Purpose and Need

April 22, 2005

HAM-75-2.30 (PID 76257)

1.0 Introduction

The I-75 Mill Creek Expressway study was initiated by the Ohio Department of Transportation (ODOT) to study alternatives that will improve traffic flow, enhance safety and minimize impacts to adjacent properties along I-75 from the Western Hills Viaduct interchange on the south to the Paddock Road interchange on the north.

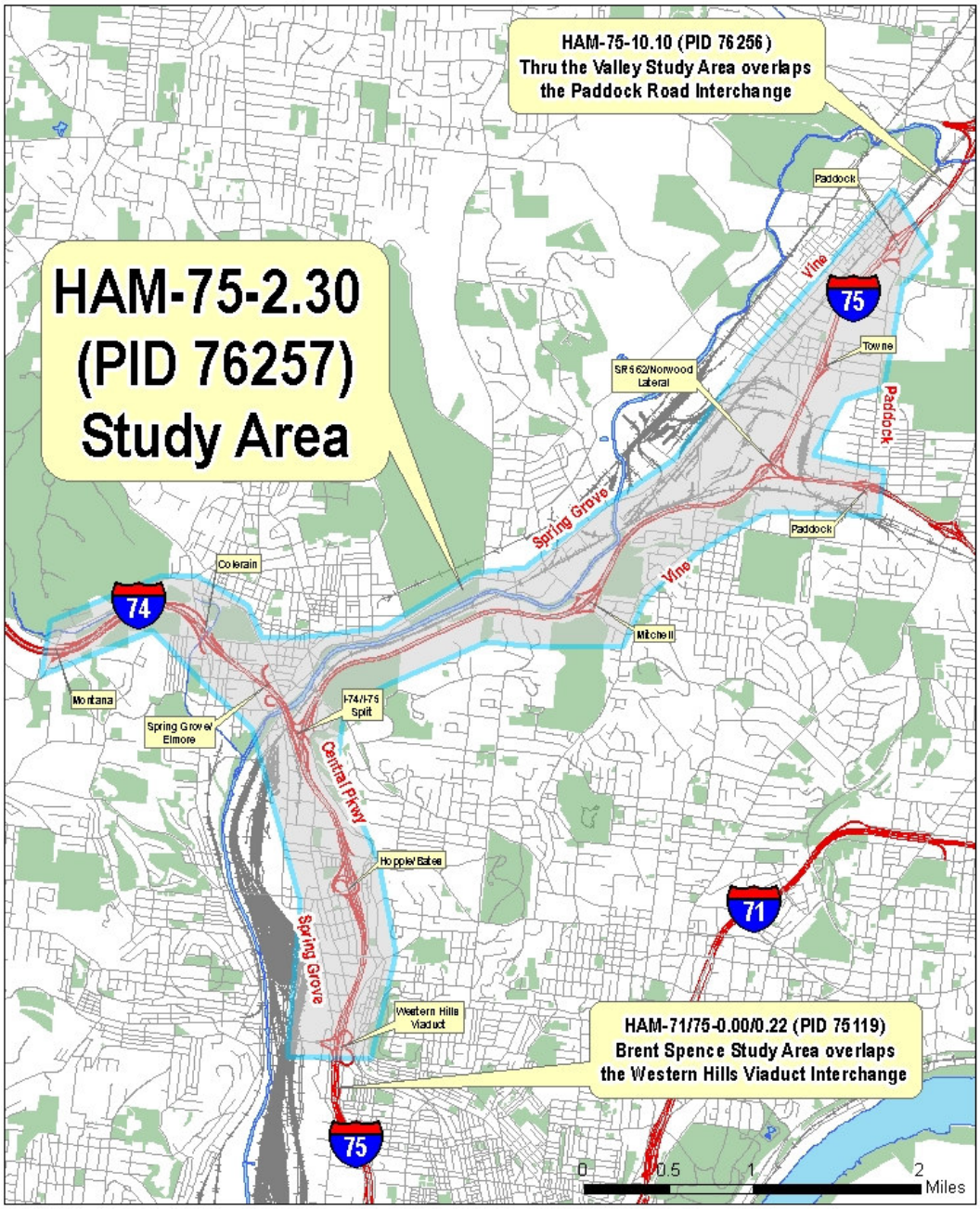
This section of the I-75 corridor has been documented as a congested freeway with a history of high accident frequency. Sections of this corridor have been identified by ODOT's Office of Roadway Safety and Mobility as high crash locations, safety hotspots and congested areas.

In 2000, the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) and the Miami Valley Regional Planning Commission (MVRPC) cooperated on a regional multi-modal transportation plan named the North South Transportation Initiative (NSTI). The NSTI's focus was to determine ways to improve safety, efficiency and reliability of the transportation networks within Southwest Ohio, Northern Kentucky and Southeast Indiana. Following analysis of the existing and future travel corridors combined with public concerns and thoughts, several projects were established to address the original focus of the NSTI. One of the most important corridors established by the public and stakeholders was Interstate 75. The I-75 Mill Creek Expressway study is intended to build upon this MIS and refine the recommendations within this portion of I-75.

2.0 Study Area

The section of I-75 under study includes the interchanges with Hopple Street, I-74, Mitchell Avenue, Norwood Lateral (SR 562), Towne Street and Paddock Road. In order to properly evaluate options at I-74/I-75, the study will also include the adjacent Colerain interchange on I-74 (See Figure 1: Study Area Map).

Figure 1: Study Area Map



When improvements to an interchange are being considered, studies are required to evaluate the conditions to the next adjacent interchange. Therefore, traffic data will be collected and evaluated on I-75 from the Western Hills Viaduct to Paddock Road, on I-74 from the Montana Avenue interchange to I-75, and on the Norwood Lateral from I-75 to the Paddock Road interchange. The study area includes portions of the City of Cincinnati, City of St. Bernard, and the Village of Elmwood Place.

This project serves as the link between two additional I-75 studies within Hamilton County. To the north, the Thru the Valley project involves the evaluation of I-75 from Paddock Road (on the south) to I-275 (on the north). To the south, the Brent Spence Bridge project involves a feasibility and constructability study of the replacement or rehabilitation of the structurally obsolete bridge over the Ohio River connecting Ohio and Kentucky. The study area begins at OH SLM 2.30 +/-, just south of the Western Hills Viaduct and continues to the Kyle's Lane Interchange at KY SLM 188.0+/- in Northern Kentucky. Both projects' goals include: improving traffic flow and reducing congestion, improving safety, enhancing the regional transportation network and developing solutions compatible with local communities.

