Roundabouts at Interchanges and High Speed Approaches

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TexITE Meeting
Fort Worth, September 23, 2016
Roundabout Interchange Ramp Terminal Types

Types of Roundabout Terminals:
• Raindrop
Roundabout Interchange Ramp Terminal Types

- Raindrop
- Single-circle (two bridges) diamond interchange
Roundabout Interchange Ramp Terminal Types

Types of Roundabout Terminals:

- Raindrop
- Single-circle (two bridges) diamond interchange
- Dual roundabouts - the most common choice for interchange locations
Roundabout Interchange Ramp Terminals

The Vail Trail - November 1994
Prior to Modern Roundabout

Politically Incorrect
by Don Siddle

THE IDEA OF THIS TRAFFIC PLAN IS TO TAKE CARS FULL OF SKIERS RUSHING TO GET ON THE SLOPES, FUNNEL THEM INTO AN UNFAMILIAR CIRCLE ON Icy SNOW PACKED ROADS.......

WHO SAYS CALIFORNIA HAS THE BEST NUTS?
Interchange Ramp Terminals
Incorporating Service Roads

Vail, CO
Roundabout Interchange Ramp Terminals

TRANSPORTATION RESEARCH BOARD

5th International Roundabout Conference
Green Bay, Wisconsin
May 8-10, 2017

Sponsored By:
TRB Committee on Roundabouts (ANB75)
Co-Chairs: Eugene Russell, Professor Emeritus and Brian Walsh, Washington State DOT

Hosted By:
The Wisconsin Department of Transportation
and the University of Wisconsin-Madison
Roundabout Interchange Ramp Terminals

New Waverly, TX
Roundabout Interchange Ramp Terminals

Link to Video
Roundabout Interchange Ramp Terminals
Roundabout Interchange Ramp Terminals
Roundabout Interchange Ramp Terminals

Austin, TX

Why Roundabout Interchange Ramp Terminals?

1. Reduce the TxDOT traffic signal maintenance burden
   - Rural communities under 50k population

2. Performance
   - Reduce peak & off-peak delay (air quality 😊)
   - Researched safety improvement (FHWA)
   - U-turns possible along divided corridors
   - Can eliminate sight distance issues
   - Lessen ramp queue length
   - Meter traffic to on-ramp merging to freeway

3. Constr cost savings
   - Bridge width/length reduced
LOCALS FLOCK TO MILTON KEYNES’ NEW ROUNDBОUT

Image Source: http://media-cache-ec0.pinimg.com/736x/0f/35/77/0f357715d25af368ecf07c06ac48108a.jpg
High Speed Approaches

Elongated splitter islands, curbing, lighting, and advanced signing can greatly improve safety at high speed approaches by alerting drivers to a changed traffic condition ahead.
Approach Design

The primary safety concern in high-speed context is clarity of the driving situation (i.e. comfortable deceleration)

✓ Provide the desirable stopping sight distance of the entry point based on approach operating speed.
✓ Align approach roadways and set vertical profiles to make the central island visible.
✓ Extend splitter islands upstream of the yield line to start of deceleration - a minimum length of 200 feet is recommended.
Speed Transition

Highway 403

Hamilton Drive

Wilson Street

50 mph

30 mph
Offset Left Design – Preferred for Rural Conditions
Offset Left Design for Multilane Approaches
Carefully Applied Curvature

Designer: attend to Information Handling Zones

- Approach Zone
- Transition Zone
Use of Successive Curves on High Speed Approaches
Inflected Approach Curves
Superelevation = wrong message + no forward sight distance

Where did the pavement surface go?

50mph
Which entry design serves the driver best?
Note: Preserve forward sight - too much chicane can lead to SMV crashes
Questions?

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