

SIDEWALK PLANNERS BEWARE:

Lessons Learned from Recent Design &
Construction Projects

2013 ANNUAL CONFERENCE
ALABAMA CHAPTER
AMERICAN PLANNING ASSOCIATION
MAY 2, 2013



G R E S H A M
S M I T H A N D
P A R T N E R S

Our Path to Today

- A. Engineers with recent design, construction engineering and inspection (CE&I) experience of sidewalk and trail projects
- B. Contrary to popular belief...sidewalk planning and design is NOT easy.
- C. Challenges encountered
- D. Lots of Eye Openers

Rules and Resources

- ▣ American Disabilities Act (ADA)
- ▣ Federal Highway Administration (FHWA)
- ▣ American Association of State Highway and Transportation Officials (AASHTO)
- ▣ Manual for Uniform Traffic Control Devices (MUTCD)
- ▣ Alabama Department of Transportation, Guidelines for Operation (ALDOT GFO 3-71)

ADA

- ▣ Law passed in 1990, amended with changes effective in 2009
- ▣ Wide ranging civil rights law that prohibits discrimination based on disability
- ▣ Title II – Public Entities (and Public Transportation)
- ▣ ADA Accessibility Guidelines (ADAAG) (1991)

U.S. Access Board

- ▣ Created by the Rehabilitation Act in 1973
- ▣ PROWAG



Proposed Accessibility Guidelines
for Pedestrian Facilities
in the Public Right-of-Way

July 26, 2011

UNITED STATES ACCESS BOARD
A FEDERAL AGENCY COMMITTED TO ACCESSIBILITY

Originally intended to supplement ADAAG to provide standards specific to public rights-of-way; most recently formatted as a stand-alone document

Released July 26, 2011

Extended to May 14, 2013

Next, final ruling to become enforceable standards by USDOT and DOJ

FHWA

USDOT Policy Statement (2010)

The DOT policy is “to incorporate safe and convenient walking and bicycling facilities into transportation projects.”

Resource Guide:

Designing Sidewalks and Trails for Access

AASHTO

- ▣ Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition
- ▣ Guide for the Development of Bicycle Facilities, 4th Edition
 - Multi-Use Paths

MUTCD (2009 Edition)

- ▣ Pedestrian Crossing Provisions
- ▣ Crosswalks
- ▣ Accessible Pedestrian Signals

ALDOT GFO 3-71

Cross-Slopes

- Less than 2% acceptable
- 2%-8% can be approved by City/County
- Over 8% requires ALDOT approval

Grades

- Sidewalk follow road grade. More than 3% grade variance requires ALDOT approval

Clear Zone

- Clear zone encroachments not directly affected by construction will be allowed to remain in place

