



X. TRANSPORTATION

The City of Richmond intends to have a well integrated transportation system composed of context sensitive road networks, mass transit and hike/bike trails to allow local residents and visitors to access employment, shopping, recreation, entertainment, and other destinations quickly and efficiently with minimal adverse impacts to the environment or neighborhoods. The City of Richmond intends to evaluate the effectiveness of its transportation system with the health and safety of its citizens and visitors and sustainability standards as its primary concerns.

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A. Introduction

Transportation systems facilitate all motorized and non-motorized movement through a community. A transportation system determines the interconnectivity that is necessary within a community, and it includes all of those elements that contribute to its pedestrian and vehicular circulation. This chapter provides information about this community's transportation system and network decisions, so that Richmond's city officials will be better prepared for the critical issues in the future. The recommendations made in this chapter are for using as the foundations of a long-range transportation plan that will help guide Richmond's transportation investments.

The transportation plan is to meet State and regional planning requirements while addressing local transportation needs for cost-effective street, transit, freight, bicycle, and pedestrian improvements. The goals, objectives, and recommendations identified in this chapter provide transportation choices for residents, employees, visitors, and firms doing business in Richmond. The ideas presented will suggest opportunities that can make it more convenient to walk, bicycle, and take transit in order to be a less auto-dependent community. Ultimately, the transportation plan created from this document will provide a balanced transportation system that supports neighborhood and countywide connectivity, plus promote economic development, while not detracting from the welfare of the community.

It is important to understand Richmond's transportation system and its integral relationship to land use throughout the city. A basic element of this relationship is the functional classification of the roadway system. An analysis of Richmond's transportation system provides insight into what types of transportation improvements will best meet the needs of Richmond's residents. This analysis includes reviewing Richmond's existing transportation network, vehicular accidents, and traffic counts. An examination of the existing traffic counts, accident incidents, planned improvements, and current level of public transportation provided the existing conditions for this area. The recommendations that are made for improving the community's transportation system take into consideration all of the information received from proposals regarding the addition or management of existing signals and signage, plus intersection and roadway improvements. Additionally, the expansion of an interconnected bicycle and pathway system, with connectors into the bike paths of adjoining cities in the region is an important part of a successful transportation system for this community. Recommendations are listed at the end of this chapter.

Richmond is located just south of Interstate 70 (I-70), and along major regional highways. These corridors provide regional and cross-country access to Indianapolis, Dayton, and points beyond. The area's proximity to I-70 and regional highways provides employment opportunities to residents and market opportunities for local businesses. At the same time, residents feel vulnerable to negative impact of traffic congestion on local streets, primarily during peak traffic periods. Part of local traffic problems stems from the city's location and reliance on the car to get around. City residents would like to minimize the impact of through traffic and create a sense of identity at primary entranceways into the city. There is also a need to increase regional and local transportation alternatives to the car. Strong support is voiced for a system of sidewalks, bike paths, and trails that provided residents with safe and enjoyable access to services, school campus areas, parks, and downtown area.

B. Goal and Objectives

Goal

Provide for existing and future transportation needs of the City through implementation of transportation improvements that facilitate local motorized and non-motorized movement, minimize the impact of regional traffic through the city, and facilitate local business access.

Objectives

1. System-wide
 - The city will develop a balanced transportation system including a completed motorized and non-motorized network.
 - The network of public rights-of-way and easements that create travel corridors are the primary infrastructure for all modes and will be managed and expanded in a manner that preserves or improves the capacity and efficiency of all modes.
2. Safety
 - Improve safety at locations where safety is deficient, striving to design solutions that are most consistent with Richmond's city character.
 - Provide and design for pedestrian safety, in the form of well-defined crosswalks and safe, identifiable access to trails and pathways.
 - Develop traffic calming measures to reduce speeding and discourage through traffic on local streets.
3. Investment and Coordination
 - Provide and implement a street maintenance program that prioritizes roadway improvements and coordinates them with economic development initiatives.
 - Identify local, state, and federal funding options to implement roadway improvements that are acceptable to the City.
 - Coordinate with neighboring communities to promote an effective and efficient local and regional transportation system.
 - Coordinate with private businesses and quasi-public agencies to develop potential roadway improvements.
 - Utilize traffic volumes along U.S. 40 and U.S. 27 as an opportunity to attract businesses.
 - Coordinate development with roadway improvements.
4. Integrated Design
 - Design all transportation facilities to contribute to a positive and attractive visual image and the desired community character.
 - Include streetscape designs that improve the physical appearance of roadways within the city.
 - Develop access management standards to manage traffic flow along corridors.
 - Enhance primary entryways to the community.
 - Develop and implement design standards that require new development to provide sidewalks and/or pedestrian and bicycle paths.

5. Transportation Impact

- Accommodate regional traffic by providing transportation options that direct pass-through traffic away from the city's internal roadway network and onto regional transportation corridors.
- Discourage pass-through traffic patterns in residential areas.
- Minimize the intrusion of through traffic on Richmond's collector and local streets.
- Direct trucks to designated routes through the city.

6. Multimodal Strategies

- Create an interconnected street system that facilitates safe travel throughout the city for pedestrians, bicyclists, and automobiles.
- Promote the greater use of alternatives to single-occupancy automobile travel with the objective of limiting the extent and duration of congestion.

7. Congestion Management

- The city will increase the efficiency of travel, promote innovative strategies, and implement travel demand strategies to limit the increase of congestion.

C. Transportation System

An analysis of Richmond's transportation system provides insight into the types of transportation improvements that will improve the quality of life for residents of Richmond. This analysis includes a review of Richmond's existing transportation network, vehicular accidents, and traffic counts. An examination of the existing traffic counts, accident incidents, planned improvements, and current level of public transportation provides the existing conditions for this area. The recommendations for improvements to Richmond's transportation system take into consideration all of the information from proposals regarding the addition or management of existing signals and signage, intersection improvements, and roadway improvements. Additionally, an interconnected bicycle and pathway system, with connectors into the bike paths of adjoining cities in the region is an important factor for improving this community's transportation system. Recommendations are listed at the end of this chapter. It is especially important to understand the transportation system and its integral relationship to land use throughout the city. A basic element of this relationship is the functional classification of the roadway system.

D. Existing Network

Interstate 70 (I-70) is the most important roadway to the City and the region, running east-west on the west and north sides of the city limits. The I-70 Corridor has emerged as a key location for new homes and many industries. The western part of the city region attracts more distribution and manufacturing firms, while the northern section consists of technological companies and higher education facilities.

Highway 27 runs north-south through the city. This full-access roadway provides the area with a direct link to Fort Wayne, Oxford, Ohio, and Cincinnati. Highway 40 connects Richmond to all the region's major urban communities to the west including Centerville, East Germantown, and Cambridge City. Urban areas in Ohio can also be accessed via Highway 40 to the east of Richmond.

E. Street Functional Classification

Streets definition is based on a functional classification, using factors such as capacity, length, spacing from other streets and the types of traffic served (shorter versus longer distance and the percentage of trucks, for example). In theory, major streets designed to move traffic are classified as arterial or collector streets, while streets designed to provide access to adjacent land uses with little or no through traffic are classified as local streets. In reality, many roadways may serve both functions in varying degrees. The Transportation Corridors Map illustrates the intended function of the street system.

Functional classification categories are summarized below. A list of streets by classification is provided in Table; Roadway Classifications. All of the city's streets are considered "urban" within the metropolitan area by the state and federal road agencies for purposes of planning and funding.

- **Interstates/Expressways.** The highest category, interstates/expressways serve most of the longer distance travel to and through the area and thus are designed to carry the highest traffic volumes. The designated interstate/expressway in the city is I-70 that is under the jurisdiction of the Indiana Department of Transportation.
- **Major Arterials.** (also referred to as Principal Arterials) This is the highest class of streets under the city's jurisdiction. Arterials often have links to the expressways through interchanges and thus move large volumes of traffic through the city or to and from major destinations within the city.
- **Minor Arterials.** This functional class serves trips of moderate length and moderate volumes, usually with a lower design speed than the major arterials. Minor arterials are intended to provide links to and between the major arterials, but have more emphasis on access to adjacent land uses. Ideally, these streets should not penetrate identifiable neighborhoods.
- **Collector Streets.** These streets serve as a link between local streets and arterial streets. Collector streets provide both access and traffic circulation within residential, commercial, and industrial areas. Moderate to low traffic volumes are typical, but they may have slightly wider pavement or design speeds than the local streets.
- **Local Streets.** Local streets make up the highest percentage of streets in the city. The primary purpose is to move traffic from adjacent land uses to the arterials, sometimes via a collector street. Design speed is typically low, as are volumes. Through-traffic on these streets is deliberately discouraged.

The chart below indicates the classification of roadways within Richmond.

