Countermeasures for Vulnerable Users

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Promoting Safety for Vulnerable Road Users
Vulnerable Road Users...

...are most at risk for serious injury or death when they are involved in a motor-vehicle-related crash

...should be considered differently on urban and rural highways, where we have unique challenges and users

How Do We Improve Safety For All?

Increase awareness and understanding of safety issues related to vulnerable road users.

Increase compliance with traffic laws and regulations related to pedestrian and bicycle safety through education and enforcement.

**Develop and use a systemic approach to identify locations and behaviors prone to pedestrian and bicycle crashes and implement multidisciplinary countermeasures.**

Encourage adequate funding levels for effective pedestrian and bicycle safety programs and initiatives.

**Create built environment (urban and rural) to support and encourage safe bicycling and walking in resurfacing projects.**

Support national, state, and local legislative initiatives and policies that promote bicycle and pedestrian safety.
Countermeasure Questions

What countermeasures are appropriate in Alabama?

Where do we need countermeasures along Alabama Roads?

How do we successfully implement countermeasures?

Many National Resources Available
Three Resources Developed for Alabama Roads

**Countermeasure Considerations for Vulnerable Road Users**
Prepared for the Alabama Department of Transportation

**ACTIVE ROUTES VISUALIZATION TOOL**
Star Guide

**Alabama Road Safety Conference - 2020**
10/22/2020

Countermeasure Considerations

A single go-to report that shares Alabama-specific implementation & design considerations for countermeasures

Based on ALDOT Specifications/ Drawings & national guidance documents
Countermeasures

Cross-sectional Countermeasures
- Wide Paved Shoulder with Rumble Strips
- Traffic Calming / Speed Management
- Passing / Auxiliary Lane
- Shared Roadway
- Sharrow/Shared Lane Marking
- Bike Lane
- Cycletrack / Separated Bike Lane
- Sidewalk
- Shared Use / Adjacent Multi-use path
- General Motorcycle Improvements

Intersection & Crossing Countermeasures
- Conventional Crosswalk
- Raised Crosswalk
- Raised Intersection
- Combined Bike Lane / Turn Lane
- Pedestrian Refuge Island / Median
- Accessible Pedestrian Features
- Curb Bulb-out / Curb Extension
- Midblock Crossing
- Rectangular Rapid Flashing Beacon (RRFB)
- Leading Pedestrian Interval Signal
- Tight Curb Radius
- Bike Box
- Roundabout / Neighborhood Traffic Circle
- Protected Intersection
- Reverse Angle Parking

Countermeasures for Vulnerable Users

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Cross-Sectional Countermeasures

### WIDE PAVED SHOULDER WITH RUMBLE STRIPS

**Overview**
- Wider paved shoulders with rumble strips can help decrease the number of fatalities and injuries caused by vehicles veering off the road. Shoulder rumble strips are positioned on the shoulder of the road between the travel lane and the curb. They are typically placed at a 90° angle to the travel lane and are designed to alert drivers of the edge of the shoulder.

**Design Considerations**
- The width of the rumble strip should be sufficient to ensure the driver's attention is captured. The strip should be placed close to the edge of the travel lane to maximize its effectiveness.
- Rumble strips should be spaced at regular intervals to maintain a consistent pattern for drivers.
- The height and severity of the rumble strip should be such that it can be easily felt but not so high as to cause discomfort or distraction.

**Implementation Considerations**
- The installation of rumble strips should be carefully planned to minimize disruption to traffic and ensure the safety of both drivers and construction workers.
- Regular maintenance and inspection are necessary to ensure the effectiveness of the rumble strips.

### BIKE LANE

**Overview**
- Bike lanes are designated areas for cyclists to ride, separated from motorized traffic. They can significantly reduce the risk of crashes involving cyclists and vehicles.

**Design Considerations**
- Bike lanes should be clearly marked with signs and pavement markings to ensure visibility and separation from motorized traffic.
- The width of the bike lane should be sufficient to accommodate cyclists comfortably and safely.
- Separation barriers, such as curbs or planters, can be used to further enhance the protection of cyclists.

**Implementation Considerations**
- Public awareness campaigns and education programs are essential to inform both cyclists and motorists about the rules and safety benefits of bike lanes.
- Regular maintenance and inspection of bike lanes are necessary to ensure they remain effective and safe for use.

