Transportation Planning Rule Analysis

for

Herber Family Apartments

Keizer, Oregon

March 17, 2016

completed with
MultiTech Engineering Services, Inc.

Prepared by:
Associated Transportation Engineering & Planning, Inc.
Salem, Oregon 97302
16-313

ASSOCIATED TRANSPORTATION ENGINEERING & PLANNING INC.
A.T.E.P., Inc.
1155 13th St. S.E.
Salem, OR. 97302
Tel.: 503-364-5066
FAX: 503-364-1260
e-mail: kbirky@atepinc.com

Memo

ASSOCIATED
TRANSPORTATION
ENGINEERING &
PLANNING INC.

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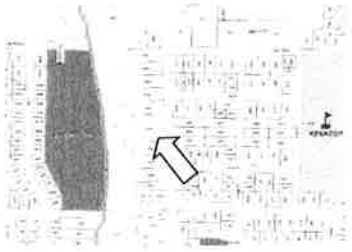
Salem, OR. 97302

Tel.: 503-364-5066
FAX: 503-364-1260
e-mail: kbirky@atepinc.com

Date: March 17, 2016
To: Mr. Mark Grenz, PE, IC
From: Karl Birky, PE, PTOE
Re: Transportation Planning Rule - Herber Family Apartments

I thank you for asking ATEP, Inc to provide this Transportation Planning Rule analysis for the proposed comprehensive plan map amendment and zone change of tax lots 3000 through 3600 of tax map 7S 3W Sec 2AA and lots 6700 through 7300 of tax map 7S 3W Sec 2AD. The 7.5 acre site is on the west side of Verda Lane between Chemawa Rd NE and Dearborn Ave in Keizer, OR. The change in the comp plan map you are requesting is from LD (Low Density Residential) to MHRD (Medium High Density Residential) and a zone change from RS to RM. In 2014 the City Council denied the request and it was appealed to LUBA. After subsequent discussion with the City, you have made changes to the site application and are resubmitting it for approval.



The 7.5 acre site is currently zoned for single family homes and the City of Keizer development code allows for single family parcels to develop with a density of 8 units/acre or in this case with 60 (theoretical) single family homes. The application you have submitted requests a comp plan map amendment and zone change to allow construction of 112 apartment units. You have asked ATEP to address the Transportation Planning Rule impact of the requested map amendment and zone change.

The Transportation Planning Rule (TPR) was adopted in Oregon years ago to provide direction and order to development in Oregon cities. The rule limits making changes to zoning and comprehensive maps that would "significantly affect" the transportation system that has developed and/or is being planned for the future in the City. For instance the rule would not allow a fast food restaurant in a residential neighborhood because it would generate significantly more traffic than is expected in a residential neighborhood. Cities use the ITE Trip Generation Manual to estimate the trip generation of a variety of uses. This study will use the Trip Generation Manual to estimate trip generation on this site. Application of the TPR often results in City's setting a cap (a limit) on the number of trips a project can generate so the traffic generated does not "significantly affect" the transportation system. This analysis recommends a cap on the trip generating capacity of development. The City should consider adding a trip generation cap of 750 daily trips, 60 AM Peak hour trips and 70 PM Peak hour trips from the site as a condition of approval.

A single family home generates 9.52 trips per day. 0.75 of those trips will be during the AM Peak hour and 1.00 trips will occur during the PM Peak hour. In this instance the site is zoned RS and could have 60 homes built on it. Sixty homes are estimated to generate 571 trips per day, 45 trips during the AM Peak hour and 60 trips during the PM Peak hour. If the zoning is changed to RM, the City Development Code would allow apartment units to be built on the site. An apartment unit generates 6.65 trips per day. 0.51 in the AM Peak hour and 0.62 trips in the PM Peak hour. The proposed 112 dwelling

units would generate 745 trips per day, 57 during the AM Peak hour and 69 during the PM Peak hour. During the AM peak traffic periods there would be an estimated 12 (57 - 45) additional vehicles using the transportation system. There would be 9 (69 - 60) additional vehicles during the PM Peak hour. There would be 174 additional trips on an average day. Roadways are designed to carry peak volumes of traffic which generally occurs during the PM Peak hour. PM Peak hour traffic generally has the greatest affect on the roadway system. The 9 additional vehicles per hour (1 vehicle every 6.5 minutes) from the apartments (instead of single family homes) will not have a "significant affect" on the traffic in the City.