Roadway Classifications

Roadway	Functional Classification
I-70/U.S. 35	Interstate/Expressway
Highway 40/National Road (W & E)	Major Arterial
Highway 27/Chester Blvd	Major Arterial
Industries Road	Minor Arterial
Salisbury Road	Minor Arterial
Middleboro Pike (S.R. 227)	Minor Arterial
New Paris Pike (S.R. 121)	Minor Arterial
Boston Pike	Minor Arterial
Williamsburg Pike	Minor Arterial
Union Pike	Minor Arterial
8 th Street	Major Collector
Garwood Road	Major Collector
Bridge Avenue/Sheridan St/Progress Dr	Major Collector
Test Road	Major Collector
Liberty Avenue	Minor Collector
Rich Road	Minor Collector
Peacock Road	Minor Collector
West Main Street	Minor Collector
Richmond Avenue	Minor Collector
N A Street	Minor Collector
E Street (N & S)	Minor Collector
NW L Street	Minor Collector
S L Street	Minor Collector
Industrial Parkway	Minor Collector
S. 37 th St/Country Club Road	Minor Collector
Henley Road	Minor Collector
S. 23rd Street	Minor Collector
15 th Street (S & N, SW)	Minor Collector
12 th Street	Minor Collector
Ft. Wayne Ave/S. 3 rd Street	Minor Collector
Sim Hodgkin Parkway	Minor Collector
5 th Street (NW & SW)	Minor Collector
Abington Pike/SW 2 nd Street	Minor Collector
13 th Street (NW & SW)	Minor Collector
18 th Street (NW & SW)	Minor Collector
Toschlog Road	Minor Collector
Others	Local Roads and Streets

Interstate 70 extends east-west on the north side of the city, and provides access to cities such as Dayton to the east and Indianapolis to the west. This interstate forms the north border of the city. Its location has attracted industrial land uses that have quick access to an express route. Within Richmond, interchanges with I-70 are provided at U.S. 40, U.S. 27, U.S. 35, and S.R. 227. Mostly vacant land exists along the corridor, but is expected to develop especially with the new hospital campus and interchange development opportunities. U.S. 27 provides a north-south route and intersects the city. A mixture of land uses including commercial, service, and light industrial is located adjacent to the corridor. U.S. 40 provides an east-west route and also intersects the city. The location of these two roadways creates a separation of areas within the city but provides both a through route and local access to area businesses, city facilities and neighborhoods.

The Federal Highway Administration defines level of service as a qualitative assessment of a road's operating conditions. It is dependent on peak-hour traffic volumes, traffic composition (vehicle size), vehicle speeds, the number of travel lanes, traffic signals, and on-street parking. The level of service classifications for primary roadways in Richmond are provided on maps at the end of this chapter.

Freeway

I-70/U.S. 35 borders the city to the north and east, and provides access to the city via the Highway 35/Willamsburg Pike, Highway 27/Chester Boulevard, S.R. 227/Middleboro Pike, and Highway 40 interchanges. The interstate is an important element of the overall transportation network within the city, and brings local, regional, and national travelers to the area. In 2002, two-way traffic along I-70 between the Highway 35/Willamsburg Pike interchange and Highway 40 interchange averaged 34,992 vehicles per day, a decrease of 3,648 vehicles per day (38,640 vehicles) in 1998. Signage, landscaping and associated corridor improvements will help to provide an identity to the area and attract travelers. Diverse and distinct uses around the interchanges will assist in establishing Richmond as a destination-base instead of a pass-through area.

Arterial Streets

Highway 40/National Road (West and East) is a principal arterial roadway that extends east-west through the city. It contains four lanes through the city and is divided by a landscaped median from approximately Garwood Road/Hayes Arboretum Road to the I-70 interchange. Highway 40 provides direct access to I-70 and continues into the state of Ohio. It also provides direct access west to Centerville.

In 2003, two-way traffic along M-40 west of Whitewater River averaged 18,685 vehicles per day, an increase of 1,318 vehicles (17,367 vehicles) from 1995. East of downtown, two-way traffic averaged 15,021 vehicles per day, a decrease of 4,084 vehicles from 1995. The heaviest traffic occurred during peak travel periods, or from 6:00 a.m.-8:00 a.m. and 4:00 p.m.-6:00 p.m. Both of these roadway segments are currently operating at acceptable levels of service for daily traffic volume. However, as traffic continues to grow additional roadway improvements may be warranted. As a general rule, as 24 hour traffic volumes approach 15,000+ and 30,000+ vehicles per day for the two lane and four lane portions, roadway design should be evaluated.

Highway 27/Chester Blvd is a principal arterial that runs north-south through the city. It contains four lanes through the city, but is divided into 8th and 9th Street from C Street to south of L Street. Highway 27 provides through routes to Fort Wayne to the north and Cincinnati to the south. In 2003, two-way traffic along Highway 27 between I-70 and Highway 40 averaged 14,744 vehicles per day, an increase in 364 vehicles from 1995. Between Highway 40 and the south city limit, two-way traffic averaged 6,380 vehicles per day, a decrease of 1,960 vehicles from 1995. Both of these roadway segments are currently operating at acceptable levels of service for daily traffic volume, but additional roadway improvements may be warranted with the opening of the new hospital and medical campus near Highway 27 and Industries Road and residential growth on the southern portion of the city.

Industries Road is a minor arterial roadway that serves east-west traffic movement on the north side of the city. The road is a major route for vehicles that access industrial properties, the Hill's Pet Products facility, Carpenter Manufacturing, and Midwest Industrial Park from Highway 27 and Williamsburg Pike. The roadway's location and parallel alignment with I-70 is ideal to serve these uses without requiring motorists to travel on I-70. Industries Road currently operates at acceptable levels of service for daily traffic volume, but additional roadway improvements may be warranted as land develops along the roadway and the new hospital campus opens.



Source: LSL



National Road East
Source: LSL

Salisbury Road serves as a minor arterial road that provides a north-south route on the west side of the city. The road connects to Highway 35 north of the city and continues south through the city limits. Access is provided to the Midwest Industrial Park and intersects with Highway 40. Improvements are planned from NW L Street to Highway 40. Salisbury Road currently operates at acceptable levels of service for daily traffic volume.



Salisbury Road at Industries Road intersection
Source: LSL

Middleboro Pike (the northern part of S.R. 227) is a minor arterial roadway that provides regional travel from near the downtown area (12th Street) to areas northeast of the city. Access is provided to I-70, and the road runs along the middle fork of the Whitewater River and Middlefork Reservoir into the downtown area. In 2003, two-way traffic along Middleboro Pike (S.R. 227) between I-70 and the U.S. 27 junction area near North 1st Street averaged 2,805 vehicles per day. The road currently operates at acceptable levels of service for daily traffic volume. North 1st Street averaged 2,805 vehicles per day. The road currently operates at acceptable levels of service for daily traffic volume.

New Paris Pike (S.R. 121) provides regional access to Richmond from Ohio. The minor arterial roadway runs parallel to the east fork of the Whitewater River. Since the road does not access I-70, New Paris Pike is designed to provide local and regional traffic access to Richmond and east-central Ohio. In 2003, I-70 averaged 5,028 vehicles per day. The road currently operates at acceptable levels of service for daily traffic volume.

Boston Pike (the southern part of S.R. 227) provides regional access to the airport and destinations south and east of Richmond. Although only a small portion of the roadway is located within the city limits, Boston Pike serves as an important roadway to the city and regional area as the main route to the regional airport. The roadway intersects with Highway 27 on the south side of the city, and provides access to Richmond Power and Light and the nearby Elks Country Club. In 2003, two-way traffic along Boston Pike averaged 2,030 vehicles per day from the intersection of U.S. 27 and Union County Line (near the Richmond airport). The road currently operates at acceptable levels of service for daily traffic volume, but volume should be monitored if air service increases at the airport.

In 2003, two-way traffic along Boston Pike averaged 2,030 vehicles per day from the intersection of U.S. 27 and Union County Line (near the Richmond airport). The road currently operates at acceptable levels of service for daily traffic volume, but volume should be monitored if air service increases at the airport.

Williamsburg Pike serves as a key regional travel route on the northwest side of the city. The roadway is identified as Highway 35 north of the city limits and changes to Williamsburg Pike south of the I-70 interchange, where full access is provided. The road provides service to industrial properties, and terminates at NW 5th Street at the fire station.



Williamsburg Pike at I-70 Interchange
Source: LSL

Union Pike provides north-south regional access to the city, and changes to NW 5th Street south of Progress Drive/Sheridan Street. Although the roadway does not provide access to I-70, it does function as an important roadway to serve industrial properties located between Highway 27 and Salisbury Road on the north side of the city. Union Pike road currently operates at acceptable levels of service for daily traffic volume, but additional roadway improvements may be warranted as land develops along the roadway.

F. Average Daily Traffic (ADT)

The table below lists the average daily traffic volumes for count stations located around Richmond. A traffic count of average daily traffic (ADT) is taken on a road over a 24-hour period counting in both directions. The magnitude of traffic is used to measure how near maximum capacity the present road is and over time determine the rate at which traffic is growing. A general ideal capacity for a two-lane road is about 15,000-16,000 ADT. For those counts where traffic is counted separately in each direction, the two need to be added to obtain ADT. capacity the present road is and over time determine the rate at which traffic is growing. A general ideal capacity for a two-lane road is in the neighborhood of 15,000-16,000 ADT. For those counts where traffic is counted separately in each direction, the two need to be added to obtain ADT.