Design Practices/Elements

- A. Zones
- B. Typical Section
- C. Crosswalks
- D. Ramps

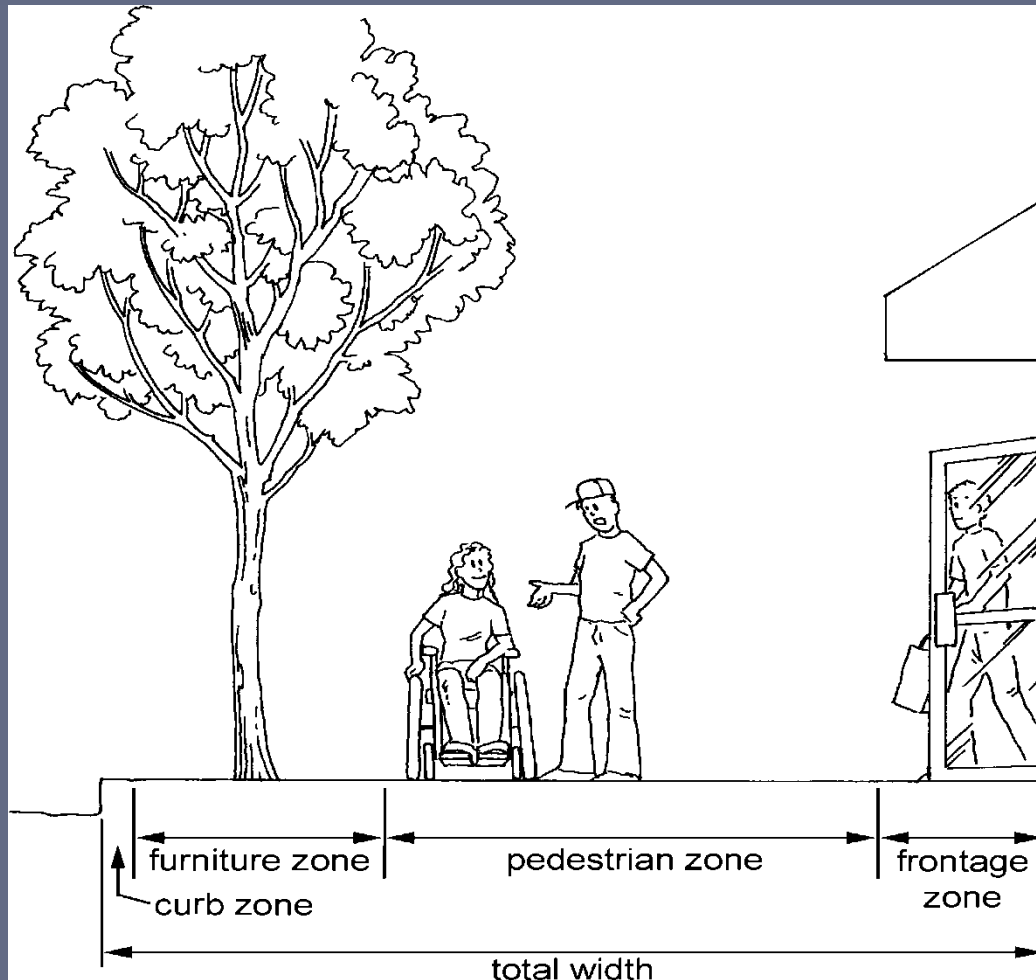
Basic Design Elements

- ▣ Zones
- ▣ Recommended Design Values from Key Resources
- ▣ Good Practices

The Zone System – Residential Street



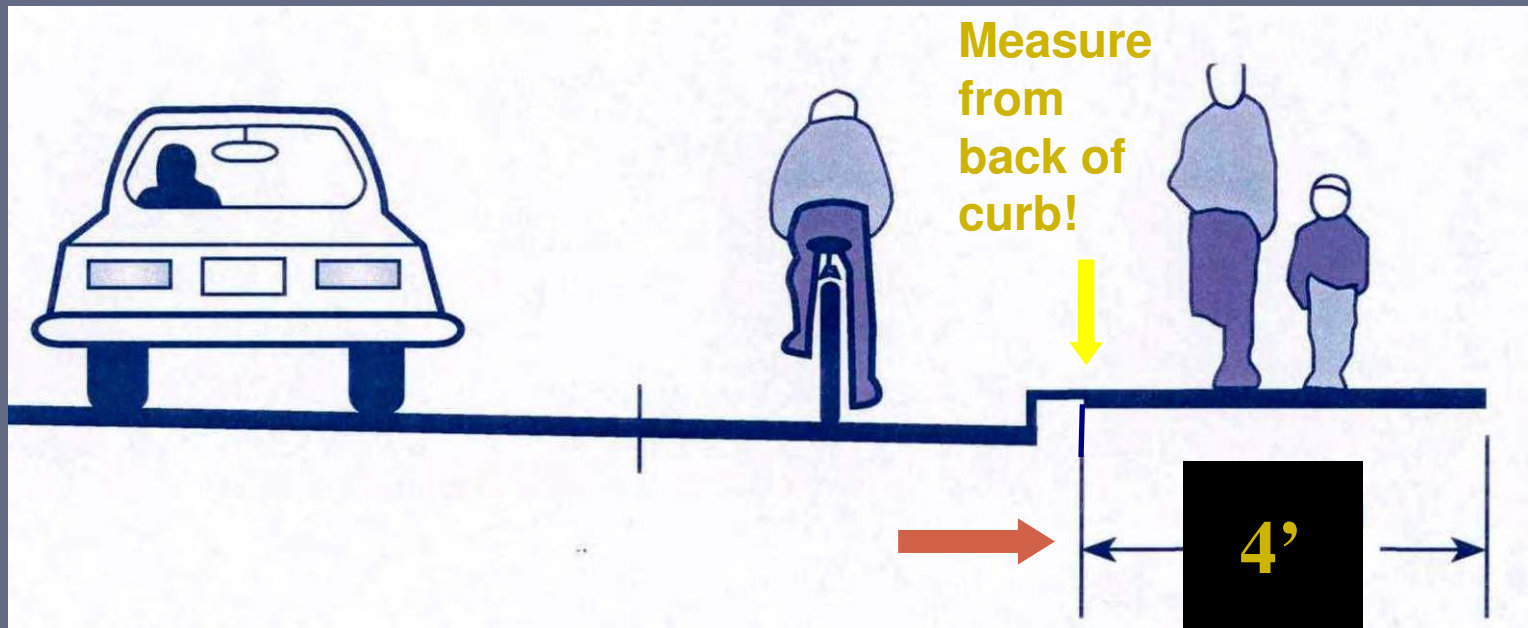
The Zone System - Commercial Street



Width

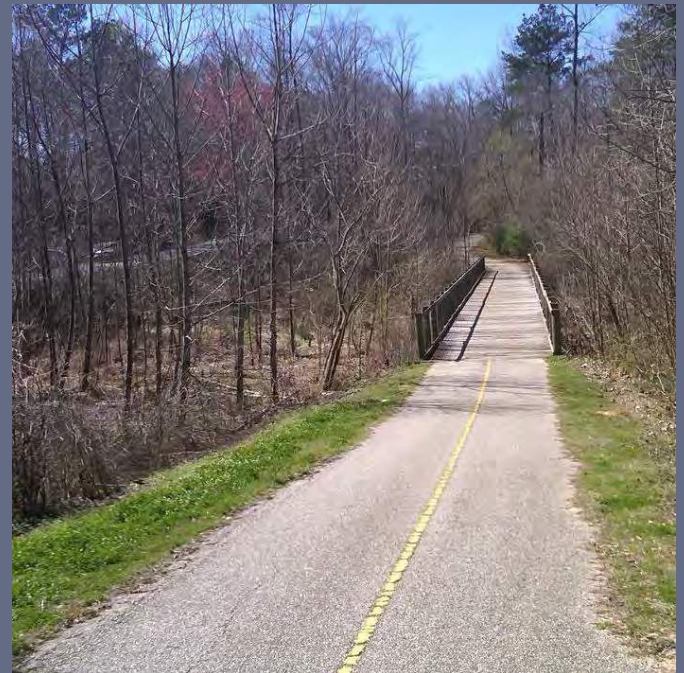
Continuous Width

- ▣ The MINIMUM continuous and unobstructed clear width of a pedestrian access route shall be 4.0 ft., exclusive of the width of the curb.