Sharing the eastern boundary of the Mill Creek Expressway Project is the Uptown Transportation Study which is studying the pressure on the transportation infrastructure of the Cincinnati neighborhoods of Avondale, Clifton, Clifton Heights, Corryville, East Walnut Hills, Evanston, Fairview/University Heights, Mt. Auburn, North Avondale, and Walnut Hills. The Uptown area is home to institutions such as the University of Cincinnati, Cincinnati Zoo and Botanical Garden, U.S. Environmental Protection Agency, Children's Hospital, VA Hospital and the hospitals of the Tri-Health and Health Alliance. A major component of the Uptown Transportation Study is to evaluate the access to interstate highways bordering the Uptown area, including I-75.

3.0 Project Setting

Hamilton County is located in the southwest corner of Ohio. The county is bordered by the Ohio River and the State of Kentucky to the south and the State of Indiana to the west. The city of Cincinnati and a large majority of its metro-area are located within Hamilton County. The predominant land cover is the Mill Creek Valley bordered on either side by hills all within an urban setting. The I-75 corridor passes north-south through Hamilton County and the City of Cincinnati, and provides a connection between the states of Kentucky and Ohio.

4.0 Regional Mobility

According to the 2000 Census data, Greater Cincinnati is ranked 23rd among metropolitan regions in the country with an estimated population just shy of 2 million. By 2030, the population is expected to climb to over 2.3 million. The Greater Cincinnati region is comprised of Hamilton, Butler, Warren and Clermont counties in Ohio, Boone, Kenton and Campbell counties in Kentucky and Dearborn, Franklin and Ohio Counties in Indiana. The Greater Cincinnati region's economic strength is dependent on an effective transportation network that connects regional job centers, neighborhoods, shopping centers, and attractions. The following quote from the Cost-Benefit Analysis of the North-South Transportation Initiative summarizes the importance of an effective transportation network:

> "Congestion-related costs take a toll on economic productivity and growth. Slow traffic causes trucks to miss "just-in-time" delivery commitments, leading carriers to incur late-

> penalties and their customers to suffer production losses and higher inventory carrying costs. The loss in competitiveness threatens jobs. In the service sector, traffic congestion creates thousands of hours of lost working time each week. Workers sacrifice productive working hours at the office by leaving for meetings earlier than desired in order to arrive on time. Meetings often start late because people are delayed. The economic value of lost working time in Greater Cincinnati exceeded $525 per driver in 1997, an eight-fold increase in cost since 1982. Cincinnati, which ranked as the nation's 34th most congested urban area in 1990, jumped to 18th by 1997."

The results of rising congestion are felt directly by the taxpayer in increased economic and social costs and through the environmental effects caused by vehicle emissions. In addition, rising congestion increases the number and severity of collisions.

In 2004 ODOT produced *ACCESS OHIO 2004-2030*, an update of the original document created in 1993. In the original document and the update, I-75 from just north of Dayton to the Kentucky state line was designed as a "Macro Highway Corridor" because of its regional and national affect on travel and trade. With I-75 experiencing increased congestion and safety issues, ODOT has selected numerous projects to remedy those inadequacies.

A related focus of the North South Transportation Initiative was the consideration of conceptual transit alternatives to alleviate the already limited systems and brace for future increases. One of the conceptual alternatives involved the introduction of light rail into the I-75 corridor. The concept put forth in the NSTI near I-75 would run from 12th Street in Covington, Kentucky through the Cincinnati Central Business District and along I-71. This light rail concept would then continue through the city of Norwood and run parallel to I-75 from the SR 562 (Norwood Lateral) to Paddock Road, where it would continue north to Kemper Road near the Tri-County Mall and I-275. As a part of the I-75 Mill Creek Expressway Study, the highway alternatives will be evaluated to ensure that the future design would not preclude the implementation of light rail in this area.

5.0 Existing Physical Conditions

The I-75 Mill Creek Expressway is typical of urban highway construction dating from the 1950's and 1960's. Lower speed curves, left-hand exit ramps, poor lane continuity, and undesirable service ramp locations are some of the problematic features within the corridor. The speed limit is posted as 55mph throughout the study area.

A description of the interstate mainlines, along with major access points and the known deficiencies are summarized below. More detail about the observed conditions may be found in the Existing and Future Conditions Report.

I-75 Mainline. The existing mainline freeway consists of four lanes each way south of the I-74 interchange, and three lanes each way to the north. A number of deficiencies such as horizontal and vertical curvature and stopping sight distance are present. The median shoulder is narrow (under 10') in most places. The minimum shoulder width for interstate routes per the *Location and Design Manual* is 15' for three or more lanes each direction. Another criterion that has proven to be an issue on urban freeways of similar age is vertical clearance under overhead structures. Existing vertical clearance has not been identified as a specific problem in this area, but later steps that consider alternatives will address this issue.

One existing mainline feature of concern is the tall concrete median barrier that is present over most of the project length. Median barriers will be examined in later steps to address potential stopping sight distance restrictions.

I-74 Mainline. The existing mainline freeway consists of three lanes each way east of the Montana interchange to the I-75 interchange. The speed limit is posted as 55mph throughout the study area. I-74 continues northwest outside of the project area and eventually connects with I-275 briefly before continuing into Indiana. The mainline is elevated above the surrounding City of Cincinnati neighborhoods of Northside and South Cumminsville. As it continues west from the Colerain interchange, the mainline is located along the hillside near Mt. Airy Forest and begins an approximately two-mile section with a steep grade at the Montana interchange.

Hopple Street Interchange. The Hopple Street interchange contains a left-hand exit in the I-75 northbound direction. It also has a substandard I-75 eastbound-to-northbound entrance terminal and the westbound-to-northbound entrance ramp originates from Bates Avenue, not Hopple Street, fragmenting the interchange. Northbound traffic from Bates is designed to continue onto I-74 and not permitted to access I-75 north; however, site visits have proven that traffic does not obey the design.

I-74 System Interchange (including Spring Grove). The I-74 system interchange presents numerous deficiencies, local access ramps, and challenging physical constraints. It does not provide directional ramps for all freeway movements. The southbound exit ramp from I-75 has a posted speed limit of 20 mph and the northbound ramp has a posted speed limit of 40 mph.

A typical system interchange allows a free-flow, high speed connection; however, local access ramps create the opposite, weaving and reduced speed entering and exiting. The I-74 EB ramp to I-75 NB includes a local exit and entrance ramp at Central Parkway adjacent to Cincinnati State College. Additional local access ramps are located just west of the 74/75 interchange. One is an exit ramp where I-74 WB traffic can exit at Colerain/Elmore, the other is an entrance ramp where SB Spring Grove traffic can enter I-74 EB and only access I-75 SB.

Colerain Interchange (I-74). The existing interchange was intended to be a system interchange connecting I-74 with the proposed Colerain Connector (SR 27). The Colerain Connector was never constructed and

the existing interchange is overbuilt for the current conditions. From Colerain Avenue on the north to the Elmore/Beekman intersection on the south the distance is over a half mile. The interchange does not allow full movements as currently constructed. For instance, Beekman NB traffic can only access I-74 WB or continue north to Colerain Avenue.

