

Accomplishments

Lidar/Ortho-imagery Flight (Topographic Surveys Base Data)

Two Design Team Walkthrus:

1. Entire length focused on Road Street Crossings, on RW Parking opportunities, landscape architectural opportunities.
2. Streambank/ railbank erosion repair and prevention.

Width and Loading Design Research and Collaboration

Bridge Evaluations – Field and Design

Study Limits Mapping and Start of Study Letters (NEPA Processes)

Wetland/Stream delineation field work

Schedule

PHASE	TASK	Start Date	End Date
Initial Screenings and Studies	Pavement Design Subgrade Assessment	4/1/2022	5/13/2022
	Streambank Scour Data Collection/Analysis	5/2/2022	5/13/2022
	Bridge Investigations	4/4/2022	4/15/2022
	Pipe Culvert Investigations	5/16/2022	5/27/2022
	Initial Road Crossing Analysis/Traffic Counts	3/29/2022	4/29/2022
	Stream/Wetland Delineations	3/29/2022	4/22/2022
	Streambank Strategies	4/1/2022	4/29/2022
	SHPO Clarification	5/2/2022	5/6/2022
	Parking Evaluations	3/29/2022	5/6/2022
Topographical Surveys	Field Surveys for Obscure Areas	4/18/2022	5/6/2022
	Base Mapping for Design	5/9/2022	5/13/2022
30% Designs & Estimates	Pavement Designs	5/16/2022	6/3/2022
	Preliminary Hydro Bridges	6/6/2022	6/17/2022
	Preliminary Hydro Pipes	6/6/2022	6/24/2022
	Bridge Designs & Estimates (assumes all bridges require replacing)	6/20/2022	7/29/2022
	Road Crossing Preliminary Designs & Estimates	6/6/2022	7/1/2022
	Preliminary TMP Memo	7/11/2022	7/29/2022
	Preliminary Streambank Designs & Estimates	6/20/2022	7/8/2022
	Preliminary Streambank Designs & Estimates	6/6/2022	6/17/2022
	Line, grade, typical sections	5/16/2022	6/3/2022
	30% Design Complete Estimate	6/27/2022	8/5/2022
	Parking Designs & Estimates	6/6/2022	6/24/2022
NEPA Process	Wayfinding/ LA Features Designs & Estimates	6/13/2022	7/1/2022
	Environmental Features Maps	5/2/2022	5/6/2022
	Start of Study Letter Updates	4/1/2022	4/6/2022
	Public Involvement Process	3/25/2022	9/16/2022
	NRTR	4/25/2022	5/27/2022
	Finalize NEPA Doc Supplement	8/29/2022	9/23/2022
	Archeology Screening (assumes no resource found)	4/11/2022	4/29/2022
Arch, Hist. Coordination with SHPO (assumes no features except bridges)	4/11/2022	4/29/2022	
Community Engagement	Steering Committee engagement	4/13/2022	9/14/2022
Scope/Fee/Contract Phase 2	Scoping Process	6/20/2022	7/15/2022
	Fee Preparation	7/18/2022	7/29/2022
	Fee Auditing/Approval	8/1/2022	8/12/2022
	Contract Execution	8/15/2022	8/19/2022

NEPA (National Environmental Policy Act)

Projects with Federal funding or Federal permitting.

Differing levels of investigation/evaluation/documentation for differing levels of impacts.

Prior Environmental Documents:

1. 2019 for action of acquiring the RW
2. 2021 for the action of proceeding to design

Basis of Prior Analysis of Environmental Impact

- Assumed paved width of 10' (minimum width for low volume greenways)
- All construction on existing bed of ballast. No deviations in the current alignments
- Bridges to be fully retained and used as is. No retrofitting for greenway purposes
- Impacts to streams and wetlands are underneath thresholds of Nationwide Permits for compliance with the Clean Water Act
- Appropriate public involvement had been performed

Construction within existing ballast – potential for deviations Traffic Safety



Potential to shift alignment to create separation between greenway users and vehicular roads and drives.