Average Daily Traffic

Traffic Area/Corridor	Daily Count	Source
I-70 at U.S. 35 Interchange	35,680	INDOT
I-70 at U.S. 27 Interchange	37,430	INDOT
I-70 at S.R. 227 Interchange	38,440	INDOT
I-70 at U.S. 40 Interchange	28,420	INDOT
U.S. 27 - SR 227 and US 27 southbound left (beginning of one-way pair)	10,970	INDOT
U.S. 27 between South C Street and U.S. 40 Eastbound	7,165	INDOT
U.S. 27 between North C Street and U.S. 40 Westbound	8,700	INDOT
U.S. 27 between South J Street and U.S. 27 Northbound	7,800	INDOT
U.S. 27 between S.R. 121 & S.R. 227 and Waterfall Road	24,720	INDOT
U.S. 27 between University Boulevard and I-70 Interchange	18,210	INDOT
U.S. 35 between I-70 Interchange and Flatley Road	5,280	INDOT
U.S. 40 between Round Barn Road and South West 17 th Street	14,580	INDOT
U.S. 40 between South 6th St and U.S. 27	14,085	INDOT
U.S. 40 between North 12 th Street and U.S. 27	13,195	INDOT
U.S. 40 between U.S. 40 Westbound & U.S. 40 Eastbound and 23 rd Street	22,380	INDOT
U.S. 40 between Industries Road and I-70 Interchange	15,020	INDOT
S.R. 121 between U.S. 27 and North 12 th Street	10,620	INDOT
S.R. 121 between North 12 th Street and S.R. 227 (Jct. North)	5,120	INDOT
S.R. 121 between S.R. 227 (Jct. North) and Garr Road	2,850	INDOT
S.R. 227 between Wolfe Road and U.S. 27 (Jct. South)	2,560	INDOT

Sources: Indiana Dept. of Transportation 2002 Interstate Annual Average Daily Traffic Volumes; Indiana Dept. of Transportation 2003 Annual Average Daily Traffic, Wayne County

Based on these figures, a decrease in traffic has occurred in the south and east portions of the city, and along I-70 between the Highway 35/Williamsburg Pike interchange and Highway 40 interchange. Traffic volumes have increased north of National Road (Highway 40) and west of U.S. 27. It is anticipated that traffic volumes will continue to increase north of National Road, specifically near the I-70 interchange, with the addition of the new hospital and medical campus and additional industrial developments. Such developments will cause a need to focus on access management, truck routing, and traffic flow measures along U.S. 27, Industries Road, and Salisbury Road. It is projected that traffic levels will increase south of National Road and east of Whitewater River as new housing developments are built within the southeast portion of the city; additional industrial parcels are developed near Industrial Parkway and Hodgin Road, and air service increases occur at the Richmond Airport.

Accidents

Traffic accidents, simply termed “crashes” by traffic engineering professionals, are one factor used to identify problems in the street system that may require correction: The number of crashes is compared to the number of vehicles traveling along a segment or through an intersection to determine the crash rate. High crash rates compared to similar locations may indicate the need for improvements, especially where there is a trend for a particular type of correctable crash. For the period from January 1, 2005 to March 31, 2005, there were 485 traffic accidents reported in Richmond. The top accident intersections within the city during this period were:

- 3 on South 16th Street and A Street
- 3 on North 5th Street and Richmond Avenue
- 2 on Chester Boulevard and Sim Hodgin
- 2 on North 8th Street and A Street
- 2 on South 15th Street and B Street
- 2 on South 9th Street and E Street
- 2 on South West 3rd Street and National Road West (Hwy 40)
- 2 on College Avenue and National Road West (Hwy 40)
- 2 on South West 5th Street and National Road West (Hwy 40)
- 2 on Garwood and National Road East (Hwy 40)

Other accidents were dispersed throughout the city. This data indicates that improvements in terms of access management, traffic signaling, and/or turning movements may need to be considered in order to improve safety along Highway 40. The development and redevelopment of parcels along this roadway should be accomplished by including access improvements and design standards that encourage safe internal circulation.

The severity of crashes is also important. A location with a history of more severe accidents, which result in personal injuries instead of just “fender benders,” may need special attention even if the rate is below the thresholds. In addition, the City monitors accident data and maintains active records through the police department, which will help identify locations where crash reduction may help to justify the expenditure of improvement funds.

G. Improvements Planning and Scheduling

The City of Richmond does not have a Road Condition Survey or a formalized Road Management Plan. The plan is based upon complaints, emergencies, new developments, complexity of the job and the cost. The city paves a specified amount of roadway miles each year. The city also receives a specified amount of state funds for local projects that occur on state or federal roads.

Newer roads are built to current specifications for drainage and road width. When older roads are repaved, they are brought up to current specifications for drainage and width. State and local funds are used for all major road construction that involves capital improvements, curbing, culverts, engineering fees, and major overhauls. For state and national roads, the city pays a maximum of ten (10) percent of up front, design costs, and a total twenty (20) percent for an entire project. State and federal contributions total eighty (80) percent. This was the case with modifications to the I-70 and U.S. 27 interchange completed in 2003.

Richmond does not have a mapping system for the city sidewalks, nor is there a sidewalk condition survey. The installation and maintenance of sidewalks are costly, so the city does not make this amenity a priority. Often, sidewalks create conflicts occur with personal property. Sidewalk repairs are scheduled when an adjoining road is repaired. Sidewalks are located in the city along most major routes, but lack pedestrian signage or designated pedestrian crossings in some areas. Clear pedestrian crossings with signage are located on National Road West (Hwy 40) and College Avenue to access Earlham College, and in the downtown area. Curbs and sidewalks are planned as part of upcoming improvements for National Road West, and the I-70/Hwy 27 interchange area. Sidewalk maintenance on state roads is the responsibility of the city.

Currently, the city's plan is to maintain the existing roadway facilities within the city, because the funds available for improvements are limited. There are a few major transportation projects scheduled for Richmond by 2010. Projects include state routes and city roads. Scheduled projects listed in the Statewide Transportation Improvement Program for fiscal years 2005-2007, and 2006-2008 (draft) include (also see Planned Transportation Improvement Projects Map):

- I-70 is scheduled by INDOT to add two additional travel lanes between S.R. 1 in Wayne County to the Ohio State Line (length of 19 miles) in 2010.
- Industries Road is currently under construction to extend east of Hwy 27 into the planned medical campus. The road will extend south internal to the development and connect to University Boulevard. The city recognizes the need to improve Industries Road from Williamsburg Pike west to Round Barn Road, and from North West 5th Street to Highway 27 as a long-term project.

- Hwy 27 interchange is planned for the following projects:
 - Pavement replacement from the centerline of Richmond Avenue to just north of SR 227/121 intersection at the Whitewater River in 2007; resurfacing from approximately one mile south of US 40 to just north of SR 121/227 in 2005;
 - Median construction including signals, signs and lights from south of the interchange to North J Street; and
 - Road construction from approximately one mile north of I-70 to 1.21 miles north of I-70;
 - Including creation of a center turn lane and improved turning radii from North I Street to almost a mile north of I-70 between now and 2009;
 - Right-of-way landscaping from north of I-70 to Industries Road; improvements to I-70/US 27 interchange including enhanced landscaping and unique retaining walls on I-70; and
 - Resurfacing of remainder of US 27 south to City limits by 2011; installation of sidewalks on both sides of US 27 from I-70 south through the City.
- Hodgkin Road is in the process of being reconstructed between Henley and South 37th Street. The city recognizes the need to improve Hodgkin Road from South 37th Street to Industrial Parkway.
- Plans for improvements to Salisbury Road include widening and resurfacing from Industries Road to US 40 West. Sight improvement plans will include the railroad crossing and at Salisbury and NW L Streets. The bridge over Lick Creek is also to be replaced.
- NW 5th Street is scheduled for a bridge replacement over the Norfolk and Southern Railroad.
- US 35 will be expanded to include added travel lanes from the I-70 interchange to SR 38.
- US 40 (National Road) is planned for the following projects:
 - In 2009, the section from SW 2nd Street to SW 17th will be reconstructed;
 - Road reconstruction from the Indiana/Ohio State Line to approximately Garwood/Hayes Arboretum Road in 2013 for a middle lane to help move regional and local traffic and improve access to the I-70 interchange;
 - Road rehabilitation from 3rd Street to 16th Street (one way pair) in 2012; and
 - Roadway improvements (curbs, sidewalks and road surface) from South West 17th Street to SW 2nd Street in 2009.
- I-70 is planned for the following projects:
 - Landscape improvements at the US 40 interchange;
 - Interchange modifications (signals, signs and lights and two bridges) at the US 27 interchange; and
 - Roadway rehabilitation from US 27 to the Indiana/Ohio State Line.

The INDOT has also earmarked \$215,000 in fiscal year 2007 for navigation and wayfinding signage on various roads in the City of Richmond.