Mitchell Avenue Interchange. The Mitchell Avenue interchange is one of the primary routes for visitors to the Cincinnati Zoo and Botanical Garden. The interchange also services large truck volumes destined for industrial facilities within the surrounding area. The existing interchange is a standard spread diamond under I-75 with two lanes in each direction and short single lane left-turn lanes. There is inadequate storage for left-turning vehicles on Mitchell Avenue at the I-75 entrance ramps. The southbound exit from I-75 is a 30 mph low-speed ramp resulting from poor sight distance.

Norwood Lateral Interchange. The Norwood Lateral interchange provides full movements to and from I-75. The configuration of the ramps is adequate, but there are insufficient acceleration and deceleration lengths, which are further complicated by the Norwood Lateral's close proximity to the Towne Street interchange. In addition, the super-elevation is substandard.

Towne Street Interchange. Towne Street is an east-west collector that terminates at Paddock Road to the east. West of the interchange Towne Street becomes Township Avenue in the Village of Elmwood Place. The Towne Street interchange is a partial interchange, with entrance and exit ramps in the northbound direction only. The proximity of the Towne Street ramps to adjacent interchanges at Paddock Road and the Norwood Lateral contributes to safety and congestion concerns. The northbound exit ramp advisory speed limit is 35 mph. There is also restricted sight distance to the east on Towne Street due to grade.

Paddock Road Interchange. Paddock Road is a north-south arterial linking older industrial and residential areas northwest and southeast of I-75. Paddock Road has two lanes in either direction and has a posted speed limit of 40mph. The Paddock Road interchange is approximately one mile north of the Towne Street interchange and about one mile south of the Ronald Reagan Highway (SR 126) interchange. The full diamond interchange allows all movements on and off I-75. The interchange was recently reconstructed and incorporates Summit Road at the I-75 NB exit ramp. The NB entrance ramp experiences merge issues at peak and non-peak travel times due to proximity of the Ronald Reagan Highway (SR 126).

6.0 Traffic Volumes and Levels of Service (2004 and 2030)

Traffic counts were collected within the I-75 Mill Creek Expressway study area on Tuesdays, Wednesdays and Thursdays during October and November 2004 to get an accurate representation of normal weekday traffic. Traffic for the at-grade intersections was collected using turning movement counts; while ramp traffic was collected using portable machine counters. Mainline volumes were determined from the HAM-75-10.10 (PID 76256) study and carried through the I-75 Mill Creek Expressway study area. Details on traffic

data collection and volumes, as well as the analyses summarized below, can be found in the Existing and Future Conditions Report.

The AM and PM peak hours were identified from the traffic counts and used in the 2004 analyses for the study area. The following table presents the results for the 2004 existing condition analyses performed on the freeway segments within the I-75 study corridor. To help illustrate the results, analyses resulting in a 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.

2004 Interstate 75 Northbound Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
Paddock Road	Towne Street	4,397	D	28.5	4,475	D	29.1
Towne Street	SR 562 (Norwood Lateral)	4,415	C	21.5	4,026	C	19.6
SR 562 (Norwood Lateral)	Mitchell Avenue	4,087	D	26.5	3,857	C	25.0
Mitchell Avenue	I-74	3,974	C	25.8	3,311	C	21.5
I-74	Bates Avenue	3,431	B	16.7	6,186	D	30.2
Bates Avenue	Hopple Street	3,174	B	15.4	5,479	D	26.6
Hopple Street	Western Hills Viaduct	3,466	B	16.9	5,728	D	27.9
2004 Interstate 75 Southbound Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
Paddock Road	SR 562 (Norwood Lateral)	5,748	E	42.1	4,829	D	31.7
SR 562 (Norwood Lateral)	Mitchell Avenue	5,108	D	34.2	4,528	D	29.4
Mitchell Avenue	I-74	4,201	D	27.2	4,533	D	29.5
I-74	Hopple Street	6,822	D	34.3	4,365	C	21.2
Hopple Street	Western Hills Viaduct	6,675	D	33.2	3,846	C	18.7
2004 Interstate 74 Westbound Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
I-75 SB	Spring Grove/Elmore	2,318	A	11.0	5,433	C	25.8
Spring Grove/Elmore	Colerain Interchange	1,837	B	11.6	5,063	D	32.7
Colerain Interchange	Montana	1,506	A	9.5	4,857	D	31.0
2004 Interstate 74 Eastbound Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
I-75 SB	Colerain Interchange	5,478	E	36.7	1,811	B	11.5
Colerain Interchange	Montana	4,513	D	28.6	1,500	A	9.5
2004 State Route 562 Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
East bound: I-75	Paddock Road	2,819	D	26.8	3,318	D	32.0
Westbound: Paddock Rd	I-75	2,687	C	25.5	3,006	D	28.6

The daily peak hour traffic on all three freeways in the study area occurs during the 7:30-8:30 AM period. Southbound I-75, eastbound I-74 and eastbound SR 562 accommodate the highest volumes of traffic during the AM Peak period. The PM peak period appears to be spread out over several hours, thereby lessening its impact in one particular hour of the afternoon or evening. While no segment is currently operating at an LOS F, two are operating at an LOS E; southbound I-75 between Paddock and SR 562, and eastbound I-74 between the Colerain Interchange and I-75. Most of the southbound I-75 segments operate at an LOS D or worse in both the AM and PM Peak hours.

2004 Ramp-Freeway Junctions. While many of the freeway components were calculated as independently acceptable, some of the congestion throughout the network is due to the merge and diverge locations at interchanges. The following table presents the results for each of these locations. Once again red and orange highlighting was used to indicate the locations of concern.

2004 Interstate 75 Northbound Ramps

Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Paddock Road Exit Ramp	Diverge	D	31.1	D	31.5
Towne Street Entrance Ramp	Merge	C	25.8	C	24.2
Towne Street Exit Ramp	Diverge	C	26.4	C	24.3
SR 562 (Norwood Lateral) Entrance Ramp	Merge	D	29.8	C	26.0
SR 562 (Norwood Lateral) Exit Ramp	Diverge	D	31.9	D	29.6
Mitchell Avenue Entrance Ramp	Merge	C	20.7	B	19.9
Mitchell Avenue Exit Ramp	Diverge	C	25.3	C	21.2
I-74 Eastbound Entrance Ramp	Merge	B	10.8	A	4.4
I-74 Westbound Exit Ramp	Drop Lane	B	15.1	E	43.7
Bates Avenue Entrance Ramp	Merge	C	22.3	B	13.6
Hopple Street Entrance Ramp	Merge	B	11.7	B	18.4
Hopple Street Exit Ramp	Diverge	B	18.2	D	28.5
Western Hill Viaduct Entrance Ramp	Merge	B	16.0	C	20.8
Western Hills Viaduct Exit Ramp	Diverge	B	19.4	C	26.5

