points throughout the project

• Effective communication is a critical component of a successful project
Scope/Schedule/Budget

- Reasonable, Clear and Concise Scope
- Realistic and Attainable Schedule
- Establish a reasonable budget
- Identify challenges and pitfalls as soon as possible to minimize their impacts to the project
Understanding the VDOT LAP Plan Development Process

Project Development
- Project Scoping
- Consultant Procurement
- Preliminary Design 30%
- Funding Concurrency
- 60% Plan Review
- 90% Plans Review Pre-Ad Check
- 100% Plans Eng Est Pre Bid Package

Environmental
- SERP NEPA Concurrence Section

State/Federal Compliance
- Right-of-Way
- Preliminary ROW
- ROW Acquisition
- ROW Certification & Clearance

Civil Rights & DBE
- Consultant RFP Review

Bid Package Review
Who is Responsible for What…..

- Consultant Responsibilities
- Locality Responsibilities
- VDOT Responsibilities
Design Requirements

• Follow the VDOT Locally Administered Projects Manual

• Comply with all Federal, State and Local Standards and Specifications

• Identify Design Exceptions early

• Ensure Compatibility with Scope of Work and Budget

• Sustainable Design
Plan Submittals

- Perform a QA of your plans
- Verify the submittal is complete per the LD 436 VDOT Checklist
- Know the clients commitments for the projects & work to meet them
**Timely Response to Project Issues**

- Addressed Issues as soon as practicable
- Relay Information to **all** Team Members
- Suggestions
  - Project Email Group
  - Progress emails
  - Regularly scheduled project meetings
  - Review meetings
VDOT Responsibilities
Successful Project Delivery

- Truly a Team Effort
- Communication is required
- Accountability is key
- Projects must be designed to be economically feasible
- Everyone plays a role in the success
Questions
Locality Administered Plan Development

Quality Control and Plan Reviews

Applying Design Flexibility
(aka Common Sense Engineering)

Jason Williams
District L&D Engineer
VDOT Richmond District
Agenda

• LAP Plan Development
• LAP Quality Control and Plan Reviews
• Applying Design Flexibility
  (aka Common Sense Engineering)
LAP Plan Development

• Responsible charge engineer?

• What does VDOT look for in set of plans?
LAP Plan Development

• How is the design developed?  
  (aka Plan Dev. Process)

• Best Practices
Stage I Example
Basis of Design Memo

MEMORANDUM

To: Mr. Brent Epps — Chesterfield County
Ms. Michele Piccolomini — Virginia Department of Transportation

From: Brian McPeters — Kimley-Horn and Associates, Inc.

Date: August 21, 2018

Route 288 Southbound to 360 Westbound Ramp Improvements & Park and Ride Lot

Subject: State Project # 0288-020-817, PE-101, RW-201, C-501 (UPC 111467)

Basis of Design Memoranum

Introduction

This memorandum has been prepared for the Chesterfield County Department of Transportation (CDOT) in support of the Route 288 Southbound to 360 Westbound Ramp Improvements & Park and Ride Lot Project in Chesterfield, Virginia. This project is the first of several projects in the vicinity of the 288-360 interchange to improve safety and reduce congestion, as identified in the US 360/Route 288 Interchange Area Study.

Route 288 is a limited access freeway running generally from southwest to northeast through significant portions of Chesterfield County from I-95 to Powhatan, Goochland, and Henrico Counties ultimately terminating at I-64 west of Richmond. Route 288 within the project limits is a divided facility with two 12-foot lanes in each direction with an 8’ graded inside shoulder (3’ paved) and 13’ graded outside shoulder (11’ paved). Route 288 throughout the project limits is posted with a speed limit of 65 mph. Route 288 is a limited-access highway functionally classified as an urban principal arterial freeway. The nearest interchanges to the study area along Route 288 are at Route 76/Route 720 (Powhatan Parkway/Lucks Lane) 2.6 miles to the north and a partial-access interchange at Route 754 (Commonwealth Centre Pkwy) 0.6 miles to the south.

US Route 360 currently runs east and west through significant portions of Chesterfield County from the City of Richmond corporate limits to Amelia County. Route 360 within the project limits is a six lane divided roadway with additional turn lanes west of the interchange. Route 360 has curbs and gutters and closed drainage west of the interchange with Route 288 and has shoulders and oper

Technical Center about 2.1 miles west of the interchange along Route 360.

Design Speed

Per Page A-3 of the Virginia Department of Transportation’s (VDOT) Road Design Manual, the selection of the roadway’s design speed is essential to project development. Kimley-Horn and Chesterfield County’s Department of Transportation (CDOT) staff reviewed the project corridor, the existing constraints, the nature and character of Route 288 and Route 360 to determine the recommended design speed for Route 288, Route 360, and Ramp A. The design speed for Route 360 will be 50 mph, for Route 288 will be 70 mph, and for Route 288 Ramp A will be a minimum of 30 mph.