H. Rights-of-Way

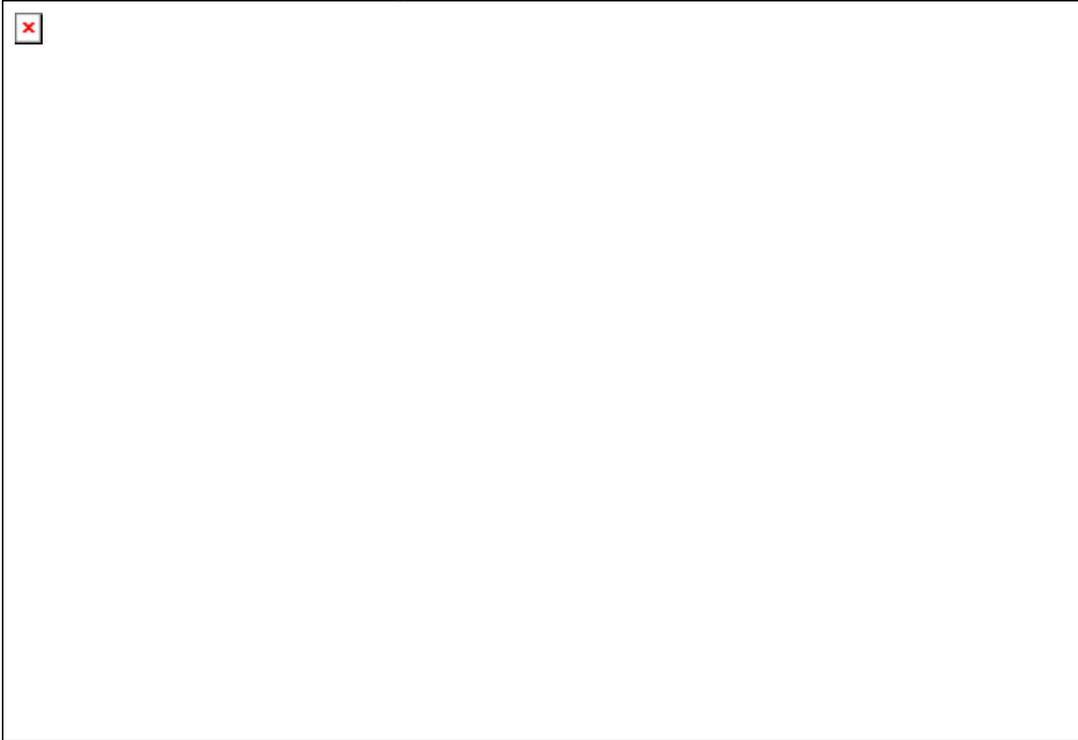
An evaluation of Richmond's will determine the space available for future sidewalks, landscaping, streetlights, signage, pedestrian amenities, roadway expansion, and other road improvements. The rights-of-way along the primary north-south streets tend to vary, while the rights-of-way along the east-west streets remain fairly constant. Due to the age of many of these streets, the available right-of-way is limited to the original sixty-six foot width. This condition inhibits future expansion due to complications and increased costs. The shallow building setbacks for the existing development reflect the current right of way. In many cases, the existing right-of-way width will have lane configurations that are sufficient for existing and projected traffic volumes.

I. Public Transportation

Roseview Transit Service

Roseview Transit provides fixed route bus service in Richmond. Hours of service are Monday through Friday, 6:15 a.m. to 5:45 p.m., and Saturday 10:15 a.m. to 5:45 p.m. Demand (on-call) service only is provided after 4:30 p.m. and no Sunday service is provided. The system operates six (6) routes throughout the city (see Route map). Service frequency is one-half hour for all routes and stops are posted along the roadways and are located past the nearest intersection. No bus pull-out areas, shelters, benches, or service information are provided at the stops. New signs were placed at approximately forty (40) bus stops in late 2004/early 2005. All buses are lift-equipped for the disabled but not equipped with bike carrying capabilities. Roseview Transit provides paratransit service for the elderly and disabled population. Paratransit, functionally defined, is a transportation service, which does not have a fixed route. It is characterized by many origins and many destinations. It is also known as demand-responsive because all trips are arranged by appointment. Special stops are also provided at Reid Hospital and State Hospital. Buses also provide hourly and half-hourly service at five (5) apartment complexes within the city.

Roseview Transit Service Map



Roseview Transit does not conduct a six (6) year Transit Development Program to identify a short-term list of capital and operations and maintenance needs, or a long range transit plan. Operational, maintenance and administrative costs are primarily dependent on federal funds rather than state assistance and fare revenues. Generally, transit fares account for up to twenty (20) percent of revenue generation. Federal grants are the main source of transit funding. The transit service plans to continue to operate with its existing fleet size and preventive maintenance plan. Routes are subject to change based on demand and potential reallocation of vehicles to high-demand areas.

With limited available federal funds, no service increases or route additions are planned with the exception of shuttle service between the I-70 interchange area and new medical campus and hospital location at U.S. 27 and Industries Road in 2007. The campus area could potentially provide Transit Oriented Development (TOD) opportunities with the integration of shuttle service. Transit Oriented Development areas focus a mix of land-uses, such as residential, office, shopping, civic uses, and entertainment within easy walking distance from a transit station (1/4 mi., 5-10 minutes). This mix of uses, combined with thoughtfully designed community spaces, plazas, etc., forms a vibrant village-like neighborhood where people can live, work, and play. Such a village is compact in size, pedestrian-friendly in design, can be customized to offer a wide variety of housing options, with convenient access to services, jobs, and plenty of ways to get around. The U.S. 27 corridor could provide transit connection areas that can serve as hubs for connecting non-motorized travelers to local transit services.

J. Rail

There are two active main rail lines in the city. The northern line runs northwest and southeast, turning south past Hwy 40. Operated by Norfolk Southern Railroad, this line provides rail service via a spur line to an industrial park located on South D Street west on Industrial Parkway on the east side of the city, and via the main line to the Midwest Industrial Park located on the northwest side of the city. Norfolk Southern is one of four primary operational lines in this service area, averaging twenty-two trains per day in 2004. The line provides through freight service from Chicago to Cincinnati, continuing to Atlanta and points south. A rail junction area exists in the vicinity bordered by Sheridan, Northwest 5th, Northwest J, and Northeast E Streets. A rail spur also extends north in the area of Hunt Street and serves additional industrial land uses, while another spur line extends west from Sheridan to Northwest First Street. This line runs diagonally with the city's grid street pattern and can cause traffic congestion at rail crossings. Grade separations exist at North 20th Street, Hwy 27, and Northwest 4th Street. Norfolk Southern anticipates significant opportunities for growth in rail operations along this line, with the potential future expansion of between one and two tracks.

The second line is operated by CSX Railroad and is located on the south side of the city, running primarily north into the city and terminating near the intersection of South 2nd Street and Hwy 40. The rail line follows parallel with the street system with limited crossings. The nearest Amtrak Station is located southwest of Richmond in Connersville, Indiana.

K. Air

While the Richmond Municipal Airport currently serves small private aviation needs, its proximity to the City and I-70 corridor, coupled with its location between Indianapolis and Dayton, suggest a greater future potential as a primary part of the overall local and regional transportation system. Good vehicular access, a growing industrial/employment base, and a convenient location offer great promise for the airport facility.

The Federal Aviation Administration (FAA) states that increased passenger traffic and larger aircraft will severely strain existing airports in the coming years. As a result, the FAA is currently focusing on new large aircraft, terminal building planning, and facilities and systems for passenger access to airports. Therefore, the City of Richmond may consider the opportunities offered to the Municipal Airport by the following trends within the aviation industry:

- Improved market position for newer, lower-cost commercial carriers that concentrate on short-haul service.
- Increased demand by the airlines for smaller 30-100 passenger aircraft.
- Growing demand for business, corporate and chartered aircraft.
- Increased usage of smaller hub and metropolitan general aviation airports.
- The growth of airports that specialize in cargo service.

Benefits of a Regional Airport

Aviation services can play a substantial role in the State and regional economy. Indiana's public airports contributed an economic impact of \$4.8 million in 2001, an increase of approximately \$3 million since 1991 (source: Aviation Association of Indiana Economic Impact Study, 2002). The key economic contributions of having aviation services located close to the City of Richmond include:

- Operating efficiencies gained by local businesses because of air service.
- A majority of tourists, conventioners, and business travelers to the region arrive via commercial air service.
- Potential to attract companies that provide a wide variety of professional services to both national and overseas clients.
- Airlines, airports, and businesses that support public airports provide jobs and income within the region.
- Government agencies that are responsible for functions such as fire suppression, disaster response, and law enforcement rely upon air service and airports to effectively carry out their missions.
- Aviation generates tax revenue through personal property taxes, taxable aviation gasoline revenues, taxable aircraft jet fuel, excise tax revenues, and sales tax on general aviation aircrafts.