Construction within existing ballast – potential for deviations Stabilize/Repair Eroded Areas



Potential to shift alignment to gain desired greenway widths and avoid expensive/impactful channel changes. Avoid cumulative impacts to streams and wetlands and stay under Nationwide Permit thresholds.

Existing Bridge Conditions – Replace or Retrofit?



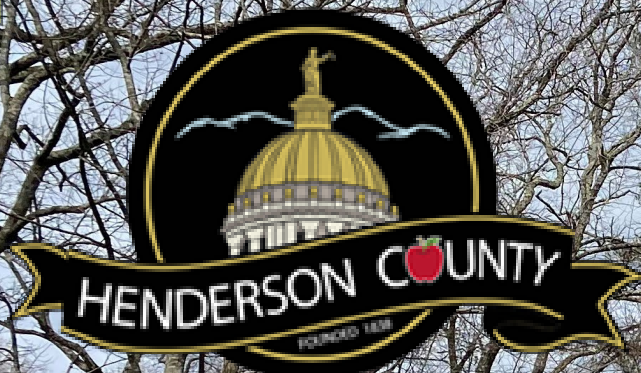
Analysis in process for structural integrity. Analysis to be performed for hydraulic conveyance. Conditions of decks, girders, piers, and seals may mean replacing all.

Does the project generate substantial controversy or public opposition, for any reason, following appropriate public involvement?

(from the Categorical Exclusion checklist – NEPA Document)

Answer is “no”, but what constitutes “appropriate public involvement”?

As the NEPA Document must be updated for other matters, we will continue public involvement thru community engagement and thru the RTAC process.



Ecusta Trail Design

Update on Engagement &
Trail Width Evaluation
April 13th, 2022



Public Engagement Update

Strategies Discussed:

- **Project Story Map:**
Coordination with Other County Information Efforts
- **Engagement Portal:** Question, Comments, etc.

Meeting 4/12 to Advance Strategies



Go Mills River

Town of Mills River Pedestrian & Bicycle Plan

To interact with this website, just scroll down the page.

[Input Meetings](#) [Project Goals](#) [Community Overview Video](#) [Questions?](#) [Stay in the Loop](#) [Thank you!](#)

The logo for Henderson County, North Carolina, featuring a stylized dome and the text 'HENDERSON COUNTY' and 'Henderson County North Carolina'.

Rail-Trail Advisory Committee

Department Staff
+ Current Planning
+ Long Range Planning
+ Apple Country Public Transit
+ Boards & Committees

Rail-Trail Advisory Committee

Calendar Date:
Wednesday, April 13, 2022 - 10:00am

Add to your calendar: [Outlook \(iCal\)](#) [Google](#)

[Back to calendar](#)

