Roundabout at Smith Level and Rock Haven?
Roundabouts vs. Signalized or Signed Intersections

Roundabouts are safer

The frequency of vehicular crashes, as well as the severity of crashes when they occur, is lower with roundabouts. When accidents do happen, the severity of injury to occupants of vehicles, as well as pedestrians, is lesser with roundabouts. Roundabouts are safer for vehicles, bicyclists, and pedestrians. The latest research shows a 40 percent reduction in all crashes and an 80 percent reduction in injury crashes in vehicle to vehicle collisions. Although there are not currently enough roundabouts in the U.S. to do a pedestrian study, studies in Europe show pedestrian-vehicle crash reductions as high as 70 percent.

Roundabouts result in cleaner air, and less delay

Roundabouts significantly reduce the time that vehicles are stopped at intersections, where vehicular emissions are at their worst. Vehicle capacity is greater while delays are lessened, because vehicles do not have to stop unless a vehicle is already in the intersection, and gaps required to merge are less because traffic is moving more slowly.

Roundabouts reduce speeding

You cannot "run" a correctly designed roundabout. Speeding vehicles run stop signs, red lights, and speed up to "beat the yellow". They also will constantly drive through a green light at varying speeds ALL above the posted speed limit. A roundabout forces vehicle drivers to slow down. "The best method of ensuring that people will drive at a lower speed is to design streets that make drivers feel comfortable traveling relatively slowly and make it very difficult to exceed a certain speed." (Lineville Road Roundabout Study, p 4)

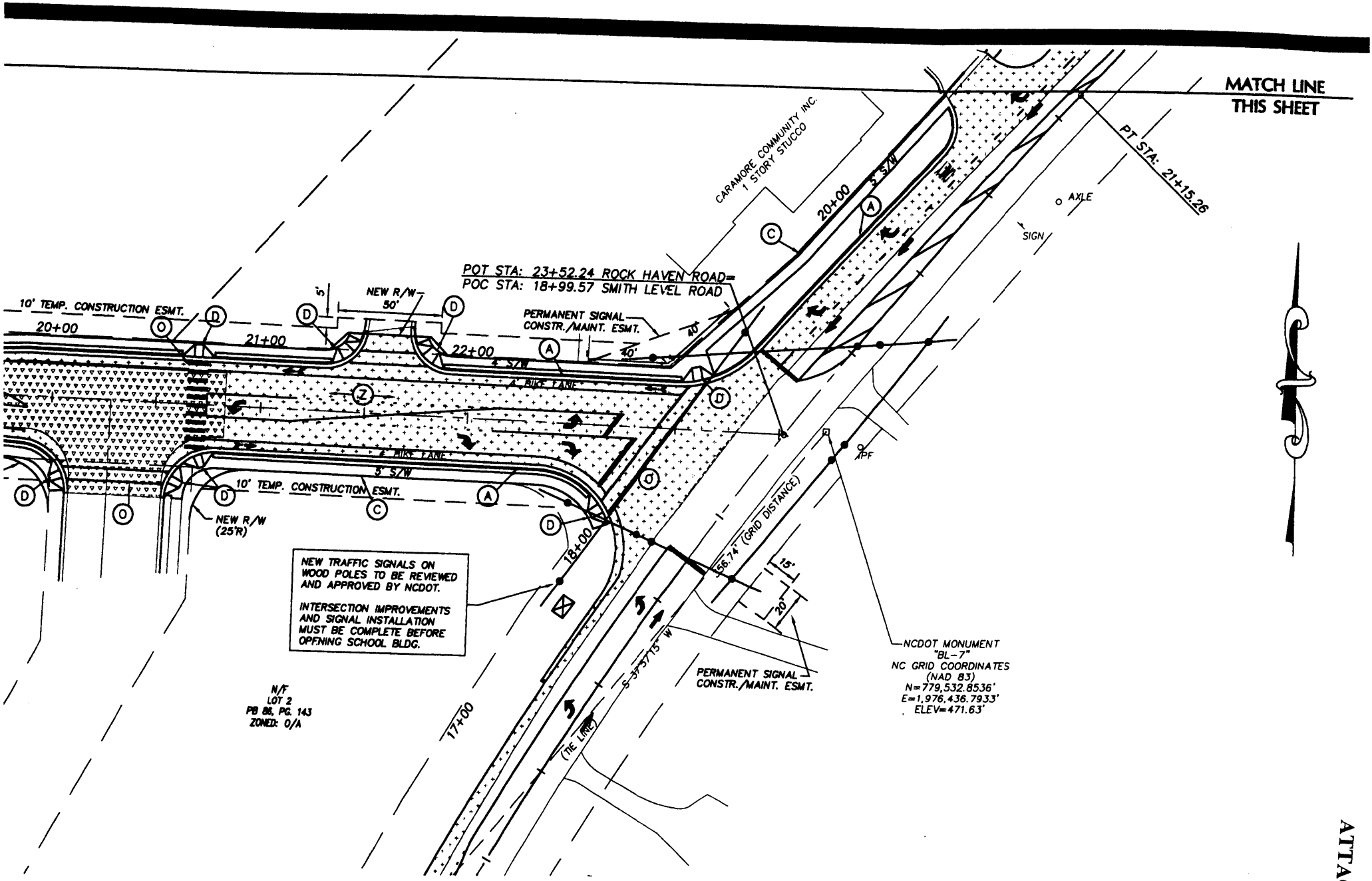
Roundabout construction

Construction costs for roundabouts are typically less than that of signalized intersections. In the case of Smith Level Road, the opportunity for roundabout construction is optimum, due to the fact that major modifications are required for the intersection of Smith Level and Rock Haven due to the construction of the new high school.

A Gateway to Carrboro

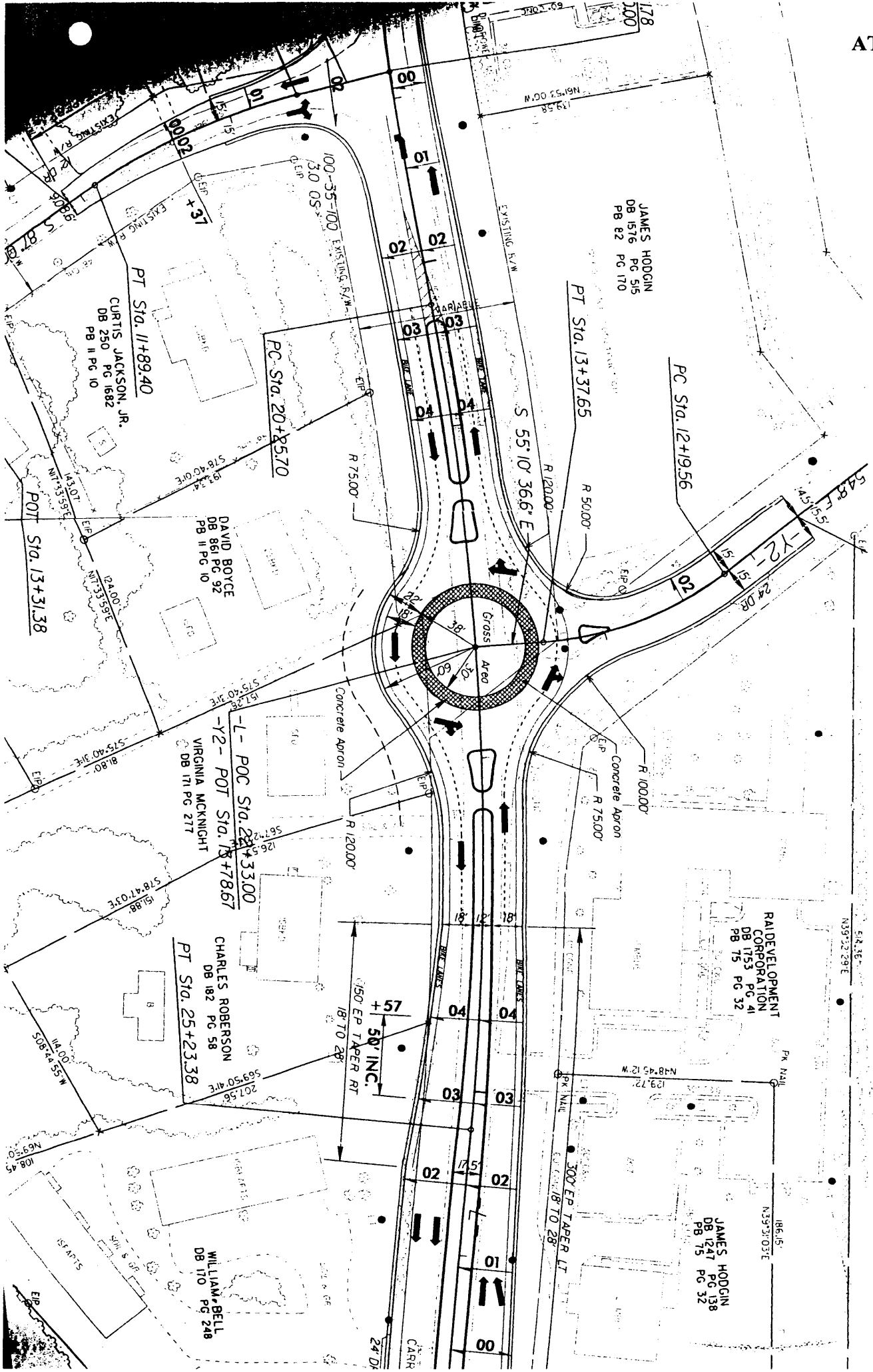
Visualize the alternative as you enter Carrboro from the south. You crest the hill past Ray Road and begin a gentle decline into our town. You speed up to beat the light at yet another wide slab of asphalt, "dressed" with multiple turn lanes and signal lights with their accompanying wires and mast arms. Or ....

