


2006-0897
December 13, 2006
Supplemental info
Hamlin Rd

**Modern Roundabouts:
An Introduction**


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 **OHM**

Rochester Hills
Dec. 13, 2006

MODERN ROUNDABOUTS


- > Genesis
- > Users (How To)
 - > Pedestrians
 - > Bicycles
 - > Drivers
- > Safety
- > Mobility (Congestion)
- > Aesthetics

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SAFETY:


Roads Are The Most Dangerous
Public Facilities
On The Face Of The Earth

✦ In the U.S., about 800 people are
killed each week.

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PEDESTRIANS


Typical Intersection = 60' (17+ seconds curb to curb) vs. Roundabout = 13' x 2 (<4 seconds each crossing)



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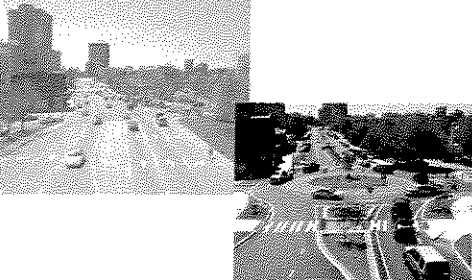
CONGESTION

= Delay + Fuel Wasted + Pollution + ...



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AESTHETIC OPPORTUNITIES



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In The Beginning


- > No Controls
- > Take Your Turn
- > Follow Rules of Road



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Evolutionary Paths Taken

- Traditional (Straight Thru) Intersections



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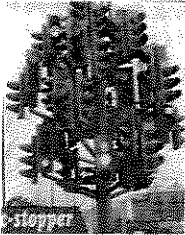
Changes In Command and Control



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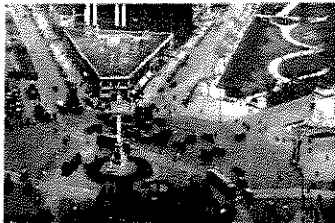
Changes In Command and Control

- Right of Way Rule (Yield to Right)
- STOP Signs
- Police Control
- Traffic Signals
 - Special Turn Lanes & Signals
 - Vehicle & Pedestrian Detection
 - Coordinated Signal Systems




Evolutionary Paths Taken

- Circular Intersections
- Shape Controls Movement



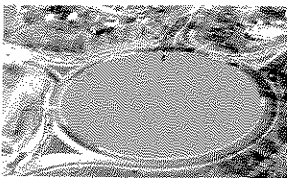



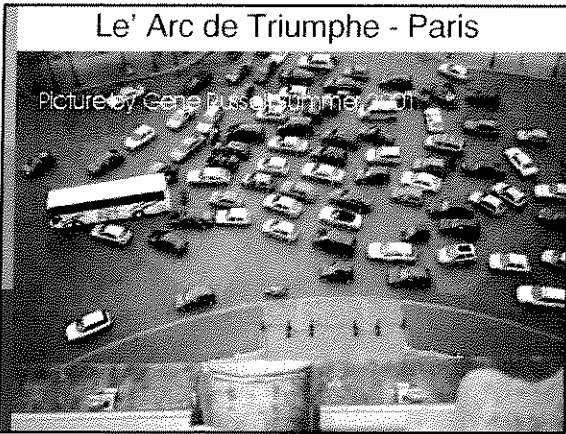
View of Kildare, UK - circa 1955 (Source: The High Speed Road Planning)

