

# I-90 Access Study Avon, Ohio

## DRAFT PURPOSE & NEED

January 17, 2007



**I-90 ACCESS STUDY**  
(AVON, OHIO)  
PURPOSE AND NEED STUDY

PREPARED FOR:

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## Background

Currently the City of Avon uses the Crocker Road and SR 83 interchanges to access I-90. In 2001, the City hired URS Corporation to complete a Master Thoroughfare Plan study. This study recommended an interchange with I-90 east of Nagel Road and west of the Cuyahoga County border. The City Planning Commission concurred and recommended that an interchange be built between 600 and 900 feet east of Lear Nagel Road in early 2003. However, in May 2003, Avon City Council voted to reject a plan to build the new interchange and opted instead to commission an Access Study for I-90 to look at the possible alternative solutions.

In April 2006, the Avon I-90 Access Study was completed. This study evaluated the adequacy of existing access to I-90 for the City of Avon and alternatives for addressing identified deficiencies. This study considered the existing roadway network bounded by Detroit Road (SR 254) to the south, Walker Road to the north, SR 83 to the west and Crocker Road to the east, including the existing interchanges with I-90. Based upon technical analyses and public input, the Study recommended construction of a new interchange on I-90 in the vicinity of the existing Nagel Road overpass.

## Purpose of the Project

The purpose of the project is to:

- **Support growth consistent with existing land use plans.** The existing industrial area for the City of Avon is currently poorly served. The only access to I-90 is provided by the heavily congested interchange at SR 83 via a circuitous route through several traffic signals and left-turns. Existing businesses have expressed concerns regarding the effects of poor access on their ability to expand and serve their customers. The City of Avon desires to meet the needs of existing businesses and to provide the necessary transportation infrastructure to better manage future growth in this area.
- **Reduce congestion to provide improved access to I-90.** The study area is currently served by two access points to I-90, the existing interchanges at SR 83 in the City of Avon and the Crocker Road interchange in the City of Westlake. Both interchanges, as well as intersections at adjacent arterials, are over capacity under current traffic volumes. As the area continues to grow, traffic congestion will continue to increase.

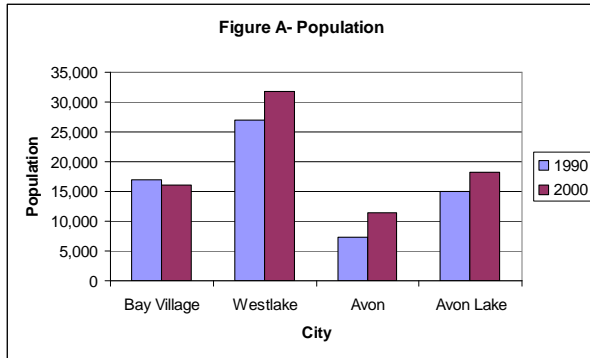
Each of these issues is discussed in detail below.

## Support Growth Consistent with Existing Land Use Plans

The City of Avon is within Cleveland's metro area, approximately fifteen miles west on I-90 from Cleveland in Lorain County. The city sits nearly four miles south of Lake Erie. Avon is bounded to the north by Avon Lake and Bay Village, and to the east by Westlake. This area has seen extensive growth over the past decade. Roughly 15,000 people have moved into this four-city region in that time.

The City of Avon in particular has experienced a high rate of growth. In July 2004, it is estimated that the City of Avon had a population of 14,880, more than double the 7,337 residents in 1990. Avon also leads the area in percentage change in population density.

Population Density	Land Area (mi <sup>2</sup> )	Pop Density (persons/mi <sup>2</sup> )-1990	Pop Density (persons/mi <sup>2</sup> )-2000	% Change in Pop Density (1990 to 2000)
Bay Village	4.63	3671.7	3473.4	-5.40%
Westlake	15.9	1699.2	1995.2	+17.42%
Avon	20.87	351.6	548.4	+55.97%
Avon Lake	11.13	1353.6	1630	+20.42%
Lorain County	492.5	550.5	578	+5.00%
Ohio	40,948	264.9	277.3	+4.68%



Commercial development is rapidly taking place within the region between the Crocker Rd and SR 83 interchanges. In 2004, a new retail area called the French Creek Square opened up at the northwest corner of Detroit Road and SR 83 and features 80,000 square feet of retail space. A large shopping complex (Avon Commons) opened at the northeast corner of the same intersection in 2001. The complex includes over 840,000 square feet of retail space on over 102 acres of land.