Typical Section

Roadway improvements consist of the following: (1) widening Route 288 southbound north of Route 360 from two lanes to three lanes, by widening to the inside in the current median of the roadway, to provide an auxiliary/deceleration lane for Ramp A, (2) widening Route 288 southbound from three to four lanes to provide an additional off lane for Ramp A, (3) Route 360 improvements consisting of a proposed lane which connects to an existing westbound right-turn lane to Route 754 (Old Hundred Road), and (4) widening Ramp A to a two lane off ramp. The proposed typical sections for Route 288, Ramp A, and Route 360 within the project limits are shown below.
Basis of Design Memo

Superelevation
Route 380 will match the existing cross slope and/or superelevation for horizontal curves. Route 288 will match the existing cross slope along tangent sections and will require TC5.11R super elevation within horizontal curves. Route 288 Ramp A will require TC5.11R super elevation.

Design Vehicle(s)
It is recommended to utilize the following design vehicles for the specified facilities within the project corridor.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Design Vehicle</th>
<th>Common Anticipated Vehicle Types</th>
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<tbody>
<tr>
<td>Route 288</td>
<td>WB-67</td>
<td>All Types</td>
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<tr>
<td>US Route 360</td>
<td>WB-67</td>
<td>All Types</td>
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<tr>
<td>Interchange Ramps</td>
<td>WB-67</td>
<td>All Types</td>
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<tr>
<td>Commercial Entrances</td>
<td>Varies</td>
<td>Vehicle selected on a case by case basis depending on current commercial use (SU-30 min)</td>
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<tr>
<td>Park and Ride Lot</td>
<td>S-BUS-40</td>
<td>Passenger cars, intercity buses, school buses</td>
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Design Criteria

Common Sense Engineering
As with any project, the project design seeks to take advantage of common sense design principles to be sure that the project delivers on the anticipated purpose and need of the project with the lowest construction cost. The current design includes common-sense engineering methodologies or decisions, which are summarized below:

* Project is within the Swift Creek reservoir watershed and is not eligible to use nutrient
LAP Quality Assurance and Plan Reviews

• VDOT vs. Locality
LAP Quality Assurance and Plan Reviews

• Developing Plan Reviewer Expertise
Title sheet on VDOT maintained road
Title sheet on non VDOT maintained road
### Design Approval Review Checklist

**DESIGN APPROVAL REVIEW CHECKLIST**

<table>
<thead>
<tr>
<th>Name of Reviewer</th>
<th>Date of Review</th>
<th>Project Number</th>
<th>UPC</th>
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**DESIGN STANDARDS:**

- SR
- IIM 227.11
- IIM 255 Description why you agree or disagree with use of IIM 255.

**Functional Classification**

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<td>Traffic Counts – 10 Year</td>
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<td>Intersection Sight Distance</td>
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<td>C&amp;G Type</td>
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**TITLE SHEET – CHECKED ITEMS**

- TC-5 Standards
- Traffic Counts

**TYPICALS – CHECKED ITEMS**

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<td>Pavement Design</td>
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Path to Success for LA Project Reviews

- Best Practices
  - District Feedback
  - Common Sense strategies are agreed to early either through draft DW’s and BOD memo
  - Concept plans are provided early for VDOT buy-in
Path to Success for LA Project Reviews

• Early focus on Major Design Elements
  – Basis of Design Technical Memorandum sets tone
  – Standards and Criteria signoff
  – MOT concepts initiated early

Surprising the Locality with fatal flaw comments late in the process isn’t acceptable to VDOT or locality
Design Waivers and Design Exceptions

– Design Waivers approved by District L&D Engineer
– Design Exceptions approved by State L&D Engineer
Design Exceptions

• Design Exceptions
  – Fairly infrequent on most LA projects
  – High speed roadways >=50 mph
    • Design Speed, Lane width, Shoulder width, Hor. Curve Radius, Maximum Grade, SSD, Cross Slope, Superelevation Rate etc
  – Low Speed Roadways <50 mph
    • Design Speed, Design Loading Struct. Capacity

Most roadways in 2nd category, only one criteria usually in play
Design Waivers

• Design Waivers
  – More common on LAP projects
  – Example Criteria
    • Ramp Geometrics, Paved Shoulder width, Curb and Gutter, Minimum Radius, Bike/Ped IIM55, Ditch Width, Lane Shifts/Tapers, Buffer Strip Width, Superelevation, ISD, Total Shoulder Width
  – In Richmond, typically see shoulder waivers, ISD, Buffer Strip Width, drainage design

This is for VDOT maintained roads only
Applying Common Sense Engineering Strategies

- Lane Widths
- Shoulder Widths (Paved/Graded)
- Buffer Strips
- Cross Slopes
- Access Management
CSE Approach to At Grade Intersection

Project Scope: Improve intersection capacity and safety

Existing Conditions
- At grade intersection
- Signalized
- Commercial Businesses in all quadrants
- 12’ lane widths
- County Curb and Gutter
CSE Approach to Parham Rd. & Patterson Ave.