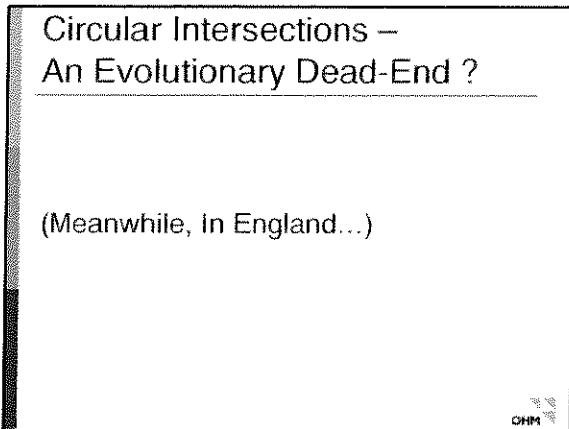


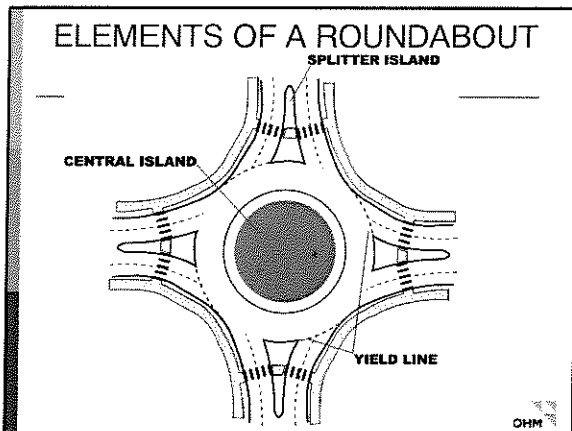
Forms In Use Up To Mid-1950s

- Circles, Small and Large
- Really Big, High Speed Circles Are Called **Rotaries**










Fundamental Rule:

←Yield-To-Left

(Entering vehicles yield to the circulating traffic.)