Industrial development has primarily been zoned on the north side of I-90 between the Crocker Rd and SR 83 interchanges. Currently, only 25% of the industrial zoned land in Avon, and 56% in Westlake have been filled by industrial companies. Henkel Industries, formerly Manco, is the largest industrial employer in the study area, with over 400 people at the Avon plant. Other noteworthy industrial companies in the study area include Lear Industrial, American Metals, and the Illuminating Co.

Industrial development has primarily been zoned on the north side of I-90 between the Crocker Rd and SR 83

Residential growth has also increased substantially in recent years south of I-90. According to the U.S. Census data, the number of housing units in the city has increased from 2,425 in 1990 to 4,291 in 2001. Avon leads Northeast Ohio in new housing units, and this number continues to grow. Since 2001, 1,221 new housing permits have been issued. According to the Master Thoroughfare Plan Study completed in 2000 by URS Corporation, 2,376 lots were platted for construction within the City of Avon, as of the end of 1999. According to the Avon Building Department, the number of new housing starts in the city has been increasing since 1998. In 2002, the City had the second-highest number of new housing starts in Northeast Ohio, with 403.

This number of new housing starts is expected to continue to rise. In 2004, 17 subdivisions in, or near, the study area are constructing new homes or are in development. These include Bentley Park, Highland Park, the Red Trail Development, Avenbury Lakes, Saddle Creek, Amberwood, The Vineyards, Avon Reserve at Summer Hill, Briar Lakes, Camelot Farms, Centennial Village, Creekside Homes, Stonebridge Creek, Village Lakes Estates, Charleston Place and Cottage Gate.

Number of Housing Units			
	1990	2000	% Change
<b>Bay Village</b>	6359	6401	+0.67%
<b>Westlake</b>	11014	13691	+24.31%
<b>Avon</b>	2425	4291	+76.95%
<b>Avon Lake</b>	5588	6934	+24.09%
<b>Lorain County</b>	99,937	111,368	+11.44%
<b>Ohio</b>	4,371,945	4,738,051	+8.37%

According to the Mayor of Avon, James Smith, the city will have approximately 46,000 residents when the city is fully built out. The median value of these housing units has increased over 100% in the last ten years, and outpaces the increase in home values in the surrounding area. This continued residential growth creates a tax burden on services for the rest of the city. To capture more tax base, the City of Avon adds industry to offset the costs of residential growth. Currently, only a small portion of the industrial zoned land has been developed. At the rate the region is growing, additional industrial expansion will be required to support the residential population.

The primary area for industrial growth is north of I-90 between the SR 83 and Crocker Road interchanges. The area is currently zoned for manufacturing or office use. Current access to I-90 for this area is inefficient, particularly for eastbound traffic. Existing businesses are concerned about traffic problems and circuitous travel patterns. Vehicles from the industrial area desiring to go eastbound on I-90 must use Chester Road westbound, pass through several signals and make several left turns in order to access I-90 at the congested SR 83 interchange. Other available routes under the existing conditions involve going north to Walker Road or south to Avon Road or Detroit Road to go west to Bradley and/or Crocker. These are also circuitous routes, and even less desirable than the SR 83 option.

Traffic operations are critical for businesses in this area. For example, Henkel used to have 72 hours from order to delivery. Now, their business requires half that. The smaller businesses in this area have similar concerns about transportation efficiency. As unemployment in northeast Ohio area increases, partially due to the loss of high-paying automotive manufacturing jobs, it becomes more critical to the entire region to effectively serve existing, expanding industries.

The City of Westlake has rejected suggestions to connect Just Imagine Drive to Clemmons Road to provide a more direct connection from Avon’s industrial area to the interchange at Crocker Road. The Crocker Road interchange is already operating over capacity. Adding additional traffic to the Crocker interchange on the north side would further degrade the service to Westlake.

Development of this area according to its best advantage and according to its existing zoning requires appropriate access to I-90 in order to maintain appropriate service to existing, expanding industries and new business investments while minimizing the effect on residential areas.