Project Scope: Improve intersection capacity and safety

Original Intersection Design

- Matched Existing Lane Width 12’, VDOT C&G, 4’ Median Strip, 4’ buffer width and 5’ sidewalk

- Potential total take of Burger King due to impacts on the number of parking spaces.
CSE Approach to Parham Rd. & Patterson Ave.

RW parcel cost
$1.5M - $2M
CSE Approach to Parham Rd. & Patterson Ave.

**Project Scope:** Improve intersection capacity and safety

**CSE Approach**
- Widening on both sides of Parham Road
- Reduced lane width, buffer width, sidewalk width, median curb width, Henrico C&G, maintain exist. Cross slopes
- No impact on Burger King parking
CSE Approach to Parham Rd. & Patterson Ave.

Project Scope: Improve intersection capacity and safety

**Impact of CSE**

- Savings on RW negotiation and relocation time and effort; making it possible to accelerate project schedule and advertise earlier

**CSE Savings**

$1.7M
To Recap

Locality Administered Plan Development

Quality Assurance and Plan Reviews

Applying Design Flexibility
(aka Common Sense Engineering)

Questions???
Americans with Disabilities Act (ADA) Design and Construction Compliance

Adam Czesnowski, P.E.
Senior Transportation Engineer for Locally Administered Projects
VDOT Salem District
ADA Considerations

• Put yourself in the position of someone who is visually impaired or uses a wheelchair

  – How will you know which direction to travel?

  – How will you negotiate ramps and slopes?
ADA Considerations

• Meeting the “minimum standard” might not be the best option
  – Site context
  – One size does not fit all

• Ultimately a court may determine if your facility is ADA compliant
  – Don’t always use the standards in decision
  – Determine if the facility is truly accessible

• Compliance is required regardless of funding source
Common ADA Non-Compliance

- Detectable Warning Surfaces
- Curb Ramp Landings
- Curb Ramp / Sidewalk Locations and Alignment at Crossings
- Pedestrian Push Button Access
- Need to Upgrade to Current Standards
Detectable Warning Surfaces

- VDOT Road and Bridge Standards CG-12
  - Applies to parallel & perpendicular ramp applications where ramp intersects a radial section of curb

  Must align with radius at back of curb line

  Ramp extends full width of landing for 2’ depth (Can stop maximum 2” from edge of curb)

  Detectable warning surface does NOT indicate direction of crossing
Detectable Warning Surfaces

• 2011 PROWAG Figure R305.2.1
  – Provides alternative options for detectable warning surfaces in radial applications

  Note minimum and maximum distances

  Domes on ramp at slope bottom

  Still extends full width

  – Design waiver required on state maintained projects

Still extends full width

Domes aligned with back of curb

Both ends of the bottom grade break are less than 1.5 m (5.0 ft) from back of curb.

One or both ends of the bottom grade break are greater than 1.5 m (5.0 ft) from back of curb.
Detectable Warning Surfaces

• Truncated Domes
  – Have to meet two criteria

Size Range

Spacing Range

– Purpose is to notify visually impaired people that they are entering a vehicle way, while letting wheelchairs easily traverse
Detectable Warning Surfaces

• Truncated Domes - Cutting Square Tiles

Issues appear upon closer inspection

Do these meet dome size standard? ✗

Looks reasonable from a distance

Do these meet dome spacing standard? ✗
Detectable Warning Surfaces

- Do these meet ADA standards?
  - Does not extend full width
  - Not properly aligned with radius or perpendicular
  - Square tiles not for use on radial applications
  - Gaps between panels
Detectable Warning Surfaces

- Does this meet ADA standards?
  - Aligned with back of curb line
  - Extends the full width of the landing area
Curb Ramp Landings

• General Guidelines
  – Required where a turning movement is necessary at a ramp along a pedestrian route
    • Between the ramp bottom and the back of curb line if ramp bottom is not at back of curb line
    • At top of ramp if ramp bottom is at back of curb line and a turning movement is required at top of ramp
  – A wheelchair cannot turn on a ramp slope
    • Direction of travel is always straight up or down ramp
  – Limited to 2% maximum running slope
Curb Ramp Landings

• Perpendicular Applications (CG-12A)
  – Must have landing area at top of ramp for 90 degree turn
    • Max. 2% slope
    • Min. 4 feet wide by 4 feet deep (5’ deep if constrained at back by curb or other vertical obstruction)
Curb Ramp Landings

- Perpendicular Applications (CG-12A)

No landing provided at top of ramp. Adjacent sidewalk is not accessible.

