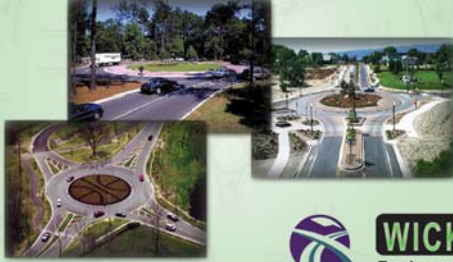


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Case Studies



Case Studies

- SR 89A, Cottonwood/ Clarkdale, AZ
- Okemos, MI
- Single Lane Roundabout (Poor entry angle and entry radius)
- Clearwater, FL

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Case Study SR 89A and Historic 89A



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Intersection Needs/Issues

- High percentage of heavy truck traffic
- Provide ability for large trucks to turn around
- Downward grade approaching the intersection from the south.
- Projected traffic volume increase.
- Providing future access points to parcels adjacent to the intersection.

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Recommended Solution



Single Lane Roundabout

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Reasons for Roundabout Recommendation

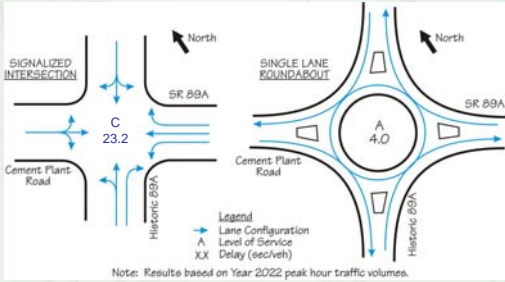
- Capacity increases as compared to a signalized intersection
- Provides a truck turn around
- Improves safety
- Provides better business access

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Higher Traffic Capacity



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Highway Access



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2022 Commercial Driveway Simulation



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Truck Turnaround Simulation



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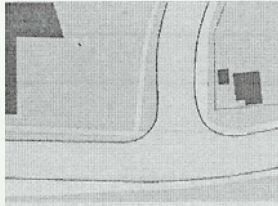
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Case Study Okemos, Michigan

➤ Originally a signalized "T" intersection

- 2,600 VPH
- Heavy lefts
- Poor LOS



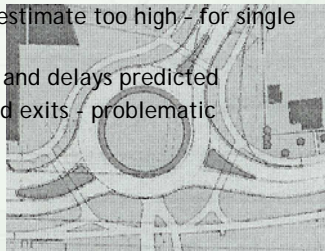
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Initial Design *with gap analysis*

- Low Circulating Flows
- SIDRA capacity estimate too high - for single lane entry
- Minimal queues and delays predicted
- Tight entries and exits - problematic



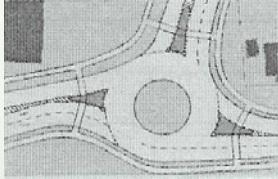
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Re-Design

- UK Capacity = 1250 not 1850 on west approach
- Two lanes needed on west leg to avoid day 1 congestion
- Entry curvature provides good deflection on approaches to slow speeds
- Small ICD has short acceleration distance into exits
 - Low exit speed
 - Safe for pedestrians



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Re-Design



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Case Study Single Lane Roundabout

- Perpendicular entry
- No deflection
- Small entry radii
- Speed controlled by the central island
- OK for very low volume or low v/c as this is forgiving
- What could improve this?



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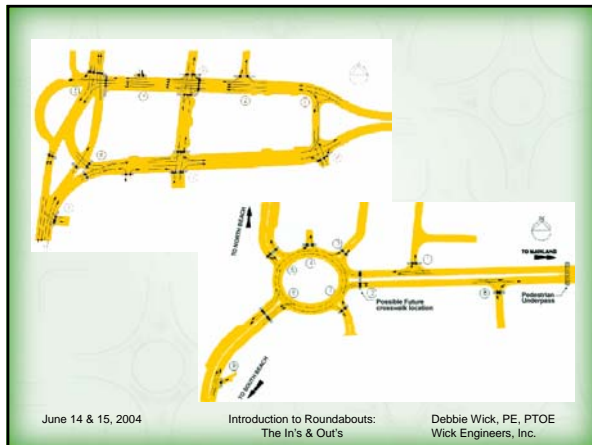
Case Study Clearwater, Fla.



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Clearwater, Fla.

- Opened midnight 12/31/1999
- Anticipated traffic varied seasonally between 30,000 and 42,000 VPD
- SIDRA design using SLR techniques
 - Very small entry and exit radii
 - Very large entry and exit angles
- Two Lane Roundabout
- 300 Crashed in the first 6 months
- Two Crash Sites

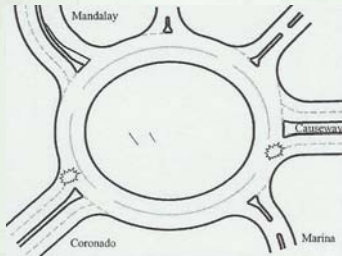
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Crash Locations



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Clearwater, Fla.

Causeway Exit

- Cause of Causeway crashes
 - Signing and Striping were at fault
 - Incorrect vehicle maneuvers seemed natural
 - Roundabout did not give correct body language
 - Driver confusion - No best way to drive
 - Initially about 25 crashes / month
- Interim scheme introduced June 2000
- *No crashes at the Causeway Exit since*

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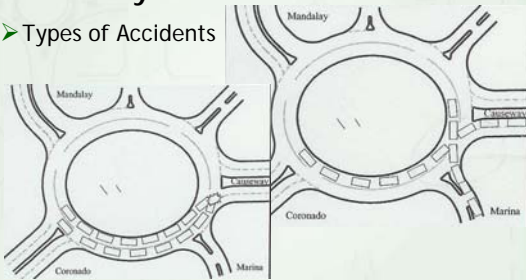
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Causeway Exit

➤ Types of Accidents



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Clearwater, Fla. Causeway Exit

- Circulating Crashes
 - Vehicles from Marina were not involved
 - Striping did not give clear direction for turning movements and lane usage
- Circulating and Marina Crashes
 - Marina traffic yields to BOTH inner and outer circulating lanes
 - The path from the Marina and the path of the circulating traffic - CROSS AT A LARGE ANGLE

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Clearwater, Fla. Causeway Exit

- Cure
 - Changes to striping and signs
 - This altered the roundabout "body language"
 - No crashes reported since then



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Clearwater, Fla. Causeway Exit

- Occasionally a driver is in the wrong lane
- BUT the geometry and striping make this clear
- The driver realizes it
- The driver feels uncomfortable - cautious
- Slows down - indicates - carefully maneuvers
- Crash is avoided
- The driver learns - taught by the roundabout
- Driver does not do it wrong twice

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References

- SR 89A Case Study - Kirkham Michael/ADOT (10/03)
- Okemos, Mich - Designing & Implementing Roundabouts, Univ. of Wisconsin (2/04)
- Kansas State University, Gene Russell
- Clearwater, Fla. - Designing & Implementing Roundabouts, Barry Crown (4/04)

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Questions????

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