The City of Keizer is working with ODOT to construct a roundabout at the intersection of Verda Lane and Chemawa Rd. This intersection is a concern to residents and users of the roadway. Roundabouts are a recent traffic control facility being used in Oregon. The literature indicates a significant increase in the number of roundabouts in the United States in the recent past. Lincoln, Nebraska found a 37% decrease in all accidents at intersections with roundabouts and a 65% decrease in travel delay. Other studies support the Lincoln experience. Traffic may move through a roundabout more slowly, but travel times are reduced because there are fewer stopping points with a roundabout and crashes at the intersection decline significantly.

While not scientific, the "Myth-Busters you-tube video" comparing roundabouts to 4 way stop control is interesting, enlightening and surprising. They found the roundabout handled 460 vehicles in 15 minutes (1840 veh/hour) compared to 385 vehicles in 15 minutes (1540 veh/hour) through a 4 way stop. This 20% improvement in capacity is consistent with other research. The 69 anticipated PM Peak hour trips the 112 apartments will generate can be added to the transportation system and it is reasonable to assume that crashes and travel times will be reduced from today's values with the completion of the roundabout.

Changing the comprehensive plan map and the zoning of the parcels will <u>not</u> generate traffic volumes that "significantly affect" the transportation system. The construction of a roundabout at the Verda Lane at Chemawa Road intersection can be expected to improve crash rates and reduce travel times with the added traffic from the planned apartments. The City should consider adding a trip generation cap of 750 daily trips, 60 AM Peak hour trips and 70 PM Peak hour trips from the site as a condition of approval. I can be reached at 503-364-5066 if there is additional information that you might find helpful. I thank you for asking ATEP to provide this analysis.

Regards,

Karl Birky, PE, PTOE
Traffic Engineer
Associated Transportation Engineering & Planning, Inc.