Typical Non-Motorist Facilities

Grand Junction, Colorado



Bike transition from multiuse pathway to bike lane along roadway*

Multiuse pathway*


Pedestrian Paths

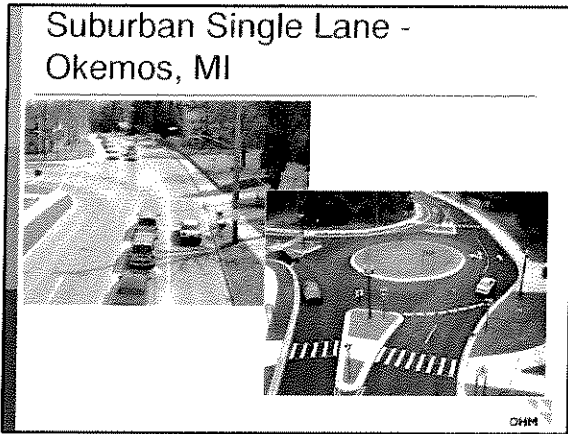
Bike Lanes

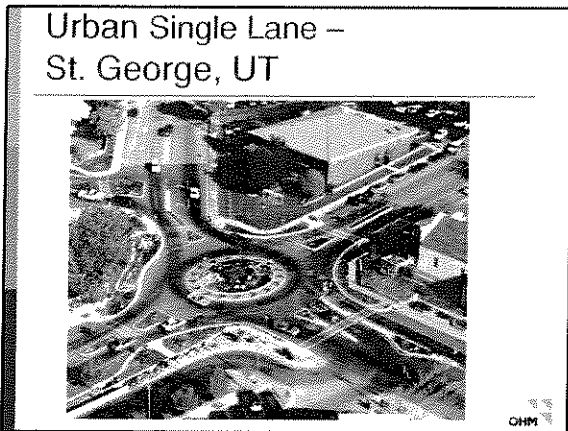


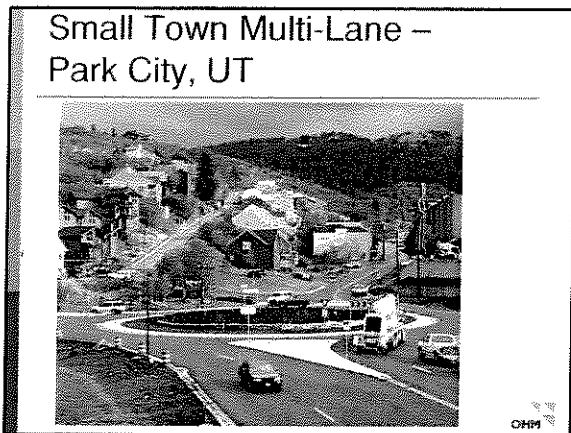
Getting to Know Roundabouts

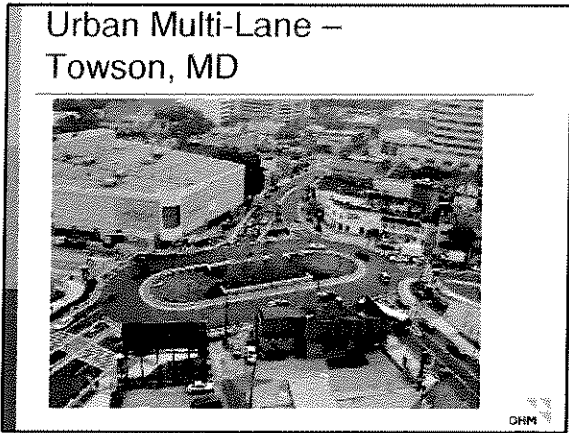
□ Narrated by
Paul W. Smith



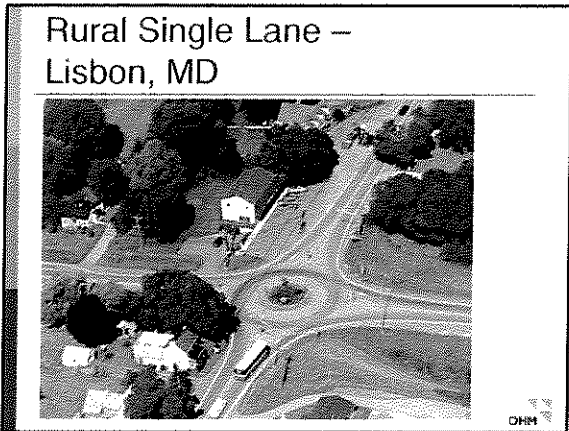