2004 Interstate 75 Southbound Ramps

Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Paddock Road Entrance Ramp	Merge	D	33.8	C	27.7
SR 562 (Norwood Lateral) Exit Ramp	Diverge	D	34.5	D	30.5
SR 562 (Norwood Lateral) Entrance Ramp	Merge	D	33.0	D	30.2
Mitchell Avenue Exit Ramp	Diverge	D	32.5	F	32.5#
Mitchell Avenue Entrance Ramp	Merge	C	24.5	D	29.4
I-74 Westbound Exit Ramp	Diverge	C	27.1	D	30.6
I-74 Eastbound Entrance Ramp	Add Lane	D	33.8	B	13.3
Hopple Street Exit Ramp	Diverge	D	32.9	C	22.0
Hopple Street Entrance Ramp	Merge	C	23.8	B	14.0
Western Hill Viaduct Exit Ramp	Diverge	D	30.2	B	19.0
Western Hills Viaduct Entrance Ramp	Add Lane	D	31.3	B	16.1

 # - The flowrate of the ramp and/or freeway exceeds capacity for the merge/diverge area, resulting in LOS F.

2004 Interstate 74 Westbound Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-75 Southbound Entrance Ramp	Add Lane	B	14.8	D	30.0
I-75 Northbound Entrance Ramp	Add Lane	B	15.1	E	43.7
Colerain Ave. @ Spring Grove/Elmore	Diverge	B	14.5	D	30.3
Colerain Interchange Exit Ramp	Drop Lane	A	9.2	C	20.9
Colerain Interchange Entrance Ramp	Add Lane	A	8.6	C	25.9
Montana Avenue Exit Ramp	Drop Lane	A	6.9	C	24.1

2004 Interstate 74 Eastbound Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-75 Southbound Exit Ramp	Drop Lane	D	33.8	B	13.3
I-75 Northbound Exit Ramp	Drop Lane	C	24.2	A	7.8
Spring Grove Avenue Entrance Ramp	Merge	D	32.8	B	15.1
Colerain Interchange Entrance Ramp	Add Lane	F	*	A	10.6
Colerain Interchange Exit Ramp	Drop Lane	F	*	A	7.8
Montana Avenue Entrance Ramp	Add Lane	D	29.4	A	10.4

** - Capacity exceeds HCS calculations*

2004 State Route 562 Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Paddock Rd to SR 562 EB Entrance Ramp	Merge	D	31.3	D	30.9
SR 562 EB to Paddock Rd Exit Ramp	Diverge	D	35.0	D	30.1
Paddock Rd to SR 562 WB Entrance Ramp	Merge	D	29.5	C	36.7
SR 562 WB to Paddock Rd Exit Ramp	Diverge	E	35.2	D	34.2

Along I-75, the southbound exit ramp at Mitchell Avenue and the northbound exit ramp at I-74 were found to be operating at an unacceptable LOS during the PM peak hour. Additionally, the Colerain Interchange eastbound entrance and exit ramps were both found to fail during the AM peak hour. Furthermore, the westbound exit ramp at Paddock Road on SR 562 was found to operate at LOS E. Several other ramps junctions were currently found to be performing at LOS D.

2004 At-Grade Local Street Intersection Analyses. Level-of-service analysis of freeway ramps does not incorporate local street constrictions occurring beyond the ramp junction. Therefore, it was necessary to analyze the local street intersections at, and adjacent to, the freeway ramps included in this study. The following tables present the intersections evaluated as part of this study and the results obtained for each location. Once again red and orange highlighting was used to detail the locations of interest.

2004 I-75 and Paddock Road Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Paddock Rd & I-75 SB ramps	AM	124.7	F	121.9	F	-	-	120.7	F	122.9	F
	PM	48.5	D	53.8	D	-	-	54.2	D	52.0	D
Paddock Rd & I-75 NB exit ramps/Summit Rd	AM	14.9	B	25.1	C	18.1	B	15.4	B	18.1	B
	PM	27.8	C	24.9	C	22.3	C	26.6	C	25.4	C
Paddock Rd & Seymore Ave	AM	22.9	C	13.3	B	14.2	B	23.0	C	19.7	B
	PM	22.4	C	13.2	B	22.4	C	20.4	C	19.3	B
Paddock Rd & North Bend Rd (stop controlled)	AM	99.8	F	-	-	54.9	F	-	-	-	-
	PM	27.1	D	-	-	11.3	B	-	-	-	-
Paddock Rd & Vine St	AM	32.0	C	33.3	C	13.1	B	31.3	C	29.5	C
	PM	24.4	C	24.6	C	18.3	B	24.5	C	22.5	C
Vine St & North Bend Rd	AM	12.8	B	13.6	B	12.8	B	13.5	B	13.3	B
	PM	14.5	B	13.6	B	14.7	B	11.9	B	13.9	B

2004 I-75 and Towne Street Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Towne St & I-75 NB ramps (stop controlled)	AM	8.2	A	-	-	15.5	C	-	-	-	-
	PM	10.4	B	-	-	129.8	F	-	-	-	-
Towne St & Paddock Rd	AM	14.0	B	-	-	14.2	B	11.2	B	13.2	B
	PM	18.4	B	-	-	19.0	B	8.6	A	15.6	B
Towne St & Chestnut Ave	AM	19.8	B	20.2	C	20.2	C	20.7	C	20.1	C
	PM	23.3	C	14.0	B	23.4	C	23.9	C	20.4	C
Towne St & Vine St	AM	15.6	B	15.7	B	11.1	B	16.0	B	14.7	B
	PM	14.4	B	13.4	B	14.4	B	13.3	B	14.0	B

2004 I-75 and Mitchell Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Mitchell Ave & I-75 NB ramps	AM	30.5	C	30.1	C	32.0	C	-	-	30.7	C
	PM	32.1	C	35.3	D	33.8	C	-	-	33.8	C
Mitchell Ave & I-75 SB ramps	AM	99.3	F	19.6	B	-	-	99.6	F	75.2	E
	PM	80.2	F	33.0	C	-	-	85.7	F	65.7	E
Mitchell Ave & Vine St	AM	101.4	F	15.9	B	109.1	F	28.7	C	82.7	F
	PM	40.4	D	98.3	F	103.1	F	22.5	C	72.4	E
Mitchell & Kenard Ave	AM	29.0	C	15.8	B	29.6	C	29.0	C	22.4	C
	PM	83.7	F	30.2	C	88.3	F	64.3	E	60.4	E
Mitchell & Spring Grove Ave	AM	63.5	E	68.6	E	66.1	E	21.0	C	62.2	E
	PM	106.2	F	108.1	F	110.8	F	112.5	F	109.3	F

