THOROUGHFARE PLAN

Franklin, IN

October 2017

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ACKNOWLEDGMENTS

PREPARED FOR:

City of Franklin, Indiana

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Council and date

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Convergence Planning LLC

CITY OF FRANKLIN, INDIANA

RESOLUTION NUMBER 2017-16

A RESOLUTION ADOPTING AN AMENDMENT TO THE CITY OF FRANKLIN COMPREHENSIVE PLAN 2013 TO INCLUDE A THOROUGHFARE PLAN AND CONFIRMING RESOLUTION NO. PC 2017-36 OF THE CITY OF FRANKLIN PLAN COMMISSION

WHEREAS, the Common Council of the City of Franklin, Indiana has determined that in order to continue to provide for the orderly and harmonious growth in and around Franklin it is necessary from time to time to update the Comprehensive Plan; and

WHEREAS, Indiana Code 36-7-4-501 states "For the promotion of public health, safety, morals, convenience, order, or the general welfare and for the sake of efficiency and economy in the process of development. The Plan Commission shall prepare a Comprehensive Plan"; and

WHEREAS, it has been determined, after assessing the existing Comprehensive Plan, that was last updated in 2013, the Common Council of the City of Franklin finds that Chapter 10: Transportation of the Comprehensive Plan should be updated at the present time to include a Thoroughfare Plan; and

WHEREAS, through public meetings of the designated Thoroughfare Plan Committee, in conjunction with HWC Engineering, an amendment to Chapter 10: Transportation of the Comprehensive Plan has been developed to include a Thoroughfare Plan; and

WHEREAS, public notice has been given by the Plan Commission, consistent with Indiana Code, and a public hearing was held in the Council Chambers of Franklin City Hall, 70 E. Monroe Street, Franklin, Indiana on the 17th day of October, 2017, to allow public comment and input regarding said plan; and

WHEREAS, the Plan Commission found that the Amendment to include a Thoroughfare Plan to City of Franklin Comprehensive Plan 2013 meets the requirements of IC 36-7-4-500, and that adoption of the Comprehensive Plan Amendment was in the best interest of the city; and

WHEREAS, the Plan Commission adopted Plan Commission Resolution PC 2017-36 (attached as Exhibit "A") recommending the Common Council of the City of Franklin approve the amendment to include a Thoroughfare Plan in the Comprehensive Plan 2013; and

WHEREAS, Common Council finds that it is in the best interest of the city to adopt the Amendment to include a Thoroughfare Plan in City of Franklin Comprehensive Plan 2013.

NOW, THEREFORE BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF FRANKLIN, INDIANA, THAT:

1) **Final Action.** The City of Franklin Amendment to Chapter 10: Transportation of the Comprehensive Plan 2013, which includes a Thoroughfare Plan, is approved as certified by the City of Franklin Plan Commission with Plan Commission Resolution PC 2017-36 and adopted by the City of Franklin Common Council.

2) **Effective Date.** This Resolution shall be in full force and effective immediately upon its passage.

3) **Filing with Johnson County Authorities.** Upon adoption of the Resolution, the Clerk-Treasurer of the City of Franklin, Indiana shall place one (1) copy of the City of Franklin Comprehensive Plan 2013 on file in the office of the Johnson County Recorder.

INTRODUCED & APPROVED by the Common Council of the City of Franklin, Johnson County, Indiana, this 20 day of November, 2017.

City of Franklin, Indiana, by its Common Council:

Voting Affirmative:

Keith Fox, Council President

Joseph P. Abban

Joseph R. Ault

Kenneth Austin

Andrew Eggers

Bob Heuchan

Richard L. Wertz

Voting Opposed:

Keith Fox, Council President

Joseph P. Abban

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Kenneth Austin

Andrew Eggers

Bob Heuchan

Richard L. Wertz

Attest:

Jayne Rhoades, City Clerk-Treasurer

KEY TERMS

There are several technical terms used throughout this plan that are specific to transportation planning. Some of these key terms are listed below. A more complete listing can be found in the appendix.

Annual Average Daily Traffic (AADT): The total traffic volume passing a point or segment of a highway facility in both directions for one year divided by the number of days in a year

Capacity: The maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic and control conditions, usually expressed as vehicles per hour or persons per hour

Functional Classification: Classification of roadways based on two key characteristics: roadway mobility (traffic volume) and roadway accessibility (entry and exit onto the roadway)

Land Use: Classification of geographic areas of land according to their primary use. Examples can include agricultural, residential, commercial, industrial, open space and recreation

Level of Service: Qualitative measure describing operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, safety, comfort and convenience

Multi-Modal: Utilizing multiple forms of transportation, including transit, vehicular, cycling and pedestrian

Right of Way: Publicly owned land reserved for public infrastructure purposes such as roadways, railroads, utilities, greenways, etc.

FHWA: Federal Highway Administration. Agency within the U.S. Department of Transportation that supports state and local governments in the design, construction and maintenance of the nation's highway system (Federal Aid Highway Program) and various federally and tribally owned lands

Indianapolis MPO: Indianapolis Metropolitan Planning Organization. Responsible for conducting a continuing, cooperative and comprehensive transportation planning process within the Indianapolis region

INDOT: Indiana Department of Transportation

EXECUTIVE SUMMARY

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FRANKLIN IS A CITY *ON THE MOVE*

In recent years, the city of Franklin has seen a downtown revitalization take root, as a result of intentional investment in improved streetscapes, pedestrian facilities and building façade upgrades around the courthouse and throughout the Central Business District. The city's investments have sparked private interest in the city's downtown core, with new local businesses bringing their own revitalization efforts to downtown. New businesses are also locating in Franklin along US 31, with major national brands like Meijer, Kroger Marketplace, Buffalo Wild Wings, Marshalls, PetSmart and others arriving since 2016.

Jefferson and King Streets, the main east/west arteries through the city, are undergoing drastic transformation as of the writing of this plan, which includes full redesign and reconstruction of the roadway, pedestrian facilities, streetscape enhancements and underground utility upgrades. The Jefferson and King Street transformation will connect seamlessly with the recently completed gateway project on the east side of the city. The trail network continues to expand, with nearly 14 miles in place, and seven miles of trail planned or already under construction.

Behind this investment is a growing city. Since 2010, the city has grown by nearly 5 percent. Regional trends support this growth, with Johnson County also experiencing 5 percent growth since 2010. In fact, the five fastest growing counties in Indiana are part of the suburban counties which surround Indianapolis, including Johnson County. The others are Hendricks, Boone, Hamilton and Hancock.

For Franklin to continue to capitalize on this momentum, it must plan for the future and ensure the transportation network within the city is ready for what is to come. This thoroughfare plan helps ensure Franklin continues moving forward in several ways:

- **Reviews and updates right-of-way standards to ensure sufficient right-of-way is dedicated along local roads as part of new development**
- **Models and analyzes roadway networks for existing and future growth, to identify potential areas of congestion and delay**
- **Provides guidance for roadway design standards and components**
- **Identifies potential short-term and long-term improvements to increase safety and efficiency of the transportation network**
- **Identifies potential policy improvements to help achieve the goals of this plan**

KEY ELEMENTS

MODELING ANALYSIS

One of the differentiating factors between this thoroughfare plan and many other thoroughfare plans is the use of a travel demand model built specifically for Franklin to provide insights into traffic impacts and capacity needs for the city as it undergoes large-scale household and employment growth.

The traffic analysis was developed by forecasting specific land development, and then using a travel demand model built specifically for this project to generate trips, distribute trips, assign estimated vehicle flows to the various road network scenarios, and then compute performance measures.