Sidewalk/Trail Locations

- ▣ Adjacent to Existing Streets
- ▣ Side Paths



Sidewalk/Trail Locations

- ▣ Old Railroad Beds (Rails-to-Trails)
- ▣ Flood Plain Areas



Sidewalk/Trail Locations

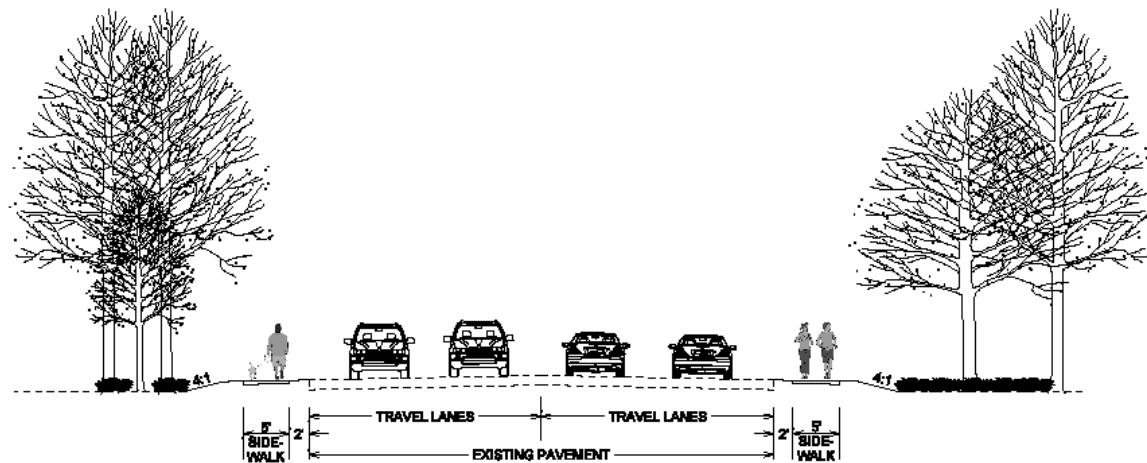
- ▣ Utility Rights-of-Way/Easements



Typical Sections

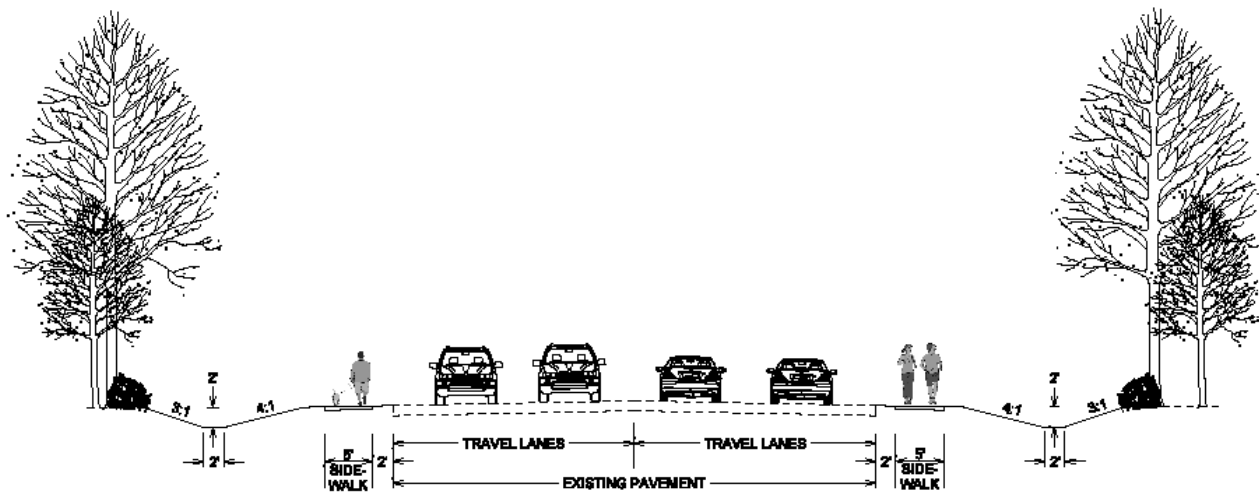
- ▣ Items to Consider:
 - Sidewalk against the curb
 - Sidewalk with grass strip
 - One or both sides of the road
 - Connections to existing pedestrian accommodations
 - Type of surfacing
 - Right of Way needs