2004 I-75 and Hopple Street / Bates Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Bates Ave & Central Parkway	AM	16.7	B	-	-	13.5	B	17.0	B	15.3	B
	PM	24.1	C	-	-	24.8	C	24.3	C	24.6	C
Hopple St/MLK Dr & Central Parkway	AM	21.5	C	40.7	D	40.1	D	43.0	D	31.1	C
	PM	28.7	C	86.6	F	83.6	F	81.7	F	66.8	E
Hopple St & I-75 NB/SB ramps	AM	18.7	B	19.7	B	-	-	19.5	B	19.2	B
	PM	9.2	A	20.6	C	-	-	20.1	C	17.8	B
Hopple St & Colerain Ave	AM	21.0	C	8.2	A	21.3	C	21.1	C	17.5	C
	PM	245.7	F	175.6	F	275.6	F	22.3	C	165.3	F

2004 I-75 and Western Hills Viaduct Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Western Hills Viaduct & Central Parkway	AM	23.5	C	14.4	B	15.0	B	23.6	C	21.8	C
	PM	26.5	C	20.8	C	14.4	B	24.3	C	20.0	C
Western Hills Viaduct & Spring Grove Ave	AM	15.5	B	-	-	7.7	A	15.0	B	12.6	B
	PM	15.8	B	-	-	11.4	B	15.2	B	13.2	B

2004 I-74 and Montana Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Montana Ave/West Fork Rd & I-74 WB ramps	AM	31.7	C	29.6	C	31.1	C	25.5	C	30.5	C
	PM	45.6	D	49.1	D	35.9	D	48.6	D	46.8	D

2004 I-74 and Colerain Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Colerain Ave & I-74 WB exit ramp	AM	16.0	B	13.8	B	16.1	B	-	-	15.8	B
	PM	17.7	B	21.8	C	22.1	C	-	-	21.6	C
Colerain Ave & West Fork Rd/ Virginia Ave	AM	67.6	E	140.3	F	14.0	B	145.0	F	109.1	F
	PM	35.1	D	45.0	D	43.4	D	42.3	D	42.7	D
Elmore St & Beekman St	AM	17.0	B	18.1	B	17.4	B	18.1	B	17.9	B
	PM	17.2	B	15.0	B	17.4	B	11.5	B	15.4	B

2004 I-74 and Spring Grove Ave / Elmore Street Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elmore St & Colerain Ave	AM	13.7	B	11.7	B	-	-	14.1	B	13.5	B
	PM	15.0	B	11.6	B	-	-	15.4	B	13.2	B
Colerain Ave & Spring Grove Ave	AM	17.6	B	-	-	8.1	A	17.8	B	15.7	B
	PM	15.2	B	-	-	7.0	A	15.0	B	11.1	B
Elmore St & William Dooley Byp	AM	-	-	17.6	B	11.1	B	17.3	B	14.1	B
	PM	-	-	21.3	C	19.4	B	21.3	C	20.2	C
Spring Grove Ave/Old Ludlow & Ludlow Ave/Hoffner St	AM	27.1	C	26.4	C	10.3	B	27.0	C	23.7	C
	PM	28.9	C	29.7	C	30.2	C	15.7	B	26.9	C
Ludlow Ave & Central Parkway	AM	20.9	C	8.9	A	21.1	C	-	-	18.6	B
	PM	22.7	C	10.1	B	21.8	C	-	-	16.0	B
I-74 WB exit ramp/Powers St & Colerain Ave	AM	12.7	B	-	-	11.9	B	12.4	B	12.4	B
	PM	12.0	B	-	-	12.7	B	12.1	B	12.3	B

2004 SR 562 and Paddock Road Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SR 562 EB ramps & Paddock Rd	AM	19.5	B	-	-	19.7	B	12.3	B	16.1	B
	PM	36.4	D	-	-	36.3	D	25.6	C	30.9	C
SR 562 WB ramps & Paddock Rd	AM	-	-	22.5	C	14.6	B	22.7	C	20.4	C
	PM	-	-	28.8	C	13.2	B	29.8	C	24.4	C

Within the vicinity of the I-75/Paddock Road interchange, the southbound ramps and North Bend intersections were computed to fail. An unacceptable LOS was also computed for the ramps intersection at the Towne Street interchange during the PM peak hour. At Mitchell Avenue, the intersections with the I-75 southbound ramps, Vine Street, Spring Grove Avenue, and Kenard Avenue were found to be unacceptable. In addition, unacceptable levels-of-service were found at the intersections of Hopple Street with Central Avenue and Colerain Avenue. Level of service analyses also produced unacceptable levels-of-service at the intersections of Colerain Avenue and West Fork Road/Virginia Avenue during the AM peak hour. LOS D operations were present at locations indicated on the table during the PM peak hour.

2030 Traffic Volumes. Year 2030 volumes were obtained using the OKI regional travel demand model assignments, using a hybrid mix of the ratio and additive methods. The 2004 peak hour volumes were adjusted to reflect the design hour volumes in Year 2030. For at-grade intersections, these volumes were then adjusted to maintain balanced flow through the respective corridors. Mainline capacity analyses for 2030 are summarized in the tables below.

2030 Interstate 75 Northbound Freeway Segments

Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
Paddock Road	Towne Street	7,488	F	*	7,133	F	*
Towne Street	SR 562 (Norwood Lateral)	7,703	E	42.6	6,546	D	32.4
SR 562 (Norwood Lateral)	Mitchell Avenue	7,269	F	*	6,772	F	*
Mitchell Avenue	I-74	7,402	F	*	6,162	F	*
I-74	Bates Avenue	7,080	E	36.3	9,149	F	*
Bates Avenue	Hopple Street	6,849	D	34.5	8,469	F	*
Hopple Street	Western Hills Viaduct	7,397	E	39.2	8,891	F	*

* - Capacity exceeds HCS calculations

2030 Interstate 75 Southbound Freeway Segments

Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
Paddock Road	SR 562 (Norwood Lateral)	8,464	F	*	8,112	F	*
SR 562 (Norwood Lateral)	Mitchell Avenue	7,718	F	*	7,753	F	*
Mitchell Avenue	I-74	6,613	F	*	7,713	F	*
I-74	Hopple Street	9,781	F	*	8,098	F	*
Hopple Street	Western Hills Viaduct	9,363	F	*	7,616	E	41.5

* - Capacity exceeds HCS calculations

2030 Interstate 74 Westbound Freeway Segments

Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
I-75 SB	Spring Grove/Elmore	2,714	B	12.9	5,774	D	27.4
Spring Grove/Elmore	Colerain Interchange	2,317	B	14.7	5,600	E	38.1
Colerain Interchange	Montana	1,993	B	12.6	5,461	E	36.5

2030 Interstate 74 Eastbound Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
I-75 SB	Colerain Interchange	6,170	F	*	2,596	B	16.4
Colerain Interchange	Montana	5,101	D	33.0	2,311	B	14.6

* - Capacity exceeds HCS calculations

2030 State Route 562 Freeway Segments							
Segment		AM			PM		
From	To	Volume	LOS	Density (pc/mi/ln)	Volume	LOS	Density (pc/mi/ln)
East bound: I-75	Paddock Road	3,574	E	35.4	3,091	D	29.4
Westbound: Paddock Rd	I-75	3,265	D	31.3	2,506	C	23.8

Unlike 2004, all of Interstate 75 southbound would operate at unacceptable levels of service in 2030, as well as most of Interstate 75 northbound. In addition, Interstate 74 westbound would operate at LOS E during the PM design hour while eastbound between I-75 and the Colerain Interchange would operate at LOS F in the AM design hour. Finally, SR 562 eastbound between Paddock Road and I-75 would degrade to an LOS E during the AM design hour.

