

CHAPTER 1 • INTRODUCTION



1.1 Study Area

In 2000, the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) and the Miami Valley Regional Planning Commission (MVRPC) under took a major planning effort, known as the North South Transportation Initiative (Initiative), to study the multimodal transportation system of their regions. The major focus of the Initiative is to improve the safety, efficiency, and reliability of the system. In effect the Initiative's primary goal was to keep the OKI and MVRPC regions moving.

The economic health of both the region and the nation depends on this transportation system to function properly and move people and efficiently into and out of the general area. Since the roadways carry a high volume of international trade and connect many high-profile industries, the importance of the interstate to commerce, and especially to trucking, cannot be overstated. Interstate 75 (I-75) and its parallel railroads are among the busiest in the nation and serves as the major transportation artery that connects communities and businesses in six states. From the Port of Miami, Florida to Detroit, Michigan where I-75 connects with Canadian Highway 401, the highway serves as one of the longest and busiest continuous interstate trade corridors in North America at approximately 2,200 miles (Public Roads, Fall 1995).

A critical point in this corridor occurs in northeastern Kentucky and southwest Ohio starting from Northern Kentucky, continuing across the Ohio River northward through the major metropolitan areas of Cincinnati and Dayton up to the City of Piqua, Ohio. This stretch of interstate connects two states, six counties, 26 cities, 14 townships, and six villages and occurs within the jurisdictions of the two Metropolitan Planning Organizations (MPOs).

The region's multimodal transportation system is comprised of many components including: interstates, regional roadways, local streets, transit systems, rail lines, and bicycle and pedestrian facilities. The "backbone" of the system, however, is I-75 and its parallel roadways and railroads.

Interstates and Secondary Roadways

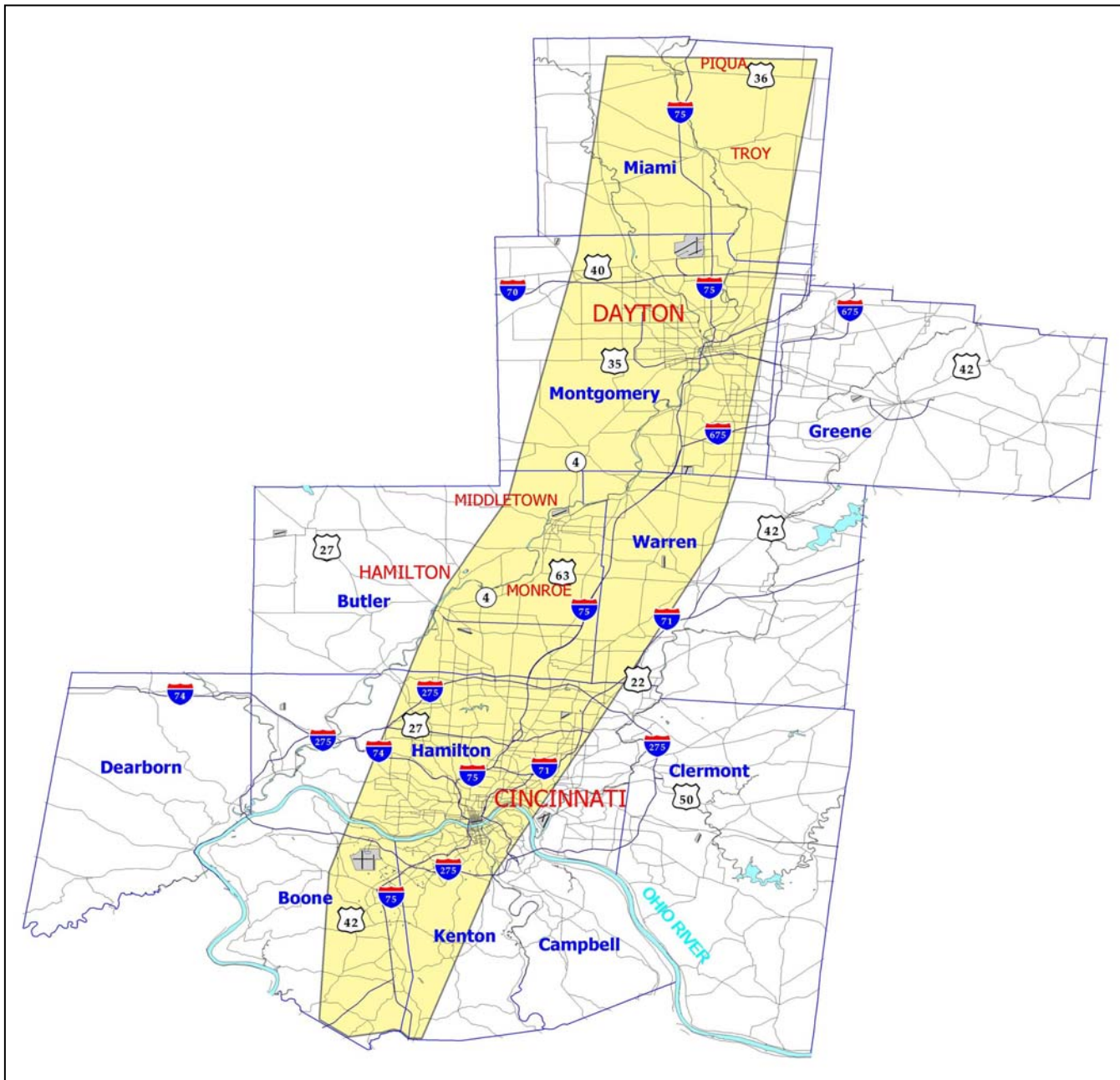
The main roadway that parallels I-75 is State Route (SR) 4, which runs north from Cincinnati through Hamilton and Dayton. United States Routes (US) in the Initiative study area include US 25, 42, 27, 50, 22, 35, 40, and 36 (Figure 1-1).