Detailed roadway information used in the modeling process included:

- Number of lanes
- Posted speed
- Travel direction
- Functional classification
- Intersection types
- At-grade rail crossings
- Grade separated rail crossings
- Traffic counts

This travel demand model allowed for evaluation of multiple future scenarios, considering such aspects as:

- Impact of differing concentrations of population within the study area
- Impact of different concentrations of employment sites within the study area
- Impact of proposed transportation network improvements on the local transportation network

Ultimately, five scenarios are presented within this plan, although many additional scenarios were evaluated throughout the planning process. These scenarios include:

Existing: The existing transportation network

Future No-Build: Future year 2045 conditions if no changes are made to the transportation network and currently planned improvements are completed

Build Scenario 1: Future year 2045 conditions with the following:

- Future no-build assumptions, plus;
- New I-65 interchange at 300N
- Improvements to Earlywood/300N corridor (remains 2-lanes)

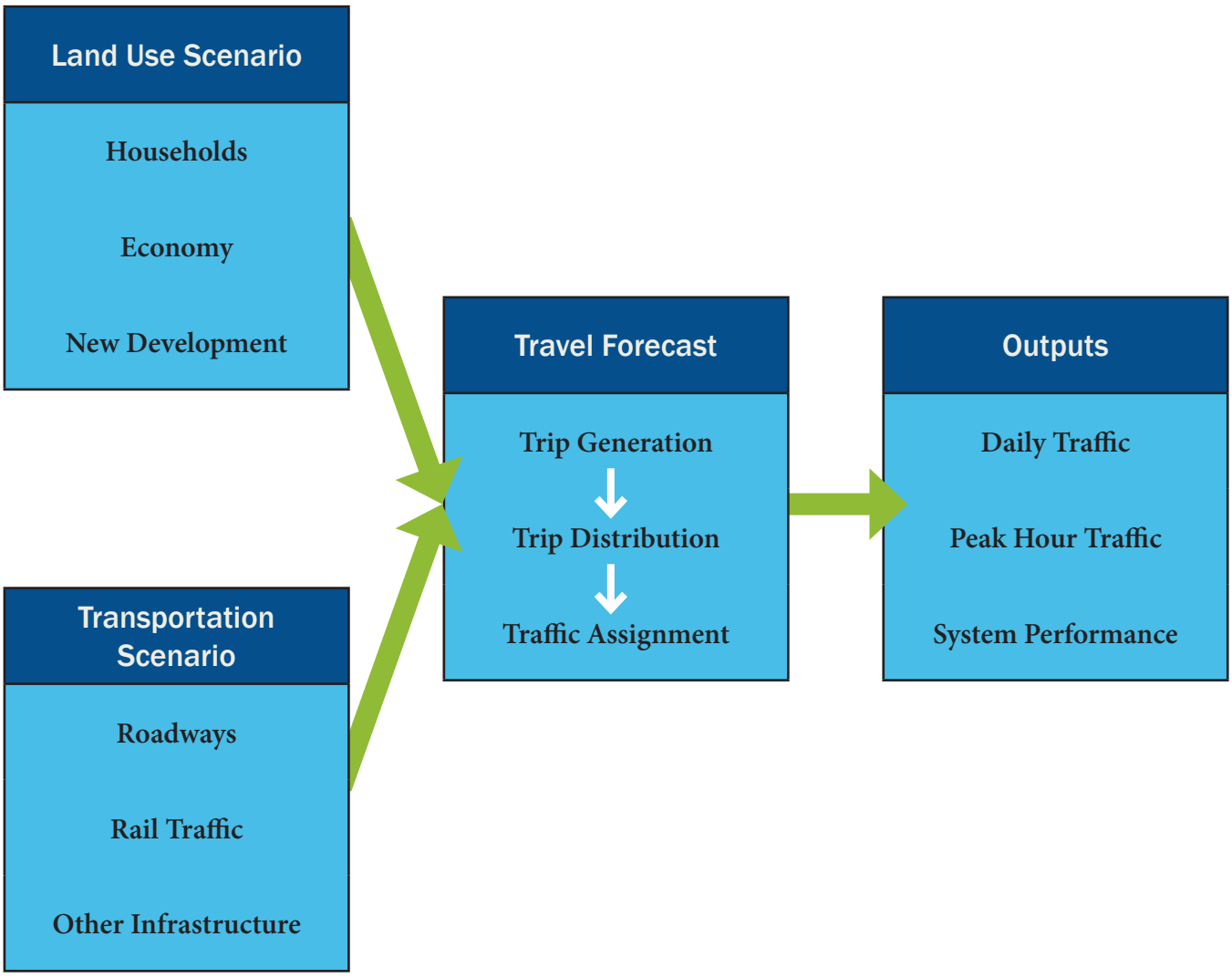
Build Scenario 2: Future year 2045 conditions with the following:

- Future no-build assumptions, plus;
- Graham Road improvement and realignment
- 14th Street and Arvin Drive connection
- Added lanes on Commerce Parkway between Arvin Drive and Graham Street
- New road connection between Westview Drive and CR 100 E
- Improvements to 200 N between SR 144 and US 31
- Long-term roundabout projects

Build Scenario 3: Future year 2045 conditions with the following:

- Future no-build assumptions, plus;
- Build scenario 1 projects
- Build scenario 2 projects

THE MODELING PROCESS



After analyzing the scenarios individually, additional future capacity improvement projects were recommended based on areas of concern highlighted by the traffic demand model.

An economic impact analysis based on the scenarios was also performed. The combined modeling and economic analysis led to the selection of priority improvements listed at the end of this executive summary.

THOROUGHFARE MAP

The Future Thoroughfare Plan Map lays out the envisioned future roadway network for the city. The thoroughfare map utilizes the same terms as the existing INDOT Functional Classification Map (arterials and collectors) to ensure continuity for future funding, as roadways shown in the Future Thoroughfare Plan Map may someday be included in the Functional Classification Map. However, the Future Thoroughfare Plan Map is specifically for the city to plan for changes to its transportation network through the year 2045.

The roadway classifications in the Future Thoroughfare Plan Map also relate to right-of-way and flexible street design standards presented in this plan. All classified roadways in the Future Thoroughfare Plan Map will be required to provide a minimum right-of-way dedication and meet certain other standards, such as lane widths, curb/gutter and sidewalk standards depending on their classification and context zone.

CONTEXT ZONES AND FLEXIBLE DESIGN STANDARDS

Today's transportation networks must consider much more than just automobile and vehicular traffic. Transportation networks must respond to the context in which they operate. A roadway will change character and function as it moves its way from the rural landscape and into a city center. In recognition of this transition, two context zones have been identified in this plan to assist with design decisions: urban and suburban.

Flexible design standards have also been provided to work in tandem with the identified context zones. These flexible design standards allow each roadway to be designed, built and updated in a way that responds to the surrounding environmental context and addresses the needs of varied users of the transportation network. These flexible design standards apply to any classified roadway on the future thoroughfare plan map.