2030 Ramp-Freeway Junctions. The following table presents the results for each of the merge-diverge locations in 2030. Once again red and orange highlighting was used to indicate the locations of concern.

2030 Interstate 75 Northbound Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Paddock Road Exit Ramp	Diverge	F	43.3#	F	42.2#
Towne Street Entrance Ramp	Merge	F	42.2#	F	41.9#
Towne Street Exit Ramp	Diverge	F	39.7#	F	35.6#
SR 562 (Norwood Lateral) Entrance Ramp	Merge	F	48.3#	F	38.9#
SR 562 (Norwood Lateral) Exit Ramp	Diverge	F	44.6#	F	42.2#
Mitchell Avenue Entrance Ramp	Merge	F	38.6#	F	36.6#
Mitchell Avenue Exit Ramp	Diverge	F	39.7#	F	34.7#
I-74 Eastbound Entrance Ramp	Merge	F	28.2#	F	18.8#
I-74 Westbound Exit Ramp	Drop Lane	B	17.9	F	*
Bates Avenue Entrance Ramp	Merge	C	27.2	F	32.0#
Hopple Street Entrance Ramp	Merge	C	23.7	F	28.9#
Hopple Street Exit Ramp	Diverge	E	38.2	F	44.8#
Western Hill Viaduct Entrance Ramp	Merge	C	22.6	F	27.3#
Western Hills Viaduct Exit Ramp	Diverge	D	33.9	F	44.7#

 # - The flowrate of the ramp and/or freeway exceeds capacity for the merge/diverge area, resulting in LOS F.

* - Capacity exceeds HCS calculations

2030 Interstate 75 Southbound Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Paddock Road Entrance Ramp	Merge	F	48.4#	F	46.2#
SR 562 (Norwood Lateral) Exit Ramp	Diverge	F	43.1#	F	42.9#
SR 562 (Norwood Lateral) Entrance Ramp	Merge	F	47.7#	F	37.1#
Mitchell Avenue Exit Ramp	Diverge	F	41.9#	F	41.2#
Mitchell Avenue Entrance Ramp	Merge	F	37.3#	F	45.1#
I-74 Westbound Exit Ramp	Diverge	F	37.6#	F	42.5#
I-74 Eastbound Entrance Ramp	Add Lane	F	*	C	19.7
Hopple Street Exit Ramp	Diverge	F	46.3#	F	38.5#
Hopple Street Entrance Ramp	Merge	F	34.1#	D	28.4
Western Hill Viaduct Exit Ramp	Diverge	F	41.8#	D	34.9
Western Hills Viaduct Entrance Ramp	Add Lane	F	*	E	37.2

 # - The flowrate of the ramp and/or freeway exceeds capacity for the merge/diverge area, resulting in LOS F.

* - Capacity exceeds HCS calculations

2030 Interstate 74 Westbound Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-75 Southbound Entrance Ramp	Add Lane	B	16.9	D	32.6
I-75 Northbound Entrance Ramp	Add Lane	B	17.9	F	*
Colerain Ave. @ Spring Grove/Elmore	Diverge	B	16.6	D	31.5
Colerain Interchange Exit Ramp	Drop Lane	A	10.0	C	20.0
Colerain Interchange Entrance Ramp	Add Lane	B	11.6	D	29.3
Montana Avenue Exit Ramp	Drop Lane	A	10.4	D	26.9

* - Capacity exceeds HCS calculations

2030 Interstate 74 Eastbound Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-75 Southbound Exit Ramp	Drop Lane	F	*	C	19.7
I-75 Northbound Exit Ramp	Drop Lane	C	23.8	A	9.2
Spring Grove Avenue Entrance Ramp	Merge	F	60.2#	D	29.2
Colerain Interchange Entrance Ramp	Add Lane	E	35.0	A	10.5
Colerain Interchange Exit Ramp	Drop Lane	D	28.3	B	13.2
Montana Avenue Entrance Ramp	Add Lane	D	27.4	B	11.5

 # - The flowrate of the ramp and/or freeway exceeds capacity for the merge/diverge area, resulting in LOS F.

* - Capacity exceeds HCS calculations

2030 State Route 562 Ramps					
Ramp	Junction	AM		PM	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Paddock Rd to SR 562 EB Entrance Ramp	Merge	D	34.0	D	34.1
SR 562 EB to Paddock Rd Exit Ramp	Diverge	E	37.5	D	32.7
Paddock Rd to SR 562 WB Entrance Ramp	Merge	D	31.9	C	25.2
SR 562 WB to Paddock Rd Exit Ramp	Diverge	E	37.0	D	34.4

As with the freeway segments, the ramp junctions on Interstate 75 would severely degrade by 2030. All of the I-75 northbound ramp junctions would operate at an LOS F during the PM design hour and most would operate at an unacceptable level-of-service during the AM design hour. For Interstate 75 southbound during the AM design hour, all of the ramp junctions would operate at an LOS F and most would operate at an LOS F during the PM design hour. Additionally, the I-75 northbound entrance ramp to I-74 westbound would operate at an LOS F. I-74 eastbound, the I-75 southbound exit ramp, Spring Grove Avenue entrance ramp and the Colerain Interchange entrance ramp would fail. Finally, the SR 562 entrance ramps in both directions would operate at an LOS E.

2030 At-grade Local Street Intersection Analyses. The following tables present the intersections evaluated as part of this study and the results obtained for each location for 2030. Once again red and orange highlighting was used to detail the locations of interest.