You become more aware of your surroundings as you slow to approach a well-designed, landscaped roundabout, the center-piece being a sign or sculpture welcoming you to Carrboro. Let's make the choice that makes sense in terms of safety, the environment, efficiency, and cost; as well as what looks, and feels, right.



ATTACHMENT B

ATTACHMENT C

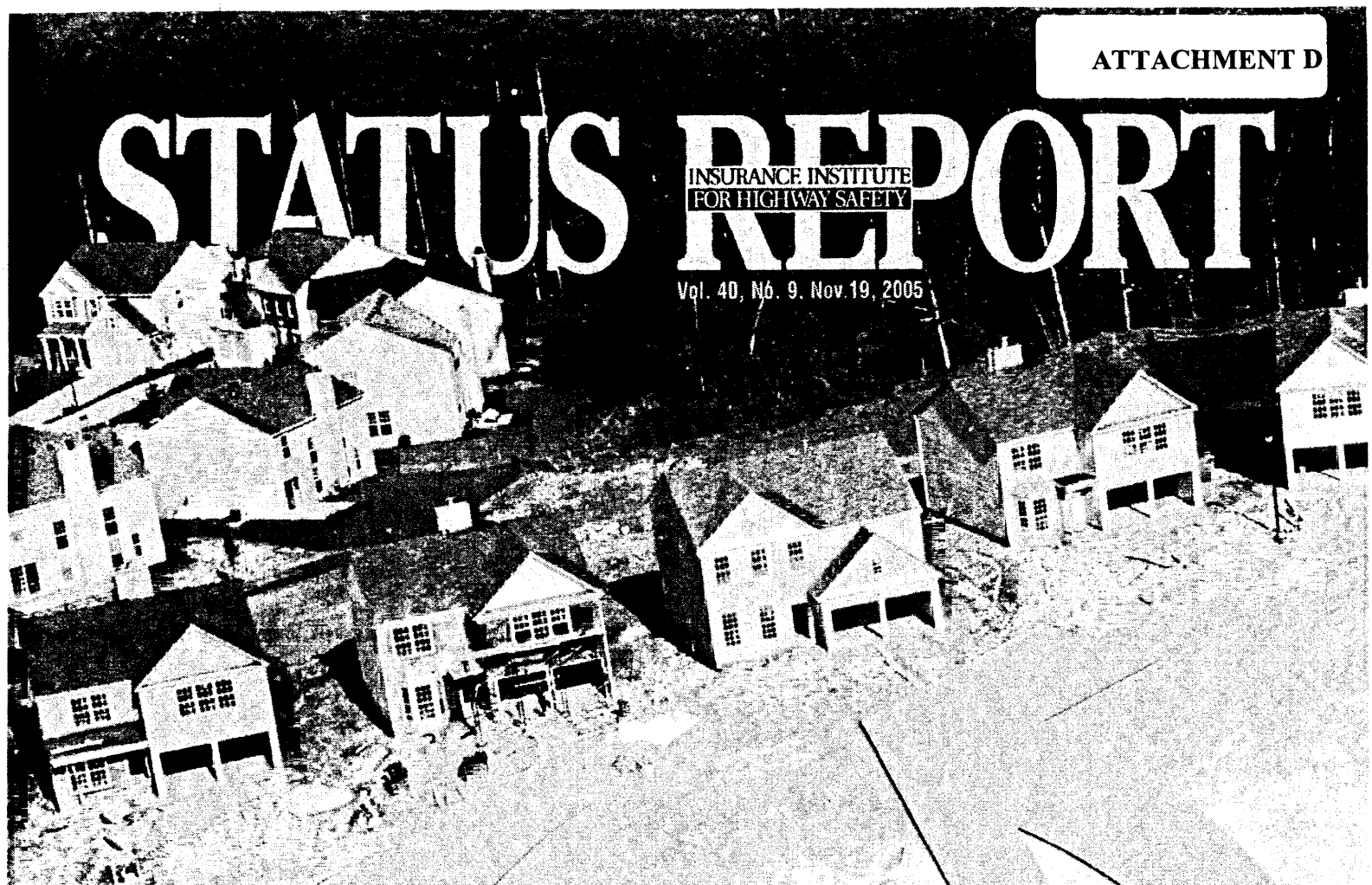


ATTACHMENT D

STATUS REPORT

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

Vol. 40, No. 9, Nov. 19, 2005



WHEN ROADWAY DESIGN OPTIONS ARE WIDE OPEN, WHY NOT GO AHEAD AND BUILD A

ROUNDABOUT?

TOO MANY NEW DEVELOPMENTS LIKE THIS AREN'T BEING DESIGNED TO REAP THE BENEFITS OF ROUNDABOUTS.

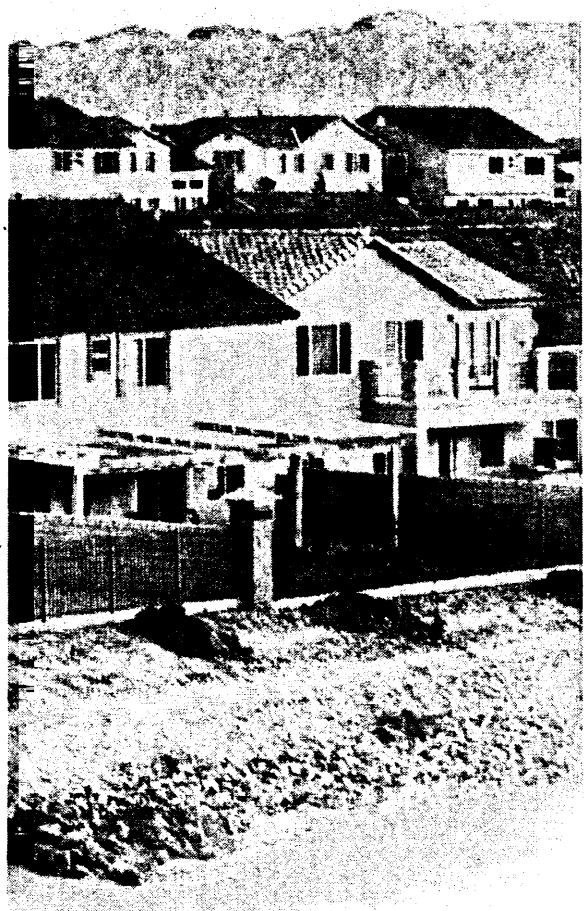
When traffic engineers plan the roads that eventually will accommodate traffic in new developments like this, the plans usually involve intersections with stop signs or signal lights. But the barren site of a future intersection might be an opportunity to consider another option for traffic management, the modern roundabout. These have been built by the tens of thousands worldwide. The main benefits have

been to improve traffic flow and reduce injury crashes by as much as 75 percent compared with intersections controlled by stop lights or signs (see *Status Report*, May 13, 2000; on the web at www.iihs.org). But only about 1,000 roundabouts have been built in the United States.

"Transportation engineers, like everybody else, generally go with what they're used to, and what they're used to on U.S. roads is constructing standard four-way intersections equipped with stop signs or signal lights. Doing this means missing the benefits of roundabouts, so we'd like to encourage officials to consider roundabouts earlier and more often in the roadway planning process," says Richard Retting, the Institute's senior transportation engineer and author of two new studies that suggest how to overcome traditional impediments to building roundabouts.

One impediment is logistical: It can be costly and disruptive to tear up an existing intersection and replace it with a roundabout. The easiest way around this is to construct the roundabout to begin with, before an intersection with a traffic light or stop sign is installed. Another roundabout opportunity is when an intersection with a signal light is scheduled for major modification.

Institute researchers studied 10 intersections where roundabouts could have been constructed but weren't. Instead local officials either outfitted the new intersections with traffic signals or retained the signal lights at intersections that were undergoing major modifications. The researchers measured traffic volumes, monitored the number of crashes that occurred, and estimated vehicle delays and fuel consumption at the intersections with the signals. Results were

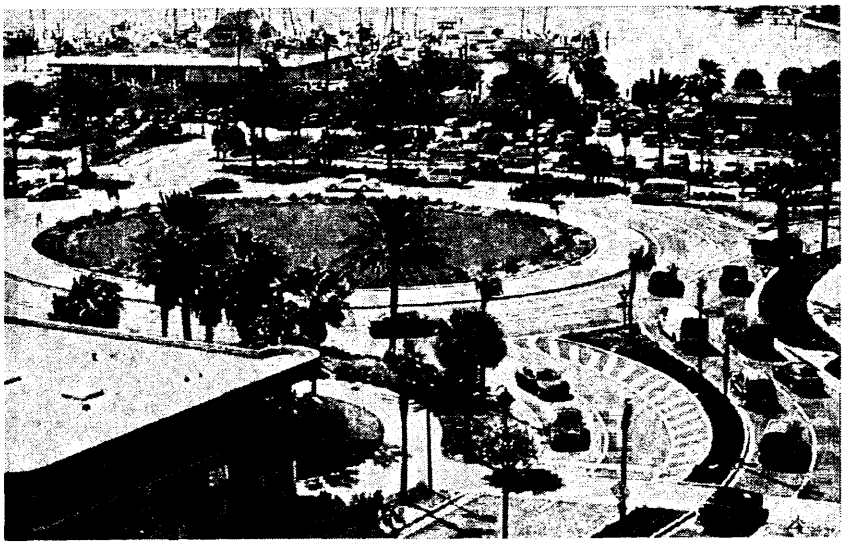


compared with estimates of what could have been expected with roundabouts instead.

A key finding is that vehicle delays at the 10 intersections would have been reduced by 62-74 percent, saving 325,000 hours of motorists' time annually. Fuel consumption would have gone down by about 235,000 gallons per year, and there would have been commensurate reductions in vehicle emissions.