Typical Section – Minor Grading



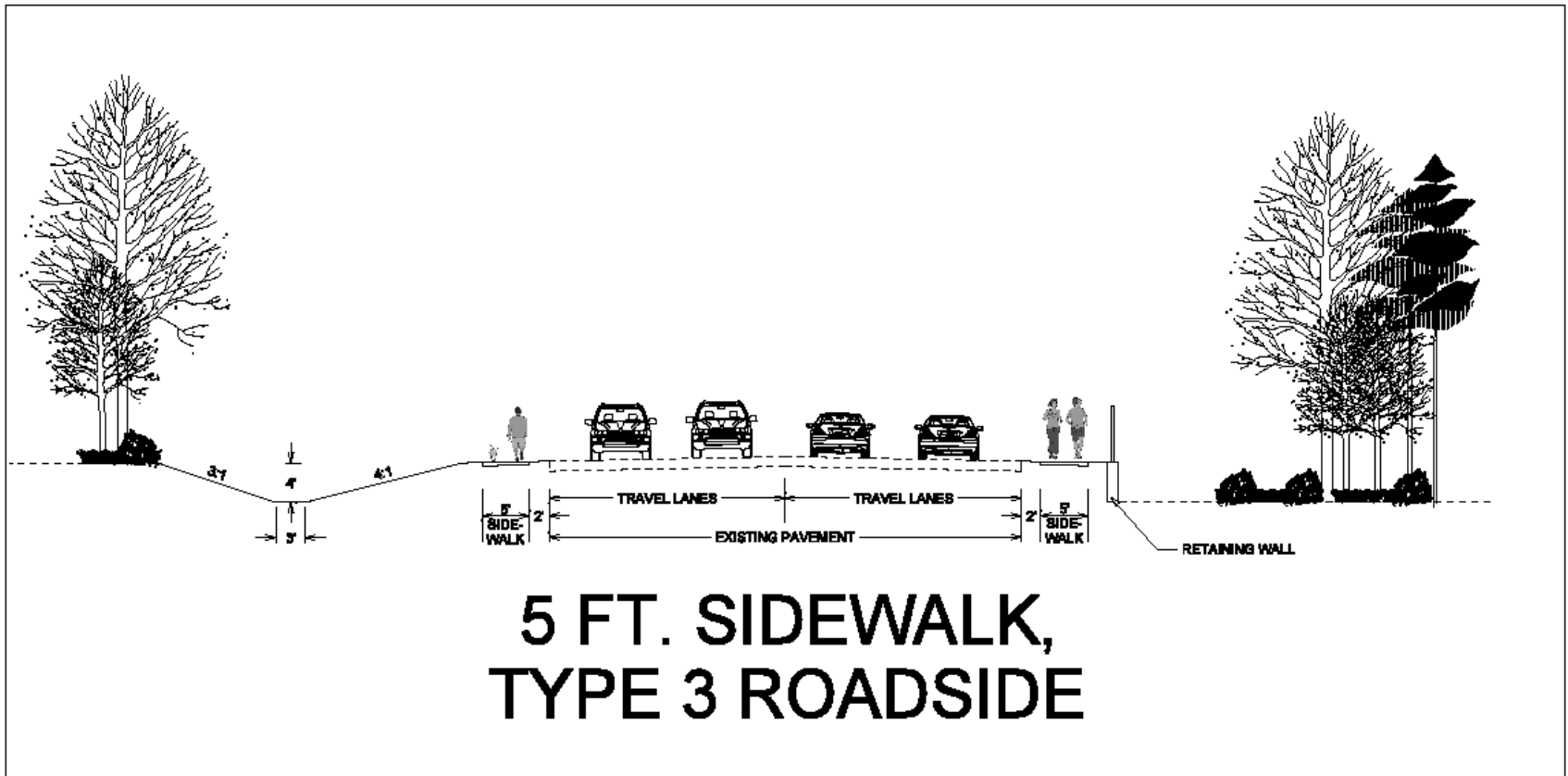
**5 FT. SIDEWALK,
TYPE 1 ROADSIDE**

Typical Section – Moderate Grading



**5 FT. SIDEWALK,
TYPE 2 ROADSIDE**

Typical Section – Major Grading



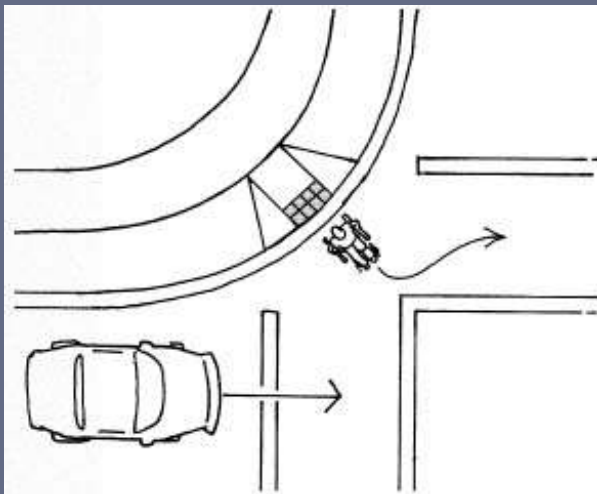
Crosswalks

- ▣ Location of Crosswalks
 - Safety
- ▣ Signs
- ▣ Accessible Pedestrian Signals (APS)

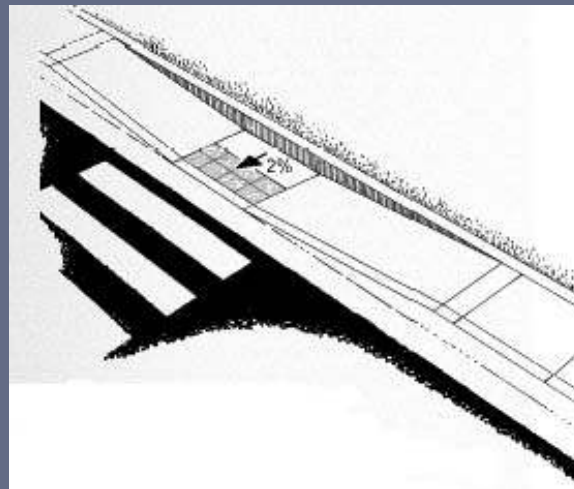
Ramps

- ▣ Perpendicular
- ▣ Diagonal
- ▣ Parallel
- ▣ Combination
- ▣ Blended Transition
- ▣ Detectable Warning

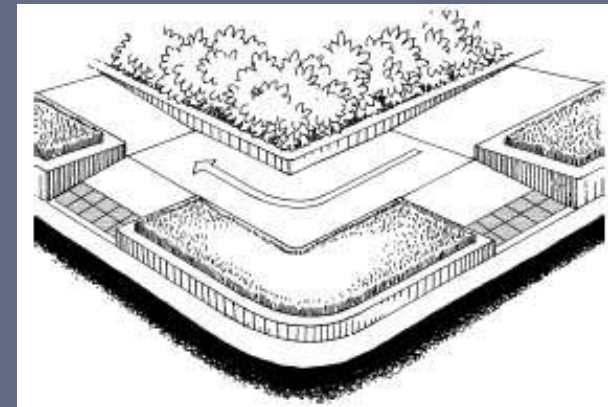
Perpendicular Curb Ramp



Diagonal Curb Ramp



Parallel Curb Ramp



Combination Curb Ramp

Infeasible to meet standards on ramp



Planning of Sidewalks

Goals:

1. Awareness of Challenges
2. Identify Challenges in Planning → Inform Clients
3. Understand Cost Impacts of Addressing Challenges
4. Develop Better Planning Documents

Walk the Sidewalk/Trail Route to Discover Challenges

- ▣ Driveways
- ▣ Terrain
- ▣ Road Crossings
- ▣ Stream Crossings



- ▣ Drainage Structures
- ▣ Utilities
- ▣ Mailboxes

Walk the Sidewalk/Trail Route to Discover Challenges

- ▣ Trees
- ▣ Fences
- ▣ Environmentally Sensitive Areas
- ▣ Right-of-Way (or lack thereof)
- ▣ Poor Soil Conditions
- ▣ Low Areas/Drainage Problems
- ▣ On-Street Parking Areas



Driveway Challenges



- ▣ Reconstruction of driveways to meet ADA? When?
 - New ALDOT GFO
 - Other Guidance
- ▣ Can the reconstruction feasibly be done?
 - Driveway slope
 - Building Setback
 - Cost? Is it a factor?
 - Technical infeasibility



Driveway Challenges

Possible Solutions



- ▣ 3' Width – ADA Minimum
- ▣ 4' Width – FHWA Minimum
- ▣ 3'-4' @ 2% or less cross slope, then tie in at reasonable slope
- ▣ Retain driveway and warp sidewalk cross slope to match driveway

Steep Driveway Slope (Before)



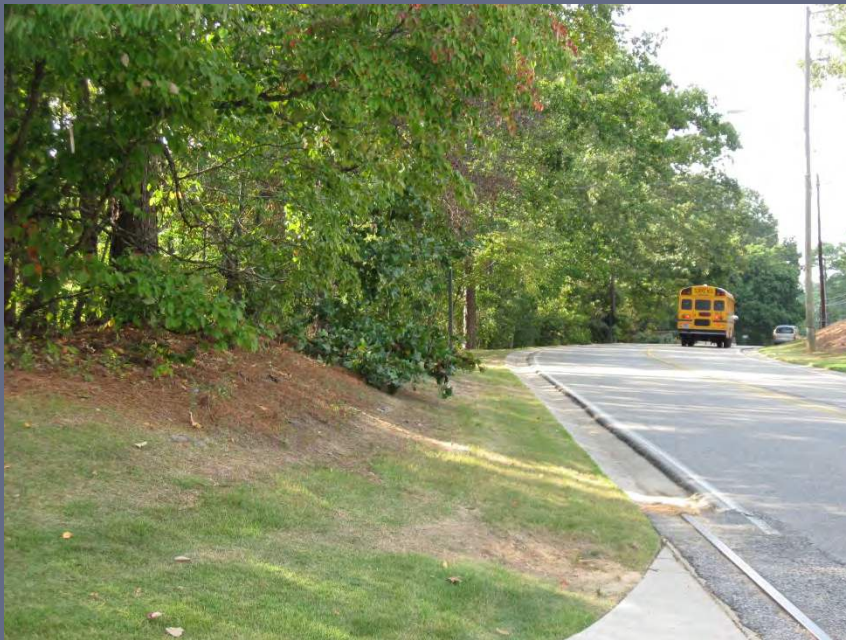
01/20/2012

After (Driveway at 8%)



Terrain Challenges

- ▣ Running Slopes
- ▣ Steep Side Slopes
 - Cuts
 - Fills/Drop- Offs



Terrain Challenges: Possible Solutions

- ▣ Retaining Walls
- ▣ Boardwalks



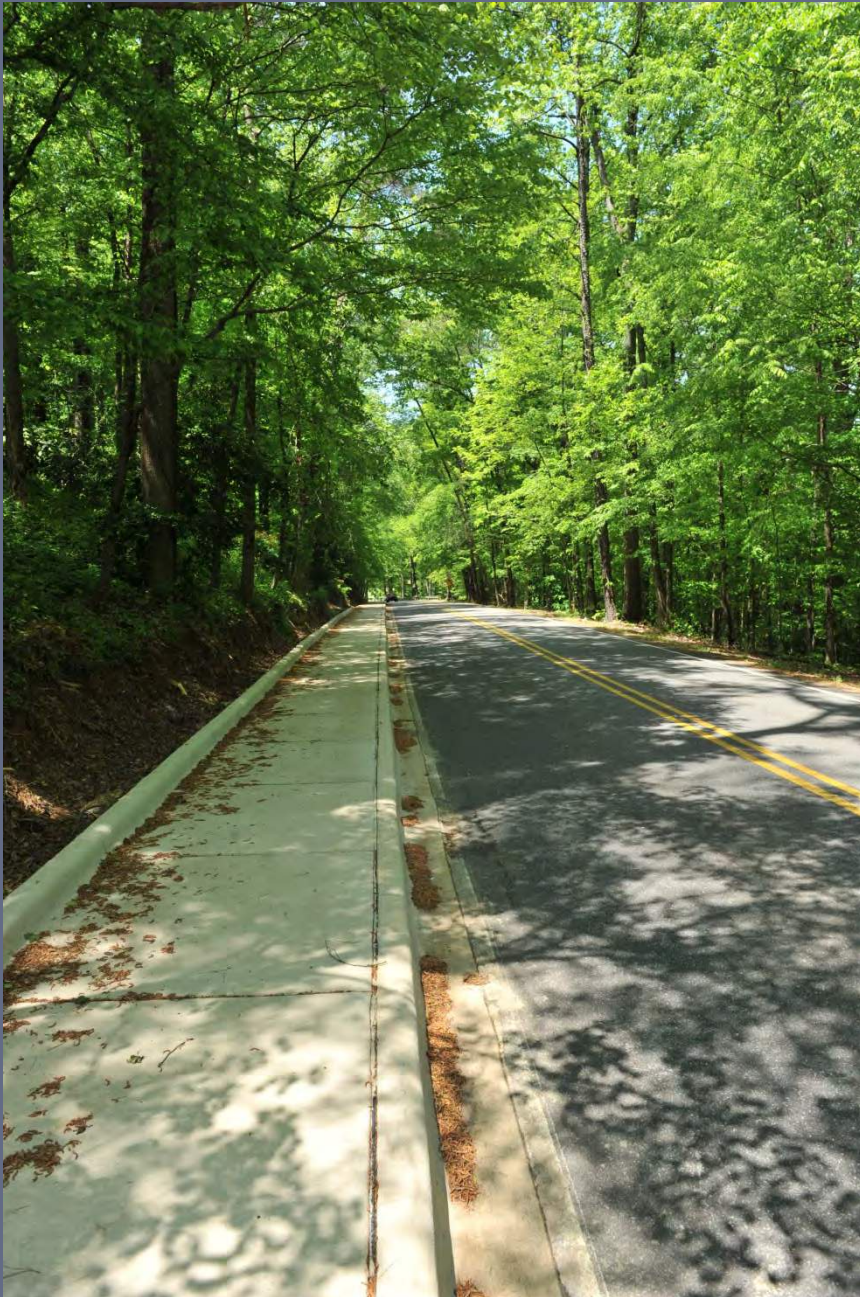
- ▣ Watch for Steps Needed to Tie In Private Sidewalks