2030 I-75 and Paddock Road Interchange Area

Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Paddock Rd & I-75 SB ramps	AM	123.4	F	17.2	B	-	-	128.4	F	102.5	F
	PM	73.4	E	67.4	E	-	-	68.7	E	70.0	E
Paddock Rd & I-75 NB exit ramps/Summit Rd	AM	13.1	B	20.6	C	19.7	B	20.7	C	17.3	B
	PM	33.8	C	40.1	D	25.8	C	34.6	C	35.7	D
Paddock Rd & Seymore Ave	AM	24.6	C	13.4	B	15.3	B	24.3	C	20.6	C
	PM	26.2	C	15.3	B	26.4	C	19.5	B	21.1	C
Paddock Rd & North Bend Rd (stop controlled)	AM	74.1	F	-	-	462.1	F	-	-	-	-
	PM	83.1	F	-	-	14.1	B	-	-	-	-
Paddock Rd & Vine St	AM	63.7	E	68.9	E	11.6	B	75.5	E	64.2	E
	PM	31.9	C	29.9	C	23.1	C	32.0	C	28.5	C
Vine St & North Bend Rd	AM	11.6	B	15.4	B	13.5	B	15.2	B	14.5	B
	PM	16.5	B	16.0	B	16.0	B	11.9	B	15.4	B

2030 I-75 and Towne Street Interchange Area

Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Towne St & I-75 NB ramps (stop controlled)	AM	7.6	A	-	-	20.5	C	-	-	-	-
	PM	11.3	B	-	-	448.2	F	-	-	-	-
Towne St & Paddock Rd	AM	13.1	B	-	-	13.2	B	12.3	B	12.8	B
	PM	34.6	C	-	-	34.3	C	5.4	A	26.7	C
Towne St & Chestnut Ave	AM	20.2	C	21.0	C	20.2	C	20.9	C	20.6	C
	PM	23.4	C	14.2	B	23.5	C	23.1	C	20.7	C
Towne St & Vine St	AM	19.8	B	20.2	C	9.7	A	20.4	C	17.9	B
	PM	15.2	B	13.7	B	15.7	B	12.6	B	14.7	B

2030 I-75 and Mitchell Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Mitchell Ave & I-75 NB ramps	AM	52.4	D	41.6	D	51.9	D	-	-	49.1	D
	PM	36.4	D	37.9	D	37.9	D	-	-	37.3	D
Mitchell Ave & I-75 SB ramps	AM	107.6	F	31.8	C	-	-	110.1	F	81.7	F
	PM	88.6	F	30.7	C	-	-	92.9	F	69.3	E
Mitchell Ave & Vine St	AM	59.6	E	13.1	B	58.9	E	25.8	C	48.0	D
	PM	29.8	C	56.0	E	54.0	D	28.7	C	44.0	D
Mitchell & Kenard Ave	AM	27.9	C	18.4	B	28.6	C	28.0	C	22.6	C
	PM	84.6	F	41.6	D	81.6	F	77.1	E	64.7	E
Mitchell & Spring Grove Ave	AM	50.7	D	47.9	D	50.7	D	22.7	C	46.6	D
	PM	111.3	F	109.7	F	111.6	F	100.7	F	109.1	F

2030 I-75 and Hopple Street / Bates Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Bates Ave & Central Parkway	AM	16.7	B	-	-	10.1	B	16.7	B	13.2	B
	PM	24.5	C	-	-	21.6	C	24.2	C	22.6	C
Hopple St/MLK Dr & Central Parkway	AM	37.3	D	43.0	D	42.3	D	40.3	D	39.3	D
	PM	33.8	C	99.5	F	93.3	F	100.3	F	77.3	E
Hopple St & I-75 NB/SB ramps	AM	27.2	C	21.7	C	-	-	29.4	C	27.6	C
	PM	9.6	A	22.8	C	-	-	22.1	C	19.5	B
Hopple St & Colerain Ave	AM	21.8	C	7.1	A	21.3	C	21.1	C	17.2	B
	PM	299.9	F	268.2	F	352.3	F	28.7	C	228.1	F

2030 I-75 and Western Hills Viaduct Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Western Hills Viaduct & Central Parkway	AM	67.0	E	9.1	A	18.8	B	61.4	E	54.2	D
	PM	23.4	C	19.1	B	22.0	C	23.6	C	22.1	C
Western Hills Viaduct & Spring Grove Ave	AM	15.6	B	-	-	8.6	A	15.6	B	13.3	B
	PM	15.8	B	-	-	13.4	B	15.6	B	14.3	B

2030 I-74 and Montana Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Montana Ave/West Fork Rd & I-74 WB ramps	AM	34.3	C	31.6	C	32.4	C	34.0	C	33.3	C
	PM	48.4	D	54.6	D	38.3	D	51.6	D	50.9	D

2030 I-74 and Colerain Avenue Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Colerain Ave & I-74 WB exit ramp	AM	16.4	B	14.3	B	16.5	B	-	-	16.1	B
	PM	16.8	B	22.1	C	21.5	C	-	-	21.3	C
Colerain Ave & West Fork Rd/ Virginia Ave	AM	74.0	E	156.6	F	14.0	B	158.7	F	117.0	F
	PM	44.8	D	43.9	D	47.3	D	43.3	D	45.9	D
Elmore St & Beekman St	AM	17.0	B	17.0	B	17.1	B	15.2	B	16.1	B
	PM	17.2	B	16.6	B	17.3	B	10.6	B	16.0	B

2030 I-74 and Spring Grove Ave / Elmore Street Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elmore St & Colerain Ave	AM	13.1	B	11.8	B	-	-	13.4	B	12.9	B
	PM	19.2	B	9.0	A	-	-	19.3	B	13.2	B
Colerain Ave & Spring Grove Ave	AM	15.2	B	-	-	6.6	A	15.1	B	12.9	B
	PM	14.6	B	-	-	6.7	A	14.9	B	10.4	B
Elmore St & William Dooley Byp	AM	-	-	17.8	B	10.8	B	17.3	B	14.2	B
	PM	-	-	22.0	C	19.2	B	22.7	C	20.8	C
Spring Grove Ave/Old Ludlow & Ludlow Ave/Hoffner St	AM	33.0	C	27.7	C	10.2	B	32.4	C	27.4	C
	PM	53.4	D	31.0	C	52.5	D	15.3	B	44.1	D
Ludlow Ave & Central Parkway	AM	20.0	C	10.5	B	19.6	B	-	-	17.9	B
	PM	20.7	C	12.7	B	20.9	C	-	-	16.4	B
I-74 WB exit ramp/Powers St & Colerain Ave	AM	12.2	B	-	-	12.0	B	12.2	B	12.2	B
	PM	12.3	B	-	-	12.6	B	11.2	B	12.1	B

2030 SR 562 and Paddock Road Interchange Area											
Intersection	Time Period	Eastbound		Westbound		Northbound		Southbound		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SR 562 EB ramps & Paddock Rd	AM	17.9	B	-	-	18.2	B	12.4	B	15.4	B
	PM	32.9	C	-	-	33.0	C	34.0	C	33.5	C
SR 562 WB ramps & Paddock Rd	AM	-	-	18.3	B	11.1	B	18.2	B	16.1	B
	PM	-	-	61.4	E	15.0	B	62.4	E	47.7	D

In addition to the intersections that experience unacceptable levels of service in 2004, a few other intersections will have capacity issues in 2030. In the Interstate 75 and Paddock Road interchange area, the Paddock Road and Vine Street intersection will operate at an LOS E during the AM design hour. The I-75 and Mitchell Avenue interchange area will continue to degrade to the point where two of the intersections will experience LOS F. The remaining intersections that will operate at unacceptable levels of service (LOS E or F) in 2030 are the same intersections that operate at unacceptable levels of service in 2004.

