

Field Testing, Marketing, and Crash Analyses of Mini-roundabouts



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FHWA Safety R&D Intersection Program



- **Field evaluation of innovative design concepts**
- **Fundamental and Exploratory Research**
- **Development and Support of Analysis Tool**

Field Evaluation Projects



- Displaced Left Turn Intersections (2 sites in UT, LA)
- Double Crossover Diamond Interchanges (8 sites in MO, NY, TN, KY)
- Restricted Crossing U-Turn Intersections (9 sites in MD)
- Intersection Speed Reduction By Lane Narrowing (10 sites in PA, OH, MO, MD)
- Detection-Control System (8 sites in FL, IL, LA, TX)
- Mini-roundabout (GA, MD, NY)*

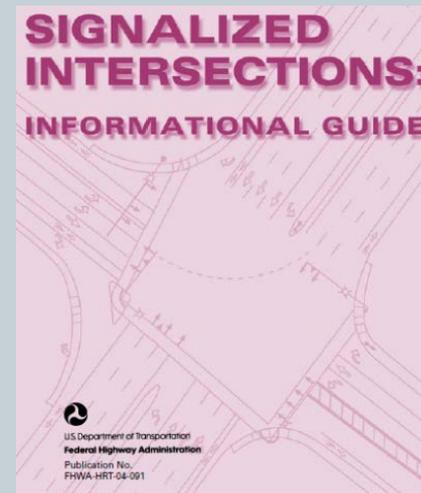
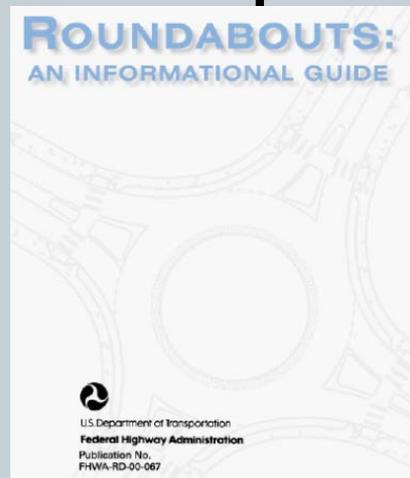
***: Recruiting up to 10 sites for evaluation**

Products Developed



- Roundabout Informational Guide
- Signalized Intersections Informational Guide
- Alternative Intersections Informational Guide
- Field Evaluation Reports on

- DLF
- RCUT
- D-CS



Fundamental and Exploratory Researches



- **Safety impacts of access mgmt policies and design techniques**
- **In-vehicle pedestrian detection using stereo vision technology**
- **Eye tracking study to detect driver visual distraction other abnormal events**

Software Tools Developed



- **Surrogate Safety Assessment Model (SAAM)**
- **Interchange Safety Assessment Tool (ISAT)**
- **Alternative Intersection Selection Tool (AIST)**

Mini-Roundabout, what is it?



- A single-lane roundabout with inscribed diameter in the range of 50 to 80 ft
- Defining feature is a traversable central island (and split islands) to handle large vehicles
- Advantages include:
 - Higher capacity than stop control
 - Fit into existing intersection ROW
 - Improve intersection operating efficiency and safety
 - Low cost (\$25,000 to \$50,000 per intersection)

Design Objectives of the Mini Central Island



- **Traversable by large vehicles**
- **Un-comfortable for small vehicles**
- **Not causing problems for winter maintenance**

Suitable Locations for Mini-roundabout



- Intersections on 2-lane or 3-lane high volume collector roads
- Post speed 35 mph or less
- Low truck volume
- Comparable traffic volume from major and minor approaches

Recommended Signing and Pavement Markings



Partnership Responsibilities



- **FHWA**

- Provides free technical supports (design templates, capacity analysis, review of geometric and signing designs)
- Conducts before/after operational & safety evaluations
- Tailors evaluation to individual site's improvement objectives whenever possible

- **Participating Agencies**

- Identify suitable sites (intersections on 2 or 3 lane roads)
- Cover costs of engineering design and construction
- Provide available traffic counts and crash data