**Provide Improved Access to I-90**

To evaluate the function of the existing access points to I-90, TranSystems prepared an assessment of the capacity of the existing roadway network between and including the existing interchanges at SR 83 and Crocker Road.

*Current Traffic Volumes.* Traffic counts were collected within the study area on Tuesdays, Wednesdays and Thursdays during April 2004, August 2005 and May 2006 to get an accurate representation of normal morning and afternoon peak hour traffic. Traffic for intersections was collected using manual turning movement counts as well as tube counts with portable machine counters. Manual turning movement counts at selected intersections were collected between the hours of 7:00-9:00 a.m. and 4:00-6:00 p.m. Tube counts were collected over a 24-hour period on selected roadway sections.

Due to the number of intersections in the study area and the availability of recent traffic studies, TranSystems utilized traffic counts and projections from previously accepted traffic studies for the Jaycox & Detroit, Jaycox & Chester, and Nagel & Avon intersections. The traffic counts or projections were then adjusted to year 2006 counts to account for traffic growth. These traffic projections, combined with the 2004-2006 traffic counts collected by TranSystems, served as the base-year or “Current Year” traffic data for analyses.

*2010 and 2030 Traffic Projections.* ODOT office of Technical Services prepared year 2010 and 2030 volumes with the NOACA regional travel demand model assignments, using a hybrid mix of the ratio and additive methods. The 2006 peak hour volumes were adjusted to reflect the design hour volumes in Years 2010 and 2030. For at-grade intersections, these volumes were then adjusted to maintain balanced flow through the respective corridors. Mainline capacity analyses for 2010 and 2030 are summarized in the tables below.

The AM and PM peak hours were identified from the traffic counts and used in the analyses for the study area. The following table presents the results of the traffic analyses. To help illustrate the results, intersections resulting in a Level-of-Service (LOS) of E or F were highlighted in red; furthermore, analyses resulting in an LOS of D were highlighted with orange, because they represent locations that are more likely to degrade to a LOS of E or F in the design year.

2010 Unsignalized Intersections											
Intersection		EB		WB		NB		SB		Overall	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Nagel Rd. & Avon Rd.	AM	--	--	B	11.30	--	--	A(L)	7.90	--	--
	PM	--	--	B	10.90	--	--	A(L)	8.00	--	--
Jaycox Rd. & Chester Rd.	AM	B	11.31	B	10.23	A	9.13	A	8.92	B	10.34
	PM	B	11.36	B	12.41	B	11.14	A	9.54	B	11.41
Nagel Rd. & Chester Rd.	AM	B	12.01	A	9.44	C	15.84	A	9.89	B	13.57
	PM	B	13.86	B	14.67	C	16.88	B	10.70	B	14.66

(L) Denotes left turn movement only.

2010 Signalized Intersections											
Intersection		EB		WB		NB		SB		Overall	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SR 83 & Detroit Rd.	AM	D	36.6	C	25.9	D	36.2	C	23.1	C	31.3
	PM	D	37.0	D	43.2	D	43.2	D	41.2	D	41.4
SR 83 & I-90 EB Ramps	AM	F	87.4	N/A	N/A	F	90.5	E	70.4	F	82.9
	PM	D	49.9	N/A	N/A	D	49.8	B	19.0	C	34.8
SR 83 & I-90 WB Ramps	AM	N/A	N/A	D	38.2	C	21.0	D	38.4	C	31.8
	PM	N/A	N/A	F	82.0	C	24.6	F	81.5	E	64.9
SR 83 & Chester Rd (West)	AM	D	39.0	D	38.3	B	19.4	D	39.1	C	30.3
	PM	D	43.1	D	38.7	C	23.1	D	43.2	C	33.8
SR 83 & Chester Rd (East)	AM	C	23.0	C	24.8	C	24.4	C	21.7	C	23.2
	PM	C	30.6	D	36.0	D	35.5	C	25.1	C	31.4
Jaycox Rd. & Detroit Rd.	AM	B	11.7	B	11.1	B	11.8	B	11.7	B	11.6
	PM	B	13.0	B	13.2	B	13.2	B	13.5	B	13.2
Nagel Rd. & Detroit Rd.	AM	B	14.3	B	11.3	B	14.4	B	11.7	B	13.4
	PM	B	13.6	B	15.4	B	14.6	B	14.9	B	14.6
Crocker Rd. & Detroit Rd.	AM	D	40.9	D	41.0	D	40.4	D	39.4	D	40.4
	PM	D	46.7	C	34.3	C	33.9	D	45.3	D	41.1
Crocker Rd. & I-90 EB Ramps	AM	D	40.6	N/A	N/A	D	37.4	A	6.5	C	31.6
	PM	C	25.8	N/A	N/A	C	24.1	B	15.6	C	20.8
Crocker Rd. & I-90 WB Ramps	AM	N/A	N/A	D	39.6	C	30.4	D	39.3	D	36.5
	PM	N/A	N/A	F	100.3	F	94.2	F	104.9	F	100.3
Crocker Rd. & Clemens Rd.	AM	F	80.6	E	66.4	F	81.6	E	63.5	E	76.8
	PM	E	56.5	F	94.1	F	88.2	F	94.6	F	85.4
Jaycox Rd. & Chester Rd.	AM	B	13.4	B	11.6	B	12.3	B	13.4	B	12.8
	PM	B	13.2	B	13.6	B	12.6	B	13.0	B	13.2