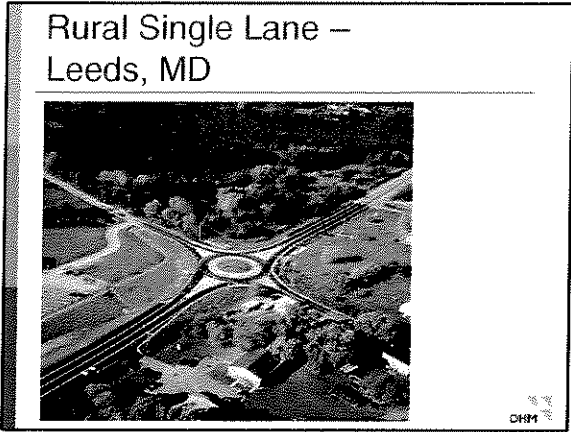




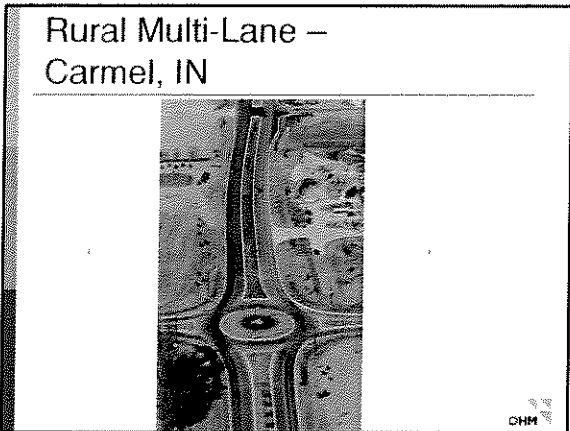


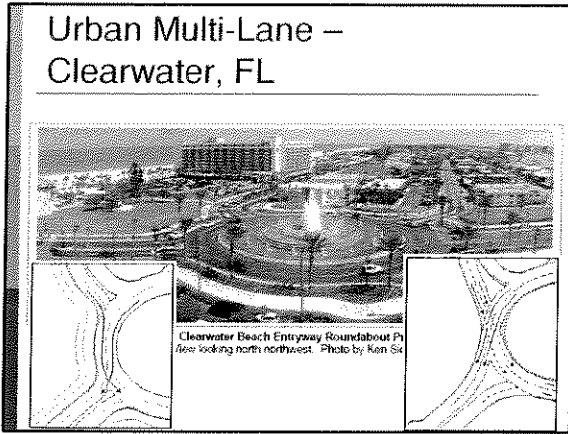


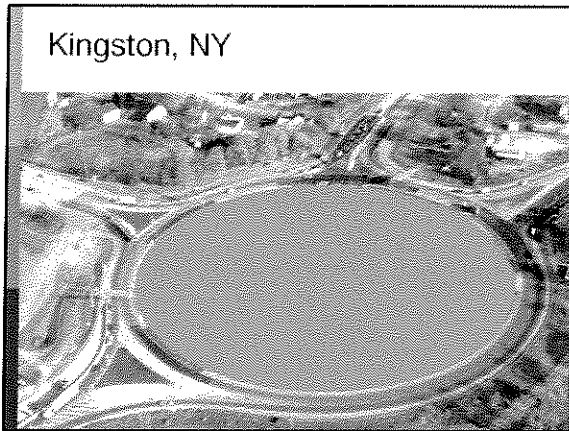




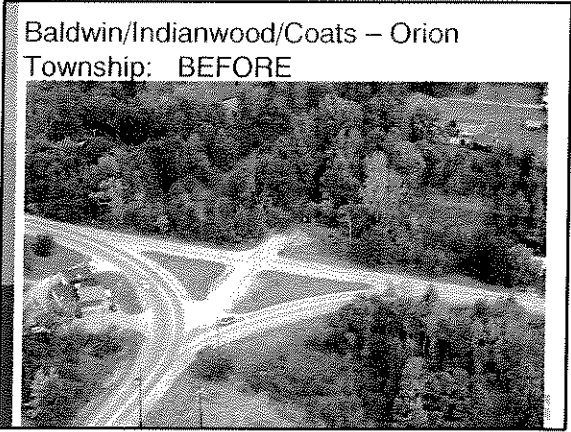















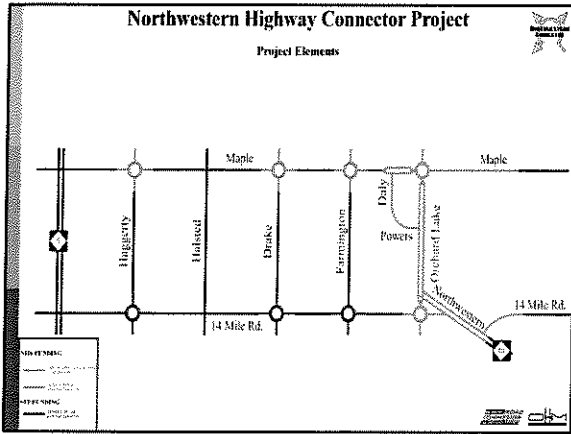
On the Drawing Board:

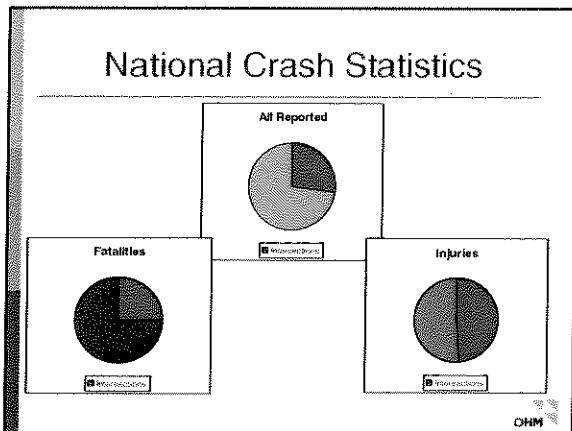


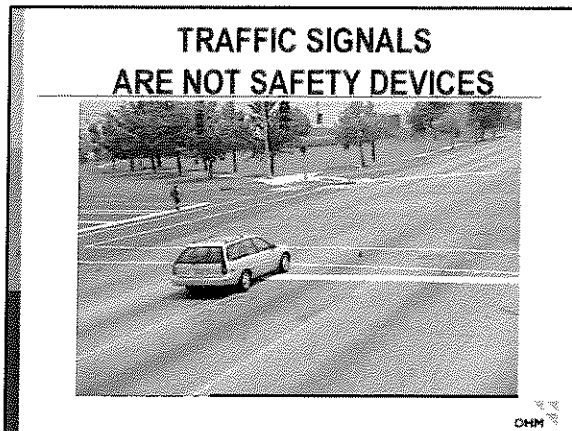
8 Roundabouts in West Bloomfield Township / Farmington Hills – Joint MDOT, RCOC, City & Twp.