In addition to the above benefits, an expansion of aviation services at the Richmond Municipal Airport could greatly enhance the quality of business, personal and family life. Aviation service affects life in Richmond in numerous ways, including:

- **Catalyst for Economic Development:** Many companies locate in a community because of the presence of an airport. An increasing number of companies and executives are avoiding the "hassle factor" of commercial airports and airlines by opting to use corporate charter air services for business travel, typically operating from smaller airports. With the expansion of the Richmond Municipal Airport as a regional-serving facility, the City should consider a marketing effort to try to attract regional or national corporate headquarters.
- **Convenient Venues for Business Activities:** Airports that offer convenient schedules to and from multiple destinations are efficient meeting venues for government officials, executives, managers, and decision-makers. General aviation airports serve as offices to "briefcase businesses." Expansion plans should include meeting rooms and conference areas that allow business meetings to take place directly on the site.
- **International Export of Goods and Services:** Air transport is critical for those companies that export goods internationally and participate in a global economy. Consideration should be made to offer an international shipment center at the Richmond Regional Airport to serve companies with a global focus.
- **Air Cargo Services:** Air cargo, consisting mainly of high-value, time-sensitive documents and goods, can play a significant role in the vitality of the region's economy. Expedient delivery of goods and services is essential to many manufacturing, e-commerce, catalog, and service businesses. Postal services depend on air transportation for timely delivery of small packages, and air cargo carriers provide air express service. Air cargo storage and distribution facilities should be considered in the development of an airport area plan.

- **Agriculture:** A regional airport can contribute greatly to the success of the region’s agricultural industry, providing services for export shipment, corporate travel, crop dusting, crop storage facilities, and aerial photography. Located in a rural area and surrounded by agricultural fields, the airport needs to recognize the importance of the agriculture industry within the area and provide such facilities to assist with the distribution of local goods.
- **Disaster Preparedness and Emergency Response:** An airport is critical for providing emergency response services to areas, and plays an important role in disaster preparedness and response. As a regional airport, the Richmond Municipal Airport could serve as a base to conduct emergency preparedness training. A facilities plan should include areas to conduct such training, including classrooms and outdoor activity areas.
- **Medical Services:** Many emergency and critical medical services are provided through aviation, including medical and life flights, flights carrying donated organs, and the retention of specialized medical professionals. An important use of the airport upon expansion is the ability to handle jets that provide emergency and medical services.
- **Education and Training:** Many smaller airports such as the Richmond Municipal Airport serve aviation-related training and education functions that concentrate on technological innovation. The students and visitors that take part in these training programs spend local dollars at hotels, restaurants, shops, and service establishments. A facilities plan should include areas to conduct such training, including classrooms and outdoor activity areas.
- **Airports as Civic Partners:** The Richmond Municipal Airport could be a destination facility for special events such as air shows, fundraising events benefiting local charities, and meetings or services for local non-profit organizations. They may also provide educational information and events for local schools and youth groups.
- **Managing Airport as a “System”:** The Richmond Municipal Airport has the opportunity to provide a wide range of air services to growing communities within the region and serve businesses along the I-70 corridor. The airport system could support businesses from high technology and medical anticipated on the north side of the City, to small companies and industries located at the Midwest Industrial Park and businesses located south of U.S. 40 off Industrial Parkway. The airport could also provide a spur connection to the Norfolk Southern Railroad line as a way to transport goods and services.
- **Recognition of Historic Significance.** The airport is potentially eligible for designation within the National Register of Historic Places, which would make a small amount of money available for restoration work. Listing in the Register could make federal transportation enhancement funds more likely available.

Development of a System Plan

The Indiana State Aviation System Plan (ISASP) (2003 Update) describes the aviation system as a journey, which begins with ground access to the airport. The ISASP is the principal means by which the State identifies airports to serve present and future air transportation needs, and to identify airport development projects, which are consistent with state policies and priorities.

The ISASP plan is also designed to allocate federal, state, and local matching funds for airport improvements.

The development of a system plan for the Richmond Municipal Airport should include the following considerations:

- **Airport Access:** The airport currently has direct access from Richmond along S.R. 227. Consideration will need to be given toward roadway improvements, including resurfacing and lane expansion, as demand for aviation services grows. Direct access via I-70 and an expansion of transit service to the airport should be considered. An extension of the Norfolk Southern Rail Line or the CSX Railroad through a rail spur should be considered as an alternative to transport goods to local businesses.
- **Airport Facilities and Services:** The current airport facilities and anticipated increase in private carrier frequency are conducive to smaller, private carrier use only. The FAA forecasts suggest that in order to increase capacity utilization and “stretch” of existing infrastructure, upgrades are needed to accommodate air traffic and to distribute utilization more evenly given the expected growth of regional jet service to smaller cities and the availability of smaller “personal” or micro-jets. As a result, an opportunity may exist to upgrade the Richmond Municipal Airport to become a “relief” facility and handle regional jet services.

In order to serve the region and become a “relief” airport for commercial carriers that would otherwise travel to Indianapolis, Cincinnati or Dayton, the airport will need to be expanded. A master planning effort will be needed to determine the space requirements and design parameters of an expanded facility. Upgrades such as water and sewer lines, a control tower, additional runways and hangars, and storage facilities will likely be needed. A water line is needed to the airport. There is currently no storm sewer. The current sanitary hook up is to Boston, Indiana but the overall capacity is unknown. In general, the site needs a variety of infrastructure improvements including but not limited to replacement of the ILS (Instrument Landing System), repair/replacement of the main hanger and improvement to the terminal.



Richmond Municipal Airport

- **Airport Vicinity Land Use:** Land surrounding the airport would most likely be developed with expanded and complementary aviation services. A market study should be performed to assist in identifying future development opportunities and related uses for adjoining lands. A land planning effort in partnership with Wayne County would also assist in determining the development design, layout, and intensity. This may entail the adoption of specific zoning provisions to ensure land use compatibility surrounding the airport.

- **Airspace Access:** Within the State of Indiana, the INDOT Aeronautics Section is responsible for promoting aviation safety. All private and public-use landing facilities are required to receive a Certificate of Site Approval. The airport is required to have an approved FAA Airspace Determination. Different applications need to be completed with the State based on the type of airport planned (public, private, etc.).

Overall, the Richmond Municipal Airport has the potential to be a strong asset for the region to serve residents and businesses, alike. The intent of the recommendations made in this Plan is to position the airport to successfully meet the region's future aviation and economic development needs, serving as a catalyst for the future prosperity of the community and surrounding region.

L. Land Use/Transportation Linkages

A link between transportation and land use is visible in the historical development pattern of Richmond (also refer to the existing land use map). Transportation routes and access provided opportunities for residential development. This residential development, which also occurred due to factors such as available land supply, lower development costs, and convenient access to emerging employment centers, and other period-specific social and cultural factors, brought other land use activities. For example, commercial uses followed residential growth. Further, larger scale regional commercial centers were attracted by the accessibility to the growing trade area population and market throughout the area by Interstate 70 (I-70), Highway 40, and Highway 27. The growing traffic counts attracted still other businesses to the commercial and industrial areas of the community.

While a variety of factors involving available land, lower development costs, convenience, and labor markets resulted in industrial land development, industrial development patterns remain principally related to transportation access. Older industrial uses developed near rail lines. Most new, significant industrial (and also office) uses have developed along major roadways and freeways. This historical development trend is readily apparent in Richmond. Industrial and other intensive land uses have occurred along major street corridors, with interchange access to freeways and interstates, adjacent to I-70.

Investment in the transportation system to meet the needs of various land uses has been a priority in the city. Continuous roadway improvements have improved the capacity and traffic operations to and through the main commercial and employment areas. Several of the more recent projects include bridges, lane improvements, signage and streetscaping that improve aesthetics in addition to operational benefits. Progress has also been made toward a non-motorized system of bikeways and walkways with the support of the Cardinal-Greenway Trail.

In Richmond, transportation investments are intended to ensure a comprehensive transportation system, to preserve the quality of life for residents and retain a desirable business climate. The future vision for Richmond involves a balanced and coordinated, multi-modal transportation system to accommodate ongoing growth and development. Thus, recommendations are provided both for the street system and modes other than the automobile, such as walking, bicycling, or use of transit. A convenient, congestion free, safe and multi-modal transportation system will continue to be an important goal for the community.

While Richmond has control over most of the streets within the city, cooperation from other agencies is needed. The Indiana Department of Transportation and Federal Highway Administration control the allocation of state and federal dollars for transportation improvements.

Another document that lists more specific recommendations, using this Plan as the foundation, is the City's Capital Improvements Program (CIP). The CIP identifies transportation improvements, along with priorities, estimated costs, and funding mechanisms.

Movement is a defining characteristic of life, and we travel to access our work, school, shopping, and entertainment opportunities. For most of us, travel itself is not the purpose, but rather it is the accessibility provided by the transportation system that contributes to our quality of life.

The efficient movement of people and goods through and within Richmond depends on an organized and well-planned system of highways, roads, walkways, trails, and transit options. A system of roadways, transit corridors, bikeways and paths tie the city together, creates a system of movement within which regional centers, neighborhood centers, and residential centers are located. Major transit corridors connect the city to the region. Primary streets, high frequency transit corridors, and major bikeways connect the city within itself; and trails and paths connect the city to its natural surroundings.