### 2010 Results

The areas with the lowest LOS tend to be located adjacent to the SR 83 and the Crocker Rd interchanges. The SR 83 & I-90 Westbound Ramps intersection (PM), and the SR 83 & I-90 Eastbound Ramps intersection (AM) are both at LOS E and F, respectively. The intersection of SR 83 & Detroit Road in the PM Design Hour experiences LOS D. Both the eastern and western Chester Road intersections with SR 83 are at LOS C. Traffic flowing through the SR 83 & I-90 Eastbound Ramps intersection (AM) experiences the longest delay with an average wait time of 82.9 seconds to clear the intersection. As with the Crocker Road interchange, travelers going to and from the SR 83 interchange are experiencing delays as they access I-90.

Not only is the SR 83 interchange experiencing low levels-of-service but the Crocker interchange is encountering them as well. The Crocker Road intersections with Clemens Road and I-90 Westbound Ramps are at LOS F in the PM Design Hour. Furthermore, other intersections with Crocker Road are also near failure levels. The Crocker Road & Detroit Road intersection is at LOS D, while the Crocker Road and I-90 Eastbound Ramps intersection is at LOS C. The longest wait time at this interchange would occur for traffic moving through the Crocker Road and I-90 Westbound Ramps intersection. There, the average traveler would wait 100.3 seconds to move through the intersection. Residents or freight haulers from the north or south side of I-90 all experience long delays when trying to access I-90.

The 2010 peak hour LOS show that travelers from each of the four jurisdictions within the study area experiencing long delays as they approach access points to and from I-90. The Regional Shopping centers and the large volume of industrial and manufacturing companies attract substantial amounts of traffic to the area. This problem is further exacerbated by the large population living just beyond the industrial belt adjacent to the highway to the north and commercial belt adjacent to the south. The SR 83 and Crocker Road interchanges act as funnels in terms of serving traffic from each of the four cities. Residents, workers and shoppers who all rely so heavily on the use of the interstate are vying for limited access to and from I-90.

2030 Unsignalized Intersections											
Intersection		EB		WB		NB		SB		Overall	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Nagel Rd. & Avon Rd.	AM	--	--	F	112.60	--	--	A (L)	9.30	--	--
	PM	--	--	F	389.50	--	--	B (L)	12.00	--	--
Jaycox Rd. & Chester Rd.	AM	F	190.46	F	51.69	C	19.26	C	22.82	F	100.88
	PM	F	200.07	F	238.44	F	91.40	E	41.01	F	160.62
Nagel Rd. & Chester Rd.	AM	F	61.89	B	14.04	F	670.01	F	129.27	F	399.37
	PM	F	181.81	F	731.03	F	700.55	F	643.12	F	614.77

(L) Denotes left turn movement only.