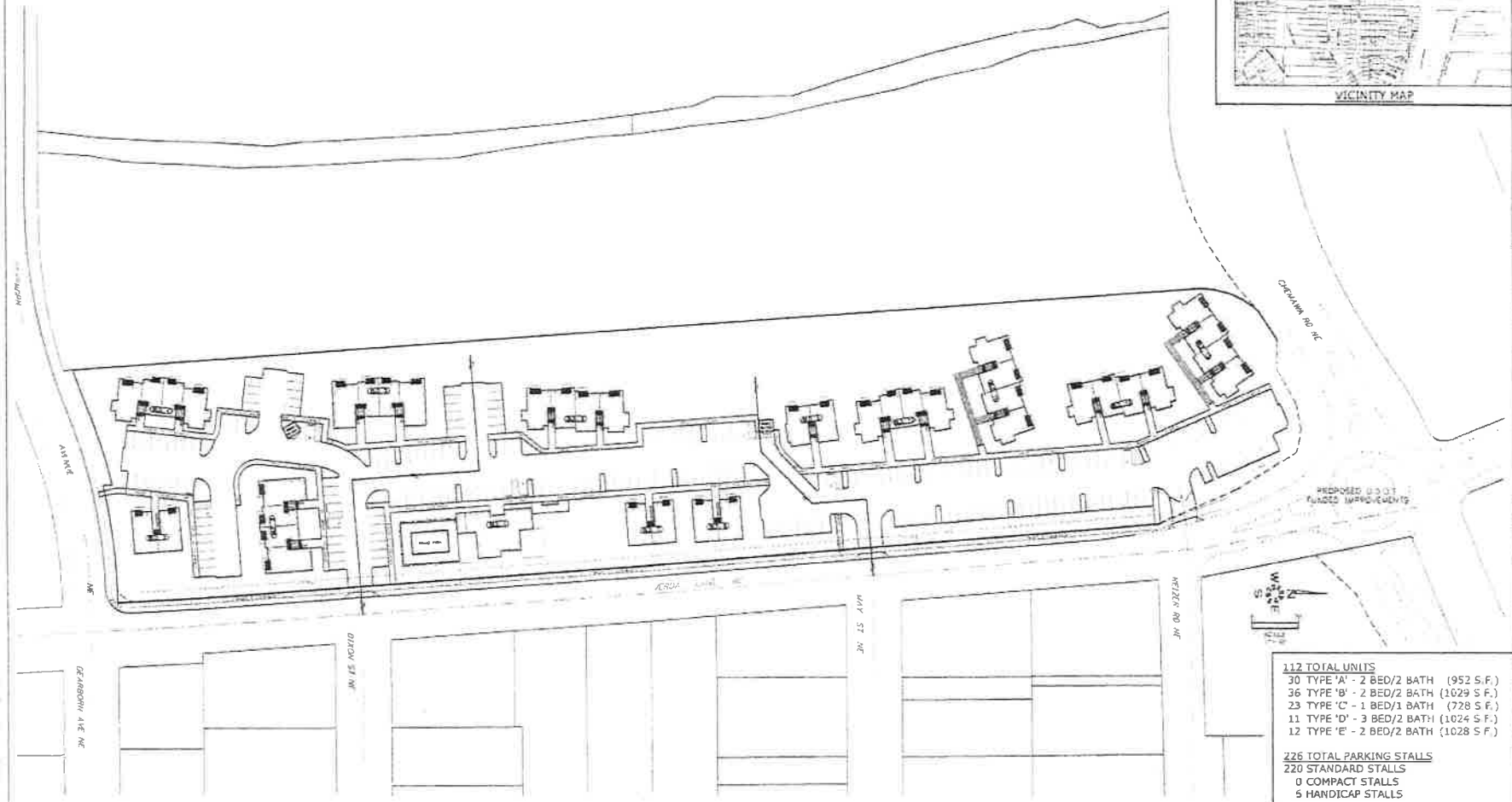
REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 22, 1991
KARL BIRKY
12/31/2017

Attached: Site Map
Trip Generation sheets
Washington DOT Information Sheet

HERBER FAMILY APARTMENTS

SEC. 2, T. 7 S., R. 3 W., W.M.
CITY OF KEIZER
MARION COUNTY, OREGON

Owner / Developer:
HERBER FARM LLC
670 CATER DR. N.E.
KEIZER, OREGON 97303



112 TOTAL UNITS
30 TYPE 'A' - 2 BED/2 BATH (952 S.F.)
36 TYPE 'B' - 2 BED/2 BATH (1029 S.F.)
23 TYPE 'C' - 1 BED/1 BATH (728 S.F.)
11 TYPE 'D' - 3 BED/2 BATH (1024 S.F.)
12 TYPE 'E' - 2 BED/2 BATH (1028 S.F.)

226 TOTAL PARKING STALLS
220 STANDARD STALLS
0 COMPACT STALLS
6 HANDICAP STALLS

SITE
1 RECREATION / OFFICE BUILDING
1 POOL
1 U.S. MAIL BOX AREA
1 PLAY/RECREATION AREAS
2 TRASH / RECYCLE

MULTI/TECH

PRELIMINARY COVER SHEET

HERBER FAMILY APARTMENTS

EXPIRES: 06-30-2017
JOB # 5725

C1.0

Single-Family Detached Housing
(210)

