COLORADO
Department of Transportation

Coffee at CDOT
Bicycle/Pedestrian/Scenic Byways

Outline

- Overview of the Colorado Scenic and Historic Byways Program
- Overview of the Bicycle and Pedestrian Program
- Dig into Context Classifications

Wifi:cØloRADo!

Colorado Scenic and Historic Byways

- 26 Colorado Byways
  - 11 National Scenic Byways (more than any other state)
  - 10 National Forest Scenic Byways
  - 2 BLM Backcountry Byways

Colorado Scenic and Historic Byways

Brief History

- 1989 – Program created by Executive Order
- 1991 – National Scenic Byways Program was created, providing federal funding to the states' byways programs.
- 2012 – Federal funding was discontinued
- 2019 – President signed Reviving America's Byways Act

However…

- Economic impact of Colorado's byways continues
  - 2016 Study

Colorado Scenic and Historic Byways

Bicycle and Pedestrian Program

5 E's

- Education
- Encouragement
- Engineering
- Enforcement
- Evaluation

Upcoming Events

Context Classification – AASHTO Greenbook

2011 Greenbook

- Rural
- Urban

2018 Greenbook

- Rural
- Rural Town
- Suburban
- Urban
- Urban Core

Category	Density	Land Use	Setback
Rural	Lowest (few houses or other structures)	Agricultural, natural resource preservation, and outdoor recreation uses with some isolated residential and commercial	Usually large setbacks
Rural Town	Low to medium (single-family houses and other single-purpose structures)	Primarily commercial uses along a main street (some adjacent single-family residential)	On-street parking and sidewalks with predominately small setbacks
Suburban	Low to medium (single- and multifamily structures and multistory commercial)	Mixed residential neighborhood and commercial clusters (includes town centers, commercial corridors, big box commercial and light industrial)	Varied setbacks with some sidewalks and mostly off-street parking
Urban	High (multistory, low-rise structures with designated off-street parking)	Mixed residential and commercial uses, with some institutional and industrial and prominent destinations	On-street parking and sidewalks with mixed setbacks
Urban Core	Highest (multistory and high-rise structures)	Mixed commercial, residential and institutional uses within and among predominately high-rise structures	Small setbacks with sidewalks and pedestrian plazas

Context Classification

Rural

Rural Town

Context Classification

Suburban

Urban

Urban Core

Context Classification

- Context classification informs planners and engineers about both the expected type and intensity of users along a particular roadway segment.
- Step towards “complete streets” and designing/providing for the needs of all facilities.

Roadway Types and Accommodation

Motor Vehicle Network Type

Expressways/Freeways*	Corridors of national importance providing long distance travel
Principal Arterial	Corridors of regional importance connecting large centers of activity
Minor Arterial	Corridors of local importance connecting centers of activity
Collector	Roadways providing connections between arterials and local roads
Local	All other roads

Bicycle Network Type:

Citywide Connector	Citywide/Regional connections or connections to major activity centers or regional bike routes stretching over several miles attracting high bike volumes
Neighborhood Connector	Neighborhood or sub-area connections allowing access to higher order facilities or local activity centers
Local Connector	Local connections of short length providing internal connections to neighborhoods or connect to higher order facilities

Design Considerations

- Speed
  - Low
  - Medium
  - High
- Access levels
  - Low
  - Medium
  - High
- Mobility levels
  - Low
  - Medium
  - High

Separation
- Low – Shared lane
- Med – Dedicated space
- High – Separated Facility

Roadway Types & Accommodation

Pedestrian Network Type:

Route Type	Description
P-1	Pedestrian activity absent
P-2	Low Volume - Peds per day
P-3	Med Volume - Peds per hour
P-4	High Volume - Peds per sub-hour

Design Considerations

- Sidewalk Width
  - P-1 – N/A
  - P-2 – Minimum
  - P-3 – Wide
  - P-4 – Enhanced

Separation/buffer should be considered in conjunction with target vehicle speed.

EFCS Matrix – Motor Vehicles

- The EFCS matrix attempts to balance the mobility vs access concepts presented in the Green Book by balancing roadway speed, access, and context.

Roadway \ Context	Rural
Principal Arterial	H speed H mobility- L access
Minor Arterial	H speed H mobility- M access
Collector	M speed M mobility- M access
Local	M speed M mobility- M access

Target Speed

Mobility

Access

Roadway \ Context	Rural	Rural Town	Suburban	Urban	Urban Core
Principal Arterial	H speed H mobility- L access	L/M speed M mobility- H access	M/H speed M mobility- M access	L/M speed M mobility- M access	L speed M mobility- M access

Target Speed

Mobility

Access

EFCS Matrix- Bicycles

- The EFCS matrix attempts to balance the mobility vs access concepts presented in the Green Book by balancing roadway speed, access, and context.