Retaining Walls



Terrain Challenges





Terrain Challenges: Possible Solutions

- ▣ Minor Elevation Adjustments
 - Sidewalk Curbs
 - Knee Walls
 - Sidewalk Turn-Downs

Terrain Challenges- Downtown Areas

- ❑ Building Floors Higher Than Road
- ❑ Stair-Stepped Building Floors
- ❑ Plan For Wide Enough Furniture & Sidewalk Zones to Make Elevation Adjustments



Road Crossings – Where & How??

- At-grade - Crosswalk
 - Intersections
 - Mid-block crossing



Road Crossings – Where & How??

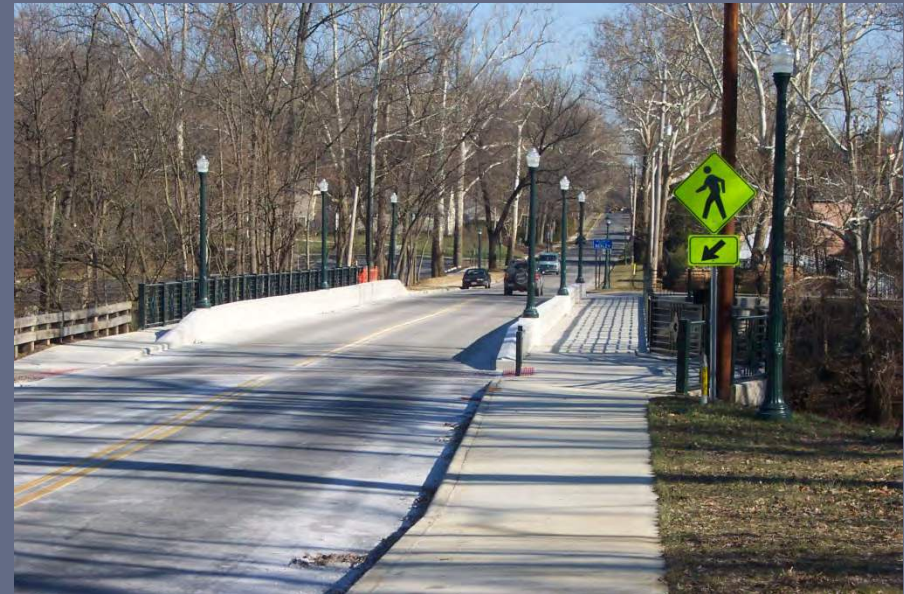
- Go Under
 - Tunnels
 - Under Existing Bridges



Road Crossings – Where & How??

High Volume and Wide
Roadways

- Go Over
 - Pedestrian Bridges
 - Across Existing Bridges



Road Crossings – Where & How??

Pedestrian Bridge Types

- ❑ Concrete
- ❑ Steel
- ❑ Prefabricated Steel Truss
- ❑ Prefabricated Aluminum Truss



Stream Crossing Challenges

- ❑ Extend Existing Pipe/Culvert
 - Check ROW
- ❑ New Pipe/Culvert
- ❑ Permitting