Meeting Information

Contact Information



Additional Outreach w/ 30% Design

To Be Determined Based on
Outcomes of Early Work



Trail Width Discussion

Trail User Function Widths

Guidelines & Best Practices

Level of Service Considerations

Similar Trail Counts vs Ecusta Context

Field Constraints

Recommendation



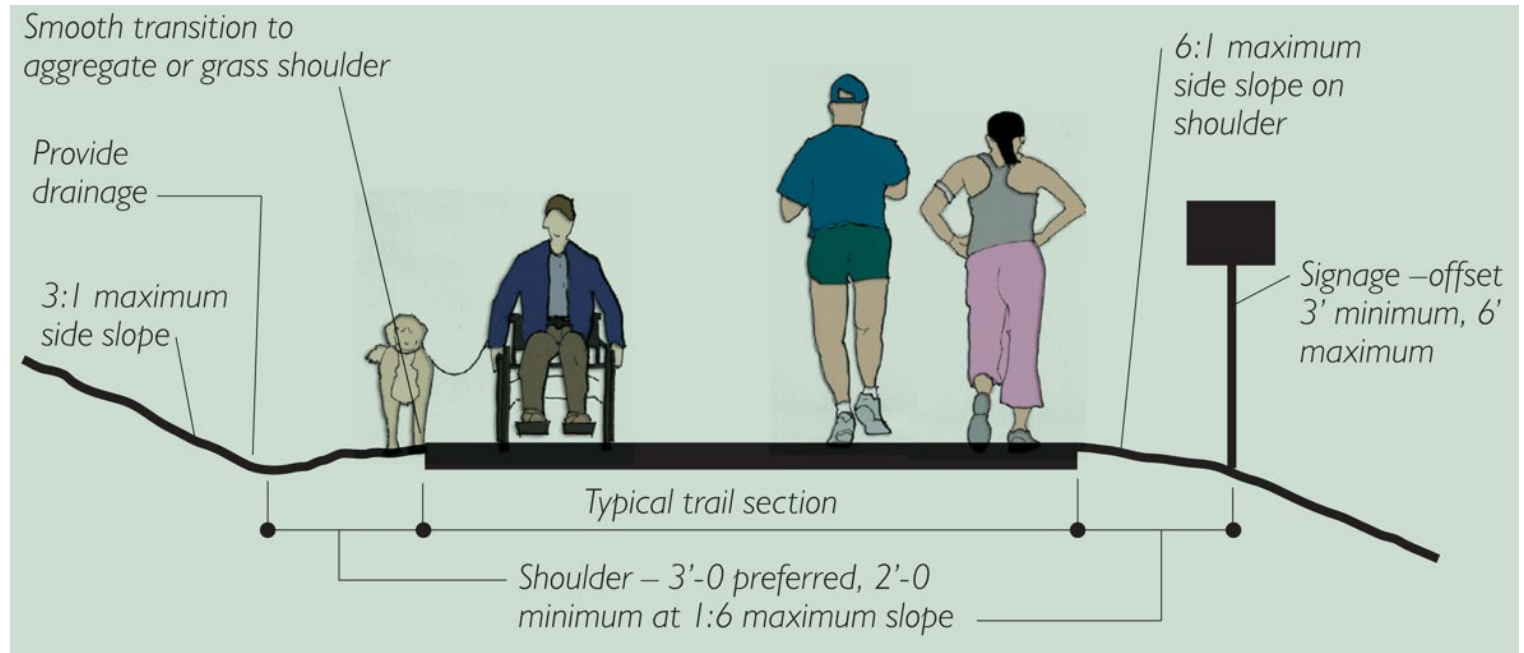
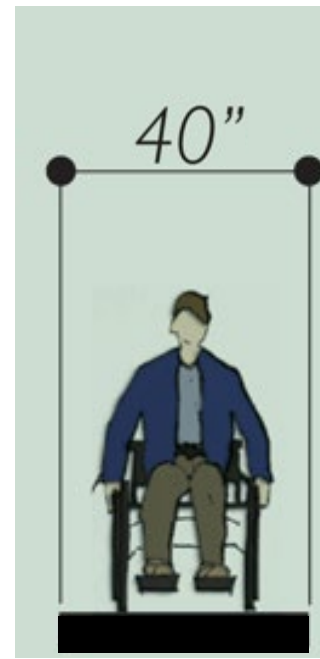
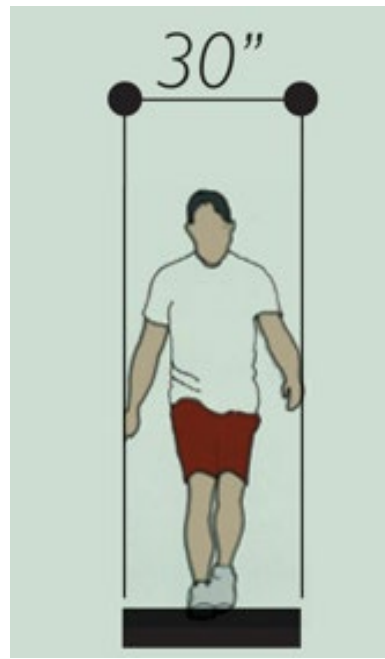
Photo Source:
Carrie Turner Photography