Examples of Constructed Minis



Mini-Roundabouts, Germany



Mini-roundabout, France



Mini-roundabout in England



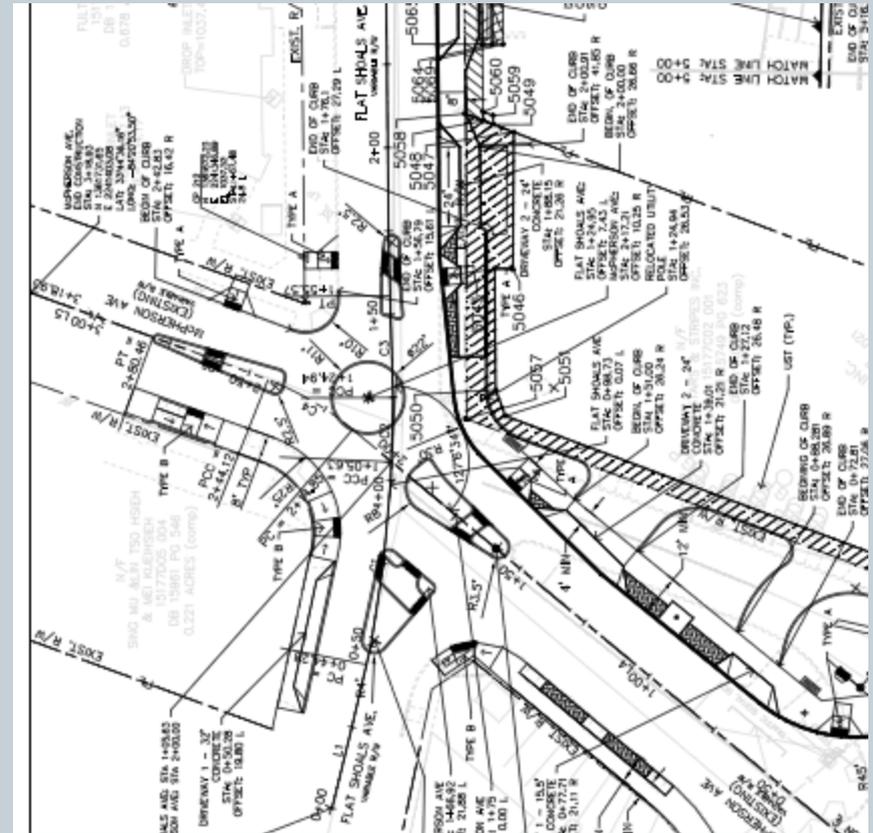
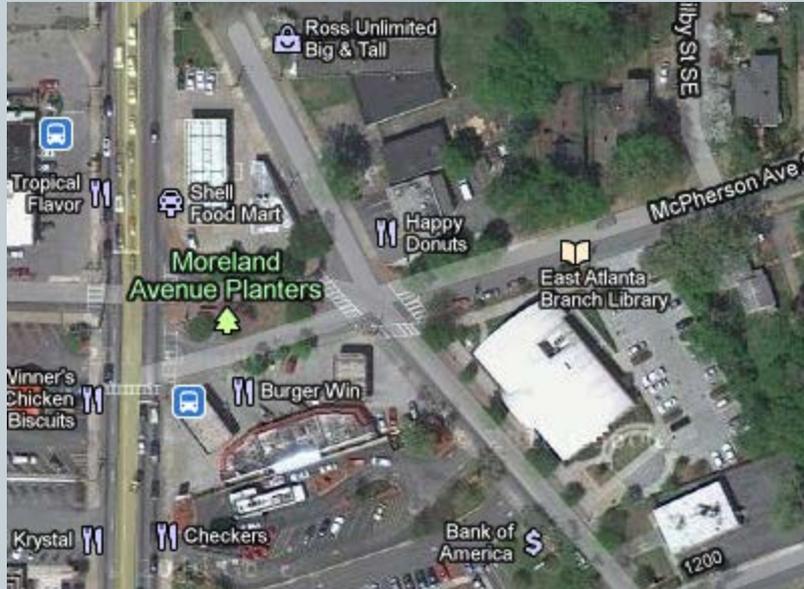
Mini-roundabout in Australia