A congestion study conducted by MVRPC showed that I-75 has the highest total delay in every period of the day when compared to the other freeways in the area. Although I-75 accounts for only 32 percent of the highway miles in the MVRPC region, it accounts for approximately 77 percent of the total highway delay. This data is in addition to studies completed by the Ohio Department of Transportation which identified that I-75, had an average daily traffic (ADT) ranging between 50,000 and 160,000¹. In many instances, this is between 100 percent and 150 percent of the designed capacity. In other words, the facility sometimes carries as much as one and one-half times the amount of traffic that it was originally designed to carry.

The physical design of numerous pieces of the transportation system, most notably I-75, is inadequate to handle the growing travel demand. The age and outdated design features include short distances between ramps, lack of adequate shoulders and truck parking areas, lane continuity problems, and inadequate merge and weave areas. The I-75 mainline lanes also are limited in number and have narrow or very limited shoulders with little recovery areas along many segments. These designs limit traffic flow on the facility respective to increasing demand and prevents the adequate and timely clearance of incidents from the roadway because there is limited physical space to move the disabled vehicles.

¹ ADT in this discussion includes northbound and southbound counts combined.

Figure 1-1: Study Area Map



The poor safety performance of I-75 is well known to transportation planners in the region, police and emergency service agencies and those who drive it daily. As an example, over the four-year period from 1995 to 1998, nearly 2,400 vehicle accidents occurred in an 11-mile section through central Dayton between the Dixie / Central and Needmore Road interchanges, according to the Traffic Operations and Safety Study. As evidenced by this survey, much of this poor safety history can be attributed to the outdated design standards to which I-75 was built. Since the 1950s, highway engineers and safety researchers have learned that many of the features drivers encounter along I-75 produce operational and safety problems, particularly as traffic volumes increase and begin to tax the roadway capacity limits. Such features include left-hand exit and entrance ramps, ramp tapers and merge / weave lengths that are too short for safe vehicle entry, close spacing between successive entrance and exit ramps, lane discontinuity (lane drop) on the mainline freeway, lack of shoulders for disabled vehicles, and insufficient vertical and horizontal sight

distances. Similarly, congestion, lack of adequate shoulders and other problems lower emergency vehicle response time.

For the years 1995 through 1999, the Ohio Department of Public Safety (ODPS) conducted a crash analysis for I-75 in Hamilton, Butler, Warren, and Montgomery Counties. The data from the analysis suggests that these conditions could have contributed to the crashes that occurred on the I-75 mainline. In evaluating the data, it should be noted that these numbers were not adjusted based on exposure to traffic and the effects that other variables (construction zones, detoured routes, etc.) may have on a crash. Caution should be used when evaluating potential crash problems based on these numbers alone.