Trail Width Basics

Trail User Function Widths

Beyond the Pavement Width



Source:

Trail Planning, Design and Development Guidelines, Minnesota Department of Natural Resources

More on Functional Width and Passing

Mix of User Types

Volume of Users

Other Factors

- Kids w/ Parents
- Dog Walkers
- Side by Side Activity Essential on Trails



Photo Credit:
Equinox

National Guidance

“Guide for the Development of Bicycle Facilities” *AASHTO 4th Edition, 2012*

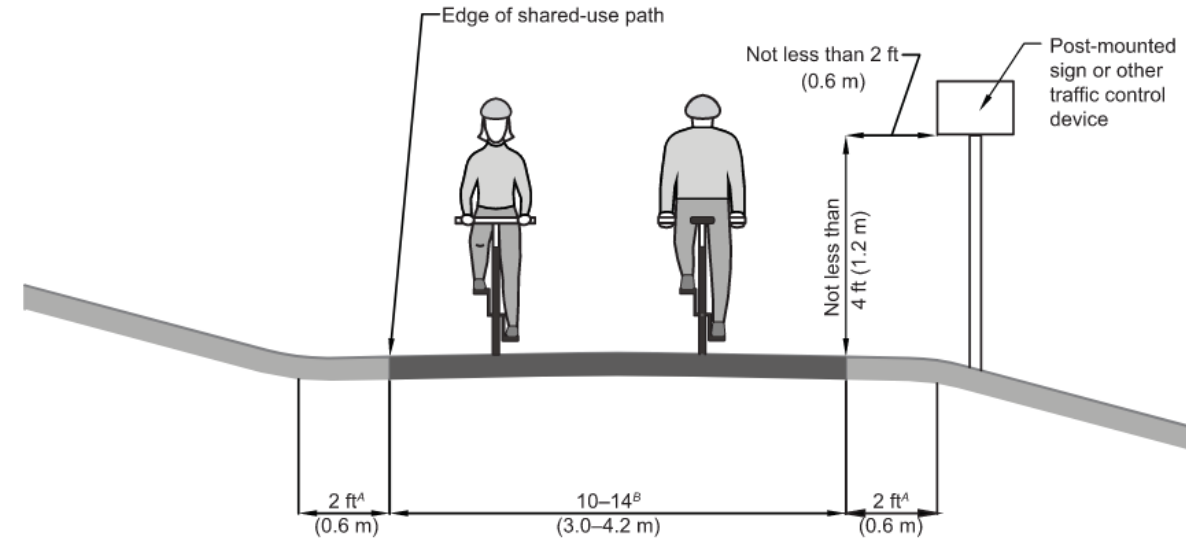
Variables that Impact Width (Section 5.2.1)

- Context
- Volume
- Mix of Users

10 Feet Minimum*

(8 Feet Sections in Constrained Locations)

Wider values applicable to areas with high use and/or wider variety of user groups



Example of 8 Foot Trail

Source: *Close the GAP Plan, City of Asheville*
Carrie Turner Photography

National Guidance

“The Shared Use Path Level of Service Calculator”

FHWA July 2006

Researched 8' -20' Wide Trails

Table 4. Average speed by mode.

Trail user type (mode)	Average speed (mi/h)	Standard deviation (mi/h)
Adult bicyclists	12.8	3.4
In-line skaters	10.1	2.7
Child bicyclists	7.9	1.9
Runners	6.5	1.2
Pedestrians	3.4	0.6

1 mi/h = 1.6 km/h

Table 3. Data profile for the average trail.

