Small Town and Rural Bicycling and Walking Design Guidance

Rebecca Gleason, MS, PE
Western Transportation Institute
Montana State University

Dana Dickman, Alta Planning and Design

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Agenda: Small town and rural bicycle and pedestrian design guidance

- Collaboration - Alta, WTI, NACo
- Funded by Blue Cross Blue Shield-MN and FHWA

Bike parking in Seward, Alaska
Background: Small town and rural bicycle and pedestrian design guidance

- Project will include:
  - Design Typologies - Online resource
  - Case Studies – examples from around U.S.
Background: Project Goals

- Provide a bridge between existing guidance on bicycle and pedestrian design and rural practice
- Develop an online tool that is ‘living’ and can be updated and improved with state of the art practice information
- Research and evidence
Background: Does your day start like ......

this? Or this?
Background: Why design for bicyclists and pedestrians?

1. User Demand
2. Safety
3. Liability
4. Health
5. Environment
6. Social Equity
Background: User Demand

Typical “goat trail” in Montana
Background: User Demand

Footprints in snow along College St. in Bozeman, MT
Background: Safety

- 59,000 pedestrians injured annually in motor vehicle crashes.
- 48,000 cyclists injured in motor vehicle traffic crashes. (NHTSA 2011)
Background: Liability

- 1990: Americans with Disabilities Act (ADA)
- Some jurisdictions have been sued to bring them into compliance
Obesity Trends* Among U.S. Adults
BRFSS, 1990, 2000, 2010

(*BMI ≥30, or about 30 lbs. overweight for 5’4” person)

2010

1990

2000

No Data          <10%           10%–14%           15%–19%           20%–24%          25%–29%           ≥30%

Source: Behavioral Risk Factor Surveillance System, CDC.
Background: Environment

- According to the US EPA, driving a car is the single most polluting action undertaken by the average citizen.

- Air quality: Transportation is responsible for nearly 80% of CO and 55% of NO emissions in U.S.
Social Equity

- Ave. annual cost to own/operate a vehicle
  - $8,000 for a small car
  - $12,700 for a large vehicle (AAA 2013)

- Average person in US spends 48% of income on housing and 20% on transportation (Dept of Labor, 2010)
Background: Cities embracing bicycle and pedestrian transportation

National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide
http://nacto.org/publication/urban-bikeway-design-guide/
Background: NACTO Urban Bikeway Design Guide-Raised Cycle track

- Description
- Benefits
- Typical application
- Design Guidance
- Maintenance
- Locations in U.S.
- Related studies
Background: NACTO Urban Streets Design Guide

http://nacto.org/publication/urban-street-design-guide/
Background: WTI Project Role-Research and Evidence

1. Literature review of rural applicable bicycle and pedestrian design guidance
2. State DOT design flexibility scan
3. Rural Roads Practitioner survey
4. Case Studies
Literature Review

- Deepen our understanding of existing guidance, best practices and constraints for rural street design for biking and walking
- Review professional publications (NCHRP, FHWA...), journal articles, grey literature
Literature Review: Rural Streets Guides

- Rural Oregon Main Street guide 1999
- Targets rural communities that want to improve safety and enhance mobility for people walking and biking
Literature Review: Rural bike or pedestrian design practices.

- Much info exists on:
  - lane width reduction
  - speed transitions
  - visual narrowing and
  - traffic calming.

- Less info on:
  - Alternative surfacing
  - Unsignalized crossings
  - Rumble strips

Rumble strips (Alta Planning and Design photo)
Literature Review: Design Practice - lane width reduction

“The narrower a road and its surroundings appear to the driver, the slower the likely traffic speeds. “

Literature Review: Design Practices – Speed Transition

- Synthesize existing practice on rural high to low speed transitions.
Literature Review: Speed Transition on rural roads

Settled Area (Low speed limit)  Transition Zone (Physical measures)  Approach Zone (Warning and psychological measures)  Rural Area (High speed limit)

Additional measures to manage speed in the settled area.
Road narrowings
Raised medians
Stepped-down speed limit etc.

Converging chevrons
Optical speed bars
Colored pavement
Advanced signing etc.

FIGURE 39 Transition zone and approach zone concepts.

NCHRP Synthesis 412 (2011)
Literature Review: Speed transition

- Reduced speed signage alone is ineffective at in reducing motorist speed.
- A change in road character is important in transition zones where there is a change in speed.
- More extensive measures tend to produce greater reductions in speed and crashes than passive methods.
Literature Review: Design Practices – Speed Transition

Figure 4-16. Rendering of a gateway.

NCHRP Report 737 (2012)
Literature Review: Design Practices – Speed Transition

- Gateway

NCHRP Synthesis 412 (2011)

FIGURE 22 An example gateway in California [Source: Veneziano et al. (2009)].
Evidence that bicycle and pedestrian considerations are standard practices in many states’ 3R projects (McGee, 2011).
Literature Review: Design Flexibility and Context Sensitive Design

- Narrower lane widths allow shorter pedestrian crossing times and flexibility for benefits such as medians and bicycle lanes on roads with speed under 45 mph (Harwood et al, 2014).
FHWA’s Flexibility in Highway Design, states that the AASHTO Green Book is often thought of as “dictating a set of national standards,” however, it is actually a set of guidelines with a fair amount of flexibility.
State DOT Design Flexibility Scan

- **Purpose** – Establish baseline understanding in range in design flexibility across the U.S.

- **Key Results**
  - 42 States reported using Context Sensitive Solutions
  - 25 states have adopted Complete Streets Policies
  - 9 have endorsed at least one of NACTO guides
Next Steps: Small town and rural bicycle and pedestrian design guidance

- Rural roads practitioner survey to learn their needs
- Case studies in small communities across United States
- Input from technical advisory committee on design practices of most importance
- Alaska small town contacts? TAC Representative?
Conclusion: Small town and rural bicycle and pedestrian design guidance

- Project will include:
  - Research and Evidence
  - Design Practices
  - Model Typologies
  - Case Studies
  - Photo Library

Protected bike lanes Jackson, WY

Model Typologies
bring the pieces together.

Bicycle advisory lanes, the Netherlands
I thought of that while riding my bicycle – Einstein in reference to the Theory of Relativity