The safety benefits also are considerable. Previous research indicates that roundabouts reduce crashes by 37 percent overall — injury crashes by 75 percent — compared with intersections that have signals. Applying these risk reductions to 5 of the 10 intersections for which crash data were available, researchers estimated there would have been 62 fewer crashes over 5 years. There would have been 41 fewer injury crashes.

"If only 10 percent of the 250,000 intersections with signals in the United States were modified as roundabouts, the national safety and fuel saving benefits would be enormous," Retting points out, "and you can reap these benefits without as many logistical challenges if you 'think roundabout' from the very beginning of a *(continues on p.4)*

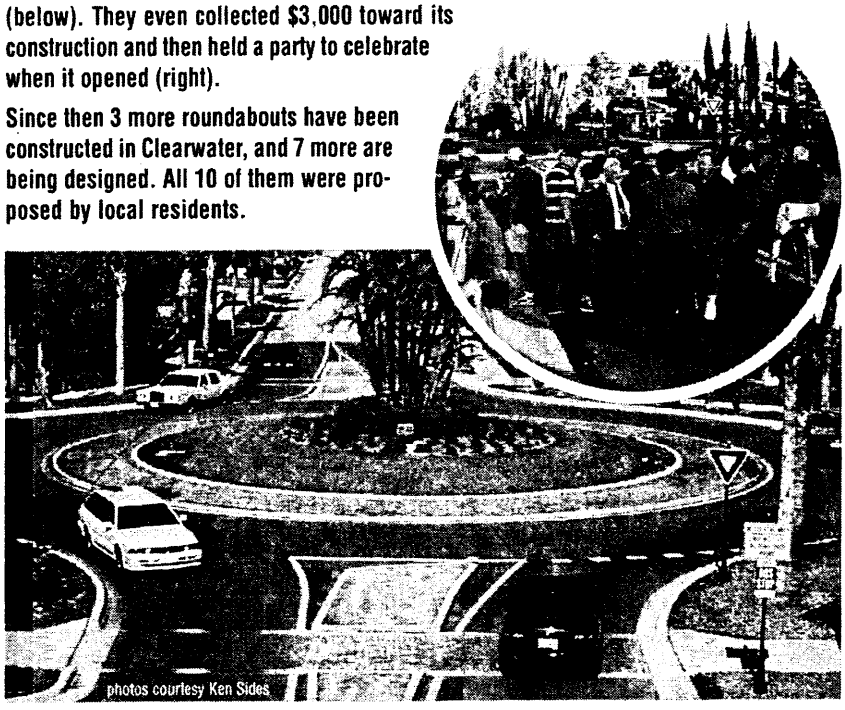


FLORIDA COMMUNITY GETS IT RIGHT

When the first roundabout (above) was constructed in Clearwater, Florida, the community's traffic operations manager wasn't a fan. "I'm an old signals and sign man. I never would have believed this would have worked, but it has convinced me that roundabouts do a remarkable job of accommodating all different kinds of users including cars, pedestrians, and bicycles," says Paul Bertels. He recalls that the multiple signal lights that had controlled traffic at this location regularly brought vehicles to a halt and caused massive backups, but now the traffic keeps moving.

Bertels wasn't the only skeptic when this roundabout opened in December 1999. Opposition began before construction and continued for a while afterward. But once engineers tweaked the design and motorists got used to the new traffic pattern, the complaints abated. In fact, Clearwater residents came to like the first roundabout so much that they requested another (below). They even collected $3,000 toward its construction and then held a party to celebrate when it opened (right).

Since then 3 more roundabouts have been constructed in Clearwater, and 7 more are being designed. All 10 of them were proposed by local residents.



photos courtesy Ken Sides

(continued from p.3) roadway project, for example when new housing or shopping developments create the need for roadway construction. Then it can be less expensive to construct a roundabout than to install traffic lights. Plus the developers may be required to fund the roundabout construction as a condition of zoning approval.

Initial opinion may be an impediment: Study after study, including the Institute's most recent one in northern Virginia, indicates the benefits of roundabouts in reducing both crashes and traffic congestion. Yet roundabouts frequently run into opposition, especially before they're constructed. Institute researchers conducted telephone surveys of residents in three communities in New Hampshire, New York, and Washington State where intersections with stop signs or traffic lights were being replaced with roundabouts in 2004. The opinion surveys were conducted before the roundabouts were built and twice more, about six weeks after construction and then about a year later.

Fifty-four percent of the survey participants initially said they opposed roundabouts. One-third said they were strongly opposed. These proportions changed considerably right after construction, as motorists began getting used to the roundabouts. Then only 36 percent said they were opposed, and the proportion in favor increased from 36 to 50 percent.

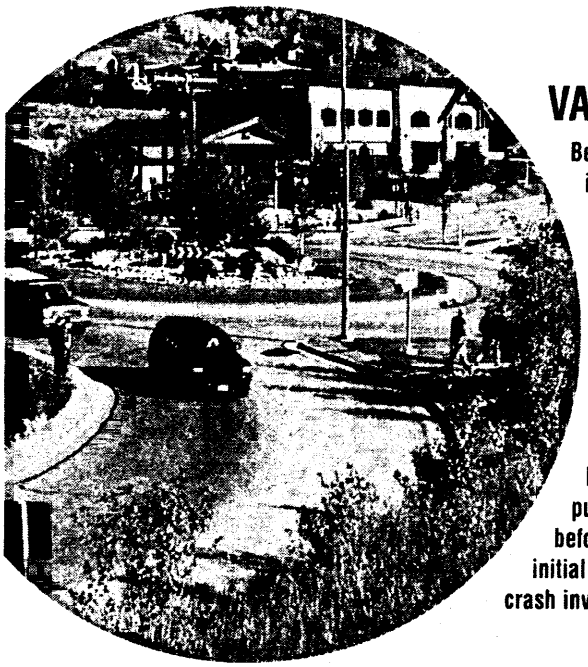
"It might not sound like much of a victory to find out that half of the respondents expressed their approval for roundabouts. But the first follow-up surveys were conducted soon after motorists began navigating this new form of traffic control. Roundabouts weren't yet routine," Retting explains. Opinion surveys conducted more recently show growing approval. More respondents now say they like the roundabouts, while fewer say they disapprove.

Previous before-and-after surveys have revealed similar turnarounds in public opinion (see *Status Report*, July 28, 2001; on the web at www.iihs.org). This is because many motorists find out, through their own experience, that vehicles generally flow more smoothly through roundabouts than through intersections controlled by traffic signals. Delays are reduced. In many cases there's no need to stop at a roundabout, just slow down.

Message for transportation officials: "What these two studies teach us is simple. Just build them. Go ahead and construct a roundabout where it's appropriate, and do it, if possible, when a roadway is first engineered," Retting advises. Especially in suburban areas where population growth and housing development are escalating and new roads are planned, officials would do well to consider roundabouts.

"Don't let initial opposition get in the way," Retting adds. "Many U.S. motorists aren't familiar with roundabouts yet, so they're wary of them. But once the roundabouts are built, the traffic flow and safety benefits turn people around, even people who weren't enthusiastic from the get-go."

For a copy of "Continued reliance on traffic signals: a case study in missed opportunities to improve traffic flow and safety at urban intersections" by C. Bergh et. al and "Traffic flow and public opinion: newly installed roundabouts in New Hampshire, New York, and Washington" by R.A. Retting et al., write: Publications, Insurance Institute for Highway Safety, 1005 North Glebe Road, Arlington VA 22201, or email publications@iihs.org.



VAIL, COLORADO: TOWN WITHOUT SIGNAL LIGHTS

Before the first roundabout was constructed in Vail, Colorado, ski season traffic was leaving visitors and local residents alike wanting to ditch their cars and just ski into town. Now traffic at every exit from an interstate highway entering Vail is governed by a roundabout. The result is that traffic backups have largely disappeared.

But the process wasn't easy. The first proposals for roundabouts were resisted. Warren Miller, a local filmmaker, protested in the newspaper for six months. Still two roundabouts were built in 1995, and the opposition diminished as motorists got used to the new traffic patterns and noticed that vehicles were moving more smoothly. The newspaper published letters from Miller, who admitted he had been wrong. With public support, two more roundabouts opened in 1997. Now Vail is known as a town without signal lights.

Besides enduring fewer backups, motorists benefit in terms of safety. Greg Hall, director of public works and transportation, says crashes were reduced by about 20 percent from 3 years before the first roundabout to 3 years after. Injury crashes have gone down 85 percent. And despite initial concerns that bicyclists and others wouldn't adapt to the roundabouts, there has been only 1 crash involving a bicycle in the 10 years since Vail opened its first roundabout.

LINEVILLE ROAD ROUNDABOUT STUDY

BROWN COUNTY PLANNING COMMISSION
NOVEMBER 2001

Lineville Road Roundabout Study

Published by the Brown County Planning Commission November 7, 2001

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I. Introduction

Prior to 1999, Bay View Middle School and Forest Glen Elementary School in the Village of Howard were bounded to the south by a county highway (Lineville Road) that carried vehicles at very high speeds. Since Lineville Road runs directly in front of the middle school and very close to the elementary school, a 15 mph school zone had been in place for several years. However, the regular posted speed limit was 45 mph, and many motorists traveled closer to this speed when children were present and above it when children were not. For this and other reasons, the Brown County Sheriff's Department designated the highway as a hazardous area to force the school district to bus kids across the road. This situation was expected to worsen when the new high school opened on the campus in 2000 and hundreds of inexperienced drivers were added to the hazardous highway's growing daily traffic load. To address this situation, the Brown County Planning Commission worked in 1998 and 1999 with the county highway department, Howard, and Town of Suamico to plan, design, and build Wisconsin's first modern roundabouts at the east and west ends of the school campus. The roundabouts were believed to be the best method of slowing drivers in the school zone and making the highway safe and accessible for pedestrians and bicyclists of all ages.