M. Strategies and Recommendations

T R 1. Transportation Plan

The City should consider preparing a comprehensive transportation plan. This document should include complete data collection of traffic counts, road cross sections, signalization and timing information, and an update of crash statistics. The Plan should be a cooperative effort between the county, city engineering department, and the police department.

More specific road improvements should be considered including road widening or narrowing based on traffic volumes and function, intersection improvements based on traffic volumes and crash data, opportunities to utilize new transportation technology, and a complete study of one-way pairs in the city.

A Coordinated Development Review Process and Committee for All Applications should be established – City of Richmond/Wayne County

T R 2. Street and Corridor Character

Street width and scale, presence of on-street parking and sidewalks, block length, building setbacks, design speed, street trees and even pavement markings and signs all contribute to the functions of the street and the perceptions of the driver. Driver perceptions can affect vehicle speed and the care used in driving. The character of the roadway corridor as viewed by the motorist also impacts the image of the community.

Successful commercial corridors should be free of unsightly clutter and easy to navigate to find a destination. Streets in residential areas should cause speeds to be reduced. In some cases, the road design elements in the city reinforce the desired image. In other cases, improvements need to be considered. This Plan relies on a wide range of concepts to help ensure the future transportation system operates safely and efficiently, but also in context with the character of the city.

T R 3. Expressway Viewsheds

Visitors' first perceptions of Richmond are largely created from views along the expressways or from their experience if exiting at the interchanges. A number of techniques can be used to help promote the quality image for the interchange areas at I-70 and Williamsburg Pike, Hwy 27, Middleboro Pike (S.R. 227), and Hwy 40.

- Work with the INDOT to coordinate improvements to I-70 and use context-sensitive design techniques to provide diverse materials for bridges and medians, extensive landscaping and appropriate lighting so the expressways contribute to the urban landscape.
- Promote use of the state’s standard freeway logo signs and informative signs along the expressways to help direct motorists to local activity areas.
- Apply access management and special zoning standards to help ensure uses near interchanges are well designed in terms of access, landscaping, lighting and signs.

T R 4. Route Designations

The identification of specific routes for types of traffic ranging from truck and hazardous materials transport routes to bicycle routes should be included in the creation of an overall transportation plan. Truck and hazardous material routes should be identified along primary routes to industrial areas and guide traffic from the interstate to such points of destination. It is important to keep such traffic away from the downtown and residential areas.

Signage and pavement striping can be used to designate on-street bike routes throughout the city in an effort to facilitate the use of alternative transportation modes and provide an interconnected motorized and non-motorized transportation system.

T R 5. Major Street Corridors

Travelers along city streets encounter a diverse mixture of land uses and a range of physical characteristics. The spectrum ranges from tree-lined residential streets with sidewalks to commercial arterials with a complexity of signs, parking, traffic controls, and turning movements. Major institutional, research, and industrial uses usually fall between those two extremes of intensity.



Source: LSL

Land use and transportation are obviously closely linked. Arterial corridors offer a prime example of the relationship of land use and traffic. Therefore, an evaluation of major streets must consider the entire “corridor” along that street. A corridor is defined as not only the street, but also sidewalks, streetscape and the adjacent sites extending from building face to building face. A “zone of influence” that extends beyond those boundaries also affects the corridor, such as nearby major land uses with their primary access to the corridor.

Both land use and traffic characteristics along major streets were inventoried to help plan for the development and redevelopment, as needed. This evaluation considered potential land uses that would complement the existing character and the traffic carrying capability of the streets.

Using the “character” approach, the major corridors were classified into three categories. Some corridors can be placed entirely within one category. Other corridors exhibit varying characteristics and may change category from one segment to another. The category used to identify the major thoroughfare corridor or segment thereof is particularly important in identifying and programming planned actions to address problems. The three major thoroughfare corridor categories are described below and illustrated on the Corridor Character Map at the end of the chapter.

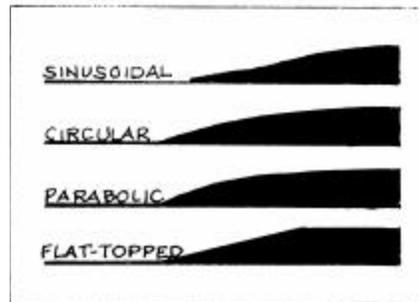
- **“Preservation Corridors”** are streets such as portions of U.S. 27 and U.S. 40, which pass through areas where the potential for significant redevelopment or conversions from one land use to another exists. These parcels should be reviewed with an eye toward preventing land use and thoroughfare conflicts through application of zoning and access management standards. Streets in this category have the opportunity to contribute positively to a well- coordinated transportation system in a setting consistent with the desired character of the corridor.
- **“Correction Corridors”** are streets bounded primarily by commercial and/or industrial uses. Traffic volumes along several of these corridors are well above the capacity envisioned when the roads and right-of-way were conceived. For example, some expressway interchanges were not designed for the level of use today. Other corridors, such as the segment of U.S. 27 between Industrial Drive and North J Street, developed over a period of years under old street design, subdivision, and zoning/site plan design standards that did not contemplate today’s volume and did not reflect the city’s current design philosophy. These corridors are complex, with confusion, traffic congestion, intensive activity, and/or an incomplete transportation network. These corridors are in need of multiple actions, such as widening and medians, to correct problems that resulted from cumulative changes over time.
- **“Expressway Viewshed Corridors”** are areas either along a freeway or expressway or at interchanges that act to serve as a “front door” to motorists traveling along these roadways. Expressway Viewshed Corridors within the study area are located along I-70. Key interchange areas are located at Williamsburg Pike Road, U.S. 27, Middleboro Pike (S.R. 227), and U.S. 40. These interchanges are in need of significant enhancements to make a dramatic statement that one has arrived in the City of Richmond. Such enhancements include:
 - “Welcome to Richmond” signs;
 - Enhanced landscaping including street trees and flowerbeds;
 - Ornamental features such as lighting, benches and banners; and
 - Extended gateway treatment along the roadways for one or two blocks.

Improvements to the appearance of the corridor along I-70 could include the addition of landscaping, signs and lighting, and screening of outdoor storage and loading areas. Some of these corrective actions will occur gradually over time as land uses change. The zoning ordinance should assure site plans are reviewed when uses change or expand so that upgrades to the site features can be applied.

T R 6. Specific Major Street Corridor Recommendations

Based on an assessment of existing conditions and public comments, the following specific improvements are identified for Hwy 40 and Hwy 27, the two main corridors within the city and also an improvement of Salisbury Road from Industries Road to US 35:

- Hwy 40 (Main Street). The streetscape should be improved outside of the downtown area to accommodate a continuous sidewalk system on both sides of the road. A boulevard with street trees and lawn should be considered for approximately ¼ mile along Hwy 40 from the city limits. The feasibility of on-street bike lanes should be considered. The remaining portion of the cross section should be preserved for a minimum of two lanes of through traffic lanes in each direction. Refer to the gateway enhancement recommendations for details on entry signage and treatment at the city limits.
- Hwy 27 (Chester Boulevard). As mentioned in the existing conditions segment of this chapter, it is anticipated that traffic volumes will continue to increase on Hwy 27 north of National Road, specifically near the I-70 interchange. U.S. 27 between University Boulevard and I-70 Interchange can be expected to increase from 18,210 to 22,570 within five (5) years (based on the rate of annual increase), with the addition of the new hospital and medical campus and additional industrial developments. Such developments and property redevelopments will cause a need to focus on access management, truck routing, and traffic flow measures. In addition, future improvements should be coordinated with the I-70/Hwy 27 interchange improvement project from south of the interchange to North J Street in 2007, and from 1.2 miles north of the interchange (Tingle Road) to 5.7 miles north of I-70 in 2007. The city should also coordinate with Roseview Transit regarding the potential for bus shelters and pull-outs, and transfer facilities in anticipation of a circulator route with increased bus frequencies.

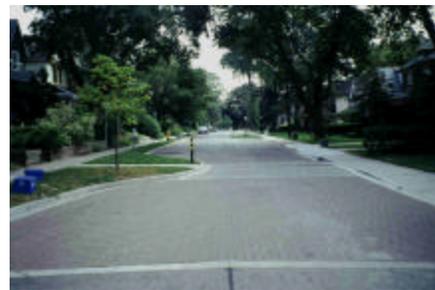


Variation in Speed Humps and Speed Tables

T R 7. Traffic Calming

Residents expect low volumes of traffic and low speeds within neighborhoods. Increases in local traffic, width of streets, and other factors may cause neighborhood traffic safety and related concerns.