Higher speed = greater separation

Higher speed = greater separation

Roadway \ Context	Rural	Rural Town	Suburban	Urban	Urban Core
Principal Arterial	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC: M separation; CC: M separation	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC: M/H separation; CC: H separation	LC: L separation; NC: M separation; CC: M separation
Minor Arterial	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC: M separation; CC: M separation	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC: M separation; CC: M separation	LC: L separation; NC: M separation; CC: M separation
Collector	LC: L separation; NC: M separation; CC: M separation	LC: L separation; NC: L separation; CC: M separation	LC: L separation; NC: M separation; CC: M separation	LC: L separation; NC: M separation; CC: M separation	LC: L separation; NC: L separation; CC: M separation
Local	LC: L separation; NC: L separation; CC: L separation	LC: L separation; NC: L separation; CC: L separation	LC: L separation; NC: L separation; CC: L separation	LC: L separation; NC: L separation; CC: L separation	LC: L separation; NC: L separation; CC: L separation

EFCS Matrix - Pedestrians

The EFCS matrix attempts to accommodate pedestrians by balancing sidewalk width and expected pedestrian volumes with context and roadway type.

More Pedestrian Environment = Greater Width

Context / Roadway	Rural	Rural Town	Suburban	Urban	Urban Core
Principal Arterial	P1: *; P2: Min; P3: Wide: P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min; P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced
Minor Arterial	P1: *; P2: Min; P3: Wide: P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min; P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced
Collector	P1: *; P2: Min; P3: Wide: P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min; P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced
Local	P1: *; P2: Min; P3: Wide: P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min; P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced

Additional Background

- NCHRP 855 - An Expanded Functional Classification System for Highways and Streets
  - Framework which expands the existing functional classification scheme to facilitate better design by taking into account context, road function, and user needs.
  - Balancing act of user needs, safety, and mobility

Context / Roadway	Rural	Rural Town	Suburban	Urban	Urban Core
Principal Arterial	H speed H mobility-L access	L/M speed M mobility-H access	M/H speed M mobility-M access	L/M speed M mobility-M access	L speed M mobility-M access
	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC, CC: M separation	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC: M/H separation; CC: H separation	LC: L separation; NC, CC: M separation
	P1: *; P2: Min; P3, P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min;P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced
Minor Arterial	H speed H mobility-M access	L/M speed M mobility-H access	M speed M mobility-M access	L/M speed M mobility-M/H access	L speed M mobility-M/H access
	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC, CC: M separation	LC: L separation; NC: M separation; CC: H separation	LC: L separation; NC, CC: M separation	LC: L separation; NC, CC: M separation
	P1, P2: Min P3, P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min;P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced
Collector	M speed M mobility-M access	L speed M mobility-H access	M speed M mobility-H access	L speed M mobility-H access	L speed M mobility-H access
	LC: L separation; NC, CC: M separation	LC, NC: L separation; CC: M separation	LC: L separation; NC, CC: M separation	LC: L separation; NC, CC: M separation	LC, NC: L separation; CC: M separation
	P1, P2: Min; P3, P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min;P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced
Local	M speed M mobility-M access	L speed M mobility-H access	L speed L mobility-H access	L speed L mobility-H access	L speed L mobility-H access
	LC, NC, CC: L separation	LC, NC, CC: L separation	LC, NC, CC: L separation	LC, NC, CC: L separation	LC, NC, CC: L separation;
	P1, P2: Min; P3, P4: Wide	P2: Min; P3: Wide ; P4:Enhanced	P1: *; P2: Min;P3: Wide; P4: Wide	P2: Min; P3: Wide; P4: Enhanced	P3: Wide; P4:Enhanced