The mere identification of a school zone does not guarantee that motorists will travel at or below 15 mph because people tend to drive at speeds that feel comfortable to them. Even a police officer with a speed detection device is not very effective because the officer cannot possibly ticket everyone traveling over 15 mph. The best method of ensuring that people will travel at a lower speed is to design streets that make drivers feel comfortable traveling relatively slowly and make it very difficult to exceed a certain speed. This was accomplished in Howard by retaining the highway's two lanes, adding bicycle lanes and sidewalks, and constructing two roundabouts to force drivers to travel at low speeds when approaching and traveling through the campus intersections. In addition to lowering vehicle speeds, roundabouts make intersections safer for pedestrians of all ages by minimizing conflicts, eliminating crashes caused by drivers disregarding red lights and stop signs, and minimizing pedestrian exposure to traffic by enabling people to cross narrow travel lanes that are separated by a median refuge at each approach.

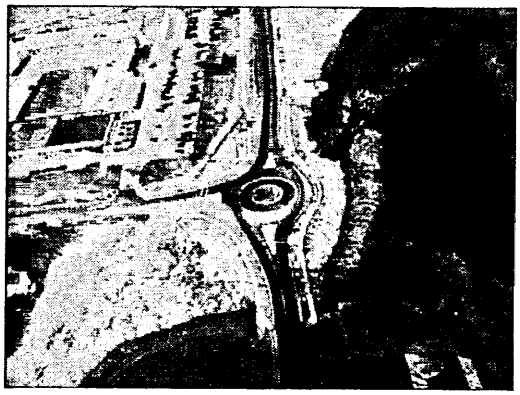
This report looks at the characteristics of the two Lineville Road roundabouts, examines how well they have performed over the last two years, and summarizes several conclusions that were reached during the examination. The report also includes letters, newspaper articles, and references to studies that comment on how roundabouts work locally and throughout the world.

II. The Lineville Road Roundabouts

The Lineville Road roundabouts are single lane facilities that are designed to force traffic to travel through them at less than 18 mph. Each roundabout has a landscaped center island, a patterned concrete truck apron, and splitter islands at the approaches that deflect traffic to the right and serve as refuges for pedestrians and bicyclists. The central islands (including the truck aprons) are about 70 feet in diameter, and each roundabout's total diameter is approximately 100 feet.

Lineville/Cardinal roundabout

Lineville/Rockwell roundabout



Crosswalks

The crosswalks at the Lineville Road roundabouts are situated one vehicle length behind the yield lines. This standard roundabout feature enables people to cross in front of drivers that are looking straight ahead instead of to their left for gaps in traffic. The position of the crosswalk is one of the features that makes roundabouts very safe for pedestrians.

Modern Roundabouts vs. Traffic Circles

Modern roundabouts are often confused with much larger traffic circles (or rotaries) that are found in the eastern United States and in many other places throughout the world, but roundabouts are different in several ways. Some of these differences are summarized below.

	Lineville Road Modern Roundabouts	**Traffic Circles**
Central Island Diameter	Approx. 70 feet (includes truck apron)	300+ feet
Design Speed	15 to 18 mph	40+ mph
Right-of-Way Granted To:	Vehicles in the roundabout	Vehicles entering the circle

The yield at entry rule at roundabouts makes them much safer than traffic circles. Roundabouts are also much more efficient because vehicles in the intersection do not have to constantly slow or stop for entering vehicles like they do at large circles.

III. Roundabout Performance

During the year between the planning commission's recommendation for the roundabouts and the project's completion in the fall of 1999, many people expressed concerns about this locally untested device. Despite years of success throughout the world, many people were convinced that the roundabouts (which were often confused with much larger traffic circles) would create traffic congestion, cause severe crashes, and lead to the injury or death of the children they were designed to protect. But this resistance began to disappear as they were being built and people had the chance to see that the roundabouts were much smaller, efficient, and attractive than they had thought. About three months after the project was completed, the planning commission found that congestion did not exist at the intersections even though the vast majority of vehicles approaching the roundabouts were traveling at or below 20 mph before reaching the crosswalks *throughout the entire day.* The planning commission also discovered that reportable crashes and injuries suddenly disappeared from the most heavily traveled of the two intersections after the roundabout was built, even though the number of entering vehicles increased significantly after the high school opened in August of 2000.

This section of the study looks at how well the Lineville Road roundabouts have performed over the last two years, and in some cases compares their performance to roundabouts throughout the world.

Vehicular Safety

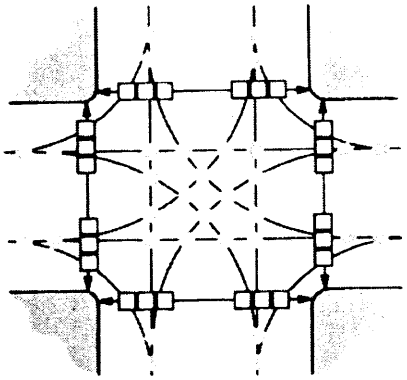
Because all vehicles travel the same direction in a roundabout, the number of conflict points is much lower than at intersections controlled by traffic signals or stop signs (see Figure 1 on the following page). The likelihood of crashes is further reduced by forcing vehicles to approach and travel through the roundabout intersections slowly, which maximizes the time that motorists have to avoid conflicts.

Lineville Road Experience

Before the roundabouts were built in 1999, the intersection of Lineville Road and Cardinal Lane experienced several reportable crashes and injuries each year. In 1996 alone, this intersection experienced five reportable crashes and eleven injuries, and reportable crashes and injuries continued to occur until the spring of 1999. This situation changed, however, as the roundabouts were being built and motorists were no longer able to run the stop signs at high speeds and meet other vehicles at right angles. According to the Brown County Sheriff's Department's crash records, there have been no reportable crashes or injuries at the Lineville/Cardinal intersection since the roundabout project began in July of 1999. These statistics are summarized in Figure 2 on Page 9 and in Appendix 1 at the end of the study. The elimination of crashes and injuries occurred in spite of the introduction of hundreds of inexperienced drivers to Lineville Road following the opening of the new Howard/Suamico High School in August of 2000.

Figure 1: Conflict Points at a Signalized or Signed Intersection and a Single Lane Roundabout

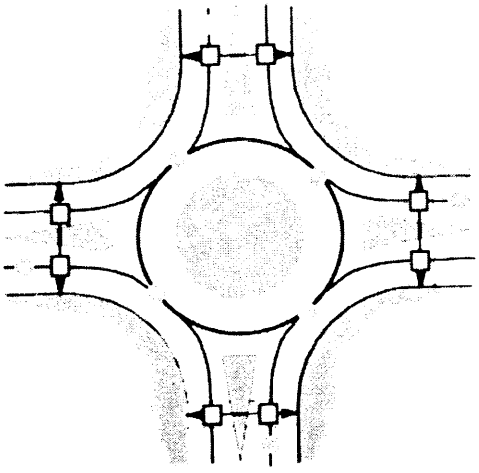
Conflicts at a Signalized or Signed Intersection



☐ 24 Vehicle/Pedestrian Conflict Points

○ 32 Vehicle/Vehicle Conflict Points

Conflicts at a Single Lane Roundabout

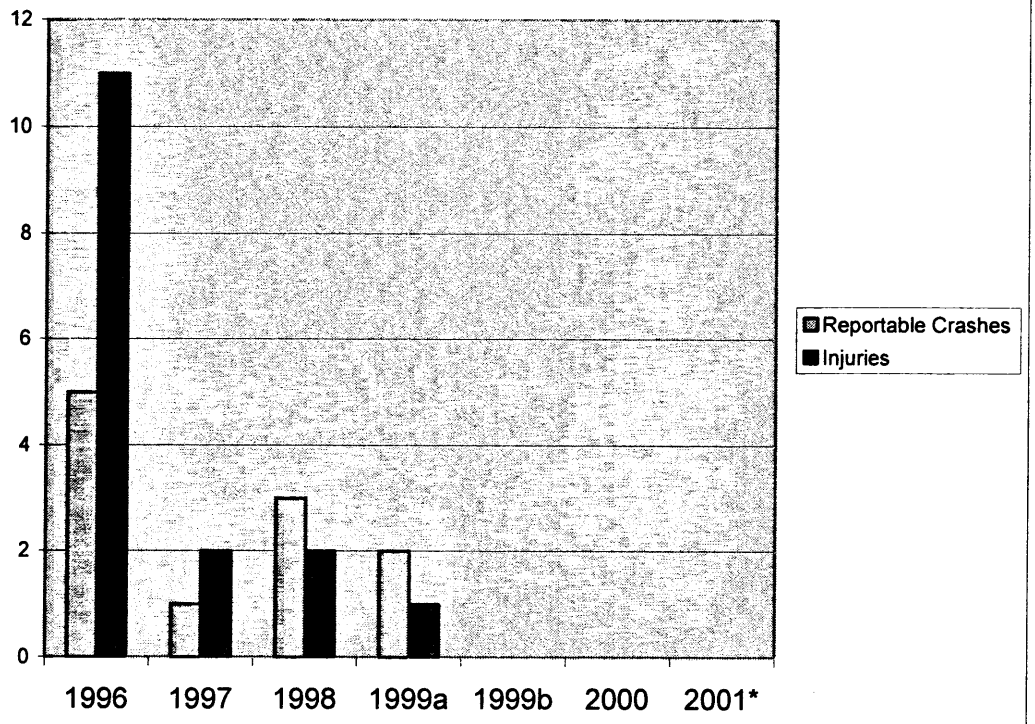


☐ 8 Vehicle/Pedestrian Conflict Points

○ 8 Vehicle/Vehicle Conflict Points

Source: *Roundabouts - Information Brief and Design Guide.* Alternate Street Design, Inc.