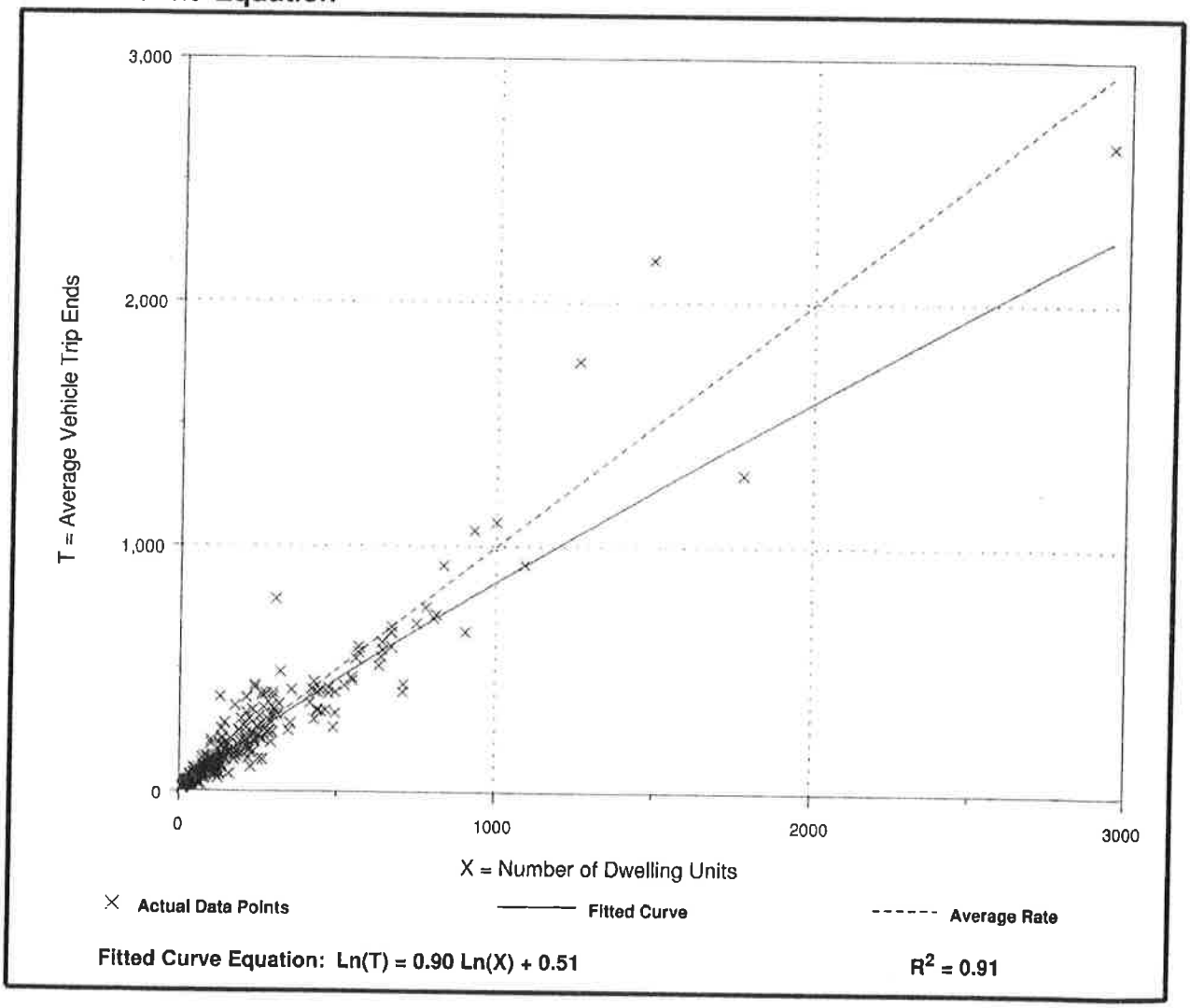
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 321
Avg. Number of Dwelling Units: 207
Directional Distribution: 63% entering, 37% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
1.00	0.42 - 2.98	1.05

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.90 Ln(X) + 0.51

R^2 = 0.91

Apartment
(220)