NCHRP 855 - Continued

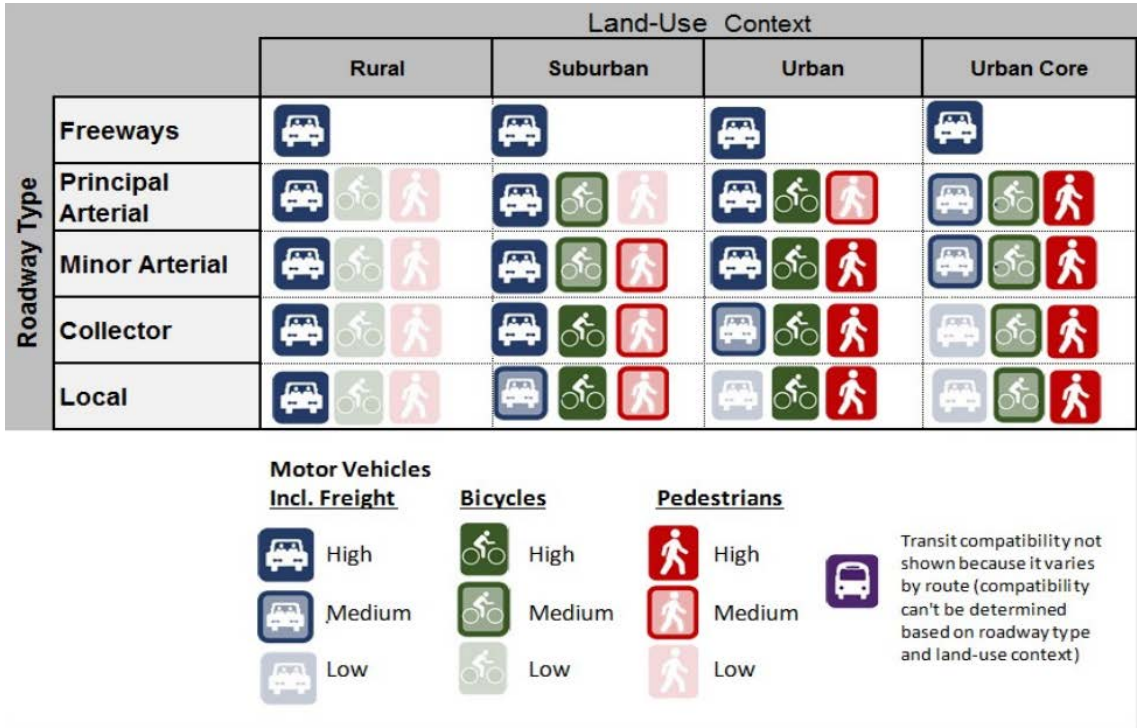
Suburban Minor Arterial with citywide connection

Context / Roadway	User	Suburban
Minor Arterial		M speed M mobility-M access LC: L separation; NC: M separation; CC: H separation P1 *; P2: Min; P3: Wide; P4: Wide

Preferred Cross Sectional Elements

- Driver: Medium speed, medium mobility, medium access (using existing guidance)
- Bicyclist: CC High Separation (Physical separation from traffic in the form of physical barrier or lateral buffer)
- Pedestrian P3 Wide (Wider than 5’ and may require separation from back of curb)