	Width	Centerline	One-way volume per hour	Adult bicycles	Pedestrians	Runners	Skaters	Child bicycles
Average trail	11 ft	Yes	105	55%	20%	10%	10%	5%

1 ft = 0.30 m



Example of 2 Lane Trail Conflicts

Source:

<https://www.fhwa.dot.gov/publications/research/safety/05139/05139.pdf>

National Guidance

“The Shared Use Path Level of Service Calculator”

FHWA July 2006

Table 8. Correlation of trail widths and operational lanes.

Width (ft)	Lanes
8.0–10.5	2
11.0–14.5	3
15.0–20.0	4

1 ft = 0.3 m

Three Lanes Requires $\geq 11'$ Trail

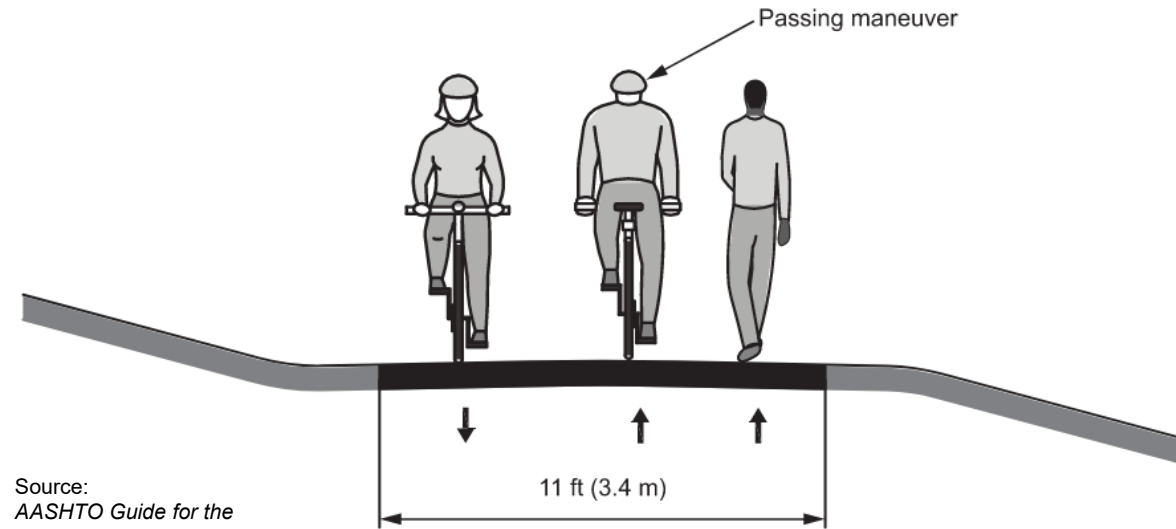


Figure 5-2. Minimum Width Needed to Facilitate Passing on a Shared Use Path



Source:
Trail Planning, Design and Development Guidelines, Minnesota Department of Natural Resources




Source:
Close the GAP Plan, City of Asheville
 Photo Credit: Equinox



Level of Service (LOS)

What does Trail Level of Service Mean for User Experience?



Level of Service	Description	Notes on User Experience and Capacity to Accommodate Growth
A Excellent	Optimum conditions	Ample space to absorb more users of all modes High-quality user experience
B Good	Good bicycling conditions	Retains significant room to absorb more users High-quality user experience
C Fair	Has at least minimum width to meet current demand	Basic service to bicyclists Modest level of additional capacity is available for bicyclists and skater modes More pedestrians, runners, or other slow-moving users will begin to diminish LOS
D Poor	Trail is nearing its functional capacity	Peak-period travel speeds are likely to be reduced by levels of crowding Addition of more users of any mode will result in significant service degradation Some bicyclists and skaters are likely to adjust their experience expectations or to avoid peak-period use
E Very Poor	Trail has reached its functional capacity	Peak-period travel speeds are likely to be reduced by levels of crowding Many bicyclists and skaters are likely to adjust their experience expectations, or to avoid peak-period use
F Failing	Significantly diminished experience for at least one, and most likely for all user groups	Does not effectively serve most bicyclists; significant user conflicts should be expected



Table 12. Shared-use path level of service look-up table, typical mode split.