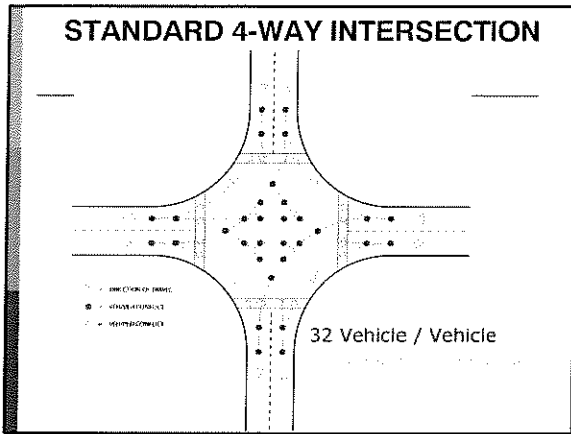
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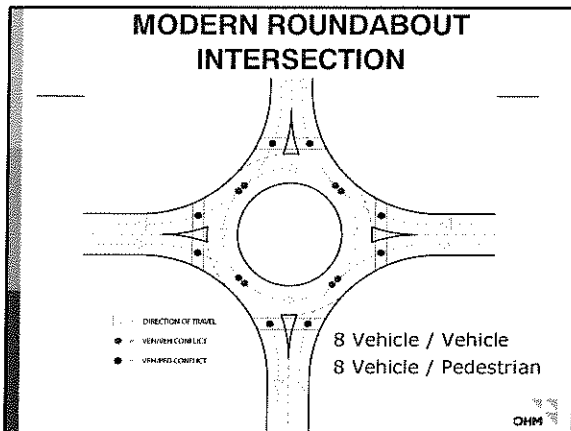
A logo consisting of a stylized 'X' shape formed by four arrows pointing outwards from a central point. The text 'NORTHWESTERN CONNECTOR' is written across the center of the 'X'.

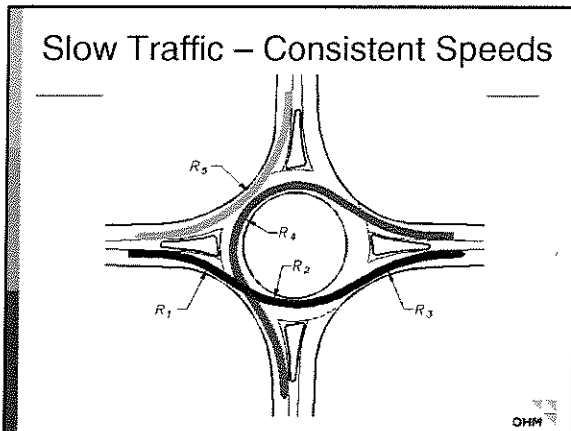


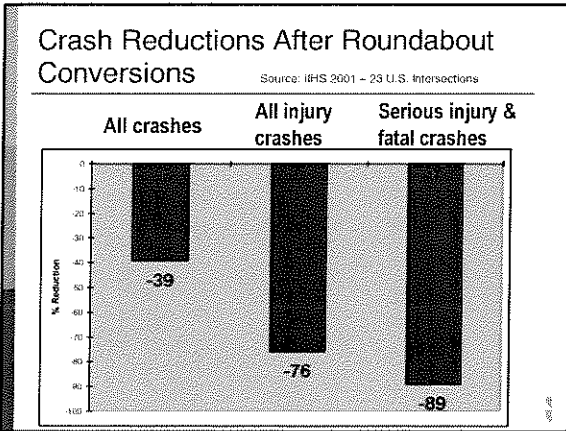












LEVEL OF SERVICE (LOS)

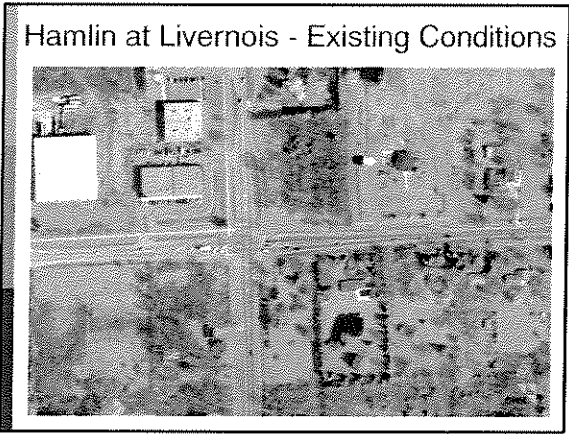
- Expression of both:
 - Capacity
 - Driver perception
- Ranges from 'A' (best) to 'F' (worst)
- Primarily based on measure of average delay