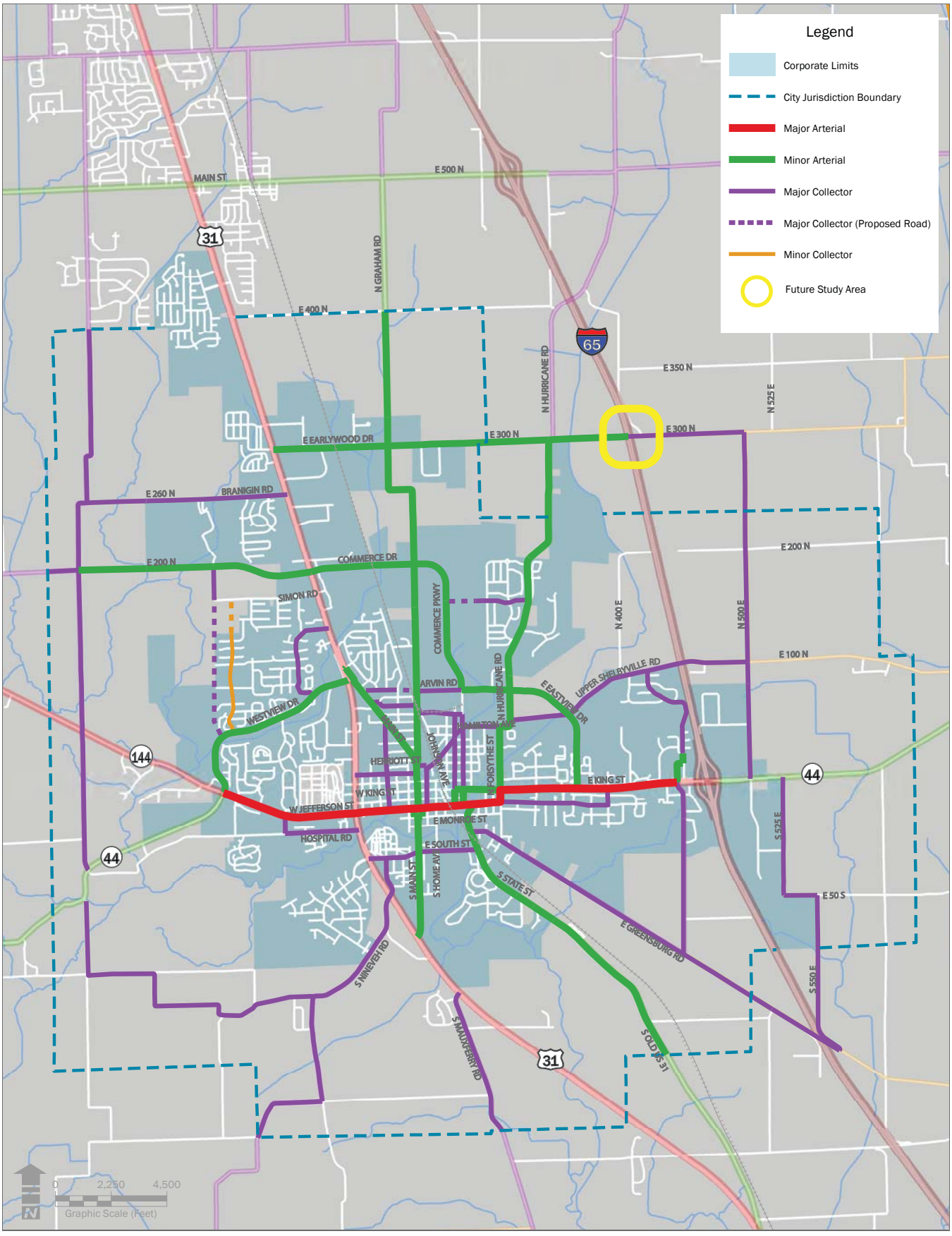
RIGHT-OF-WAY STANDARDS

The standards contained within this plan are minimum design standards. The city may require increased standards if necessitated by local conditions. It is also recognized that existing conditions may limit the available right-of-way and necessitate less right-of-way than indicated in the table below. When such constraints are present, required right-of-way dedication will be reviewed on a case by case basis.

Table A: Right-Of-Way Requirements

	No. of Lanes	Minimum Right-of-Way	
		Urban	Suburban
Major Arterial	2-4	70'	110'
Minor Arterial	2-4	70'	100'
Major Collector	2	60'	70'
Minor Collector	2	50-60'	60'
Local Road	2	50'	50'

FUTURE THOROUGHFARE PLAN MAP



PRIORITY STRATEGIES

The Transportation Plan Recommendations section contains a robust list of short, medium and long-term improvements and policy recommendations based on traffic modeling, community input, working group feedback and review of current and previous planning efforts. However, there are several projects and policies which should be considered priority strategies due to their impact on the city or their ability to lay the groundwork for other identified recommendations. Not all of these priority strategies are short-term. Some may be long-term, but require action in the short-term to ensure success. The priority strategies are identified below.

POLICY

- Update INDOT roadway classifications as needed to ensure funding eligibility for future roadway projects
- Pursue discussions with INDOT regarding a future interstate interchange at CR 300 N/Earlywood Drive. Future actions may include a feasibility study and an interchange justification study.
- Evaluate adopting traffic impact fees
- Update city ordinances to require traffic impact studies according to the thresholds and standards of the Indiana Department of Transportation's Applicant's Guide to Traffic Impact Studies
- Develop a bike and pedestrian plan, incorporating the trail network as a component
- Evaluate a formal access management policy for US 31, Earlywood Drive, King Street, CR 500 E and CR 200 N
- Evaluate a formal access management policy for the truck route, including Eastview Drive, Arvin Drive, Commerce Parkway and Commerce Drive

IMPROVEMENTS

Complete improvements currently funded and scheduled for construction including:

- Reconstruction of Jefferson Street between US 31 and Forsythe Street, including pedestrian facilities
- Reconstruction of King Street between Forsythe Street and Fairway Lakes Drive, including pedestrian facilities
- Reconstruction of East Jefferson Street bridge at Hurricane Creek
- Intersection improvements including a roundabout at Eastview Drive and Upper Shelbyville Road
- New roadway to service Linville Business Park off of Graham Road north of Commerce Parkway
- Extension of Brookhaven Drive between Bridlewood Drive and Commerce Parkway
- Intersection improvements including a roundabout at Arvin Drive and Commerce Parkway
- Reconstruction of South Main Street between Young's Creek bridge and US 31, including pedestrian facilities
- Intersection improvements, including a roundabout at Jefferson Street and Westview Drive
- Intersection improvements, including a roundabout at Graham Road and Commerce Drive
- Pedestrian improvements at Mallory Parkway and US 31
- Urban trail and pedestrian improvements along West Jefferson Street between Westview Drive and the Johnson County Fairgrounds
- Pedestrian trail along Eastview Drive, Arvin Drive and Commerce Parkway

Pursue additional improvements with short to medium-term benefits including:

- Extension of Arvin Drive between Graham Road and Younce Street
- Improve capacity of Commerce Parkway between Arvin Drive and Graham Street
- Extension of CR 100 E between CR 200 N and Westview Drive
- Realignment of Graham Road on the north and south of Earlywood Drive

Pursue improvements in partnership with INDOT including:

- Feasibility of a new I-65 interchange at CR 300N
- Congestion mitigation along US 31 within city limits

Pursue targeted pedestrian improvements, including:

- Pedestrian improvements along Forsythe Street between Franklin Greenway Trail and King Street
- Pedestrian improvements along State Street/Old US 31 between Wilson Way and South Street

Plan for the following improvements, as development continues to occur and population continues to increase:

- Improve capacity of CR 200 N between SR 144 and US 31 as a connector to the future I-69 corridor
- Improve capacity of Graham Road between Commerce Drive and Earlywood Drive
- Improve capacity of Earlywood Drive/CR 300 N between I-65 and US 31, including roundabouts at Graham Road and Hurricane Road

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INTRODUCTION

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PURPOSE OF PLAN

The Franklin Thoroughfare Plan is a long-range transportation planning tool which provides public officials, property owners, developers, residents and other parties involved with development and transportation projects with guidance on creating a transportation system which will support the community's future needs.

The plan is not a traffic study intended to address immediate traffic concerns, and the plan does not establish rules and procedures for dealing with neighborhood traffic conditions, such as traffic calming mechanisms.

However, this plan does identify potential future improvements which should help increase the safety and efficiency of the transportation network as a whole. Any potential improvements identified in this plan will be considered for implementation as funding at the federal, state and local level permits.

This thoroughfare plan was formed around *three main goals*:

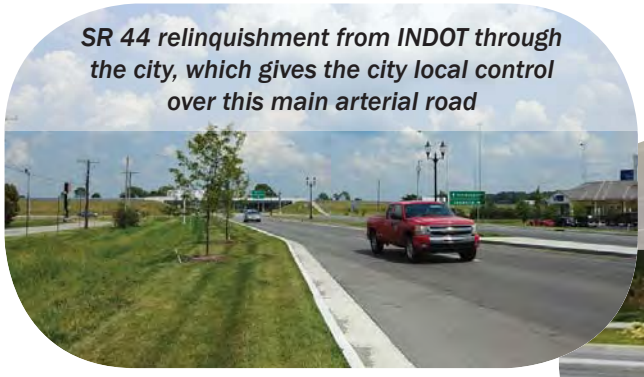
1. Provide a safe transportation network for motorists, bicyclists and pedestrians
2. Maintain an efficient roadway network
3. Create a transportation system that encourages other modes of transportation, such as walking, bicycling and the use of public transit

Though the plan was guided by the listed goals, the plan's purpose is to help achieve the following *objectives:*

- Preserve and establish right-of-way
- Identify locations and corridors where new or improved transportation facilities are needed
- Provide a safe, efficient, accessible and connected transportation network
- Establish and encourage a complete streets philosophy throughout Franklin's transportation network, which supports other transportation options, such as walking, bicycling and public transit
- Establish a context sensitive philosophy, including guidelines and standards for roadways, which acknowledges the ability to expand or widen roadways in an urban and built context is prohibitive and innovative strategies should be prioritized
- Create continuity among the different classifications and typologies of roadways, pedestrian facilities and bicycle facilities
- Coordinate land use and economic development goals with establishment of transportation network priorities

TRANSPORTATION PLANNING PROGRESS AND IMPROVEMENTS

Even though Franklin has not had a formal thoroughfare plan, the city has not been sitting still. Below are a few snapshots of road and trail projects under construction or completed over the last 3-4 years.