Sufficient landing provided at top of ramp to turn and access sidewalk.

Wheelchair can only travel in this direction.
Curb Ramp Landings

- Parallel Applications (CG-12B)
  - Must have landing area at bottom of ramps for 90 degree turn
    - Max. 2% slope
    - Extends from detectable warning surface to back of curb regardless of buffer strip width
Curb Ramp Landings

• Parallel Applications (CG-12B)
  – Single direction crossing still requires a landing area with a maximum 2% running slope
  – Min. 4’x4’ landing area required for turning movement when truncated domes not aligned with direction of travel
Curb Ramp Landings

• Parallel Applications (CG-12B)

No landing provided at top of ramp. Adjacent sidewalk is not accessible.

Wheelchair can only travel in this direction

Parallel ramp should not have curb within direction of travel

Although intended to be when installed, these are not parallel curb ramps.
Curb Ramp Landings

• Parallel Applications (CG-12B)

Full level landing area provide for turning movement prior to traveling ramp slope

Detectable warning surface can be located within level landing / turning area
Curb Ramp Alignment

• Parallel Applications (CG-12B)
  – With buffers strip between sidewalk and curb, alignment is straight forward
  – Without buffer strip, a small buffer strip wedge can be added at the intersection
    • Note that landing is aligned with crosswalk
Curb Ramp Alignment

• Parallel Applications (CG-12B)
  – Alternative option if space is unavailable for small buffer wedge
    • Not recommended since it directs wheelchair users out into intersection
  – Previous CG-12B Parallel Ramp standard no longer an acceptable option
    • Landing size typically not sufficient
    • Sidewalk and Detectable Warning Surface direction cues are conflicting
Curb Ramp Alignment

- Best alignment for two-way corners
  - Two-direction landing area
  - Ramps beyond landing area (wheelchair well out of travel lane before negotiating ramp)
  - Direction clear for each crossing (No corner confusion)
  - Truncated Domes aligned with direction of travel
Curb Ramp Alignment

• Perpendicular Applications (CG-12A)
  – Grade break at bottom of ramp must be perpendicular to travel direction
    • If ramp starts at back of curb line, ramp must be perpendicular to curb/gutter line
  • Wheelchair can’t negotiate change in direction and ramp slope at same time
  • 2011 PROWAG Figure R304.5.2
    – Grade break for skewed ramp still perpendicular
    – Requires Design Waiver
Curb Ramp Alignment

- Perpendicular Applications (CG-12A)
  - Maximum 13% grade break for wheelchairs
  - With 8% ramp slope, gutter slope must be reduced to 5%
Curb Ramp Alignment

- Direction of pedestrian travel must align with receiving ramp

Angled crosswalk is NOT acceptable solution
Curb Ramp Alignment

- Adjustments made for proper crossing alignment

Parallel ramps align with direction of crossing
Curb Ramp Alignment

- Avoid ramps that require turning movements in travel lanes

Pedestrians need to walk out into travel lane to access ramp
Curb Ramp Alignment

Far ramp is aligned with median island cut

Median island cut missing turn in island before next crossing

Pedestrians following line of travel will walk into main line of traffic

Solution
Curb Ramp Alignment

- Both ramps in the line of travel
- Note how opposite ramp is designed to direct pedestrians only in one direction
Curb Ramp Alignment

- Clear, straight line required between ramps

- Do not bend crosswalk around median islands
Pedestrian Signal
Push Button Locations

• Must be accessible (Reachable)
  – No higher than 42” from ground
  – Maximum 24” reach from level paved landing
    • Landing Min. 30”x48”
  – Min. 30 inches and Max. 10 feet from curb line of the ramp
  – Positioned for forward or parallel approach
Pedestrian Signal
Push Button Locations

• Common pitfalls to avoid
  – Placing button access from ramp slope
  – Pole is reachable but button is oriented so that the reach is greater than 24 inches
  – Placing the button too far beyond the end of a sidewalk
Curb Ramp Upgrades

• Alterations to transportation facilities require upgrading all connected curb ramps to current ADA standards
  – Alterations include pavement overlay (i.e. Primary Extension / SGR paving projects)
  – Applies to all projects regardless of funding source (even if only local funds)
  – Additional Guidance in IIM-TE-376.1 – Americans with Disabilities Act Requirements of Maintenance and Operational Projects
**Additional ADA Reminders**

• Existing pedestrian routes must remain accessible during construction
  – If a section of sidewalk is closed during construction, an ADA accessible detour must be provided (per Virginia WAPM)

• Review design for compliance and verify constructed facilities are compliant
Questions?

Network for Success
Local Programs Workshop
Virginia Department of Transportation