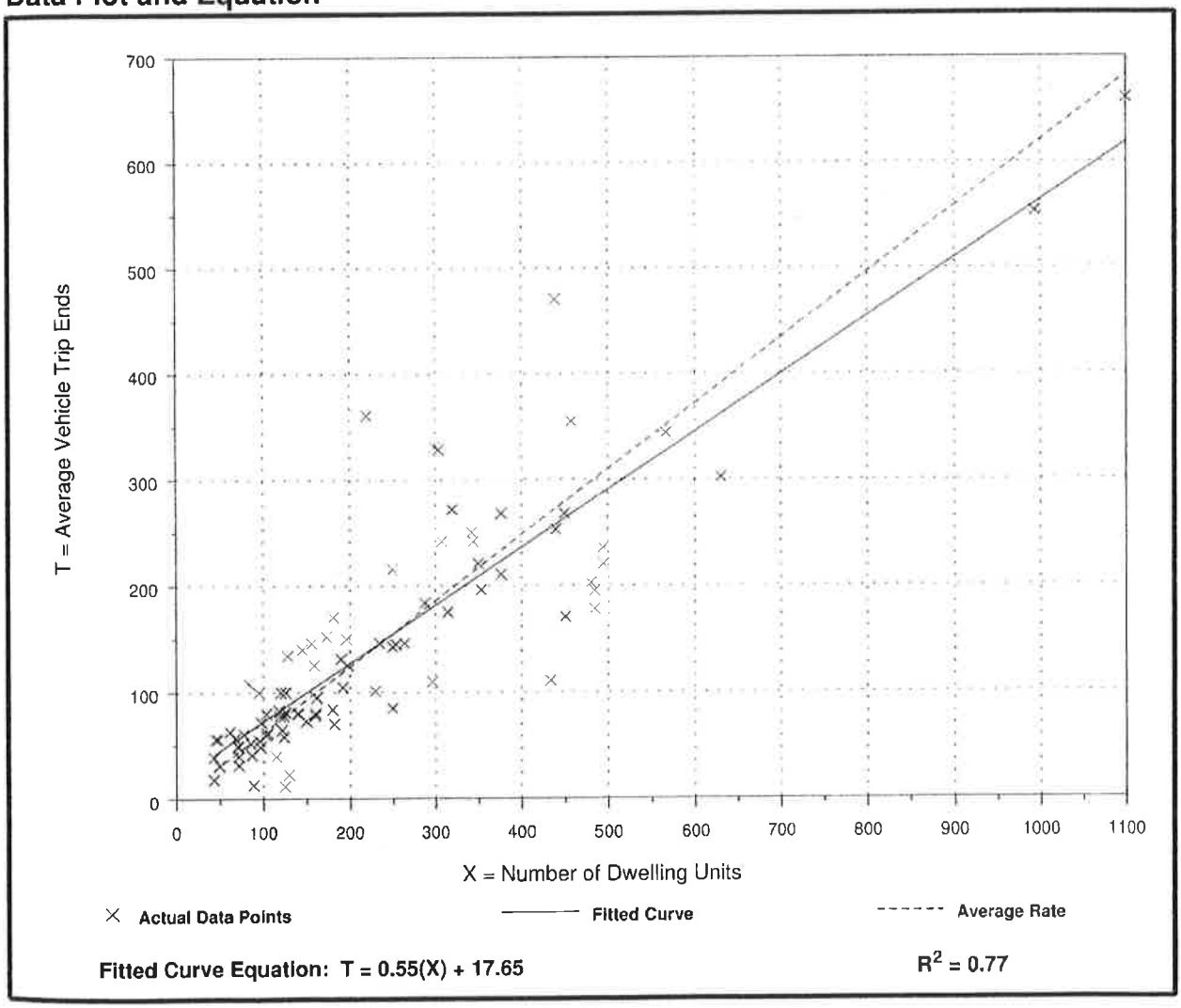
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 90
Avg. Number of Dwelling Units: 233
Directional Distribution: 65% entering, 35% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.62	0.10 - 1.64	0.82