Traffic calming is a way to visually and physically impede speeding in residential areas. The physical change in the road parameters and the psychological change in the “feel” of the road combine to reduce the speed of vehicles. Some of the most common traffic calming devices includes:



Street Narrowing, Slow Points or Chokers
Source: LSL

- **Speed humps** are vertical constraints on vehicular speed and are designed according to a safe vehicle speed (15 to 20 mph). They are raised areas that extend across the width of the pavement and range between 2-4 inches in height and 14-22 ft in length. Specifications on speed hump design are site specific and dimensions are unique to each location.
- **Speed tables** are vertical constraints, similar to speed humps, constructed with a table or flat portion in the center. They can create a street environment that is pedestrian friendly by being used in combination as a raised crosswalk. They provide visual enhancement, reduce vehicle speed and enhance the use of non-motorized transportation. Unlike speed bumps, speed tables are designed to allow traffic movement and can even accommodate snow plowing.
- **Street narrowing, slow points, or chokers** include curb modifications, channelization, and sometimes landscaping features that narrow the street to a minimum safe width. They are often installed at intersections to reduce speed and/or redirect traffic. They provide larger areas for landscaping, enhance the neighborhood, facilitate loading and unloading, and optimize the pedestrian crossing locations.
- **Angle points or chicanes** are curbed horizontal deflections in the path of vehicle travel. They are built along the edge of the travel-way similar to street narrowing treatments. They use physical obstacles and parking bays, and are staggered so drivers must slow down in order to maneuver through the street. Trees are often used at the slow point to restrict driver vision and create a feeling of a “closed” street.
- **Boulevard slow points or channelization** include center located islands that divide the opposing travel lanes at intersections or at mid-blocks, pedestrian refuge treatments, and the other standard forms of intersection traffic control islands. These are aimed at reducing speeds while enhancing the pedestrian crossing points and safety.
- **Intersection diverters** are features that partially close an intersection to limit the allowable turning movements and divert traffic. They are used to convert an intersection into two unconnected streets, each making a sharp turn. This alters traffic flow patterns and limits the ability of vehicles to cut through residential neighborhoods.
- **Street closures** are highly constrictive and affect the network traffic flow by eliminating neighborhood traffic from cutting through. Closure may be an option where there is a correctable crash history. Road closures are generally a poor choice, since traffic may just divert to other streets and repeat the problems elsewhere. Also access by emergency vehicles is impeded.

- **Roundabouts** are raised, center rotary islands that are used as a replacement for traffic signals and stop signs at intersections. While these can be used as an effective intersection control, they also have an added traffic-calming benefit by deflecting vehicles out of their normal path, slowing traffic, and reducing the number of conflict points. They also improve capacity and safety of the intersection and improve neighborhood aesthetics. Modern American roundabouts are also being used at a growing number of locations as alternatives to signals along arterial streets. Smaller scale “traffic circles” are also being used on non-arterial streets.



Roundabout
Source: drivers.com

- **Perimeter treatments** are visual and physical treatments used to communicate a message to drivers entering a residential neighborhood. Traffic signs, intersection narrowing, boulevards, textured pavement surfaces such as brick and landscaping features are often used to create this effect. Entry treatments are used to increase driver awareness to changes in roadway environment.

Residential developers should be specifically encouraged to incorporate traffic calming measures during the planning and design phases of new residential areas. Where appropriate, these concepts greatly reduce future problems and will help maintain the value of the neighborhood. The cost of a traffic calming measure when incorporated in the planning and design phases of the project is minimal. However, retrofitting an existing intersection or residential roadway segment with traffic calming measures could be significantly more expensive.

With regard to existing situations in developed neighborhoods, “retrofitting” traffic calming measures may also be appropriate. For example, there may be complaints about cut-through traffic, especially when the adjacent arterial streets become congested, and motorists begin seeking alternate routes. In some cases, the traffic problems are just a perception, but in other cases there may be a problem to address. Installation of stop signs is a common response, but studies have shown they are not always effective in producing desired results.

Alternatives to stop signs could be considered, especially where the location does not meet “warrants” specified by the State of Indiana. Where such concerns arise, the city may wish to follow the following three-step sequence used successfully by other cities:

- Document the problem. This could involve speed studies or evaluation to determine if there is an unusually high percentage of cut-through traffic. Some communities involve the residents in this process as an educational element as often they realize their neighbors are the speeders. The neighborhood can then work to reduce the problem with help from the city.
- Where a documented problem exists, such as more than 15% of the vehicles traveling over 30mph, corrective measures may be needed. The first step is typically enforcement, speed monitor signs, and other simple methods to slow traffic or direct it to more appropriate streets.

- Where measures are needed, one of the variety of tools mentioned above can be used to alter driver behavior and help traffic fit the character of the area.

To conclude, implementing a traffic calming program within new residential developments or to address circumstances within existing developed areas, should involve the following:

- Traffic calming measures should be examined from an area-wide traffic calming perspective.
- Traffic calming measures should be used as speed controls rather than volume controls to prevent the diversion of through-traffic to parallel residential streets.
- It is important to highlight the presence of traffic calming measures by landscaping and treating the street edges. These measures complement the engineering design by softening the appearance of speed humps and enhancing the appearance of more aesthetic measures such as chicanes and traffic circles. Also, landscaping measures can enhance engineering measures and make them more effective and safer by highlighting their presence.
- Traffic calming devices should be designed in coordination with emergency services to ensure that safe emergency vehicle access is maintained to all areas. Details such as mountable curbs and gutters can often help resolve access problems.
- A risk management program should be implemented to minimize liability issues through proper location, design, signage, marking and lighting of traffic calming devices.

T R 8. Street Capacity & Operational Improvements

Street capacity refers to the capability of a roadway to accommodate the expected traffic flow with an acceptable amount of delay, i.e. minimal congestion. Traffic engineers measure this capacity through a comparison of the volumes, usually during the peak hour, to the designed capacity. This determines the amount of average delay per vehicle. This statistical analysis is then translated into a “level-of-service” from A-F. Streets with current or projected poor traffic operations should be designated for improvements. Actual traffic conditions, including crashes, will need to be frequently monitored to adjust the list of recommended projects in a Capital Improvement Program.

Future traffic conditions should also consider land use and socio-economic factors. Street improvement projects typically fall into two major categories: Capacity Expansion Projects and Capacity Preservation Projects. Capacity Expansion projects include widening major roadway that will add lanes, new roadways, and new freeway interchanges. Capacity Preservation Projects include reconstruction without addition of lanes, signal improvements, or enhancement actions such as bikeways, walkways, landscaping, and historic preservation. Pavement management, bridge maintenance, and many types of safety improvements are included in the preservation category.

Major planned transportation improvements are illustrated on maps at the end of this chapter and a more detailed list of proposed projects including the year that improvements are scheduled to occur can be found in the existing conditions section under the subsection titled, Improvements Planning and Scheduling.

In addition to street improvements, the city can help manage traffic through a variety of tools to reduce vehicle trips or lessen their impact. These various “transportation management” tools are described in the next section.

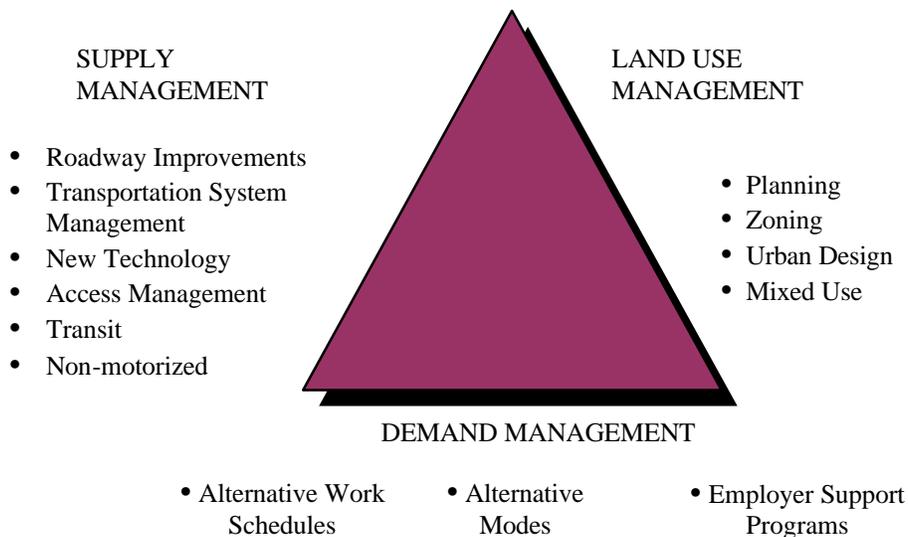
N. Transportation Management Techniques

The concept of transportation management is simple. Every automobile trip that can be eliminated by giving people other choices, such as transit or walking will help to relieve the street system, as will a land use arrangement that shortens trips. Every driveway that is eliminated or redesigned will help preserve capacity and reduce potential for accidents. Current streets may be able to operate better with new technology, such as signals that respond to actual traffic conditions or informing motorists of alternate routes when there is congestion or an accident. Collectively, these ideas will help address the city’s transportation needs in the future.

Another tool to help address traffic flow is to reduce the amount of travel demand, especially during the peak travel hours when congestion is most prevalent. This approach, called demand management, can involve working with major employers to revise shifts or offer flexible hours to reduce peak demands. Other ideas could be to encourage use of transit for employees by working with Roseview Transit on scheduling and to ensure site plans are designed in a “transit friendly” way.