Level of Service

Examples Nearby Trail Counts

Trail	Peak Hour*
Ecusta (Existing)	(8/hr)
RADTIP	(22/hr)
Thermal Belt Rail Trail	(11hr)
Reed Creek Greenway	(30/ hr)
Fletcher Park	(95/ hr)
Swamp Rabbit Trail	(164/ hr)

**One Direction of Traffic
(Existing Volumes, Does Not Include Growth Projection)*

		Trail Width (feet)						
		8	10	12	14	16	18	20
Trail Volume (One Direction per Hour)	25	B	B	B	B	A	A	A
	50	D	C	B	B	A	A	A
	75	D	C	B	B	B	A	A
	100	D	D	B	B	B	A	A
	150	E	D	C	C	B	B	B
	200	F	E	D	C	C	B	B
	250	F	F	D	D	C	C	C
	300	F	F	E	E	D	C	C
	400	F	F	F	F	E	E	E
	500	F	F	F	F	F	F	F
	600	F	F	F	F	F	F	F
	800	F	F	F	F	F	F	F
	1000	F	F	F	F	F	F	F

1 ft = 0.3 m

Table Assumptions

Mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicyclists.

An equal number of trail users travel in each direction (the model uses a 50%/50% directional split).

Trail volume represents the actual number of users counted in the field (the model adjusts this volume based on a peak hour factor of 0.85).

Trail has a centerline.

Fletcher Park

Approx 3 mile (w/ loops)
Out and Back
Fletcher Population: 8000
Future Extensions Planned

Ecusta *(When Complete)*

Approx 20 Miles *(+Hellbender Network Connection)*
Hendersonville to Brevard, NC

Hendersonville Population:	14,000
Laurel Park Population:	2,700
Horseshoe Population:	2,400
Brevard Population:	8,000
<i>Eventual Asheville Connection</i>	<i>92,000</i>



Swamp Rabbit Trail

Approx 22 Miles

Travelers Rest to Greenville, SC

Travelers Rest Population: 5,100
Furman University 2,700
Greenville Population: 68,000

Future Extensions Planned

Ecusta *(When Complete)*

Approx 20 Miles *(+Hellbender Network Connection)*

Hendersonville to Brevard, NC

Hendersonville Population: 14,000
Laurel Park Population: 2,700
Horseshoe Population: 2,400
Brevard Population: 8,000

Eventual Asheville Connection 95,000



Photo Credit: Greenville County Parks



Table 12. Shared-use path level of service look-up table, typical mode split.

Level of Service

Nearby Trail Peak Hour Volume (1 Direction)

Ecusta (Existing) (8/hr)

RADTIP (22/hr)

Thermal Belt Rail Trail (11hr)

Reed Creek Greenway (30/ hr)

Fletcher Park (95/ hr)

Swamp Rabbit Trail (164/ hr)

Ecusta Estimate (100-200/ hr)

Ecusta

Level of Service D or Better

12' Standard

14' In Heavier Use Areas

10' Minimum in Constrained Locations

		Trail Width (feet)						
		8	10	12	14	16	18	20
Trail Volume (One Direction per Hour)	25	B	B	B	B	A	A	A
	50	D	C	B	B	A	A	A
	75	D	C	B	B	B	A	A
	100	D	D	B	B	B	A	A
	150	E	D	C	C	B	B	B
	200	F	E	D	C	C	B	B
	250	F	F	D	D	C	C	C
	300	F	F	E	E	D	C	C
	400	F	F	F	F	E	E	E
	500	F	F	F	F	F	F	F
	600	F	F	F	F	F	F	F
	800	F	F	F	F	F	F	F
1000	F	F	F	F	F	F	F	

1 ft = 0.3 m

Table Assumptions

Mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicyclists.

An equal number of trail users travel in each direction (the model uses a 50%/50% directional split).