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ROUNDBOUT LOS

- ❖ Best demonstrated through a review of a case study:
 - Hamlin Road at Livernois Road***
 - > Existing 3-Lane intersection w/ traffic signal (including left turn phases)
 - > Forecast traffic to increase by ~30%

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CASE STUDY – Hamlin at Livernois

Current Preferred Alternative – Draft EA

- Widen Hamlin corridor to 4-lane boulevard
- Includes ~ 0.5 mile of Livernois boulevard
 - ✦ Signal control of Hamlin / Livernois intersection and adjacent crossovers
 - ✦ Requires 66 parcels of ROW
 - ✦ Approximate cost \$ 19.5 million (includes PE, ROW & CON)

Best Option Evaluated for Safety & Mobility

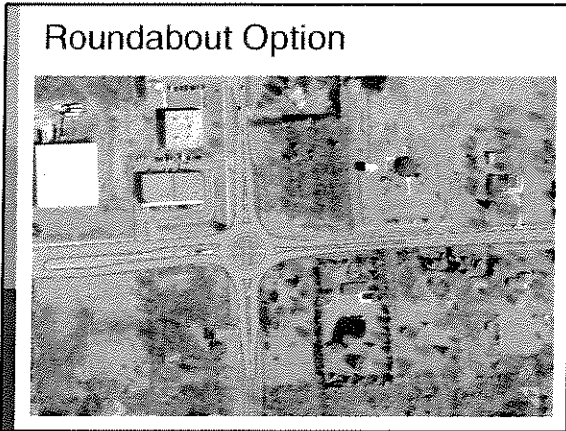
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CASE STUDY – Hamlin at Livernois

Potential Option

- Widen Hamlin corridor to 4-lane boulevard
- Replace Hamlin / Livernois intersection with 2-lane roundabout
 - ✦ Requires 46 parcels of ROW
 - ✦ Approximate cost \$ 17.8 million (includes PE, ROW & CON)

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CASE STUDY – Hamlin at Livernois Alternatives

P.M. Peak Period	2006	2025		
	Existing 3-Lane w/ Signal	Existing 3-Lane w/ Signal		
Level Of Service (LOS)	E	F		
Average Delay (Sec./ Veh.)	58.3	111.6		

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CASE STUDY – Hamlin at Livernois Alternatives

P.M. Peak Period	2006	2025		
	Existing 3-Lane w/ Signal	Existing 3-Lane w/ Signal	4-Lane Boulevard Option	
Level Of Service (LOS)	E	F	C	
Average Delay (Sec./ Veh.)	58.3	111.6	30.8	

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CASE STUDY – Hamlin at Livernois
Alternatives

P.M. Peak Period	2006	2025		
	Existing 3-Lane w/ Signal	Existing 3-Lane w/ Signal	4-Lane Boulevard Option	Two Lane Roundabout Option
Level Of Service (LOS)	E	F	C	A
Average Delay (Sec./ Veh.)	58.3	111.6	30.8	6.4

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- CASE STUDY** – Hamlin at Livernois
- Roundabout Option
- Better LOS
 - Lower vehicle delay
 - Fewer ROW Impacts (-20 parcels)
 - Lower cost (-\$1.7 million)
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- Environmental Consequences**
- Added Delay =
- Fuel Consumption
 - Air Pollution
 - Noise
- Excess Widening =
- Resources to Pave
 - Storm Water Run Off
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Cost Issues
— Signalized Intersection
vs. Roundabout

Initial Costs To Build	Annual Costs To Operate
<ul style="list-style-type: none">➤ Surface area paved➤ Staging construction➤ Traffic signs➤ Pavement markings➤ Traffic & pedestrian signals➤ Street lighting	<ul style="list-style-type: none">➤ Electrical & Communication➤ Relamping➤ Depreciating equipment➤ Pavement markings➤ Crash damage to equipment➤ Emergency service providers responses to crashes