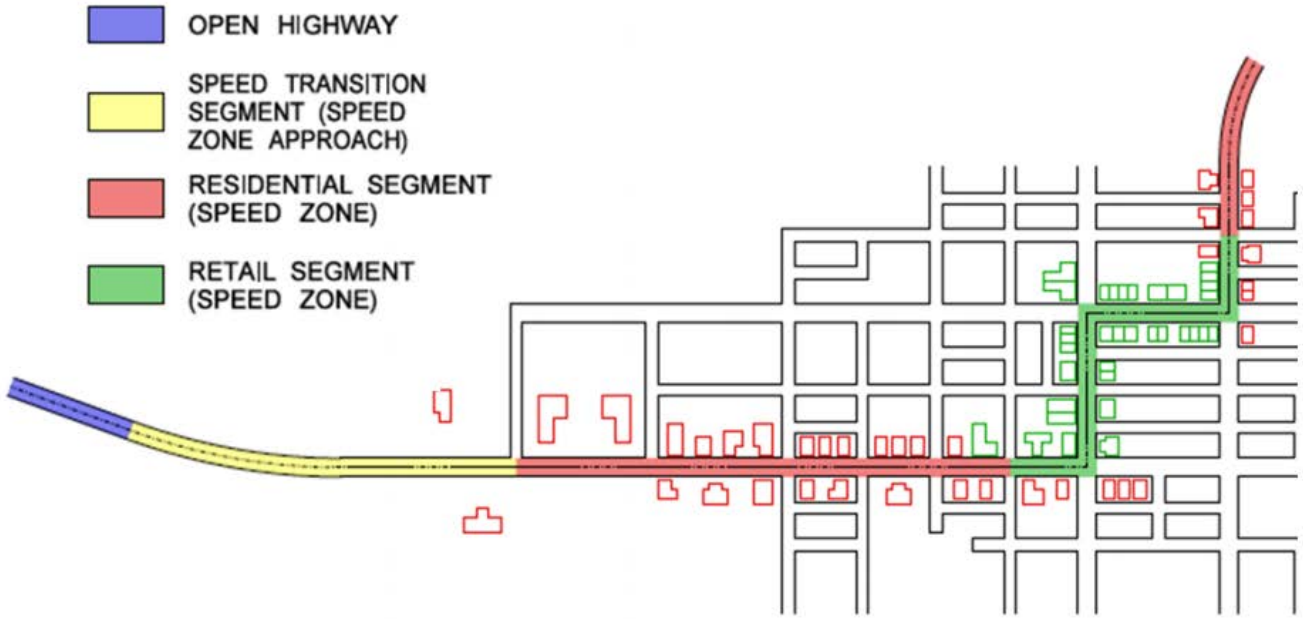
Example – WSDOT



Land Use Characteristic →	Increased Modal Accommodation Level
High proximity to activity centers	Pedestrian, Transit, Bicycle
Industrial and commercial land uses in surrounding area	Auto, Freight
High densities of both residential and employment	Bicycle, Pedestrian, Transit
Minimal building setbacks adjacent to roadway	Bicycle, Pedestrian
Human scale architecture present	Bicycle, Pedestrian, Transit
Transportation Characteristic →	**Increased Modal Accommodation Level**
Well-established grid network	Bicycle, Pedestrian, Transit, Auto
T-2 freight route	Auto, Freight
Streetside elements	Bicycle, Pedestrian, Transit
Frequent signalized intersections along route	Auto, Transit, Pedestrian

Section 11.03.03 –
Start with the initial modal accommodation level for each mode and adjust to establish final level based on project-specific conditions

Example WSDOT



- Speed Transition Segments
- Traffic Calming
- Geometric Treatments

FDOT – Context Classification

FIGURE 2 FDOT CONTEXT CLASSIFICATIONS

C1-Natural
Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.

C2-Rural
Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.

C2T-Rural Town
Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.

C3R-Suburban Residential
Mostly residential uses within large blocks and a disconnected or sparse roadway network.

C3C-Suburban Commercial
Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.

C4-Urban General
Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.

C5-Urban Center
Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.

C6-Urban Core
Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population >1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.