According to the type of crash data (Table 1A) obtained along I-75 in Hamilton County, from the Ohio river to I-275, it was found that a large percentage of crashes were rear-end crashes (approximately 48 percent). I-75 in Hamilton County has shorter distances between interchanges, which can cause an excessive number of lane changes, leading to high rates of crashes. The high number of angle and sideswipe collisions (approximately 29 percent) is consistent with crashes caused by merging and diverging vehicles.

Table 1A demonstrates that I-75 in Hamilton County has experienced a number of rear-end crashes (3,443) from 1995-1999. Some possible factors in this high number include small clearances between vehicles, operator negligence to compensate for existing weather, visibility, and construction conditions. I-75 through Hamilton County is one of the heavier traveled segments of the roadway because of local use combined with truck traffic, especially at peak times.

In Montgomery County, approximately 40 percent of accidents on I-75 from I-675 to Needmore Road were classified as rear-end crashes. Small clearances between vehicles, operator negligence to compensate for existing weather conditions, visibility, and construction conditions are all factors that contribute to rear-end collisions. In addition, a high percentage of angle and sideswipe collisions (approximately 25 percent) indicate potential issues with merging/diverging and/or the ability to change lanes, especially during peak-hour traffic conditions.

Table 1A
I-75 Mainline Crash Overview – 1995-1999 Crash History *

Number (and Percentage) of Crashes by County						
Types of Crashes	Boone/Kenton**	Hamilton	Butler	Warren	Montgomery	Miami
Angle	278 (7.6)	728 (10.2)	108 (11.2)	138 (13.4)	517 (12.3)	125 (9.9)
Rear-end	1,491 (40.7)	3,443 (48.1)	354 (36.6)	263 (25.5)	1730 (41.3)	279 (22.0)
Sideswipe (Same Direction)	642 (17.5)	1,157 (16.2)	111 (11.5)	100 (9.7)	578 (13.8)	128 (10.1)
Sideswipe (Opposite Direction)	14 (0.4)	184 (2.6)	3 (0.3)	12 (1.2)	87 (2.1)	13 (1.0)
Head On	11 (0.3)	74 (1.0)	10 (1.0)	20 (1.9)	41 (1.0)	6 (0.5)
Single Vehicle/Other	1,224 (33.4)	1,569 (21.9)	380 (39.3)	500 (48.4)	1,237 (29.5)	718 (56.6)
Total	3,660	7,155	966	1,033	4,190	1,269

* Data provided by the KYTC and ODOT

** Boone/Kenton Crash history summarizes data from 1998 to 2001

Butler and Warren Counties both have a large percentage of rear-end crashes and a higher number of single vehicle/other crashes (approximately 39 percent and 48 percent, respectively).

Transit Systems

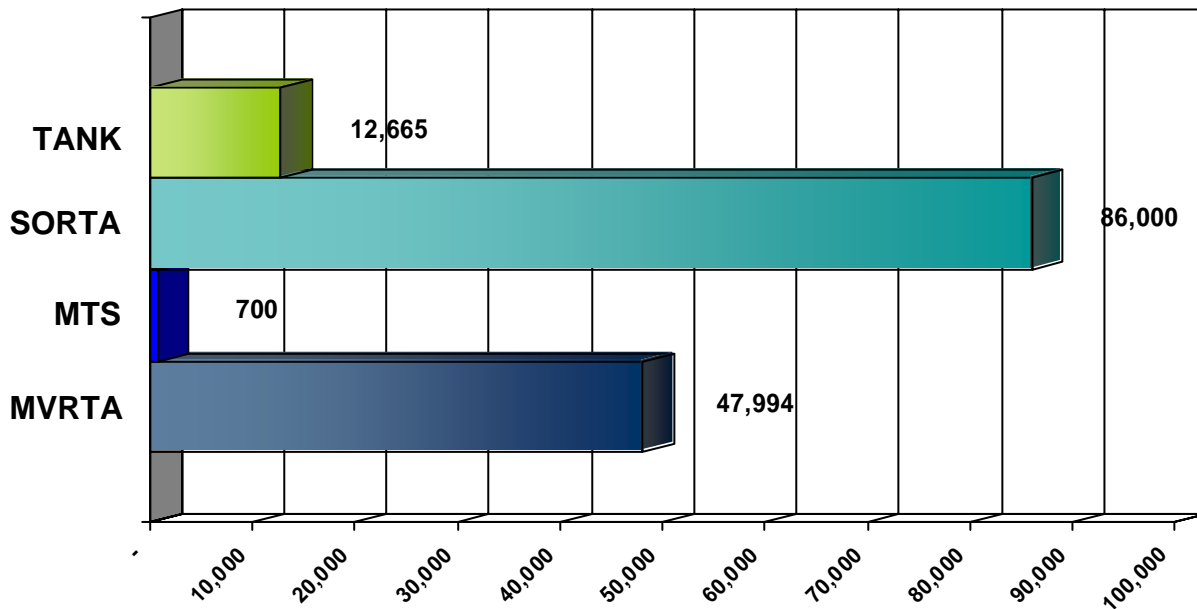
In addition to the highway, the region is connected by five major transit systems:

- Transit Authority of Northern Kentucky (TANK)
- Southwest Ohio Regional Transit Authority (SORTA)
- Butler County Regional Transit Authority (BCRTA)²
- Middletown Transit System (MTS)
- Miami Valley Regional Transit Authority (MVRTA)

Together in 1999, these systems carried over 154,000 independent passenger trips each day according to the Federal Transit Administration (FTA) (Figure 1-2). Currently, the design of the transit systems in the regions are “point focused” meaning that passengers must be transported to a central point, often a downtown transfer point, in order to complete their journey. Many routes of the transit systems function in this manner, which is like a hub and spoke – the hub being the downtown transfer point. Unfortunately, this type of trip is no longer conducive to what many customers want and need. As a result, transit travel times are often longer than they would be for other forms of travel.



Figure 1-2: Daily Transit Ridership In 1999



*NO DATA AVAILABLE FOR BCRTA.

Total Unlinked Trips

The routes associated with each of these transit systems are shown in Figure 1-3, on the following page.

² Noted that the funding sourced for the BCRTA was reduced during the course of this study which resulted in a significant reduction in transit service in Butler County.

TANK operates a traditional bus-only service with regular fixed routes and express service primarily from Northern Kentucky suburbs to downtown Cincinnati. The service is focused on the morning and afternoon peak period and operates primarily Monday through Friday. The TANK system has good ridership for the service levels provided.

SORTA, also known as METRO, operates regular fixed route and express service from park-and-ride lots and other locations in the greater Cincinnati area including Hamilton, Clermont, Butler and Warren counties. They are currently in the process of implementing a strategic plan to enhance their system in order to promote regional connections. SORTA's "MetroMoves" plan proposes the development of 25 regional hubs throughout the system. Each hub will become a focal point of transit operations allowing seamless transfers between routes. In addition to regular fixed routes, SORTA also offers special routes for sporting and other special events and access paratransit services. A new initiative begun in 1999 created a job access service. This service called the JobBus is a new type of service designed to link unemployed and under-employed area residents to jobs in Warren County, Fairfield and Sharonville.

BCRTA operated a fixed route system, the Butler Blast, serving south central Butler County and the surrounding areas. The system ran seven fixed routes in Hamilton, demand response service, an employment express route from Hamilton to Fairfield, an employment circulator in Fairfield and a Fairfield route with a connection to Forest Fair Mall. The system operated 60 smaller vehicles consisting of airport shuttle type vehicles (cutaways), smaller transit buses (Orion IIs) and minivans. Unfortunately, service was disconnected in 2003 due to a lack of local funding.

The MTS is operated by the City of Middletown, Ohio and provides transit service within the limits of Middletown, Ohio, adjacent to the former BCRTA service. The service provides limited fixed-route transit service primarily along four routes during weekdays only in the municipal limits. Curb-to-curb paratransit service is available to eligible persons with disabilities during similar hours of operation.

The MVRTA serves the greater Dayton region. In addition to regular fixed route service, MVTRA also offers a curb-to-curb paratransit service to individuals with disabilities and a special bus service designed to fit the needs of senior citizens. They also provide a Hop (Dash) Service, which offers free rides during off-peak hours within the Central Business District in Dayton and Oakwood. There are currently no plans to significantly increase transit service to Miami County.