Data Plot and Equation



Fitted Curve Equation: T = 0.55(X) + 17.65

R^2 = 0.77

Washington State Department of Transportation

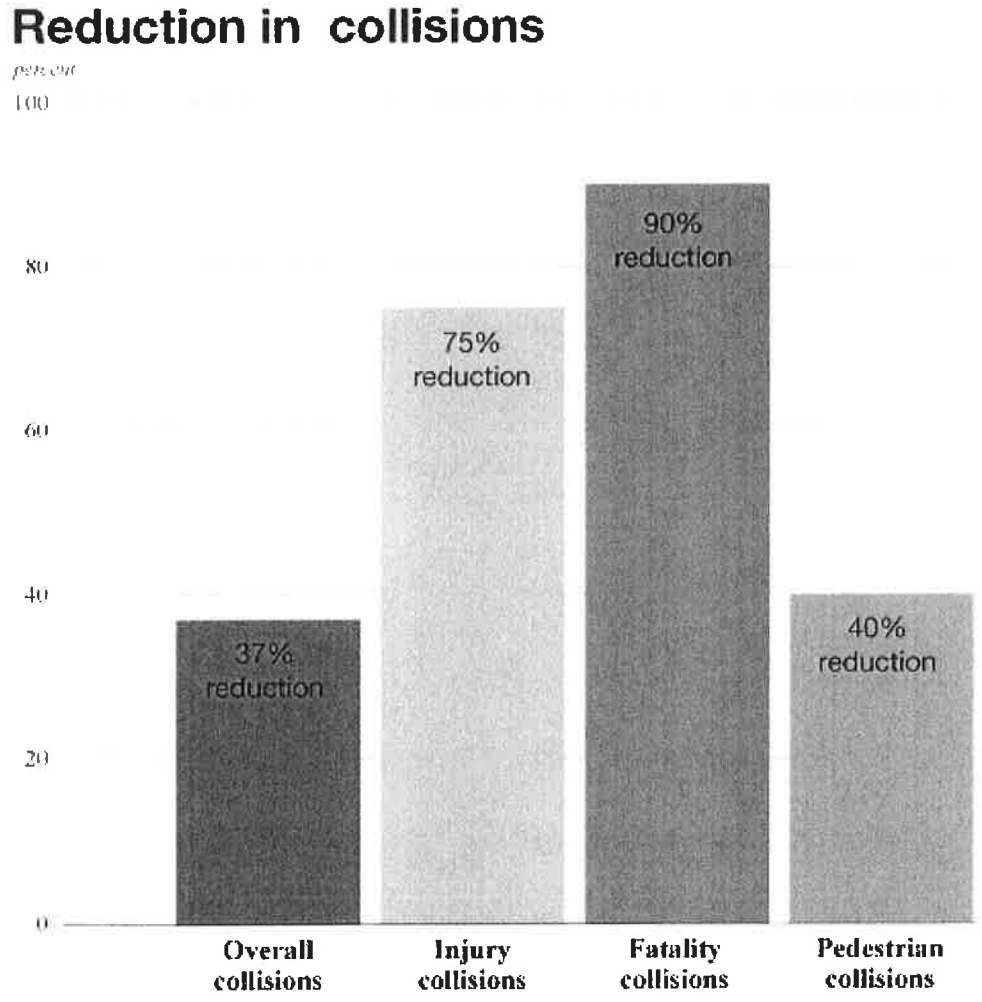
Roundabout Benefits

Improve safety

Studies have shown that roundabouts are safer than traditional stop sign or signal-controlled intersections.