Sterling, CO

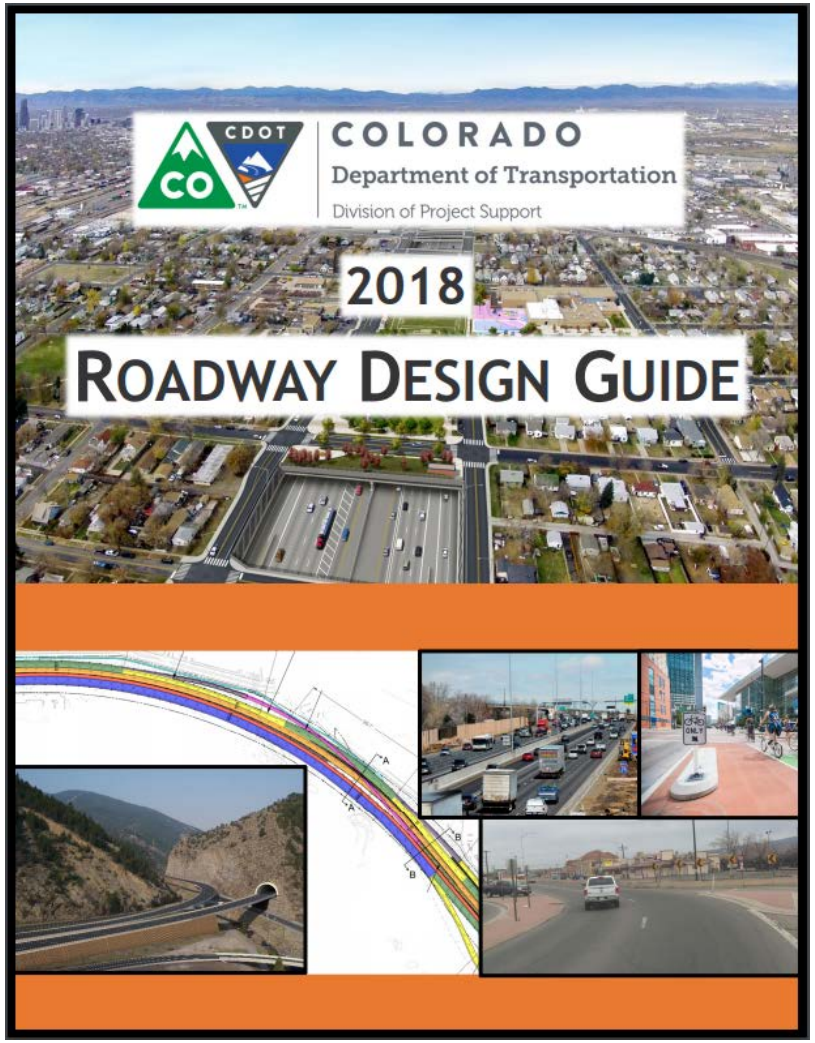
Relationship to the RDG

CDOT Roadway Design Guide

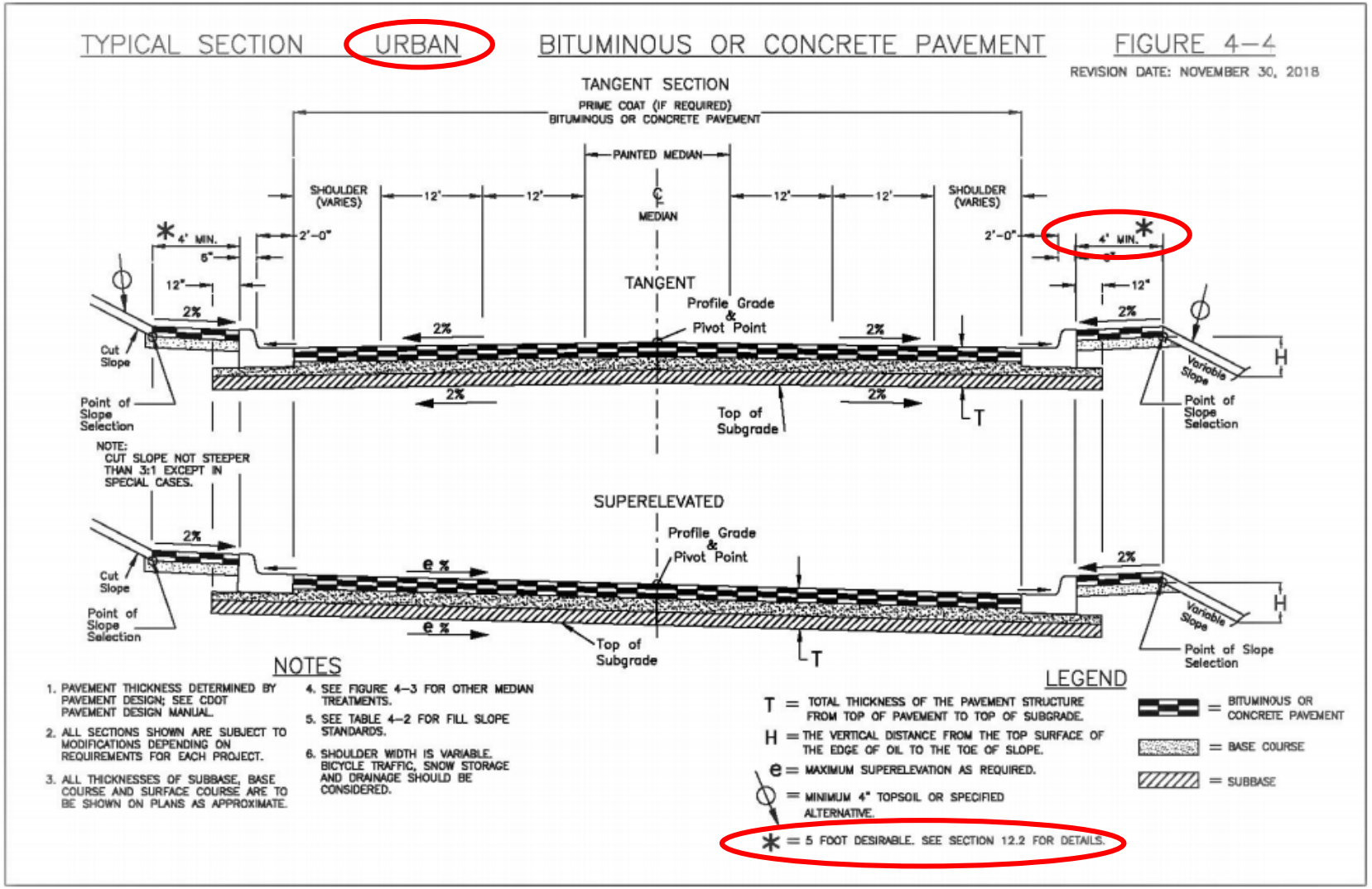
- Currently very motor vehicle centric

Opportunities to Improve:

- Balancing modal needs (trade-offs)
- Integrating context and land use into design
- Appropriate accommodation for non motorized users for various roadway types (functional classes)



CDOT RDG Example



Questions?

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