7.0 Safety

The portion of the I-75 corridor under study has been documented as a congested freeway with a history of high accident frequency. The sections of this corridor, along with the sections of I-74 and SR 562, on the High Crash Location Identification System (HCLIS), are shown in Table A below. This system is used to identify high hazard locations. Many sections and interchanges located in the study area show up on this list. I-74 from SLM 18.49 to 18.99 ranks first and SR 562 from SLM 0.56 to 1.06 ranks second. Overall, seven sections and three interchanges on I-75, two sections and one interchange on I-74 and two sections and one interchange on SR 562 appear on the list. Six sections on I-75 in the study area rank in the top one hundred on the HSP list.

Table A: Highway Safety Program Listings in Study Area

	Begin Mile	End Mile	Location Type	HCLIS Rank
I-75 Corridor Segments and Interchanges	5.52	6.02	Section	24
	7.50	8.00	Section	35
	3.52	4.02	Section	39
	8.50	9.00	Section	47
	4.50	5.00	Section	52
	2.54	3.04	Section	83
	6.50	7.00	Section	121
	6.04	--	Interchange	557
	3.05	--	Interchange	655
	6.46	--	Interchange	661
I-74 Corridor Segments and Interchanges	18.49	18.99	Section	1
	17.50	18.00	Section	48
	19.02	--	Interchange	622
SR 562 Corridor Segments and Interchanges	0.56	1.06	Section	2
	0	0.56	Section	210
	0	--	Interchange	640

Source: ODOT Office of Roadway Safety and Mobility High Crash List, 2001-2003

Safety Hot Spots were also identified using Data from the Office of Roadway Safety and Mobility. The Hot Spot locations are based on having 200 or more accidents in an area over a three year period, regardless of traffic volume and other factors. Ohio roadways are divided into two-mile segments, and the number of crashes is compared to a given rate to establish if a hot spot exists. Table B below lists the Safety Hot Spots in the study area. It should be noted that the entire I-75 Mill Creek Expressway study area is listed within the following Safety Hot Spot table.

Table B: Safety Hot Spots

	Begin Mile	End Mile	# of Crashes	# Fatal	# of Injuries
I-75 Corridor Segments	2.22	4.22	802	2	205
	4.22	6.22	666	1	180
	6.22	8.22	688	0	180
	8.22	10.22	580	1	130
I-74 Corridor Segments	16.00	18.00	351	2	89
	18.00	19.47	255	0	72
SR 562 Segments	0.00	2.00	525	2	136

Source: ODOT Office of Roadway Safety and Mobility Safety Hot Spot List, 2001-2003

Crash Data Analyses. Traffic Crash information for the study area was obtained from both ODOT's Office of Roadway Safety and Mobility and from the Ohio Department of Public Safety (ODPS). These data include a summary of crashes in the study area from ODOT and OH-1 reports for all crashes occurring between 2001 and 2003 within the study area. All crashes were analyzed and incorrect and missing data were corrected using the individual OH-1 reports.

The accidents were then mapped by year (2001-2003) utilizing the ArcGIS software and an aerial photograph of Hamilton County obtained from the Cincinnati Area GIS (CAGIS). Safety mapping is included in the appendices of the I-75 Mill Creek Expressway Existing and Future Conditions Report.

Crash reports from ODPS were analyzed to determine crash rates throughout the study area. Along the I-75 corridor within the study area, 2830 accidents were logged between the years 2001 and 2003. On I-74, in the study area, 611 accidents were logged and 345 accidents were logged on SR 562 during this same time period.

Crash rates in accidents per million vehicle miles traveled were determined for segments along the three highway mainlines in the study area. Once the I-75, I-74 and SR 562 mainlines were divided into smaller segments, crash rates were determined for years 2001, 2002, 2003 and a combined 2001-2003 rate based on 2002 ADTs. Crash rates for each mainline were then calculated using the weighted average of the 2002 ADTs for that specific mainline. The rates were then compared to the statewide average crash rates which take into account the number of lanes and functional classification.

The overall crash rates for all segments along both Northbound and Southbound I-75 were higher than the average crash rates for similar facilities in Ohio. The worst segment has a crash rate more than seven times greater than the statewide average. Overall, the corridor has a crash rate of 3.697, which is drastically higher than the statewide average rate of 1.403.

Along I-74, the crash rates for the majority of the segments are greater than the statewide average rates. The overall crash rate for the corridor is 3.022 accidents/ million vehicle miles traveled (acc/mvmt), which is more than two times the statewide average rate of 1.411 acc/mvmt.

Lastly, most of the segments along SR 562 are greater than the statewide average rates. The corridor has an overall crash rate of 2.951 acc/mvmt, which is two and a half times higher than the statewide average rate of 1.185 acc/mvmt.

8.0 Summary

The purpose of the I-75 Mill Creek Expressway study is to efficiently serve existing and future traffic volumes, reduce the number and severity of collisions, and correct substandard physical conditions that contribute to these problems.

Efficiently Serve Existing and Future Traffic Volumes

- By 2030, nearly all of I-75 through the study area will fail, functioning at Level of Service F in the a.m. or p.m. design hour, or both.
- By 2030, I-74 in the study area will function at LOS E or F in a.m. or p.m. design hour.

Reduce the Number and Severity of Collisions

- I-74, I-75 and SR 562 in the I-75 Mill Creek Expressway study area appear on ODOT's Safety Hot Spot list. Additionally, many segments on these routes appear on the HCLIS list. The segment on I-74 from SLM 18.49 to 18.99 ranks first on that list and the segment on SR 562 from SLM 0.56 to 1.06 ranks second.
- I-75 within the study area experiences a crash rate of 3.697 accidents per million vehicles miles traveled. On I-74, the crash rate is 3.022 acc/mvmt. For SR 562, the crash rate is 2.951 acc/mvmt. These rates are more than twice the statewide average rate for facilities of their type.
- The high crash rates contribute to congestion levels even higher than those expected based upon traffic volumes alone.

Correct Substandard Physical Conditions

- Since the I-75 Mill Creek Expressway construction dates from the 1950's and 1960's, lower speed curves, left-hand exit ramps, poor lane continuity, and undesirable service ramp locations are prevalent throughout the corridor. These substandard physical conditions contribute to accidents and to congestion problems.