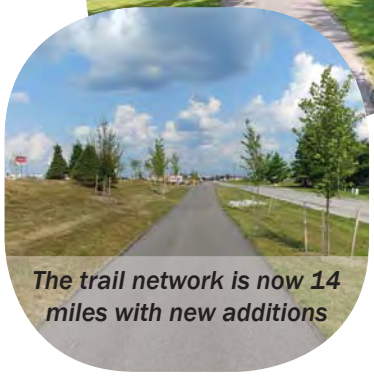
SR 44 relinquishment from INDOT through the city, which gives the city local control over this main arterial road

King Street improvements at the interstate

Main Street Reconstruction, including lighting and pedestrian facilities

Truck route established to divert heavy truck traffic from the downtown

Jefferson Street Reconstruction, including lighting and pedestrian facilities (on-going)



The trail network is now 14 miles with new additions

Roundabout construction at Walnut Street and Main Street

Beyond these improvements, there are also several planned projects on the horizon, including:

- Additional roundabouts along Eastview Drive, Arvin Road and Commerce Parkway truck route to improve efficiency and connectivity of I-65 and US 31
- Seven miles of trail planned or under construction
- Roundabout at Westview Drive and West Jefferson Street

PLANNING PROCESS

As Franklin does not currently have a formal thoroughfare plan, preparation for this plan began with a review of the 2013 City of Franklin Comprehensive Plan with a special focus on Chapter 10: Transportation. A brainstorming session with city staff also helped clarify the city's need for a thoroughfare plan. As part of the analysis of the plan, the following data was reviewed:

- Existing and future land uses
- Population and growth trends
- Employment trends
- Functional classification of county and city roadways
- Travel demand forecast
- Traffic modeling based on assumed future conditions

WORKING GROUP

The plan was guided by a working group of city staff from the Department of Planning and Engineering, Department of Economic Development and the Mayor's Office. Key concerns raised by the working group at the outset of the plan included:

- Supporting future growth with planned infrastructure
- Connecting key community assets
- Evaluating east to west connectivity
- Ensuring that the plan thinks long-term, but allows for flexibility
- Creating a flexible and workable traffic model
- Supporting proposed improvements with economic benefit
- Pedestrian connectivity and safety
- Context sensitive solutions and complete streets

PUBLIC OPEN HOUSE AND SURVEY

A public presentation was held on June 6, 2017 at 6:00 p.m. at Beeson Hall to gather input from residents about areas of concern in the transportation network, as well as what transportation network components and amenities should be prioritized. A public survey was also made available at the meeting, and subsequently posted online. Nearly 30 people attended the public meeting and 50 responses were received from the online survey.

Input is received at the public open house on June 6, 2017

REFERENCED PLANNING DOCUMENTS

Several other plans were reviewed and consulted when their content and goals directly or indirectly related to objectives identified in this plan. Types of plans reviewed included:

Comprehensive plans: A plan which provides policies and objectives for future development, land use and public ways, public spaces, public structures and public utilities within a community.

Economic development plans: A plan which provides guidance and action steps toward improving the economic prospects and climate within a defined geographic area.

Statewide Transportation Improvement Plan (STIP): A four-year planning document that lists all state transportation projects expected to be funded in those four years with federal funds and those state-funded projects that have been deemed as regionally significant.

Thoroughfare/transportation plans: A coordinated plan for future transportation needs containing recommendations and prioritization for improvements to transportation deficiencies.

Plans reviewed include:

Regional

- The 2035 Indianapolis Metropolitan Planning Organization (MPO) Long Range Transportation Plan
- 2016 Indianapolis MPO Regional Bikeways Plan
- The 2016 Central Indiana Transit Plan
- 2016-2019 INDOT Statewide Transportation Improvement Plan
- 2015 Central Regional Logistics Council - Strengthening the Crossroads: Driving Central Indiana's Logistics Industry

Local

- 2015 City of Franklin Parking Study
- 2014 City of Franklin Interstate 65 Interchange Economic Development Plan
- 2013 City of Franklin Comprehensive Plan
- 2013 Town of Bargersville Comprehensive Plan
- 2011 Johnson County Comprehensive Plan
- 2011 Whiteland Comprehensive Plan
- 2009 City of Franklin, Indiana Gateways, Greenways & Redevelopment Study
- 2005 City of Franklin Downtown Revitalization Plan

While the previously listed plans all had useful insight and objectives which informed this plan, the 2013 City of Franklin Comprehensive Plan specifically addressed several objectives for Franklin related to its transportation network, including:

- *GOAL 2: I*mprove the functionality and access of the transportation network by including multiple modes of transportation in future planning and construction projects.
  - Traditional transportation infrastructure should be complemented by alternative fuel vehicles, pedestrian connectivity, bicycle improvements and universal accessibility.
- *GOAL 4:* Support efforts to develop a regional transit plan and take proactive steps toward the implementation of more transit-friendly design within the city.
- *GOAL 5:* Improve local east-west travel corridor options.
- *GOAL 7:* Promote community connectivity and health by supporting the expansion of the local trail and sidewalk network.

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CONTEXT & BACKGROUND

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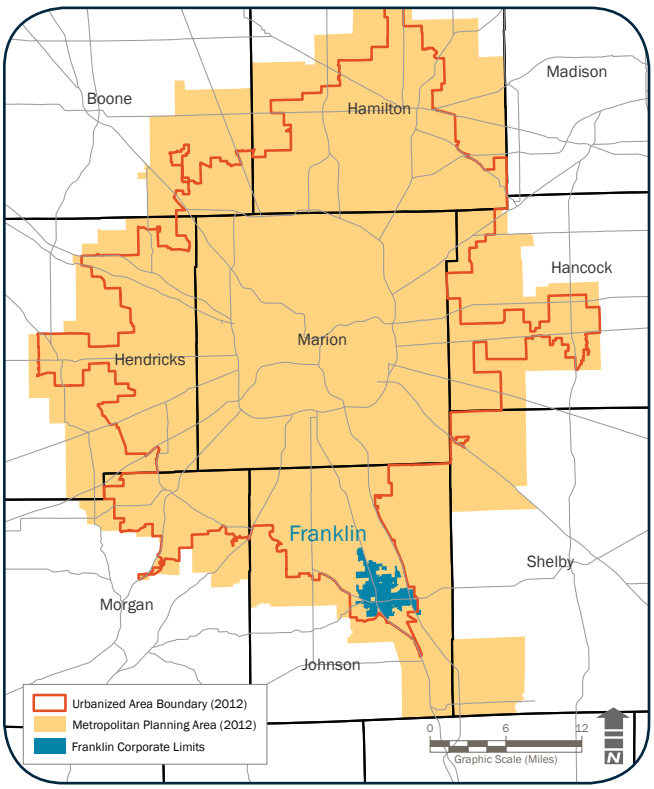
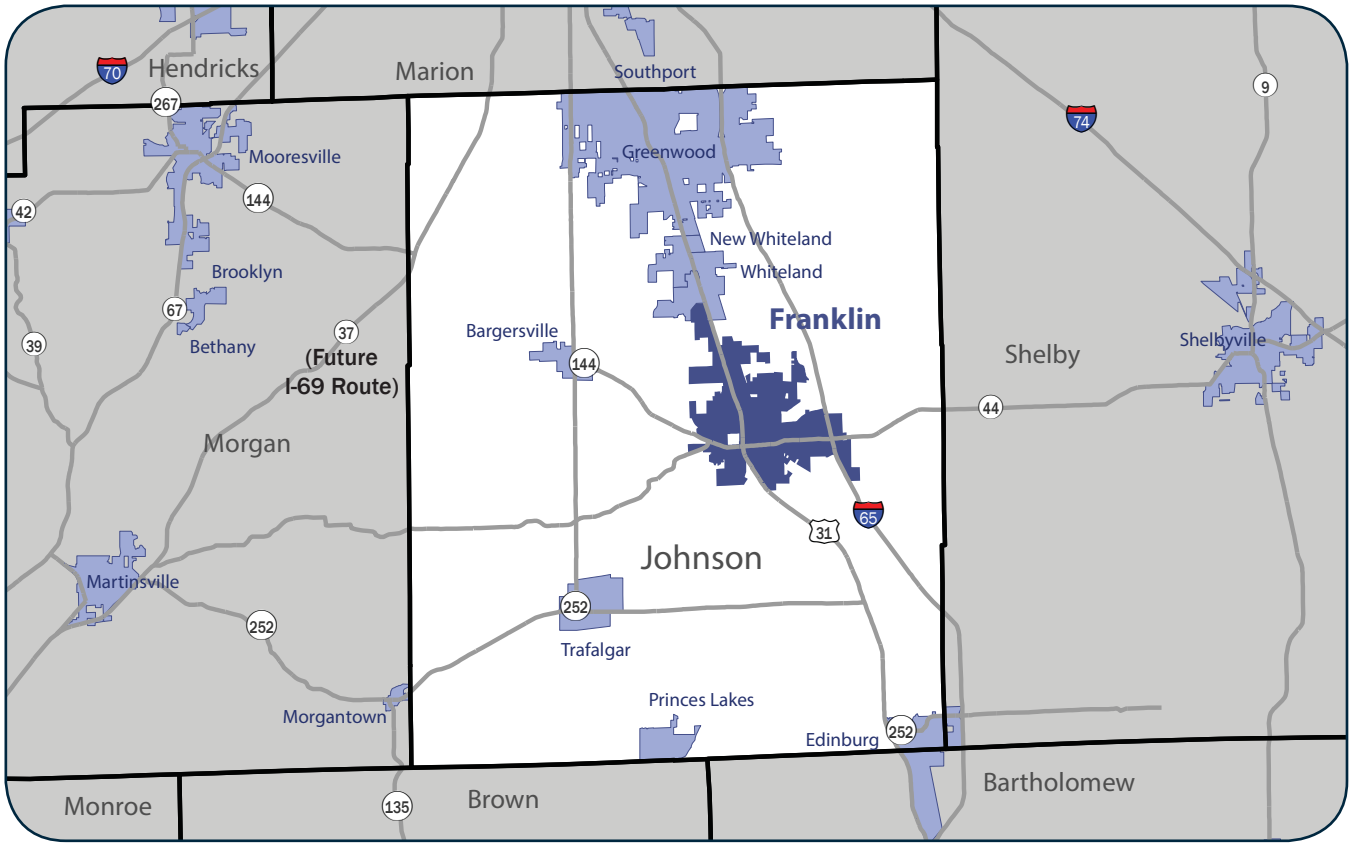
DEMOGRAPHIC, ECONOMIC AND POPULATION TRENDS