Figure 2: Reportable Crashes and Injuries at the Lineville Road/Cardinal Lane Intersection (1996 - 2001)



1999a: January 1, 1999 - July 31, 1999 (before roundabout - still a two way stop)
1999b: August 1, 1999 - December 31, 1999 (during and after roundabout construction)
2001*: Through October 1, 2001

Source: Brown County Sheriff's Department Crash Records: 1996 - 2001

The only reportable crash at either of the roundabouts over the last two years was a minor rear end incident at Rockwell Road shortly after the roundabouts were completed in 1999. This crash caused damage to one of the two vehicles and did not involve any injuries.

Other Experience

The near elimination of reportable crashes and complete elimination of injuries at the two Lineville Road intersections in spite of the significant traffic volume increase is consistent with the performance of single lane roundabouts throughout the world. In 1998, the Transportation Research Board's *Modern Roundabout Practice in the United States* report examined crash frequency and injury severity studies that had been conducted in America and several other countries over a ten year period. The report indicated that each country experienced a significant reduction of vehicle crashes and a tremendous reduction of injuries at intersections where single lane roundabouts had replaced stop signs and traffic signals.

Pedestrians at the Roundabouts

Single lane roundabouts that have replaced traffic signals and stop signs have significantly reduced the number of vehicle/pedestrian crashes and drastically reduced the severity of these crashes at intersections throughout the world. Roundabouts are safer for pedestrians for the following reasons:

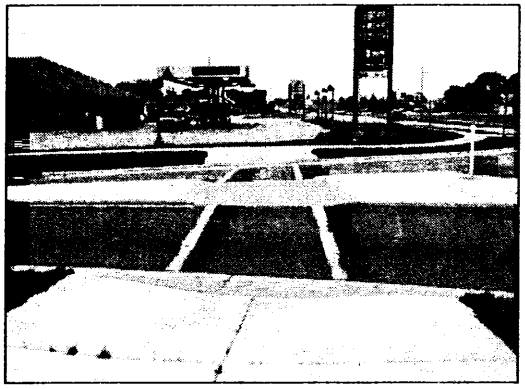
The number of conflict points is much lower. Because all vehicles travel the same direction in a roundabout, the number of vehicle/pedestrian conflict points is much lower than at intersections controlled by traffic signals (see Figure 1). The likelihood of crashes is further reduced by forcing vehicles to approach and travel through a roundabout intersection slowly, which maximizes the time that pedestrians and motorists have to avoid conflicts.

Severe crashes caused by non-attentive driving are eliminated. For example, vehicle/pedestrian crashes that occur when motorists run red lights, ignore stop signs, and make right turns on red do not happen at roundabout intersections. The roundabouts force drivers to pay attention to their surroundings as they approach and pass through the intersections.

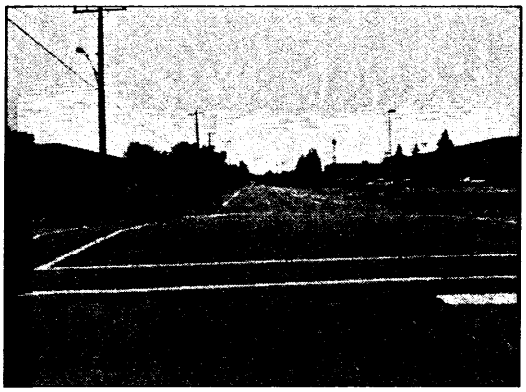
Pedestrian exposure to traffic is much lower because the crossings are shorter. The splitter islands at the roundabout approaches allow people to cross one narrow lane of slow moving traffic at a time instead of four (or more) lanes of vehicles that would likely be traveling very fast through a signalized intersection. A roundabout's narrow lanes and islands enable people to walk approximately 13 feet between the curb and island across one lane of slow moving traffic, wait for a gap, and walk another 13 feet from the island to the curb across the second lane of traffic.

If Lineville Road had been expanded to include four through lanes with left turn lanes at the intersections, pedestrians could have been forced to cross more than 60 feet of driving area while looking for vehicles approaching from several directions. The pictures below and on the following page illustrate the difference between the crossing distance at a single lane roundabout and two typical two-lane streets in Howard.

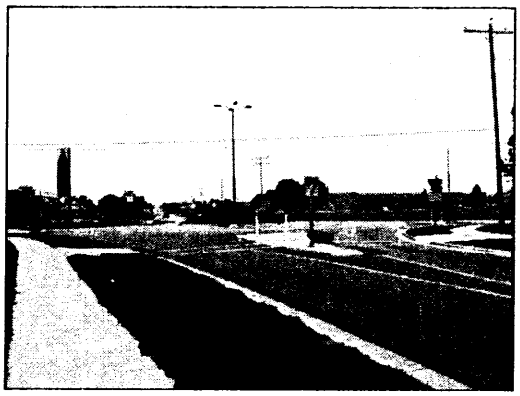
Lineville/Cardinal roundabout crosswalk



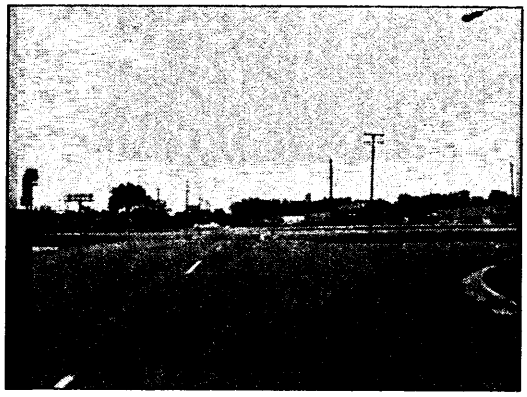
Woodale/Cardinal crosswalk



Total crossing distance at the Lineville/Cardinal intersection



Portion of crossing distance at the Memorial/Velp frontage road intersection



All of the streets pictured above carry one lane of traffic in each direction, but the roundabout intersection requires pedestrians to cross far less driving area than the two conventional intersections. The roundabout also makes motorists more aware of their surroundings by forcing them to slow down and change direction as they approach and pass through the intersection.

Roundabouts in School Zones

Roundabouts in school zones are very beneficial for pedestrians for the reasons discussed above and because they place the responsibility for avoiding vehicle/child crashes with the adult motorist. At a signalized intersection, motorists often do not have time to react when a child incorrectly (or correctly) enters the crosswalk because the motorist is traveling too fast. Even though the child legally has the right-of-way and may be incapable of accurately judging the distance and speed of oncoming vehicles, it becomes the child's responsibility to get across the wide signalized intersection safely because motorists might not have time to avoid a crash. But single lane roundabouts like the two in the Lineville Road school zone enable adult motorists to avoid hitting children by forcing the motorists to slow down as they approach and pass through the crosswalks.

Roundabouts also enable crossing guards to easily help children across busy streets. In February of 2001, the Green Bay Press-Gazette interviewed the crossing guard that was stationed at the Cardinal Lane intersection after the roundabouts were built and the sheriff's department removed the hazardous designation from Lineville Road. According to the guard, crossing children at the roundabout is very easy because the splitter islands allow her to stop one lane of slow moving traffic at a time. When asked why she believes the Howard roundabouts are viewed as controversial by some residents, she told the reporter that she has seen no close calls or accidents at the roundabouts in the two years she has been stationed there. She added that she has not had to report any drivers to the sheriff's department and that those that believe the roundabouts are controversial are "afraid of change." The entire article can be found in Appendix 2 of the study.

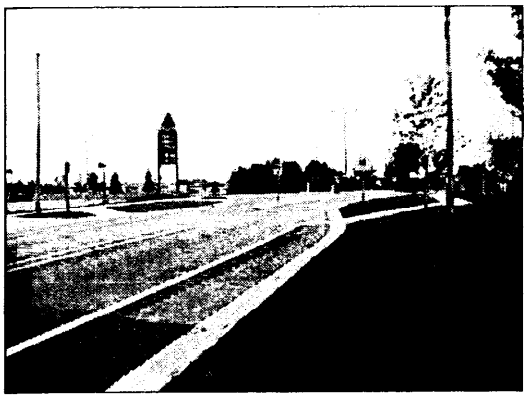
Other Experience

The TRB's 1998 *Modern Roundabout Practice in the United States* report also addressed pedestrian safety at roundabouts throughout the world. The studies that were conducted in the United States, the Netherlands, Germany, and in other countries found that the number of pedestrian crashes was significantly reduced and that injuries virtually disappeared at intersections that had been converted from stop signs and signals to single lane roundabouts.

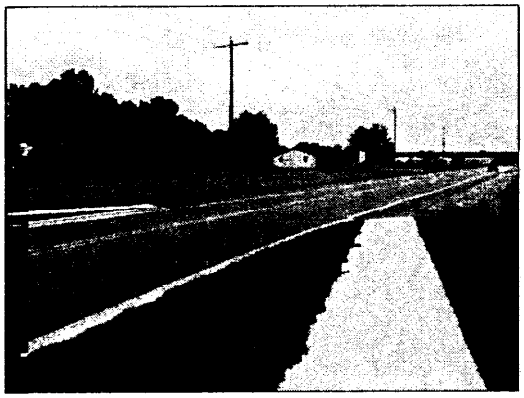
Bicyclists at the Roundabouts

The Lineville Road roundabout intersections were designed to provide bicyclists two circulation options. Bicyclists that feel comfortable entering the flow of traffic can do so at the roundabouts because traffic is forced to travel at a bicyclist's pace. However, less experienced bicyclists that do not want to enter the traffic flow have the option to leave the street prior to the intersection, cross the street at the designated crosswalks, and re-enter the street at the desired approach.