Roundabouts reduced injury crashes by 75 percent at intersections where stop signs or signals were previously used for traffic control, according to a study by the Insurance Institute for Highway Safety (IIHS). Studies by the IIHS and Federal Highway Administration have shown that roundabouts typically achieve:

- A 37 percent reduction in overall collisions
- A 75 percent reduction in injury collisions
- A 90 percent reduction in fatality collisions
- A 40 percent reduction in pedestrian collisions



Source: Federal Highway Administration and Insurance Institute for Highway Safety (FHWA and IIHS)

There are several reasons why roundabouts help reduce the likelihood and severity of collisions:

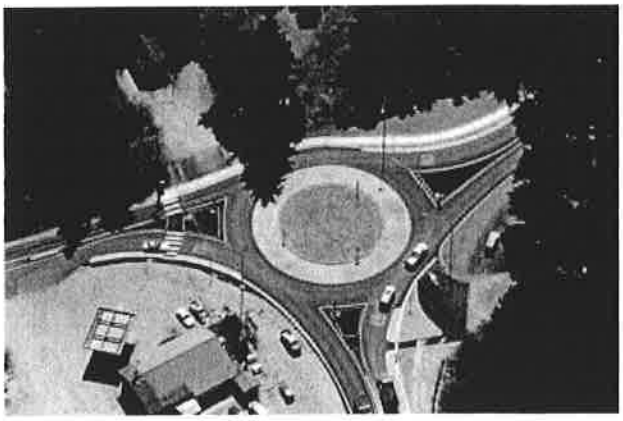
- **Low travel speeds** – Drivers must slow down and yield to traffic before entering a roundabout. Speeds in the roundabout are typically between 15 and 20 miles per hour. The few collisions that occur in roundabouts are typically minor and cause few injuries since they occur at such low speeds.
- **No light to beat** – Roundabouts are designed to promote a continuous, circular flow of traffic.

Drivers need only yield to traffic before entering a roundabout; if there is no traffic in the roundabout, drivers are not required to stop. Because traffic is constantly flowing through the intersection, drivers don't have the incentive to speed up to try and "beat the light," like they might at a traditional intersection.

- **One-way travel** – Roads entering a roundabout are gently curved to direct drivers into the intersection and help them travel counterclockwise around the roundabout. The curved roads and one-way travel around the roundabout eliminate the possibility for T-bone and head-on collisions.

Curious to know more? Watch a video about how roundabouts improve safety.

Reduce delay, improve traffic flow



Contrary to many peoples' perceptions, roundabouts actually move traffic through an intersection more quickly, and with less congestion on approaching roads. Roundabouts promote a continuous flow of traffic. Unlike intersections with traffic signals, drivers don't have to wait for a green light at a roundabout to get through the intersection. Traffic is not required to stop – only yield – so the intersection can handle more traffic in the same amount of time.

Studies by Kansas State University http://www.ksu.edu/roundabouts/ measured traffic flow at intersections before and after conversion to roundabouts. In each case, installing a roundabout led to a 20 percent reduction in delays. Additional studies by the IIHS of intersections in three states, including Washington, found that roundabouts contributed to an 89 percent reduction in delays and 56 percent reduction in vehicle stops.

Less expensive

The cost difference between building a roundabout and a traffic signal is comparable. Where long-term costs are considered, roundabouts eliminate hardware, maintenance and electrical costs associated with traffic signals, which can cost between $5,000 and $10,000 per year.

Roundabouts are also more effective during power outages. Unlike traditional signalized intersections, which must be treated as a four-way stop or require police to direct traffic, roundabouts continue to work like normal.

Less space

A roundabout may need more property within the actual intersection, but often take up less space on the streets approaching the roundabout. Because roundabouts can handle greater volumes of traffic more efficiently than signals, where drivers may need to line up to wait for a green light, roundabouts usually require fewer lanes approaching the intersection.

Good locations for roundabouts

Roundabouts are safe and efficient, but they are not the ideal solution for every intersection. We look at several factors when deciding to build a roundabout at a specific intersection. Engineers consider these characteristics when determining the best solution for a particular intersection:

- **Accident history** – data about the number of accidents, type of crash, speeds, and other contributing factors are analyzed.
- **Intersection operation** – the level of current and projected travel delay being experienced, and

backups on each leg of the intersection.

- **Types of vehicles using the intersection** – we look at the different kinds of vehicles that use the intersection. This is especially important for intersections frequently used by large trucks.
- **Cost** – this includes the societal cost of accidents, right-of-way (land purchase) requirements, and long-term maintenance needs.

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