LOCATION

Franklin is located in central Johnson County within Franklin Township, approximately 25 miles south of the city of Indianapolis. Franklin is the county seat of Johnson County, and is the second largest community in the county after Greenwood. The city also lies within the Indianapolis Metropolitan Planning Organization (MPO) planning jurisdiction, which creates additional funding opportunities for the city. Interstate 65 runs along the eastern edge of the city, and the future Interstate 69 corridor lies approximately 12 miles to the west along SR 144.



Franklin lies in the southern portion of the MPO Planning Area, within the U.S. Census Urbanized area



Franklin serves as the county seat for Johnson County, and is nearly in the center of the county

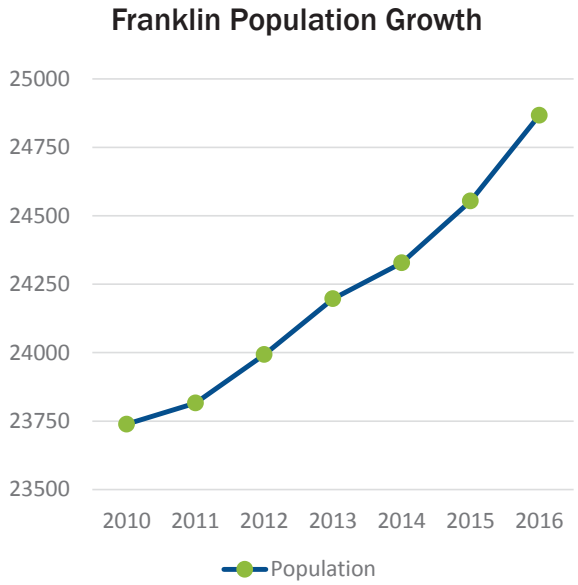
POPULATION GROWTH

Franklin has experienced steady growth since its founding, but experienced a significant jump in population in the 1990's. The city continues to expand and is expected to grow around 1 to 2 percent annually over the next several years according to multiple growth projections, as illustrated in Table B.

Franklin also benefits from its location in Johnson County, which was the fifth fastest growing county in the state in 2016. The northern end of the county has experienced more growth than the central portion, with Bargersville and Whiteland both experiencing faster growth rates than Franklin, even though those communities are significantly smaller than Franklin. Growth has slowed in Franklin, but this likely has more to do with the city reaching its limits in terms of available land, than it has to do with lack of people moving to the county and area.

Table B: Historic and Projected Annualized Growth Rates	
Average **Historic Growth** Rate Since 2010	0.71%
Projected Growth Rates	
Indiana Zoom Prospector Projected (2021 forecast)	1.47%
Indianapolis MPO Projected (2035 forecast)	1.80%
Indianapolis MPO Projected (2045 forecast)	2.2%
INDOT Projected (2035 forecast)	1.72%
Esri Projected (2021 forecast)	0.83%
Average of Projected Rates	1.60%

Indiana Zoom Prospector: Tool of the Indiana Economic Development Corporation
MPO: Metropolitan Planning Organization
INDOT: Indiana Department of Transportation
Esri: GIS Mapping and Spatial Data Analytics



Source: U.S. Census Population Estimates Program

A review of residential building permits for the city since 2010 also indicates a general trend in growth, with an average of 50 single family permits per year. However, in 2017, there have already been 92 new single family residential building permits, representing a significant increase over previous years.

Additionally, as of the writing of this plan, the number of housing units has risen by 3.6 percent in the city since 2010.

Table C: Single Family Residential Permits	
Year	**Total**
2017	*108
2016	63
2015	63
2014	70
2013	50
2012	44
2011	29
2010	28

Source: city of Franklin
** year to date*

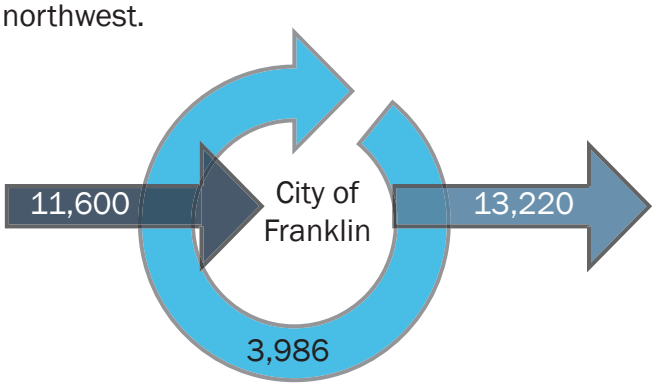
COMMUTING

Census on the Map, an online mapping tool from the U.S. Census Bureau, allows for commuting data analysis on specific geographies. The data below represents an analysis based on the city limits of Franklin and a two mile buffer around the city for 2014.

On the whole, more people commute out of the city and buffer area than into it for work. However, since 2010, the net outflow of workers has decreased from 3,833 to 1,620. The percentage of those people living and working in Franklin and the buffer area has also increased to 23.2 percent from 21.7 percent in 2010. The trend is that more people are living and working in Franklin and the surrounding buffer area, with 3,986 doing so in 2014.

Commuteshed: 13,220 people leave the city limits and buffer area for work, representing 76.8 percent of workers who live within the analyzed area. Of those who do commute out of the city, the majority are commuting north and northwest, with smaller percentages traveling other directions.

Laborshed: 11,600 people commute into the city for work, representing 74.4 percent of those employed by businesses within the analyzed area. The majority of those commuting into the city are commuting from the north and northwest.