Mini-Roundabouts in USA



To Be Constructed, Atlanta, GA



Newly constructed in Takoma Park, MD

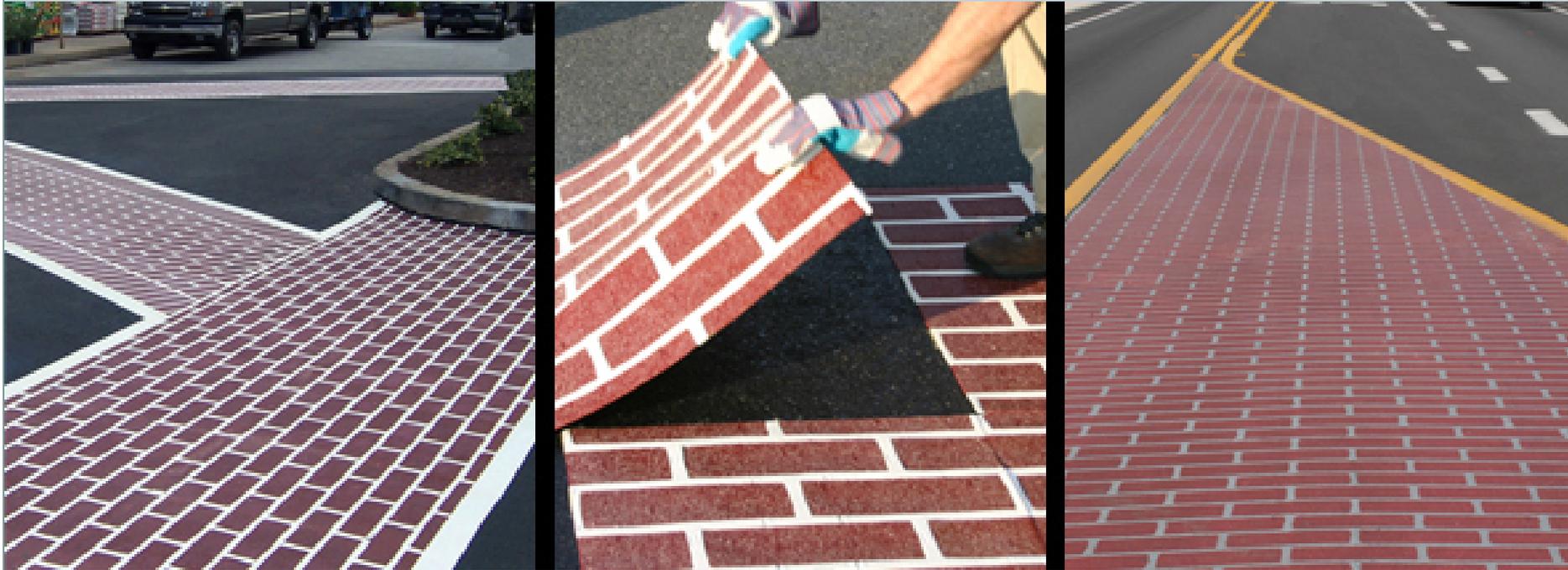


Best to use raised but traversable islands



Surface Material of central Island

Stamped epoxy or concrete



Use edges that are raised



Temporary Traffic Circle in Phoenix, AZ



The Following Examples are NOT mini-roundabouts



**PAY ATTENTION TO THE USEFUL IDEAS
THAT CAN BE USED WHEN DESIGNING MINI-
ROUNDBOUTS**

Small size 1-lane roundabout, FL

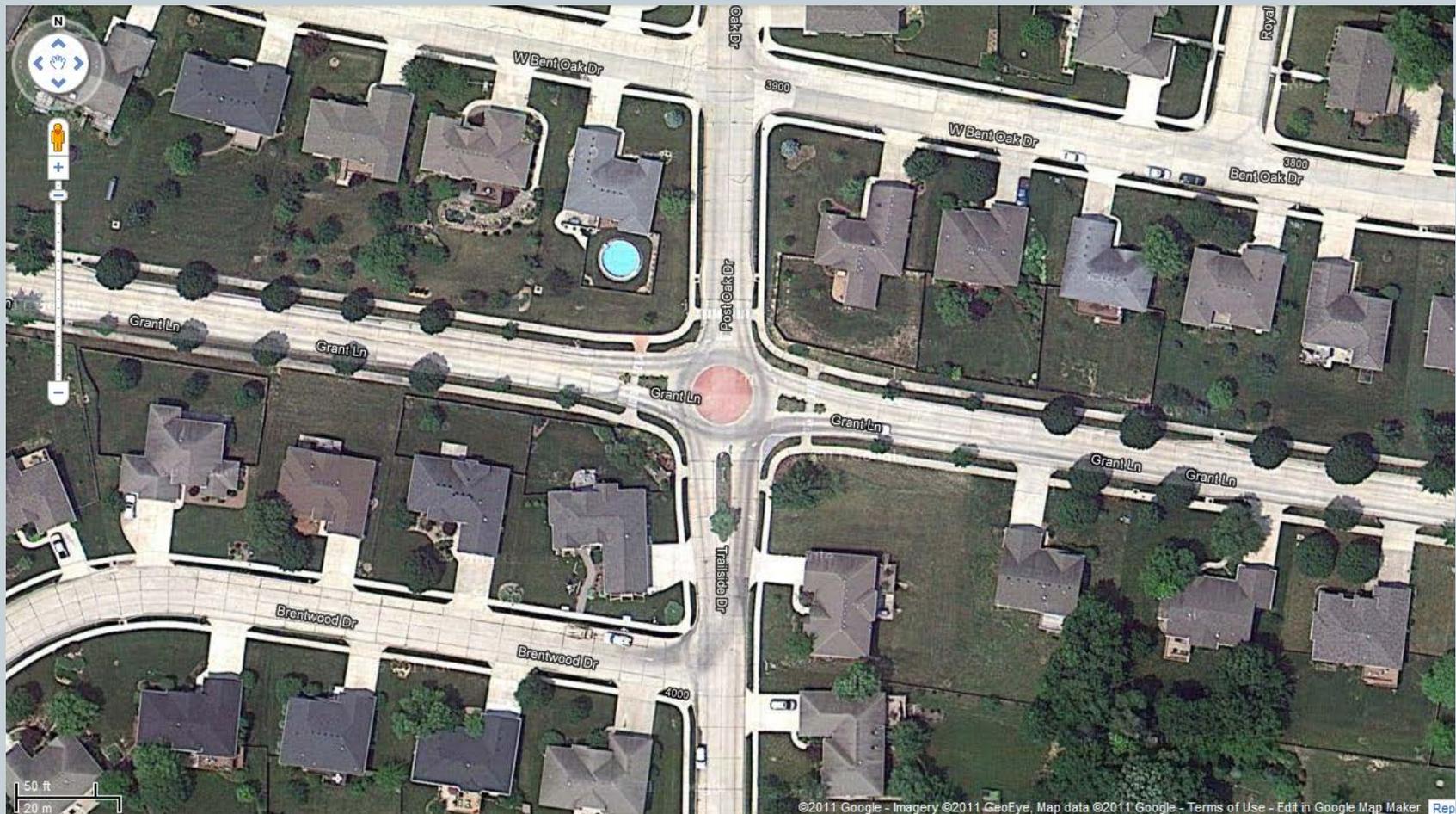


Small Roundabout in Phoenix, AZ



Quasi Mini

Grant Ln & Trailside Dr, Columbia, MO



Grant Ln is a high volume collector road with post speed of 35 mph

Traversable Central Island

Grant Ln & Trailside DR, Columbia, Mo



Split Island, Grant Ln & Trailside DR, Columbia, Mo



Takoma Park, MD



- Large vehicle getting around mini-roundabout
- Driving around a mini-roundabout
- Traversing a mini-roundabout
- Multiple cars entering a mini-roundabout

Stevensville, MD



Basic Characteristics



- **Traffic volume = 600 vph (595 vph collected):**
 - Leg 1: 160 vph, Leg 2: 240 vph, Leg 3: 200 vph.
- **Traffic movement:**
 - Left-turn (67%), Right-turn (33%)
- **Traffic composition:**
 - Car (46%), SUV/pickup (51%), and Truck (3%)
- **Average Travel time through the roundabout**
 - Right-turn: 2-3 sec
 - Left-turn: 5-7 sec (car/SUV), 10 sec (truck)
- **Stopping Behavior**
 - Completely Stop (15%), Rollover and No-Stop (85%)

Stevensville MD



- Large vehicle exiting expressway
- Camper
- Long truck and boat
- Long truck making right and left turns
- Motorcycle and trucks etc
- Simultaneous entries
- Small truck and driver confusion
- SUV with tow-car
- Vehicle stream

Contact Information

Mini Roundabouts Evaluation



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Questions?



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Lake Stevens, WA (2016)

