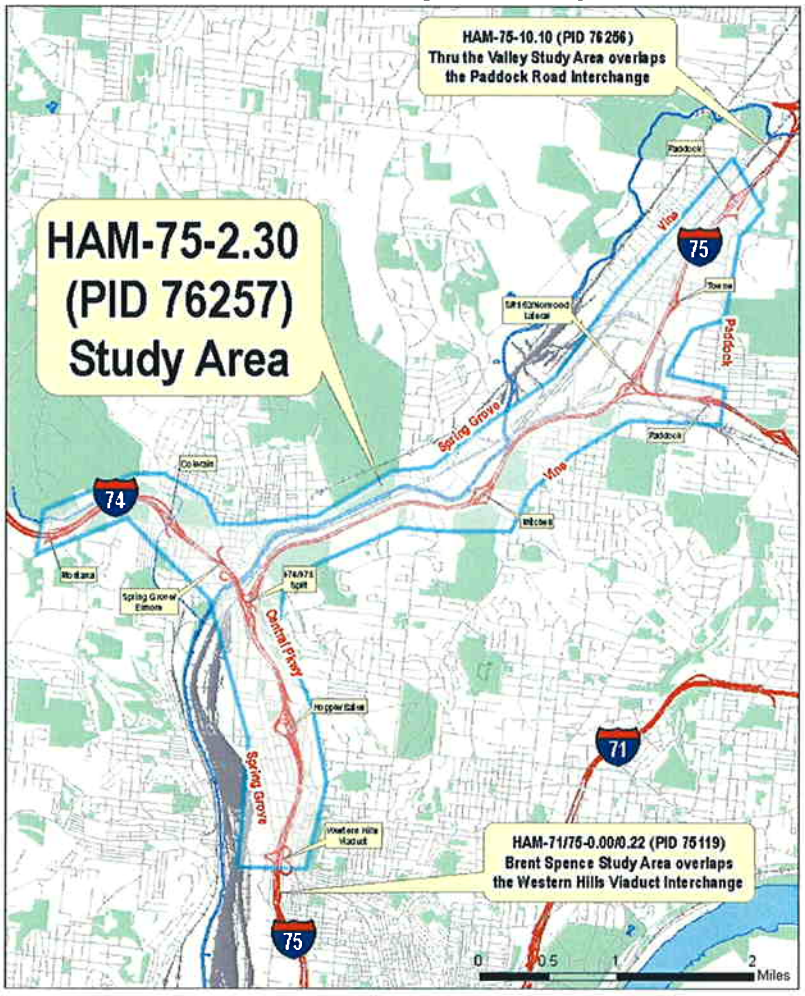
PURPOSE AND NEED

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.

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 was 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.

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.

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).

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.

2004 Traffic Volumes and Mainline Analyses. 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