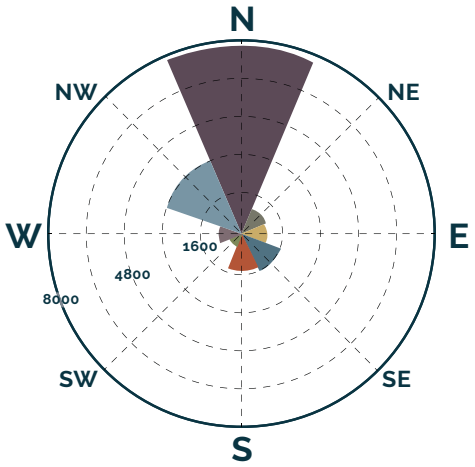
Commuter flow into, within and out of Franklin

In 2014, of those who are employed in Franklin and the two mile buffer:

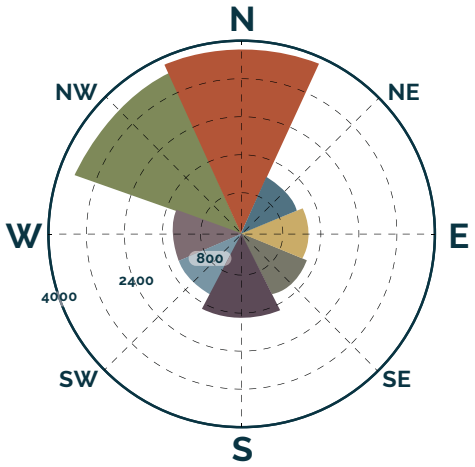
- 18 percent live in Franklin. Nearly the same as 2010.
- 13.6 percent live in Indianapolis, up from 11.2 percent in 2010.
- 8.7 percent live in Greenwood, up from 7.9 percent in 2010.

In 2014, of those who live in Franklin and the two mile buffer and are employed:

- 35.2 percent work in Indianapolis, down from 36.8 percent in 2010.
- 19.5 percent work in Franklin, up from 17 percent in 2010.
- 8.7 percent work in Columbus, up from 7.9 percent in 2010.



Direction of travel - commuters out of Franklin



Direction of travel - commuters into Franklin

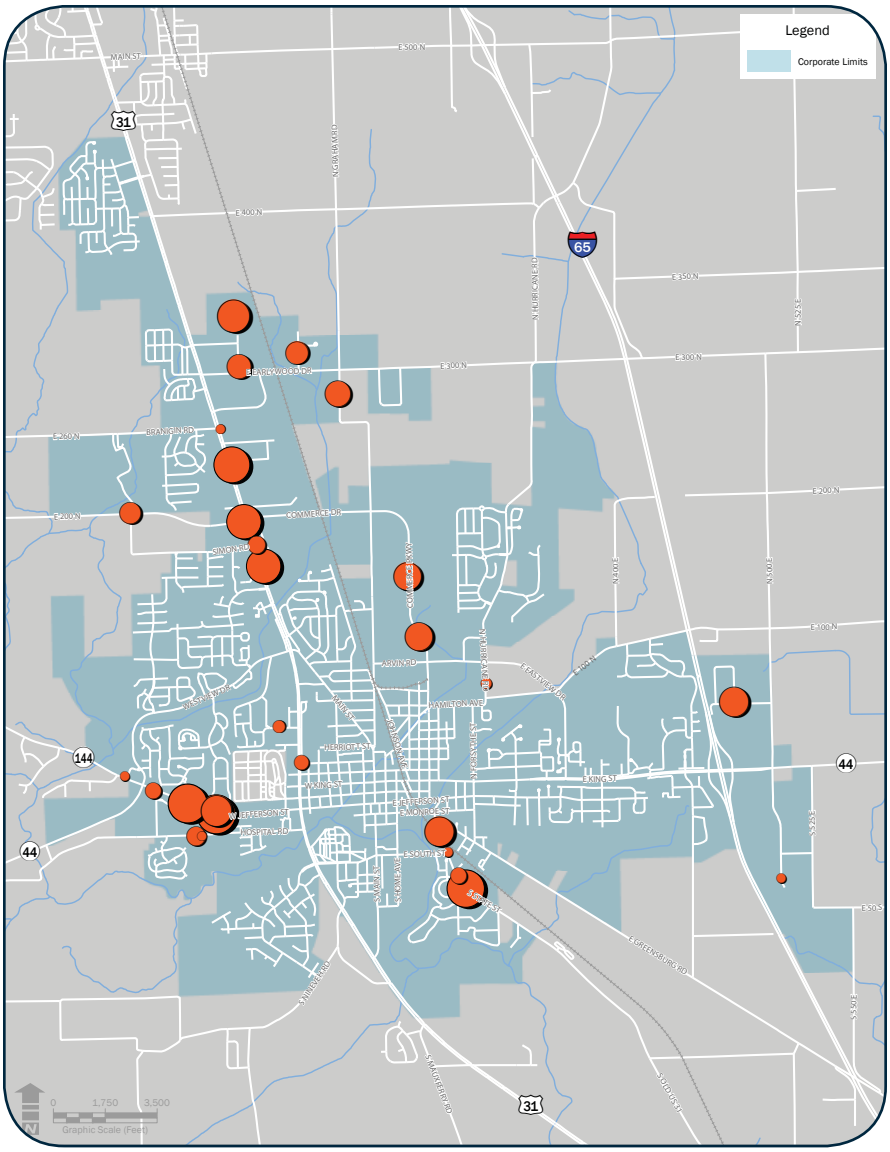
EMPLOYMENT

There has been an increase in the population with post-secondary education, which has benefited total employment. Twenty-one percent of the population had a bachelor's degree or higher in 2010, compared to 24 percent of the population with a bachelor's degree in 2015. High school graduation rates have also greatly increased, from 85 percent to 94.5 percent.

Total employment also grew by 17 percent between 2000 and 2015. The top five industries by employment in 2015 were:

- Educational services, and health care and social assistance (24.7%)
- Manufacturing (19%)
- Retail trade (11%)
- Arts, entertainment, and recreation, and accommodation and food services (9.9%)
- Professional, scientific, and management, and administrative and waste management services (8.5%)

MAJOR EMPLOYERS (100+ EMPLOYEES)



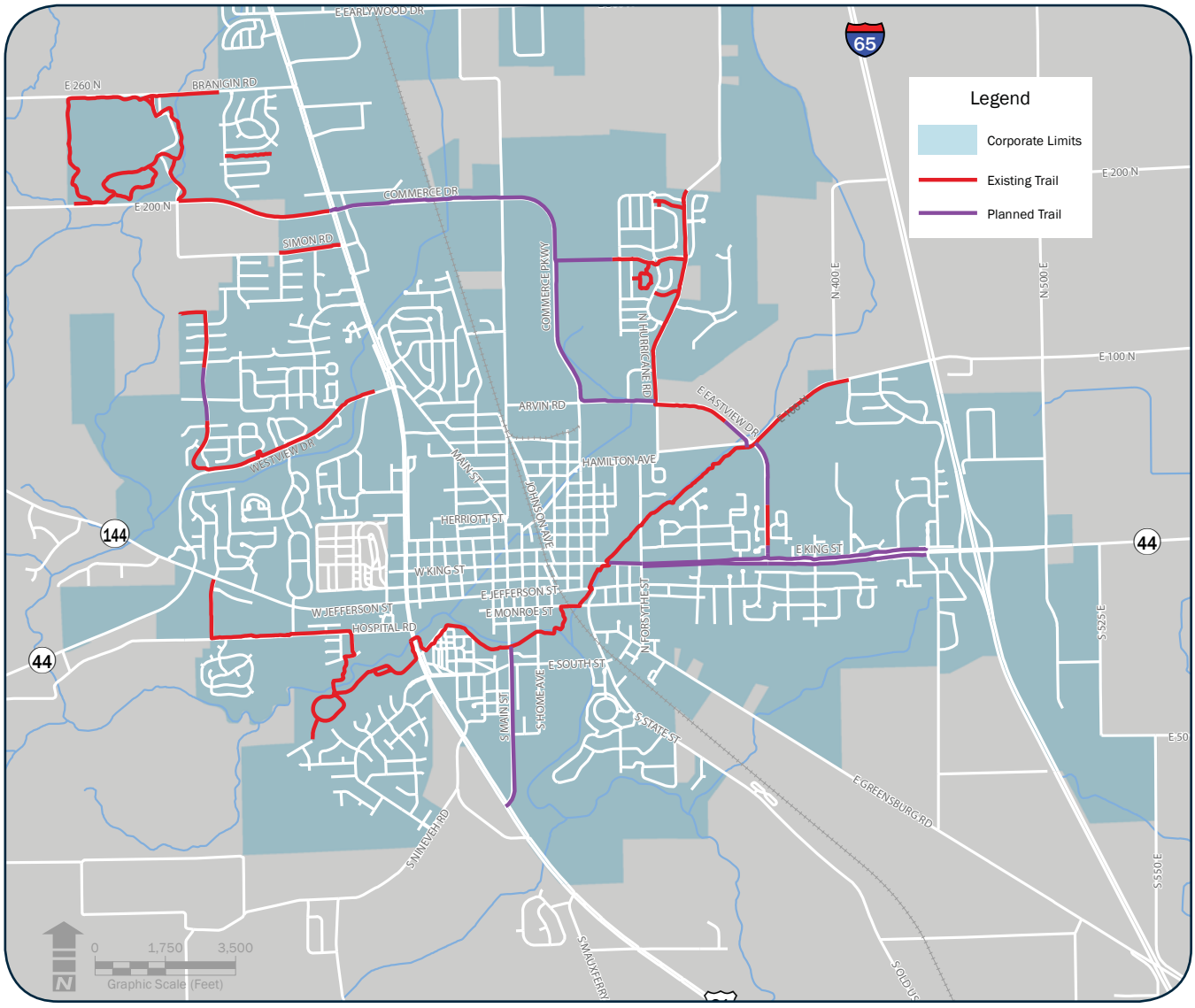
OTHER MODES OF TRANSPORTATION

PEDESTRIAN AND CYCLIST

Many of the key themes and top issues raised through public input concerned pedestrian facilities. Franklin currently boasts over 10 miles of trails. This trail network was consistently noted as a positive feature in the community that residents were very proud of. Approximately seven miles of trail are also planned by the city to add to the network, or already under construction.