Trail volume represents the actual number of users counted in the field (the model adjusts this volume based on a peak hour factor of 0.85).

Trail has a centerline.

Other Key Factors: Cost and Constructability

Constraints

- Right of Way & Property Impacts
- Steep Grades
- Utilities
- Drainage
- Environmental Constraints



Recommended Typical Sections

12' Wide

US 64 to White Pine



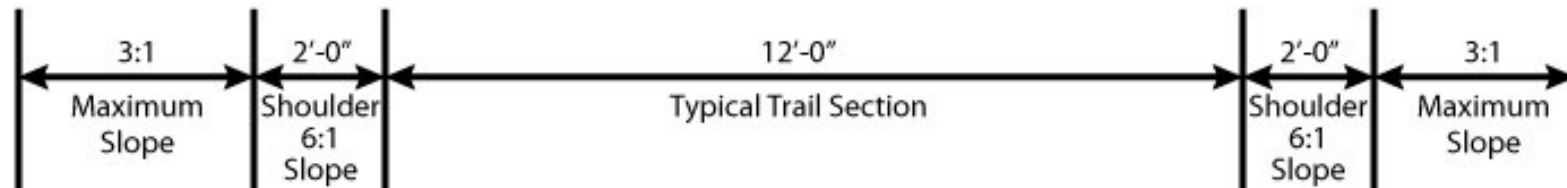
14' Wide

White Pine to US 25



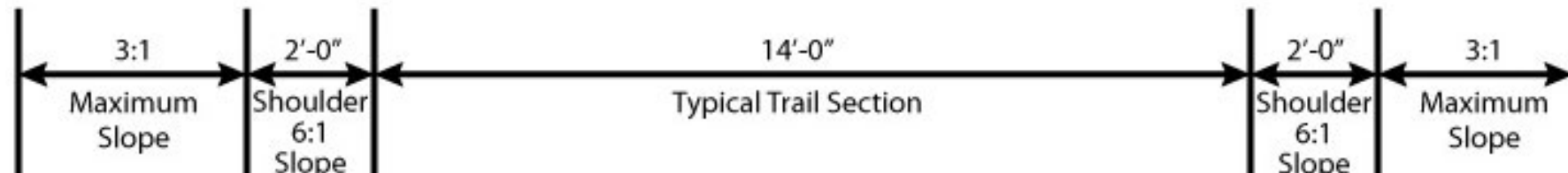
Typical Section 1

US 64 to White Pine Drive



Typical Section 2

White Pine Drive to US 25

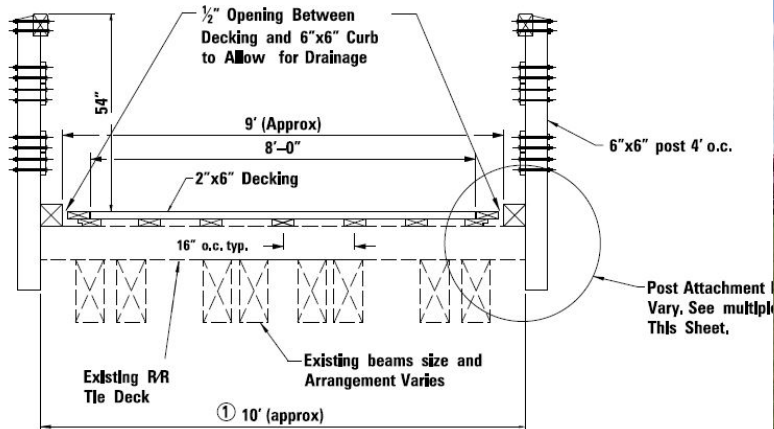


Vehicular Access Issues

Bridge and Pavement Designs

Many public road access points and a few private road access points.

Designing Pavement Structures and Bridges to accommodate vehicles—
maintenance and emergency



Bridge Deck Typical Section
Not to scale



Questions?