Freight Trucking and Rail Lines

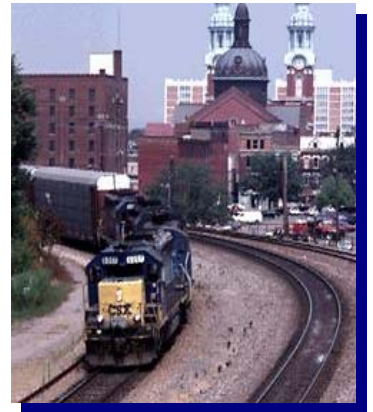
Trucks and rail provide the primary means of shipping goods cost effectively throughout the region, the United States, and into Canada. Truck traffic alone is a large percentage of the traffic volume on I-75, ranging on average between 10 and 30 percent. As estimated by the Federal Highway Administration (FHWA), truck miles nationally on I-75 exceed five billion annually and the volume of trucks approaches almost six million annually. Truck operating expenditures in the Ohio corridor are approaching \$7 billion annually (Public Roads, Autumn 1995).



Today's competitive marketplace demands fast and efficient transportation linkages. These often occur through common carrier or private carrier motor freight (trucks), and bridge the chain of goods and materials from suppliers, producers, and finally consumers. Many industries currently rely on "just-in-time" plant operations to manage inventory and production. Just-in-time delivery is based on businesses keeping only enough inventory, spare parts and/or raw materials on hand to satisfy daily orders or to sustain minimal amounts of production. Increasingly, businesses are no longer stockpiling huge quantities of

goods and raw materials in anticipation of orders. Timely and reliable freight flow logistics are critically important to highly price-competitive businesses, including the automobile industry, which plays a major role in the regional economy. Across Michigan, Ohio, Kentucky, and into Tennessee and Georgia, I 75 is widely known as “Auto Alley” because of the large volumes of automobile related goods shipped between component facilities, assembly plants, suppliers and distributors.

Rail transportation is also equally important to the multimodal transportation system in the corridor. The Queensgate Rail Classification Yard in northwest Cincinnati has the capacity for 4,000 train cars, and is one of the busiest freight rail yards in the Midwest. The ability to shift freight from highway to rail will continue to play a large role in increasing rail capacity in the region. Several of the existing rail lines parallel I-75. The existing rail lines in the project area include:



- CSX
- Norfolk Southern
- Indiana and Ohio (I&O)
- Amtrak (passenger rail)

According to the Ohio Rail Development Commission, more than 250 freight trains per day pass through or have destinations within the Initiative’s study area. The amount of freight that rail has the ability to carry is substantial. One fully loaded train car carries the same load as three semi-trucks. Intermodal traffic has been the fastest growing segment of the rail industry over the past 20 years. This segment of the market is anticipated to continue to grow (Access Ohio, ODOT, 1995). However, the heavy traffic volume along the existing rail lines limits this growth. For example, a CSX freight line operating in this corridor carries over 21 million gross tons per mile per year (most of this cargo is grain). However, significant diversion of highway freight movements to rail is not expected or economically feasible (2025 Long Range Transportation Plan, MVRPC). See Figure 1-4 on the following page for map of existing freight rail lines in the corridor.

Regionally, average daily truck traffic on I-75 exceeds 15,000 trucks per day within the I-275 beltway of Northern Kentucky and Cincinnati (Freight Transportation Study, OKI). In downtown Dayton, truck traffic approaches 15,000 per day (Freight Movement Study, MVRPC). Truck travel on I-75 is about double the average level observed on other comparable freeways in the United States. Truck volumes are expected to increase.

The OKI Metropolitan Transportation Plan notes that trucks are used extensively for carrying goods produced both inside and outside the region to local destinations or for moving them to other markets. An increase in future truck traffic has potential implications on the existing highway system. Daily traffic operations, safety, and pavement, as well as bridge life and costs, are key issues of concern because of the high volume of truck traffic in the region.