While the trail network is a popular amenity within the city, public feedback indicated that it isn't always easy to connect to the trails. Safe and easily navigable routes along sidewalks and roadways aren't always available or may be in poor shape. Additionally, pedestrian facilities don't always connect to major destinations in the city, especially along US 31. As Franklin continues to develop the trail network, close attention will also need to be paid to the smaller pedestrian network of sidewalks and bike lanes that tie into the trails.

EXISTING AND PLANNED TRAIL NETWORK



PUBLIC TRANSIT

In 2014, the Indiana state legislature enabled Marion, Hamilton, Hancock, Johnson, Delaware and Madison counties to certify referendums, to fund public transportation improvements, provided that Marion County first pass a referendum before any other successful referendums can move into implementation. In November 2016, voters in Marion County supported the referendum and in spring 2017, the City-County Council approved a 0.25 percent income tax hike to help finance bus rapid transit lines.

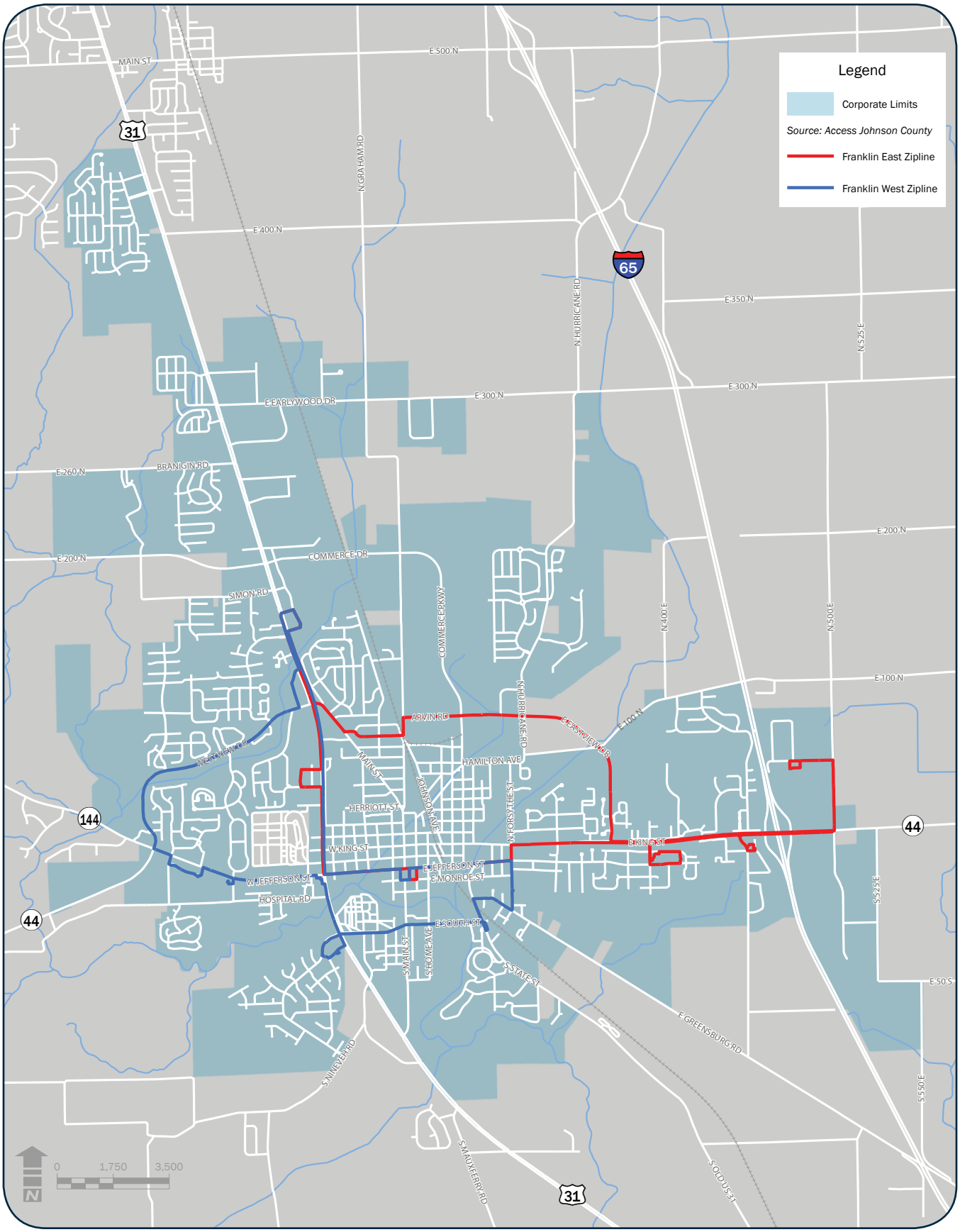
The 2016 Central Indiana Transit Plan from Indy Connect, a partnership of IndyGo, Indianapolis MPO and The Central Indiana Regional Transportation Authority (CIRTA), outlines regional public transportation routes. The first route to move forward after the successful referendum is phase one of the Red Line, an electric bus rapid transit system. Phase one would run from Broad Ripple south to the University of Indianapolis. Plans for the Red Line include a phase two extension to Carmel and Westfield and a phase three extension to Greenwood. The southern extent of phase three of the Red Line is Smith Valley Road and US 31 in Greenwood.

The Central Indiana Transit Plan also calls for additional bus rapid transit lines to radiate out from the downtown transit center in Indianapolis. The Purple Line would extend from downtown to the city of Lawrence. The Blue Line would extend from downtown to the Indianapolis International Airport and the town of Cumberland. The Green Line would extend from downtown to Fishers and Noblesville. All lines, including the Red Line, would connect at the downtown transit center.

The Indy Connect held an online survey from May 1 to July 5, 2017 to solicit input from Johnson County residents regarding preferences and priorities on transit as part of the Central Indiana Transit Plan. Those survey results were not available as of the drafting of this plan, but interested parties may visit www.indyconnect.org for updates.

Not withstanding future opportunities to connect to the bus rapid transit system, public transit for Franklin is currently provided through Access Johnson County, which provides two fixed bus/van routes in Franklin and an on-demand service available Monday through Friday from 9:00 am to 4:00 pm. Johnson County Senior Services, which provides door-to-door transportation for residents age 60 and older, also serves the city and county. Though not available in Franklin, the northern portion of the county, including Greenwood, is also served the Central Indiana Regional Transit Authority (CIRTA). Johnson County and Franklin are also served by the ride-sharing services such as Lyft and Uber, though drivers for those services are not always available.

PUBLIC TRANSIT ROUTES - ACCESS JOHNSON COUNTY



AIR

Two airports can be found within close proximity of Franklin. The Franklin Flying Field is a privately owned, public use airport located three nautical miles south of the city. The Indy South Greenwood Airport is a larger general aviation airport north of Franklin, just west of Interstate 65. Interstate 65 access is less than two miles away and leads right to downtown Indianapolis. The airport provides a 5,100 foot runway, 3-acre ramp, 10,000 square foot heated hangar, on-site courtesy and rental cars, and a modern terminal. Three aircraft maintenance facilities and two flight schools with aircraft rental are located on site. The Indianapolis International Airport is located 36 miles from Franklin along Interstate 65 and Interstate 70.