Bicycle lane termination point



Bicycle lane entry point



The roundabouts and bicycle lanes along Lineville Road and (until recently) Cardinal Lane south of the intersection have made the area safer for bicyclists of all ages and skill levels. These improvements prompted Bay View Middle School to permit its students to bicycle to school starting in the spring of 2000 (see Appendix 5).

Bicycle Federation of Wisconsin President Peter Flucke also told planning commission staff that he believes the roundabouts are safe and efficient for bicyclists and that he supports the construction of single lane roundabouts elsewhere to enhance bicycling throughout the state. Mr. Flucke also mentioned that bicyclists appreciate not having to stop at the roundabouts because it takes a significant amount of energy to accelerate from a complete stop.

Other Experience

The studies conducted by the TRB, Federal Highway Administration (FHWA), and other agencies found that single lane roundabouts that have replaced signals and stop signs have significantly reduced the *severity* of vehicle/bicycle crashes, but the reduction in the *number* of crashes has not been as substantial as that experienced by motorists and pedestrians.

Traffic Capacity

The capacity of roundabouts is greater than the capacity of signalized intersections because there are no yellow and red delay and stop times. Vehicles do not have to stop at a roundabout intersection unless another vehicle is approaching from the left within the roundabout. The gap size needed to merge into a roundabout intersection is also less than at a signalized intersection because traffic is moving very slowly.

In 2000, the Federal Highway Administration published *Roundabouts: An Informational Guide*. This report addresses several characteristics of single and multi-lane roundabouts and is designed to be the guide for the development of roundabouts in the United States. According to the FHWA guide, the average delay per vehicle at roundabouts is much lower than the average delay per vehicle at signalized intersections:

Example 1: Average delay per vehicle at an intersection that has a total major street volume of 1,000 vehicles per hour and 10 percent left turns.

- Signalized intersection delay per vehicle: 13.5 seconds
- Roundabout intersection delay per vehicle: 1.75 seconds

Delay reduction per vehicle with a roundabout: **11.75 seconds**

Example 2: Average delay per vehicle at an intersection that has a total major street volume of 1,000 vehicles per hour and 50 percent left turns.

- Signalized intersection delay per vehicle: 16 seconds
- Roundabout intersection delay per vehicle: 3 seconds

Delay reduction per vehicle with a roundabout: **13 seconds**

These examples illustrate how much more efficient roundabouts are than traffic signals and show that this efficiency difference becomes even more significant as the percentage of left turning traffic increases at an intersection.

Lineville Road Experience

Over the last two years, the Brown County Highway Department has periodically filmed traffic passing through the Lineville Road roundabout intersections during the morning and afternoon peak travel periods. These videos show that school buses, fire trucks,

and other large vehicles can easily navigate the roundabout and interact with large volumes of vehicles at the intersections. The videos are available for viewing at the Brown County Planning Commission.

On August 31, 2000, the highway commission filmed traffic entering and leaving the new Bay Port High School at the Rockwell Road roundabout during the morning of the first day of classes. Planning commission staff also counted the number of vehicles that passed through the roundabout during five minute intervals between 7:00 a.m. and 7:15 a.m. The results are shown in Figure 3 below.

Figure 3: Vehicle Movements at the Rockwell Road Roundabout During the First Morning of Classes at the New Bay Port High School – 8/31/00

Time Interval	WB Right	WB Thru	EB Left	EB Thru	SB Left	SB Right	Interval Total	Hour Equivalent
7:00 – 7:05	62	4	39	25	1	0	131	**1,572**
7:05 – 7:10	61	4	37	39	4	0	145	**1,740**
7:10 – 7:15	58	8	22	40	6	0	134	**1,608**
Total Movements	181	16	98	104	11	0		
Movement Percentage	44%	4%	24%	25%	3%	0%		

WB = Westbound
EB = Eastbound
SB = Southbound

The video footage and vehicle counts show that the equivalent of over 1,700 vehicles per hour can pass through the three leg Rockwell Road roundabout with virtually no delays. This volume is especially significant because most of the drivers were relatively inexperienced high school students that could have been using the roundabouts for the first time.

Letters from the Sheriff's Department and Middle School

Not long after the roundabouts were completed in 1999, the director of the Brown County Sheriff's Department's Patrol Division and the principal of Bay View Middle School sent letters to Howard that commended the village for making Lineville Road safer and more efficient. These letters can be found in Appendix 3.

Emergency Vehicles, School Buses, and Other Large Vehicles

Many trucks and other large vehicles that travel through the two Lineville Road roundabouts are able to do so within the travel lanes. However, large vehicles that need

a little extra space are able to drive over the slightly elevated patterned concrete areas that surround the center islands. These "truck aprons" are designed to keep smaller vehicles in the driving lanes while allowing semis and other very large vehicles enough space to slowly make their turns. Since being built, the roundabouts have handled large vehicles on a daily basis. Because the intersections are designed to accommodate semi-trailer trucks, the school buses, dump trucks, and other large vehicles that frequently pass through the roundabouts can navigate the intersections without using the truck aprons. One of the highway department's videos shows the De Pere Fire Department's ladder truck doing circles around the Lineville/Cardinal roundabout to demonstrate that large emergency vehicles can easily use the intersections.

School Buses at the Roundabouts

The ease of getting school buses through the intersections was reflected in a September 1999 Green Bay Press-Gazette article that contained several quotes from the manager of the school bus company that serves the Howard-Suamico School District. According to the manager, "...the buses not only have an easy time turning through the roundabouts, but breaks in traffic make it easier to pull out of Bay View Middle after school." The manager also said that he "...would definitely recommend something like roundabouts in other districts." The entire article can be found in Appendix 4.

Construction and Maintenance Costs

Construction Costs

Single lane roundabouts typically cost less to build than signalized intersections because they do not require loop detectors, mast arms, lights, and other equipment. Single lane roundabouts also need less pavement and right-of-way than most signalized intersections.

The exact costs of the Lineville Road roundabouts were not calculated by the Brown County Highway Department because they were components of a large corridor reconstruction project. However, the highway department has developed cost estimates for single lane roundabouts and signals at other intersections in the village. These estimates are summarized below.

Figure 4: Cost Estimates for Single Lane Roundabouts and Signals at Howard Intersections

Intersection	Costs for Roundabouts	Costs for Signals	Savings with Roundabouts
Cardinal/Glendale	$115,000	$250,000	$135,000
Cardinal/Woodale	$179,300	$313,000	$133,700
Woodale/Velp	$190,700	$445,000	$254,300
Totals	**$485,000**	**$1,008,000**	**$523,000**

Source: Brown County Highway Department

Since the intersections listed in Figure 4 are similar to the Lineville/Cardinal and Lineville/Rockwell intersections, it can be assumed that the Lineville Road roundabouts were the less expensive options as well.

Maintenance Costs

According to the Brown County Highway Commissioner, maintaining the Lineville Road roundabouts has cost the county virtually nothing over the last two years because there is nearly nothing to maintain. The patterned concrete truck aprons, pavement, and central islands are in very good condition. The only maintenance costs associated with the roundabouts have been for snow removal, and these costs would have been incurred with or without the roundabouts.

The highway department has found over the last two winters that it is easy to remove snow from a roundabout because plows do not have to make several passes through the intersections. The plow only has to circle the driving area and truck apron and push the snow to the terraces. This experience is similar to the experience of Montpelier, Vermont, and other cities in the United States that must clear significant amounts of snow from their roundabouts each winter.

Development Issues

At the beginning of 2000, the Village of Howard approved the construction of a third roundabout at the intersection of two village streets south of Lineville Road. Since the new roundabout was approved after a subdivision plat for the immediate area had been accepted by the village, the subdivision's developer was concerned about access to the lots at the intersection's corners and the possible financial impact on these lots. However, after using the Lineville Road roundabouts and finding that the homeowner at the northeast corner of Lineville Road and Cardinal Lane likes the roundabout, the developer's concerns disappeared. The developer even wrote a letter to a Green Bay alderman in May of 2001 to dispel the rumor that the new roundabout was hurting the value of her subdivision's lots. This letter states that the developer feels a roundabout can be an asset to a development because it is attractive and efficient. The letter also mentions that the developer has her daughter building her new house near the new roundabout. The letter can be found in Appendix 6.

IV. Conclusions

The following general conclusions were reached during this study:

- The Lineville Road roundabouts have significantly reduced vehicle speeds near Bay Port High School, Lineville Intermediate (formerly Bay View Middle) School, and Forest Glen Elementary School. The Brown County Sheriff's Department has also not received any complaints about speeding since the roundabouts were built.

- Reportable vehicle crashes have virtually disappeared from the two intersections and injuries have been eliminated. This occurred in spite of the introduction of hundreds of inexperienced drivers to Lineville Road's existing traffic load after the new high school opened in August of 2000.

- Students are now allowed to walk to school, and the crossing guard stationed at the Lineville/Cardinal intersection told a newspaper reporter that she loves the roundabouts because they enable her to easily get children across the street. The crossing guard also told the reporter that she has not seen any close calls or crashes at the roundabouts.

- Bicycling has been made safer, and students are now allowed to bike to school. The president of the Bicycle Federation of Wisconsin also believes the roundabouts are safe and convenient for bicyclists and supports their construction throughout the state.

- The three leg roundabout at Rockwell Road was capable of handling the equivalent of 1,740 vehicles per hour with virtually no delays during the morning of the first day of classes at the new high school.

- The director of the Brown County Sheriff's Department's Patrol Division and the principal of Bay View Middle School both believe that traffic congestion and speeding have been significantly reduced along Lineville Road. The patrol director and principal also believe that safety has been greatly enhanced by the roundabouts.

- Semi-trailer trucks, school buses, fire trucks, and other large vehicles can easily pass through the roundabouts. The manager of the school bus company that serves the Howard-Suamico School District even stated that he would recommend roundabouts in other school districts.