Air Transportation



Air transportation plays a large role within the multimodal transportation system. The Greater Cincinnati / Northern Kentucky International Airport is a regional and national hub for many large airlines, most notably Delta and its regional connection partner (ComAir) for passengers and primarily DHL Worldwide Express for freight. The Dayton International Airport, in addition to serving many passenger airlines, serves as a hub for Emery Worldwide Express, a multi-modal

transportation and logistics company. Between 1981 and 1998, processing goods at Dayton International rose from approximately 450 tons of freight per year to over 621,000 tons per year (MVRPC Freight Movement Study, 1999). According to the National Planning Data Corporation, the Dayton International Airport is the best 90-minute air market in the nation.

Figure 1-4: Freight Rail Lines

1.2
Background

Other major express parcel delivery services located in the study area include Airborne Express, United Parcel Service, and Federal Express. Both truck and rail services, which depend on I-75, feed these airfreight sorting facilities. In addition to these two major international airports, there are several other regional airports in the Initiative's study area.

Water Transportation

Barge is the primary mover of goods produced in the OKI region for market areas between 500 and 700 miles away (Freight Transportation Study, OKI, 1996). Nearly 14 million tons of cargo was shipped through water ports in Cincinnati in 1999, ranking it third in the amount of cargo handled on the Ohio River (Freight Transportation Study, 1996).



The first task undertaken as part of the Initiative was to determine the issues in the corridor and the goals of the study. Several public involvement techniques were employed to provide a forum to gather input and comments regarding the issues and concerns of the multimodal transportation system. The public involvement activities solicited input from stakeholders including state representatives, county officials, city officials, village officials, township officials, other agencies and groups who have an interest in the multimodal transportation system and the general public.

Issues that arose from those public involvement activities included:

- Infrastructure conditions and design constraints
- Travel growth/congestion
- Land use and environment
- Existing resources
- Need for alternatives (route/modes)
- Safety

Based on discussion ideas and comments gathered throughout the project scoping and public involvement processes, the following Goals and Objectives were developed to help guide the Initiative through the development and evaluation of potential alternatives to address the issues and concerns associated with the multimodal system:

Goal #1 - Promote a balance between sustaining the operational condition of the existing system and maximizing its safety, efficiency and cost-effectiveness.

Identify regional alternatives that are compatible with and maximize the investment in the current transportation system.

- Identify alternatives that are fiscally feasible.
- Demonstrate that the overall benefits of improvements are reasonable given life cycle costs (capital, operations and maintenance (O&M)).

Goal #2 - Cooperatively address transportation system design, safety, congestion and mobility problems that affect both local residents and through travelers, including trucks.

Improve system safety.

- Reduce delay and travel times.
- Increase modal choices.
- Improve connectivity between modes.
- Improve levels of service (i.e. highway, transit, other modes).

Goal# 3 - Support opportunities for economic development through transportation system improvement projects that incorporate sustainable design and funding options and that promote a balanced approach to keeping people and the economy moving.

Improve accessibility and mobility to freight and distribution centers.

- Enhance access to employment centers.
- Provide greater mobility options including reverse commute, cross-town and other opportunities / services.
- Enhance access to major activity centers. (i.e. airports, job centers, shopping areas, universities/colleges, hospitals, etc.)
- Promote land use policies and transportation investments that are compatible and concentrate development along existing transportation corridors.
- Promote opportunities for joint development and private participation in transportation investments to leverage existing resources and accommodate the development of more projects.

Goal # 4 - Maintain and improve community-wide / regional quality of life with respect to the natural and built environments by fostering supportable investments that are sensitive to community preservation and equity.

Preserve/improve air quality.

- Minimize adverse environmental impacts including neighborhood and community disruption.
- Protect sensitive areas. (i.e. neighborhoods, habitat areas, etc.)
- Support transportation investments that promote community cohesion including non-motorized travel (pedestrian, bicycle, etc.)
- Promote investments that seek to equalize the distribution of impacts and benefits to the community
- Explore impacts of proposed alternatives / projects on different socio-economic groups

Goal # 5 - Reach consensus on a Preferred Program of Projects that support a shared future vision for both the Cincinnati and Dayton regions respectively over the intermediate and longer term(s).

Promote projects that benefit both regions and minimize competing interests.

- Produce a Preferred Program of Projects that is supported by the public, elected officials, and implementing agencies