### Countermeasures for Vulnerable Users

These countermeasures are designed to protect vulnerable users such as cyclists, pedestrians, and other road users who are particularly at risk of injury or fatality in traffic accidents. Implementing these measures can help create a safer environment on our roads.
Intersection & Crossing Countermeasures

**PEDESTRIAN REFUGE ISLAND / MEDIAN**

**Overview**
- Pedestrian refuge islands, fixed or moveable, are a road safety improvement designed to protect pedestrians from vehicular traffic and improve pedestrian safety at intersections or along roadways.

**Design Considerations**
- Engineers should consider the following design elements for refuge islands:
  - **Width**: The width of the refuge island should be 5 to 10 feet to allow pedestrians to safely cross the roadway.
  - **Location**: Refuges should be located at intersections, mid-block locations, or anywhere pedestrian traffic is heavy.
  - **Markings**: Refuges should be marked with visible markings to indicate their presence.

**Implementation Considerations**
- Pedestrians should be educated on the importance of using refuge islands.
- Refuges should be accessible to people with disabilities.

**COMBINED BIKE LANE / TURN LANE**

**Overview**
- Combined bike lanes and turn lanes are a road safety improvement designed to improve the safety for cyclists and drivers at intersections.

**Design Considerations**
- Engineers should consider the following design elements for combined bike lanes:
  - **Width**: The minimum width for a combined bike lane should be 5 feet.
  - **Markings**: The lane should be marked with visible markings to indicate its purpose.
  - **Signage**: Appropriate signage should be provided to inform drivers and cyclists of the lane's purpose.

**Implementation Considerations**
- Cyclists should be educated on the importance of using combined bike lanes.
- Drivers should be reminded to yield to cyclists in the lane.
An ArcGIS Software Toolbox App that provides potential routes where we can add countermeasures that promote VRU safety

Routes support individuals reaching preferred destinations along efficient corridors
Active Routes to Everyday Destinations

Step 1: Where Are the People?
Step 2: Where Do They Want to Go?

Step 3: What Paths Get Them There?
Step 4: What Should Improve?

Provide Feedback!

Step 5: Ideas for Moving Forward!
A guided step-by-step process for selecting appropriate countermeasures

Provides guidance on developing a plan for engagement & implementation
Step 1: Establish Goals

As you think about the goals for your community, consider the following:

01 Establish goals for your community

02 Select action items

Step 2: Select Action Items

Active Transportation

Check out the resources below to find action items that will make your community safer:

- Reduce speed limits
- Install speed humps
- Promote active transportation
- Engage the community with walking/biking
- Engage with schools/districts on walking/biking

Countermeasures for Vulnerable Users
Step 3: Build a Work Plan

**Step 03: Build Your Work Plan**

- **Action Items**
  - Why is this important for our community?  
    - Reduce the number of injuries and fatalities associated with traffic crashes involving vulnerable users.
  - How will we know we succeeded?  
    - Decrease the number of traffic crashes involving vulnerable users.

**Countermeasures for Vulnerable Users**

**Action Items**

- **Sidewalk Accessibility Improvements**
  - Sidewalk Accessibility
  - Pedestrian Improvements
  - Play Streets

**Physical Activity Stations**

**Sidewalk Accessibility Improvements**

*Sidewalk Accessibility Improvements*

- Increase sidewalk accessibility for all users, including individuals with mobility impairments.
- Implement curb cuts and accessible shapes at intersections.
- Add tactile paving for improved pedestrian navigation.

**Physical Activity Stations**

- Biking
- Walking
- Distant activity

**Play Streets**

- Create play streets in neighborhoods to promote safe play areas for children.
- Implement temporary traffic calming measures to enhance pedestrian safety.

**Pedestrian Improvements**

- Install pedestrian signals at intersections.
- Add crosswalks and pedestrian islands to improve pedestrian safety.
- Implement traffic calming measures to reduce vehicle speeds near schools and parks.

**Play Streets**

- Implement street closures for play-related activities.
- Add playgrounds and sports facilities.

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Action Items

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Here to Support Your Work!
Questions & Discussion

Request Materials: jlamondia@auburn.edu