- Roundabouts are relatively inexpensive to construct and maintain, and snow can be removed easily from the intersections.

- The developer of a new subdivision immediately south of Lineville Road believes that roundabouts can enhance subdivisions. This conclusion was reached after she used the Lineville Road roundabouts and found that a homeowner at the Lineville/Cardinal intersection likes this roundabout.

The results of this study indicate that the Lineville Road roundabouts have created a safe, efficient, and attractive environment for drivers, pedestrians, bicyclists, nearby

residents, students, and others that use them often. The success of this project should encourage other communities to seriously consider installing modern roundabouts at their intersections for the reasons identified in this study.

Appendix 1: Crashes at the Lineville Road/Cardinal Lane intersection: 1996 - 2001

1996 (Two way stop)

Date	Type	Factor	# Vehicles	# Injuries
May 10	Angle	FTY	2	2
June 5	Angle	FTY	2	5
August 15	Angle	FTY	2	1
September 17	Angle	FTY	2	0
December 13	Angle	FTY	2	3

Reportable Crashes: 5
Number of Vehicles Involved: 10
Number of Injuries: 11

1997 (Two way stop)

Date	Type	Factor	# Vehicles	# Injuries
May 14	Angle	FTY	2	2

Reportable Crashes: 1
Number of Vehicles Involved: 2
Number of Injuries: 2

1998 (Two way stop)

Date	Type	Factor	# Vehicles	# Injuries
August 29	Angle	DTC	2	1
October 27	Rear	?	2	1
November 30	Angle	FTY	2	0

Reportable Crashes: 3
Number of Vehicles Involved: 6
Number of Injuries: 2

1999: January 1 – July 31 (before roundabout – still two way stop)

Date	Type	Factor	# Vehicles	# Injuries
January 8	Angle	FTY	2	0
March 25	Angle	FTY/ID	2	1

Reportable Crashes: 2
Number of Vehicles Involved: 4
Number of Injuries: 1

1999: August 1 – December 31 (during & after roundabout construction)

No reportable crashes

2000

No reportable crashes

2001 (Through October 1)

No reportable crashes

Notes

- Source: Brown County Sheriff's Department crash records (1996 – 2001)
- The number of vehicles entering the Cardinal/Lineville intersection increased after the roundabout was built because the project removed the southbound slip lane that connected Lineville to Cardinal west of the intersection.
- Traffic volumes at the Cardinal/Lineville intersection further increased when the new Bay Port High School opened in August of 2000.
- For a crash to be reportable, a law enforcement officer has to believe that a vehicle has sustained a minimum of $1,000 damage.
- FTY = failure to yield.

Appendix 2: February 6, 2001, Green Bay Press-Gazette article about the crossing guard stationed at the Lineville/Cardinal roundabout.

9/26/2001

Guards man roundabouts for kids

Unique intersections keep traffic in check during school hours

BY KATRINA STAUDE
PRESS-GAZETTE

SUAMICO - Denise Haltom, bundled up against the 19-degree weather, climbed out of her car at 7:50 a.m. on Thursday and got ready to brave the cold.

'I hate it in the winter ... I just don't want to get up and put long johns on ..." she said. "But I like the kids and it's enjoyable when there's more of them."

Haltom, one of 10 crossing guards that help the Howard-Suamico School District students get to their destination safely, has been a guard on the roundabout at Lineville Road and Cardinal Lane for two years. She said winter is her least favorite time of the year on the job.

"It gets lonely when there's no kids in the winter," Haltom said.

Carrying her stop sign and wearing her bright orange crossing guard jacket, Haltom takes up her post at the roundabout - one of the more controversial and contemporary traffic arrangements in Howard as well as an interesting situation for a crossing guard - working to get children safely across a street where traffic never stops.

The roundabouts

The two roundabouts on Lineville Road were a novelty to the state when they were built in the summer of 1999. Since that time, roundabouts have provided sporadic controversy when a new one is considered.

The roundabouts on Lineville were built in a high-traffic location, with 14 buses and more than 50 parents coming through Lineville Intermediate School on a regular afternoon. Bay Port High School dismisses at a different time than the Intermediate school, reducing traffic in the afternoon.

"At first, I was a little apprehensive - wondering how they would work to slow traffic,' said Lineville Intermediate Principal Chuck Templer. 'Overall, I'm very pleased with the way they've slowed traffic down. Traffic in general is traveling at a much slower rate in front of our school than it was prior to the roundabouts.'

Because of the way traffic moves through a roundabout intersection, without stopping at lights or signs, the design forces crossing guards to use a different procedure for getting children across streets safely.

"I guess I wondered how difficult it would be, but they seemed to pick it up easily,' said Sharon Davidson, deputy clerk for Howard. 'The police went out in the beginning and helped them figure out how to do it."

Islands, located in the middle of the street, help the guards get children safely across, one lane at a time.

"Personally, I love them, and I'll tell you why," Haltom said. "You only have to stop one lane of traffic, then go to the middle and wait. The cars can't go much faster than 20 mph through the roundabout, so the crossing aspect here is great."

Templer also feels the crossing of children through the roundabout is running smoothly.

"I think the crossing guard does a wonderful job of getting those kids through there," Templer said, adding that motorists generally see the roundabouts coming and slow down.

First on duty

"I was the first one out here when they decided to put a guard out here," Haltom said, speaking around a scarf she said she's thankful for on cold days.

On most winter days, Haltom said waiting around for the one or two children that may or may not come along can get monotonous and chilly.

"Once in awhile, I get one little boy during the winter ... maybe one or two children.' Haltom said.

"There are usually 1 0 to 20 kids in the springtime."

Haltom likes the job because it allows her to be home with her children, Hannah, 1 0, and Samuel, 8. Her children used to be home-schooled, but now attend Green Bay Christian School.

Overall, Haltom thinks the roundabouts are easier for crossing guards to get children safely across streets. When asked about the controversy surrounding the issue of roundabouts in the area, Haltom just shook her head.

"I think it's just people being afraid of change,' Haltom said. "There've been no close calls, no accidents. I haven't had to report any drivers. It pretty much goes smoothly. If they see a vest, they slow down pretty much.'

Appendix 3: Letters from the Brown County Sheriff's Department and Bay View Middle School Principal concerning the roundabouts.

E-25

SHERIFF'S DEPARTMENT

300 EAST WALNUT
PO. BOX 22003
GREEN BAY, WISCONSIN 54305-2003
PHONE (920) 448-4200 FAX (920) 448-4206

THOMAS J. HINZ
SHERIFF

November 15, 1999

Mr. Robert Strazishar
Howard Village Board President
2456 Glendale Ave,
Green Bay, WI 54313

Dear President Strazishar:

This letter is in response to an inquiry made by Village Trustee Henry Luxem. The current roundabouts located on Lineville Road are not presenting any safety hazards. They are actually solving two particular problems that we had prior to their installation. Those problems were,

1. Traffic congestion from the school to Lineville Road. At times last year, an officer was tied up with traffic control because vehicles could not enter Lineville Road due to traffic volume. This problem has diminished.

2. Speeding on Lineville Road near Bayview Middle School. The roundabouts provide speed control by making it impossible to navigate a vehicle through the roundabout at a high rate of speed. There have been no complaints of school zone speeding on Lineville Road since the roundabout installation.

The above information was gained by talking to the officers currently working during school hours in the village and my observations. I appreciate the village taking an innovative position in installing the roundabouts. Your action has made Howard a safer community!

Please feel free to contact me at your convenience with any questions or concerns. My phone number is 448-4220.

Sincerely,

Captain Dennis Kocken
Patrol Division Director

Cc Sheriff Tom Hinz
Lt. Scott Semb

E-26

BAY VIEW MIDDLE SCHOOL

National **Blue Ribbon School**

2700 Lineville Road Green Bay, Wisconsin 54313
(920)434-4010

Chuck Templer
Principal

Joe Wallander
Associate Principal.

No,/ember 15,1999

Village of Howard Board of Trustees
P.O. Box 12207
Green Bay, WI 54307-2207

Dear Village Board Members,

I am writing to provide you with an update regarding the functioning of the roundabouts, which were installed on Lineville Road in the vicinity of Bay View Middle 5chool where I am the principal. In my opinion they are slowing traffic in front of school and allow for smooth traffic flow.

Bay View has approximately 900 students at the present time. Each morning about twenty-six school busses converge on our school in about a ten-minute time span. Additionally, nearly seventy-five students get dropped off by their parents. With that amount of traffic the potential for congestion and back-ups certainly exists. I have been very pleased with how the roundabouts have handled the traffic volume. The roundabout at Rockwell Road is at the entrance to our school and has caused no concerns to date.

I'd like to express my thanks to the Village Board for your efforts in making improvements to Lineville Road in the vicinity of our school. The roundabouts allow for smooth traffic flow, have slowed traffic in front of school to a safe speed, and are aesthetically pleasing, The new sidewalks along Lineville Road allow students who choose to walk to and from school to do so safely. Thank you for your continuing concerns for the safety of our students.

Sincerely,

Chuck Templer, Principal

Appendix 4: September 1999 Green Bay Press-Gazette article about school bus traffic at the roundabouts.

15.09.1999

Roundabouts are a hit in Howard

Despite some confusion, traffic slows in front of schools

BY JOHN DIPKO
PRESS-GAZETTE

More than two weeks after the start of school, the use of two ring-like road turns is in full swing in front of the Howard-Suamico District's Bay View Middle School.

The turns, called roundabouts, are slowing traffic along Lineville Road, middle school Principal Charles Templer said. He said traffic does not exceed 25 mph, quite a change from the 40-mph norm last year.

"I haven't seen any problems since school started," Templer said. 'I'm pretty satisfied."