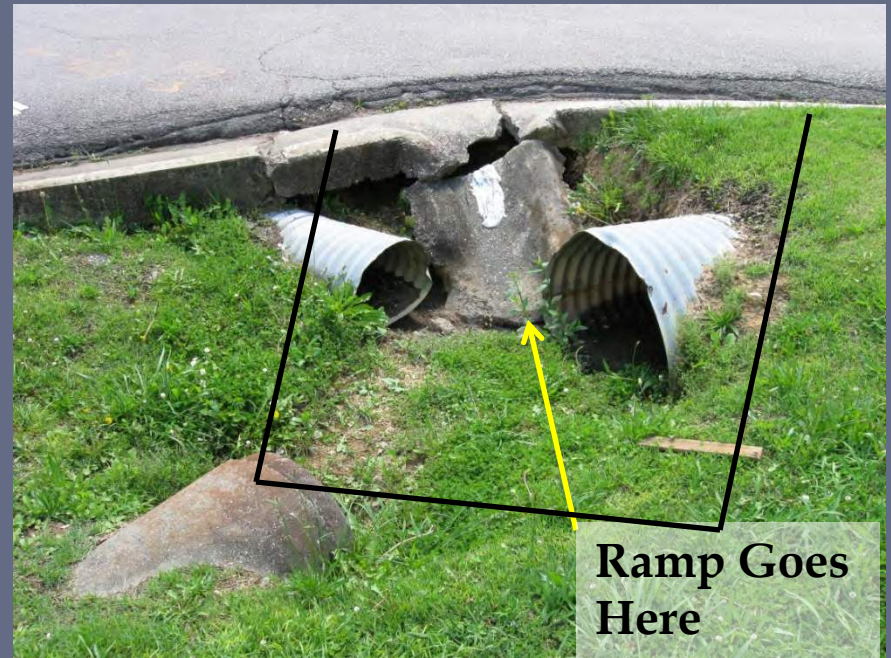
Stream Crossing Challenges

- Pedestrian Bridge
 - Constructed in Place
 - Precast
 - Prefabricated
 - Steel
 - Wood
 - Aluminum



Drainage Structure Challenges

- ❑ Inlets
- ❑ Pipe Ends/Headwalls
- ❑ Underground Boxes/Vaults



Utility Challenges

- ❑ Visible & Invisible
- ❑ Avoid or Relocate?
 - Check ROW



Utility Challenges

- ❑ Cost Impacts
 - May be cheaper & easier to move sidewalk than relocate utility
- ❑ Delays



Challenges- Trees

- ❑ Avoid or Remove??
 - Can it be removed (legally)?



- ❑ Roots
 - Future hazard
 - Future maintenance

Challenges – Mailboxes

- ❑ Decorative – Brick
- ❑ Avoid or Move??
 - Check ROW
- ❑ Grass Strip Width



Challenges- Fences

- ❑ Avoid or Relocate??
 - Check ROW
- ❑ Decorative
Fences/Walls



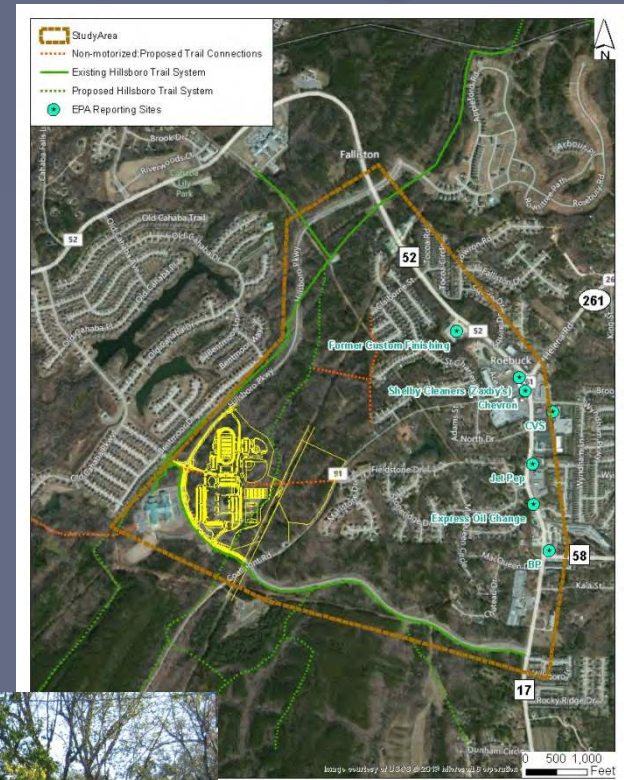
Challenges – Environmentally Sensitive Areas

Conduct Environmental Screening To Identify:

▣ Hazardous Materials Sites:

Current or Former

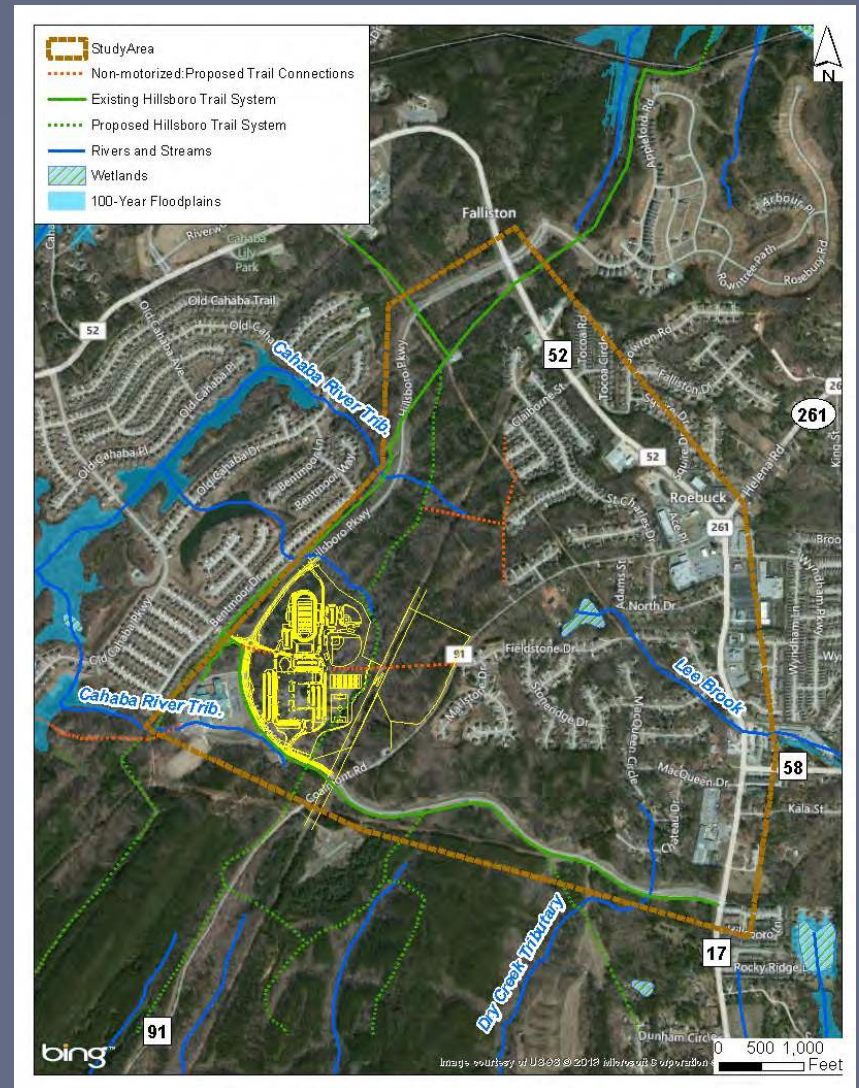
- Gas Stations
- Dry Cleaners
- Landfills
- Auto Service
- Industrial Sites