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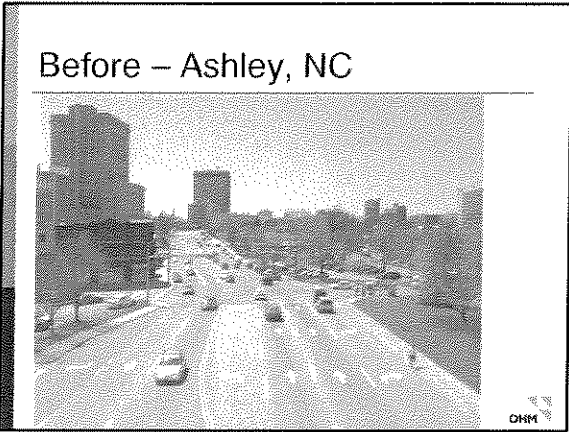
SITUATIONS WHERE ROUNDABOUTS SHOULD BE CONSIDERED

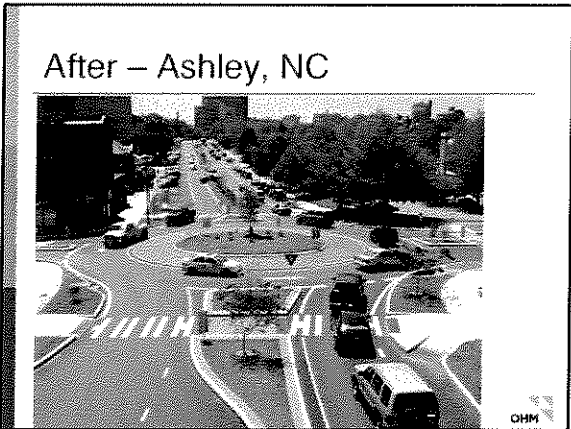
- ❖ Existing congestion problems
- ❖ Known safety problems
- ❖ Balanced entering traffic volumes, or
- ❖ High percentage turning movements

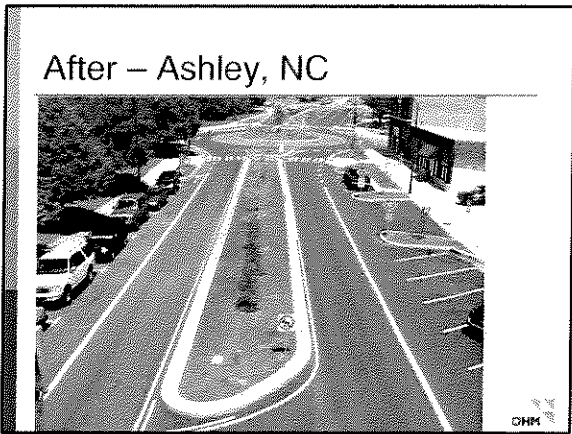
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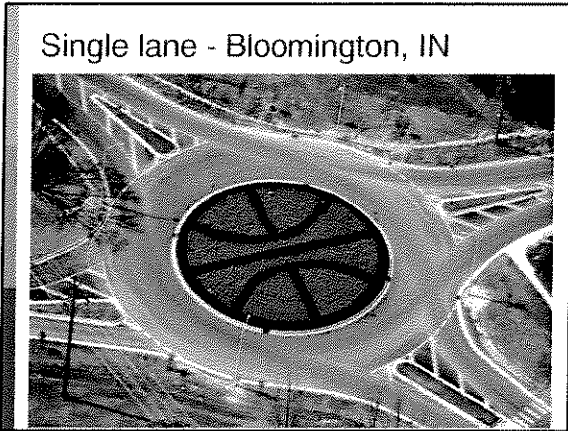
AESTHETIC OPPORTUNITIES

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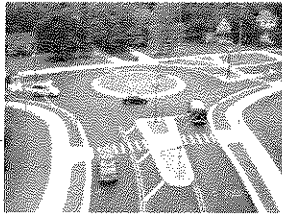






Modern Roundabouts Summary

- Defined roundabout
- Use / location
- Benefits
 - Safety
 - Traffic calming
 - Capacity
 - Environmental
 - Emissions - Stormwater
 - Aesthetics



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MODERN ROUNDABOUTS References


- ❖ Roundabouts: An Information Guide, FHWA 2000
- ❖ NCHRP 3-78 IMPROVING ACCESS TO ROUNDABOUTS AND CHANNELIZED TURN LANES FOR THE VISUALLY IMPAIRED
- ❖ www.roundaboutsusa.com
- ❖ www.ksu.edu/roundabouts/
- ❖ www.alaskaroundabouts.com
- ❖ www.roundabout.kittelson.com

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MODERN ROUNDABOUTS

Safe, Effective Intersection Treatment

QUESTIONS ??




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