Traffic Impact Analysis

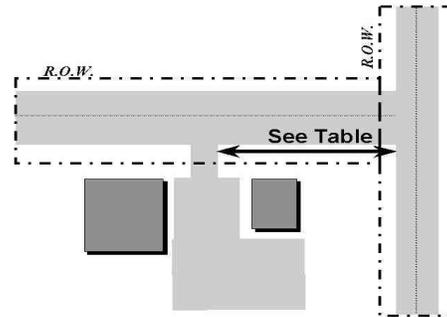
One procedure to help ensure that traffic impacts are properly evaluated is to require a traffic impact study prior to approving site plans, rezoning, or special uses for significant projects. Generally, a traffic impact study is recommended for a project that would generate 50 or more directional (one-way) trips in the peak hour or 500 trips in an average day. A well prepared traffic impact study will also address site access issues, such as the potential to share access or use service drives. The study should analyze options to mitigate traffic impacts, such as changes to access or improvements to the roadway. In some cases, the developer may assist in funding improvements to help offset the direct impacts of the project.



Access Management

Widening and intersection improvements are not the only ways to improve traffic operations along a street. One technique to help preserve capacity and promote safety while delaying or avoiding the need for widening is access management. Access management involves comprehensive controls to minimize conflict points, reduce the potential for accidents, and help preserve the street's ability to carry traffic.

Access management standards could be applied to new development proposals, and during road improvements to revise existing access that does not meet the current standards. A general review of access management concepts is provided below, and provides a foundation for a Codified Access Management Ordinance.



Driveway Spacing from Intersections
Source: LSL

- **Number of Access Points.** The number of driveways allowed along major streets affects traffic flow, ease of driving, and accident potential. Reasonable access must, however, be provided for each use. If direct access to the adjacent roadway is necessary, the number of access points should be limited to one where possible. Every effort to limit the number of driveways; and encourage access off side streets, service drives, frontage roads, and shared driveways will help.
- **Driveway Spacing from Intersections.** The minimum spacing of access points from intersections should be in accordance with the table below (measured from pavement edge to pavement edge as shown on the figure):

Signalized locations: *

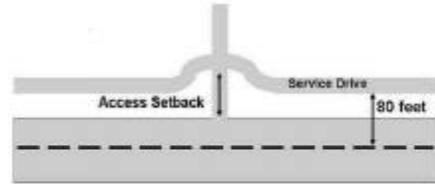
- along U.S. 27 and Hwy 40 300 feet
- along other public streets 200 feet

Unsignalized locations:

- along U.S. 27 and Hwy 40 300 feet
- intersections with U.S. 27 and Hwy 40 300 feet
- other intersections 150 feet

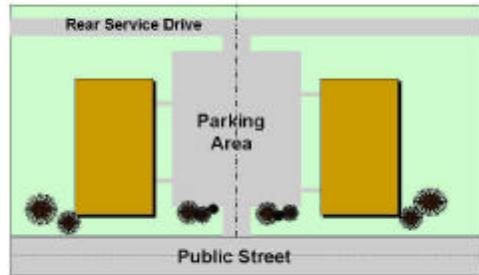
* Spacing shown for signalized intersections should also be applied at intersections where INDOT indicates spacing and approach volumes may warrant a signal in the future.

Changes to these guidelines should only be considered if it can be demonstrated by a traffic impact study that the driveway operation will not result in conflicts with vehicles at the adjacent intersection. These guidelines can also generally be applied to spacing from access points on the opposite side of the street. Preferably, major access points should be aligned with, or 250 feet from, major access points on the opposite side of the street. The actual dimensions will vary depending upon existing and expected turning movements.



Frontage Road Minimum Setbacks
Source: LSL

Alternative Access. Alternative access should be encouraged along arterials, such as shared driveways, rear service drives, or frontage roads. Commercial developments and parking lots should be connected through front or rear service drives. Frontage drives, rear service drives, shared driveways, and connected parking lots should be used to minimize the number of individual driveways along major streets, while preserving the property owner's Frontage roads or service drives should be constructed in accordance with the following standards:



Alternative Access
Source: LSL

- A. Service drives and frontage roads should be set back as far as reasonably possible from the intersection of the access driveway with the public street. A minimum of eighty (80) feet should be maintained between the public street centerline and the pavement of the frontage road, with a minimum sixty (60) feet of throat depth provided at the access point, as measured from exit lane stop bar to service drive.
- B. The alignment of the service drive can be refined to meet the needs of the site and anticipated traffic conditions, provided the resulting terminus allows the drive to be extended through the adjacent site(s).

Posted Speed (mph)	Driveway Spacing* (in feet)	
	Minimum	Recommended
30	150	185
35	175	245
40	200	300
45	315	350
50+	350	455

* As measured from the centerline of each driveway.

Note: Spacing on boulevards may be adjusted

Source: LSL

In areas within one-quarter mile of existing or future signal locations, access to individual properties should be provided via these alternative access methods rather than by direct connection to a major arterial. Ideally, this should be through a rear service drive (a rear service drive has adequate depth for on-site stacking, compared to a "frontage" road).

In the case of existing, proposed or recommended rear service drives, additional access to individual properties may be allowed through direct connection to the adjacent arterial street, provided that movements at these driveways are restricted to right turns into and/or out of the site, and are appropriately spaced as discussed later in this section.

- **Driveway Spacing from Expressway Ramps.** A minimum of 600 feet is recommended between expressway ramps and any driveway.
- **Driveway Spacing from Other Driveways.** Minimum and desirable driveway spacing requirements should be determined based on posted speed limits along the parcel frontage, traffic conditions, and sight distance and in consideration of the amount of traffic a particular use is expected to generate. Guidelines are shown on Table 8-1 but can be varied upon specific findings and in consideration of published traffic engineering manuals such as the AASHTO Greenbook.

The "desirable" values provided in Table 8-1 are based on the sight distance necessary to allow an egressing vehicle to enter the arterial traffic stream without causing oncoming traffic to decrease their speed by more than 10 mph, and should be required where parcel size permits. The "minimum" values in the table are based on the distances required to avoid conflicts between vehicles turning right or left from adjacent driveways. In order to prevent left turn conflicts, possible driveways should be aligned with those across the street or offset a sufficient distance from driveways across the street in accordance with the minimum spacing standards listed in the table. In the case of expansion, alteration, or redesign of existing development where it can be demonstrated that pre-existing conditions prohibit adherence to the minimum driveway spacing standards, the driveway spacing requirements could be modified, but the recommended driveway spacing should not be reduced by more than 60 feet.

Right-of-Way Preservation

they are expected to handle now or in the future. The right-of-way and development along several segments limit road widening, intersection improvements, installation of boulevards, and/or the addition of desired bike paths. Acquisition of additional right-of-way to accommodate desired improvements can delay projects and escalate costs. The advance right-of-way acquisition process also reduces later disruption to homes and businesses that would otherwise need to relocate or redesign their site.

A cooperative effort to preserve right-of-way in advance of the planned roadway improvements could help address this issue. Three methods that could be considered are negotiations to donate lands during development approvals, advanced acquisition, or preservation through clustering.

1. **Donation.** Landowners and developers often understand the benefits of donation of land needed for right-of-way. Land donation can expedite improvements that will benefit the landowner. A landowner may also be eligible for tax benefits through donation or dedication. In some cases, the city may wish to support variances from setbacks where the setback from the new right-of-way would create a non-conforming situation. Alternatively, the zoning ordinance could include special standards for such situations.
2. **Advance acquisition.** Traditionally, right-of-way is purchased after the improvement has been designed. Advanced acquisition could involve purchase at an earlier date when costs are lower. Some road agencies maintain funds to purchase right-of-way if a development is proposed where right-of-way will be needed in the future. Thus, the right-of-way can be purchased at a lower cost.
3. **Density Transfer.** The city might allow a developer to transfer the density that could occur in the future right-of-way to another location on the site through special zoning provisions.

Multi-Modal System Recommendations

A unified multi-modal system for the city of Richmond with connections between modes could provide additional transportation alternatives to a vehicle. The following is a brief description of its components.

Sidewalks and Pathways

The sidewalk and pathway segment includes three different cross-sections to serve their intended function. These cross-sections are described below along with their relationship to other aspects of the Comprehensive Plan.

- Sidewalks – five foot wide or greater sidewalks
- Multi-Modal Paths – six to eight foot wide sidewalk
- Greenway Pathway - eight-ten foot wide pathway

Bus Routes

The plan indicates a linkage between established routes and the other modes of travel offered in the City. The City should continue to work in collaboration with the transit authority so the system can respond to changing needs and new development projects. A circulator system should be considered along Highway 27 to service the new hospital campus and higher education facilities that are located in close proximity to each other. The route could provide high frequency service between a downtown transit center and the campuses, while providing connections to existing routes.

Bus Routes and Multi-Modal Pathways

In instances where there is an important link to a community facility, connection to an additional transportation mode, or along key transportation routes, the bus route and multi-modal pathway routes overlap.

Rail

The multi-modal plan links sidewalks, pathways, and bus routes to the historic train station. The train station serves as a historic feature to the city and enhancements at the train station are encouraged.

O. Transportation Maps

1. Corridor Character
2. Planned Transportation Improvement Projects
3. Right-of-Way