Brown County, with financial help from the village of Howard and town of Suamico, built two roundabout turns this summer where Lineville crosses Rockwell Road and Cardinal Lane.

The turns are the first of their kind in Wisconsin and are designed to reduce accidents near Bay View Middle School, 2700 Lineville Road; the nearby Forest Glen Elementary School, 1935 Cardinal Lane; and the future Bay Port High School behind the middle school.

Bus drivers have had little trouble navigating the turns since school started Aug. 30, but the new, circular concept is stirring some confusion among some drivers.

Howard parent Denise Skow, who passes through the Cardinal Lane roundabout when she drives her fifth-grade daughter to and from Forest Glen, said she likes the new turns. Her eighth-grade son takes the bus to Bay View Middle but is picked up after school by his mother.

But Skow said she has heard of and seen drivers pull into the roundabout, take a sharp left and drive in the wrong direction. She also has seen drivers stop at the roundabout, unsure of what to do, even though the turns are well-marked.

The full-time mom and six-year resident of Howard said she believes the hubbub will lessen with time.

'The traffic does seem to move slowly," she said. "Some education needs to happen in the community. Some people are still unsure of the direction of traffic or exactly what to do. I think that will come."

The ongoing construction could add to the confusion, Skow said.

Workers still need to finish curb-and-gutter on the outside of the turns, and then finish paving and matting work and add more markings and island splatters, county Highway Commissioner Roger Kolb said. He said the work should finish in early October.

The roundabouts may have helped drivers of the 23 buses at Bay View Middle and 12 buses at Forest Glen Elementary, said Todd Gauthier, manager of Lamers Bus Lines Inc. Lamers provides busing services to the Howard-Suamico School District.

The buses not only have an easy time turning through the roundabouts, but breaks in traffic make it easier to pull out of Bay View Middle after school, Gauthier said.

"I would definitely recommend something like roundabouts in other districts," he said. "It definitely slows down traffic."

Things have gone well with the turns so far but the real measure of their success will happen next fall, when the district opens its 350,000-square-foot high school just northwest of the middle school, Skow said.

"When we add 1,500 students plus staff trying to get to the high school at one time, that will be the true test," she said.

Appendix 5: Spring 2000 notice from Bay View Middle School about allowing students to bicycle to school.

E-31

Attention: New Residents of Howard-Suamico

The School District of Howard-Suamico is updating its database of new children in the school district between birth and 4½ years of age. If you have moved into the Howard-Suamico area after April 1, 2000, and have a child who was born after September 1, 1995, please call the district's Pupil Services Office at 434-4689 to register your child. This information will aid the district in planning for student population growth, as well as allowing the school district to contact you regarding services offered to preschool children.

Use of Facilities for Walking

District buildings are available for residents to use for walking exercise if a custodian is on duty.

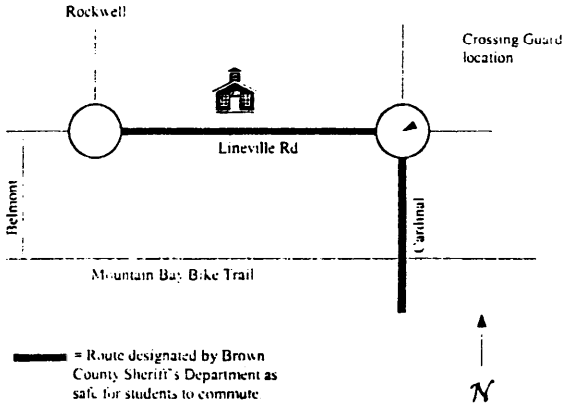
Please call the building principal, and he/she will inform the custodian that you will be using the building for walking.

Bicycles at School

Recently, Lineville Intermediate School (formerly Bay View) has been in the news regarding our policy for riding bicycles to school. Officially, we have strongly discouraged our students from riding bicycles to school and recently have not allowed bicycles ridden to school to be kept on school property. Our issue has always been the safety of our students. The Brown County Sheriff's Department had previously designated all of the roads leading to Lineville School as hazardous to pedestrians, and therefore, we have bussed all of our students to school.

The Sheriff's Department has now lifted the "hazardous road" designation for Cardinal Lane from the Mountain Bay Bike Trail north to Lineville Road due to road improvements for that section of the road. In addition, the Sheriff's Department indicated that a crossing guard must be located at the intersection of Cardinal Lane and Lineville Road for students to move through that intersection. The Village of Howard has secured a crossing guard for the roundabout corner of Lineville and Cardinal. The crossing guard will be present during the following times on school days: 7:00 a.m. until 7:30 a.m. and 2:30 p.m. until 3:00 p.m. Therefore, we will allow students to commute on the designated "safe" road to ride bicycles to school and park them on school property.

Our dilemma is that some of our students may want to bike to school on roads that are narrow and have no bike lanes. We continue to discourage those students from riding bicycles to school. However, our policy will be to let that remain a parental decision. The improvements to Lineville Road have slowed traffic in front of school, and the bicycle lanes on Cardinal Lane have helped to ease some of our safety considerations with students biking to school. Now that the Village of Howard has begun crossing guard service at the Cardinal-Lineville roundabout, we will allow students to park bicycles on our property.



30

Appendix 6: Letter from a developer to a Green Bay alderman discussing her view of roundabouts in Howard.

E-33

RIVER CITY
REALTORS

May 3, 2001

Mr. Ron Antonneau

Hi Ron:

I'm writing this letter to clarify a conversation we had at a Builder's meeting with regard to round-abouts. I ran into Henry Luxem the other day and he asked me why I was against them; then I heard from the Village of Howard that I was quoted in an article in the Press Gazette. So, this keeps coming up - I am not against round-abouts. I did make a statement with regard to the round-about placed at the intersection of Belle Plaine and Belmont Rds. in Howard. We have a subdivision there called Highridge Estates 1st & 2nd Add. The preliminary was approved in 1996 - the 1st Add in 1998 and the 2nd Add in 1999. Our corner lots were 110xl35. We were not aware, at the time of platting, that the round-about would be put in. In 2000, when we received the information for the approval for Belle Plaine the Village told us that the intersection of Belle Plaine and Belmont would include a round-about. They also informed us at the same time that our comer lots (107 and 58) would not be allowed to have driveways on Belle Plaine; but would have to access off Belmont. Not being familiar with a round-about and how it would effect the lot values we priced the comer lots less than the other lots on Belle Plaine. But it is not unusual for us to price the comer lots less than interior lots.

Had we known the round-about was planned for the Belle Plaine/Belmont intersection we would have made our corner lots larger. We would have also adjusted the lot sizes on the Belle Plaine lots flanking the corner lots to put more room between the round-about and any future driveways located on Belle Plaine. So we were not happy with the fact that this came up after our plat had been approved. But we have not had a problem selling the lots on Belle Plaine-we have not yet sold the corner lots however. We do a lot of sales to builders for spec homes and they do not seem to be leery of how the round-about will effect the sale of a spec on Lot 107 or 58 as much as the shallowness of the lot when you have to face Belmont Road and just what you can fit on the lots.

Also the round-abouts were just new on Lineville Road and there was a lot of controversy about them; so we were not sure how that would effect the lot values. We have since used the round-about on Lineville Road and find they are far better than a four-way stop; and better than a traffic light, which makes you stop whether there is other traffic or not. We also spoke to the one home owner at the intersection of Cardinal Lane and Lineville Road and asked her

how she liked the round-about. She told us she liked it better than the stop sign that was there previously - that she thought she would have to add on to her driveway so she could go out of it forward; instead of backing out; because she never could get out to go to work with all the traffic and buses going to the school. She said since the roundabout was installed she has not had any trouble getting out of her driveway.

We did take precautions because the plat was well underway and then the round-about was thrown in the mix. After using the Lineville round-abouts and talking to the homeowner on the Northeast comer of the Cardinal/Lineville Rd intersection we feel our concerns were unwarranted and had we had the option to adjust our plat to accommodate the round-about it would not have been of concern at all. We actually feel it makes a great entrance to our neighborhood and we didn't have to pay for it, design it nor do we have to keep it up.

Personally, I like the round-about and feel it can be an asset to a development. It does exactly what it is suppose to do; it keeps traffic flowing; but slows it without stopping it. Plus when completed it is a far nicer looking intersection than a four-way stop or traffic light. People say they don't know how to use a round-about; but four-way stops have been around for a long time and no one seems to know how to use them yet.

We need to be open to these new ideas and not oppose them just because they are new and we don't understand them. The round-about at Belle Plaine/Belmont was being done at the same time as the proposed round-about at Cardinal/Glendale. We owned property on three corners of the Belle Plaine/Belmont intersection and we did not fight the roundabout at all. We were never opposed to it. We were only opposed to the fact that we were not given the option to adjust our lots accordingly. I even have my daughter building her new house on Copper Mountain Ct. just off the round-about intersection of Belle Plaine and Belmont Rds.

Ron, I would suggest that you or anyone else who has questions on round-abouts go use the ones on Lineville Road during a time when school traffic is heavy. Also go look at the comer of Belle Plaine and Belmont Roads and see what a nice addition it makes to our development. In this time when we are looking for things to calm and slow traffic and use less pavement while still accommodating the necessary amount of traffic - this is something that actually does what it was designed to do. Don't judge it before you look at it. The people in our subdivision like it.

Ron, I am forwarding with this a copy of the plat as we platted it and then a copy of how the Village changed it to put the round-about in. You'll see what I'm talking about.

E-35

Sincerely,

RIVER CITY REATLORS, INC.
Pat Kaster

cc: Karl Weber
Roger Kolb
Paul Jadin
Chuck Lamine
John Bunker
Dave Weise, Village of Howard

Msw: Roundabouts/Lineville Road roundabout study – final study – November 2001