2030 Signalized Intersections											
Intersection		EB		WB		NB		SB		Overall	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SR 83 & Detroit Rd.	AM	D	48.9	D	38.4	D	48.1	C	25.3	D	40.3
	PM	D	41.8	D	43.8	D	40.3	D	43.5	D	42.7
SR 83 & I-90 EB Ramps	AM	F	79.6	N/A	N/A	F	175.6	F	111.4	F	153.8
	PM	F	95.1	N/A	N/A	F	95.1	D	37.1	E	66.8
SR 83 & I-90 WB Ramps	AM	N/A	N/A	E	62.3	D	37.1	E	61.0	D	52.0
	PM	N/A	N/A	F	143.3	E	78.5	F	145.2	F	124.6
SR 83 & Chester Rd (West)	AM	D	43.4	D	42.9	C	26.4	D	43.4	D	36.0
	PM	D	51.7	D	49.3	C	24.8	D	51.3	D	40.5
SR 83 & Chester Rd (East)	AM	C	29.0	C	28.2	C	28.9	C	24.4	C	27.8
	PM	E	57.8	E	59.5	E	62.1	D	54.4	E	58.0
Jaycox Rd. & Detroit Rd.	AM	B	12.1	B	12.0	B	12.2	B	12.5	B	12.2
	PM	B	13.6	B	15.6	B	14.6	B	16.0	B	14.9
Nagel Rd. & Detroit Rd.	AM	C	20.7	B	13.4	C	22.1	B	12.6	B	18.9
	PM	B	18.9	D	54.8	E	60.1	C	27.6	D	40.3
Crocker Rd. & Detroit Rd.	AM	D	40.4	D	44.0	D	43.7	C	33.8	D	40.3
	PM	D	42.4	E	61.4	D	42.4	E	61.4	D	52.3
Crocker Rd. & I-90 EB Ramps	AM	E	70.6	N/A	N/A	E	65.7	A	4.6	D	54.7
	PM	D	47.4	N/A	N/A	D	42.4	C	23.7	D	36.2
Crocker Rd. & I-90 WB Ramps	AM	N/A	N/A	D	51.3	D	43.5	D	50.8	D	48.4
	PM	N/A	N/A	F	145.0	F	140.1	F	136.9	F	141.2
Crocker Rd. & Clemens Rd.	AM	F	147.5	F	105.3	F	146.7	F	106.3	F	137.3
	PM	F	167.0	F	108.6	F	169.0	F	163.5	F	156.8
Jaycox Rd. & Chester Rd.	AM	C	20.3	B	11.4	C	21.4	B	18.7	B	17.7
	PM	C	27.7	C	24.5	C	25.8	B	13.9	C	24.0

### *2030 Results*

As the region continues to grow, more and more traffic flows in from I-90 through a limited amount of access points. Again the intersections surrounding the two interchanges are at failing LOS. To the west, the SR 83 intersections with Chester Road (East), I-90 Westbound Ramps (PM), and I-90 Eastbound Ramps degrade to LOS E or F as well. The SR 83 intersections at Detroit Road and Chester Road (West), both degrade to LOS D. In addition, the Crocker Road intersections with I-90 Westbound Ramps (PM) and Clemens Road both degrade to LOS F. The intersection at Crocker Road & I-90 Eastbound Ramps degrades to LOS D. To the west, the SR 83 intersections with Chester Road (East), I-90 Westbound Ramps (PM), and I-90 Eastbound Ramps degrade to LOS E or F as well.

Outside the intersections directly adjacent to the SR 83 and Crocker Road interchanges, the intersection of Nagel Road & Detroit Road slips to LOS D by 2030. All of the Unsignalized intersections evaluated degrade to LOS F. The increase in traffic on Nagel Road is directly related to the growth expected in the area.

Delay times at intersections close to the SR 83 and Crocker Road interchanges substantially increased and in most cases, the delay times increased. The SR 83 and I-90 Eastbound Ramps intersection and the Crocker Road & Clemens Road intersection led the area with an increase of delay time of 70.9 seconds and 71.4 seconds increase, respectively. Unsignalized intersections outside the interchange areas were also found to degrade from overall LOS B in 2010 to LOS F in 2030. The intersection at Nagel & Chester went from 14.66 seconds in 2010 to 614.77 seconds in 2030 for delay time.

As the population grows, delay times will continue to increase on current over-capacity roadways, and possibly spill over onto roadways that were once operating at LOS C or better. Without improved access to I-90, this trend will continue well beyond 2030.