Challenges – Environmentally Sensitive Areas

Conduct Environmental Screening To Identify:

- ▣ Wetlands
 - Wet Areas/Ponds
 - Stream Crossings
 - Major Drainage Pipes



Challenges – Environmentally Sensitive Areas

Conduct Environmental Screening To Identify:

- ▣ Public Spaces
 - Parks
 - Schools
- ▣ Cemeteries
- ▣ Historic Areas
- ▣ Archaeological Sites
- ▣ Approvals/Permitting
 - FHWA
 - Corps of Engineers (USACOE)
 - ADEM



Challenges – Right of Way (Or Lack Thereof)

- ❑ Will ROW or Easements Be Needed?
 - ROW
 - Permanent Easements
 - Temporary Construction Easements
- ❑ Building Setbacks
- ❑ Parking
- ❑ Cost Impacts
 - Residential – Lower or No Cost
 - Commercial – Not So Low Cost



Challenges – Safety Pedestrian, Cyclist & Vehicle

- ❑ Steep Side Slopes & Drop Offs
 - 1' or Wider “Shoulders”
 - Fill Slopes Flatter Than 3H:1V → Slope OK
 - Fill Slopes Steeper Than 3H:1V → Need Barrier



Challenges – Safety Pedestrian, Cyclist & Vehicle

❑ Barriers

- Landscaping
- Railing
 - Metal, Wood, Cable, Composites
- Guardrail



Challenges – Safety Pedestrian, Cyclist & Vehicle

- ❑ Roadway Clear Zone
 - Area Adjacent to Roadway That Must Be Free From Hazards
- ❑ Hazards
 - Retaining Walls
 - Light Poles
 - Tunnels
 - Steep Slopes (>3H:1V)
 - Sidewalks/Trails??







Challenges – Lighting Considerations

- ▣ When To Provide Lighting?



Other Challenges

- ❑ Poor Soil Conditions
- ❑ Low Areas/Drainage Problem
 - Flood Plain Areas
- ❑ Cost Impacts



Other Challenges

- ❑ Planters
- ❑ Decorative Walls
- ❑ Subdivision Signs
- ❑ Parking Areas



Cost Impacts

Cost Impacts

Retrofitting a sidewalk into existing conditions can be costly when everything doesn't fit quite into place

Things that can significantly impact cost:

- ☐ Bridges
- ☐ Retaining Walls
- ☐ Boardwalks
- ☐ Handrailing
- ☐ Right-of-Way/Easements
- ☐ Utility Relocations
- ☐ Large Drainage Structures (Culverts, Inlets)

Costs

❑ Sidewalk

- Concrete \$45 - \$50 / Sq. Yd.
- Asphalt \$14 - \$18 / Sq. Yd.

❑ Asphalt Trail (all inclusive) ~ \$90 / Sq. Yd.

❑ Retaining Walls

- Depends on type (Segmental, MSE, Cast-in-Place Concrete, Stacked Stone)
- \$30 - \$50 / Sq. Yd.

❑ Pedestrian Bridges

- Varies Greatly Depending on Location, Type, Span Length, Height & Other Factors
- \$85 - \$140 / Sq. Ft.

Costs

❑ Handrailing

- Depends on type (steel, wood, fiberglass, composite, custom-built, prefabricated)
- Decorative metal \$100+ / Lin. Ft.

❑ Box Culverts

- Depends on size & number of barrels
- Contact precaster for prices

❑ Lighting

- Depends on type, spacing, “extras”
- \$1500-\$7500+ Per Light

❑ Utilities

- Contact utility companies

Costs

- ▣ Sidewalk Typical Cost Ranges
 - 5' Sidewalk (Roadside is Basically Flat and Requires Minimal Re-grading)
 - ▣ \$300,000-\$550,000/mile
 - 5' Sidewalk (Roadside Requires Minor Re-grading, possible Right of Way purchasing)
 - ▣ \$600,000-\$900,000/mile
 - 5' Sidewalk (Roadside Requires Major Re-grading, possible Right of Way purchasing)
 - ▣ \$1,000,000-\$1,700,000/mile

General Principles

A good sidewalk is essential to meet ADA:

- ▣ Sidewalk surface must be smooth
- ▣ Sidewalk must be wide enough
- ▣ Sidewalk must be clear of obstructions
- ▣ Driveways cannot slope excessively
- ▣ Not every possible design can be anticipated in standards
- ▣ When site conditions create constraints, meeting standards part-way may be acceptable

Meeting Standards

- ▣ Meet standards as best as you can, however cost should not be a reason to not meet the standards
- ▣ Document and Disclose to client



QUESTIONS???

Presenters

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