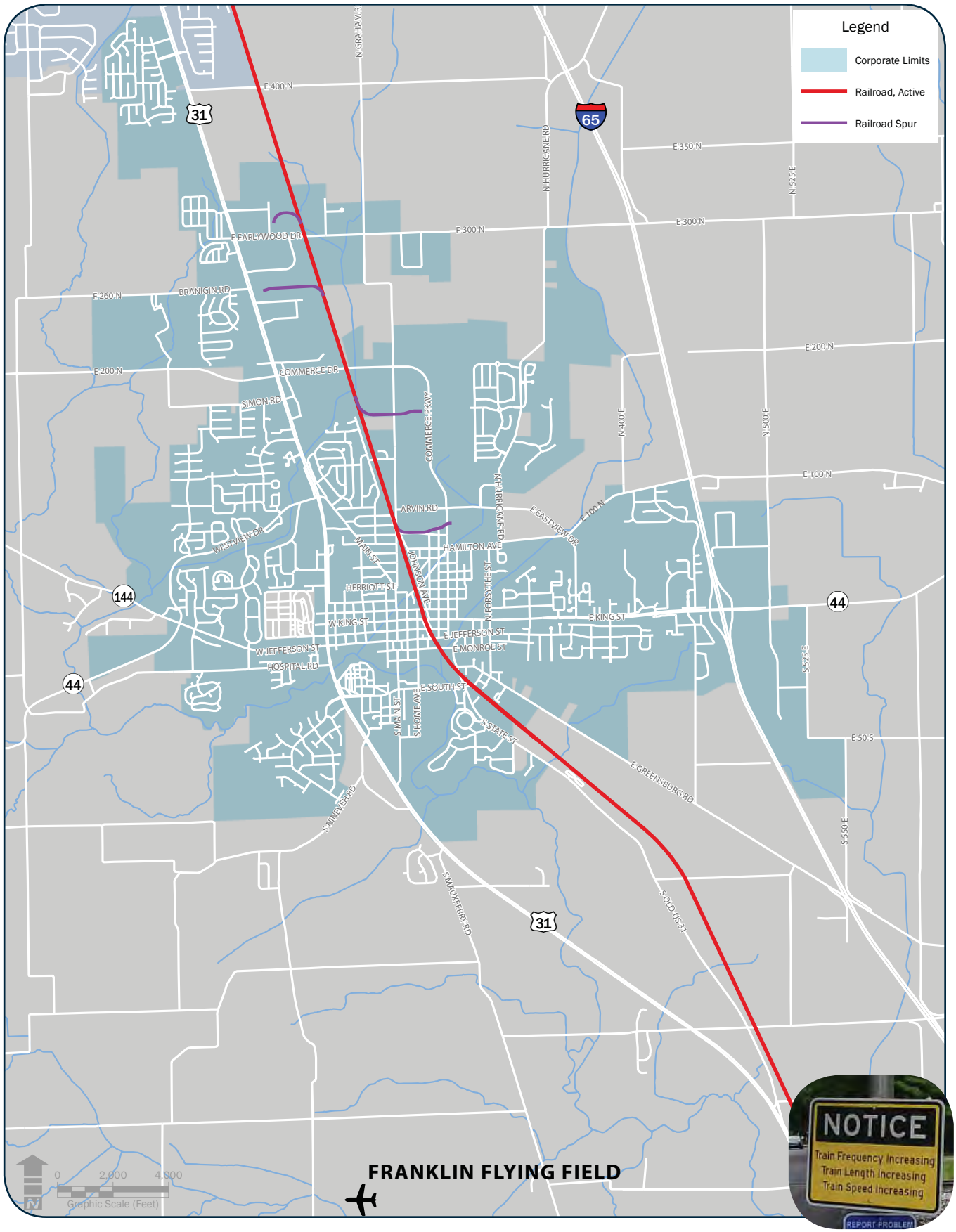
RAIL

Franklin contains one of the major railroad lines in the county, which Louisville and Indiana Railroad operates. The other major railroad line is operated by Indiana Railroad on the west side of the county, running through Bargersville. This summer, work has started on improving the crossings along the Louisville and Indiana Railroad track to allow for faster and longer trains between Indianapolis and Louisville, Kentucky. The current 25 mph speed limit will gradually be increased to 49 mph on the upgraded tracks and train frequency will increase from two to three trains a day up to 16 trains per day.

Franklin Flying Field

Railroad tracks at Graham Street

AIR AND RAIL FACILITIES



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3

NETWORK ANALYSIS

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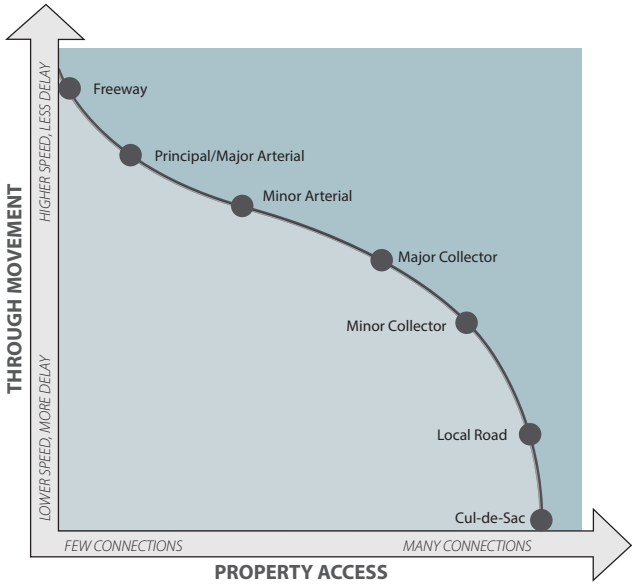
EXISTING CONDITIONS

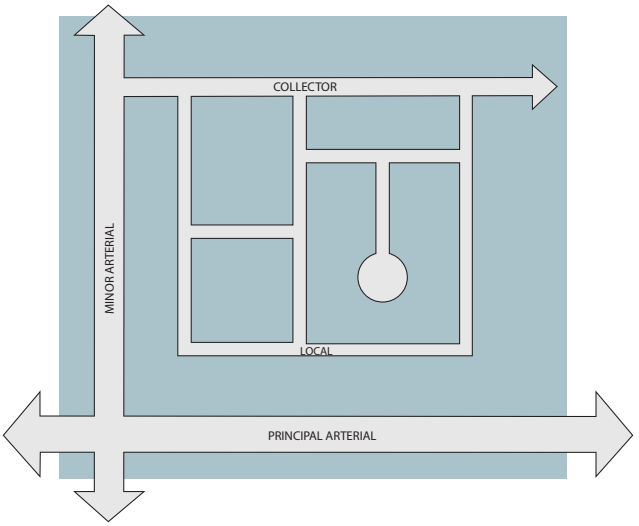
EXISTING ROAD NETWORK

The existing roadway network in Franklin consists of an interstate, several state highways, busy urban streets and low-volume local roads. These different types of roadways serve different purposes; some to carry vehicles at a high speed over a long distance, others to provide access to businesses and residences.



Roadway classifications occur along diverging axis of through movement (mobility) and property access (accessibility)

Main Street serves as a minor arterial through Franklin, connecting the downtown to areas north of the city along US 31



Roadway classifications establish a hierarchy, which serve to create a functioning and efficient roadway network

CLASSIFICATION DEFINITIONS (FHWA)

The Federal Highway Association (FHWA) defines functional classification designations based on the priority of mobility for through-traffic versus access to adjacent land. In other words, streets are designed along opposing continuums to either connect to destinations or to carry through-traffic. Other important factors related to functional classification include access control, speed limit, traffic volume, spacing of routes, number of travel lanes and regional significance.

Interstates, such as I-65, are the highest classification of roadway. They prioritize mobility and have extremely limited access. Interstates are high speed, high volume and have statewide or national significance. They are planned and maintained by state authorities with federal oversight.

Other Freeways & Expressways look very similar to interstates, but without the interstate designation. These have regional or statewide significance. SR 37 through Martinsville is an example of this classification; there are none in Franklin or Johnson County at this time.

Principal Arterials carry high volumes of regional traffic. They serve major cities from multiple directions, while in rural areas they provide connectivity between cities such as Franklin and Greenwood. Arterials provide direct access to adjacent land, but may limit the number of intersections and driveways in order to give higher priority to through-traffic. Principal arterials are spaced at three to five miles in suburban areas, and farther apart in rural areas. US 31 through Franklin is an example of a principal arterial.

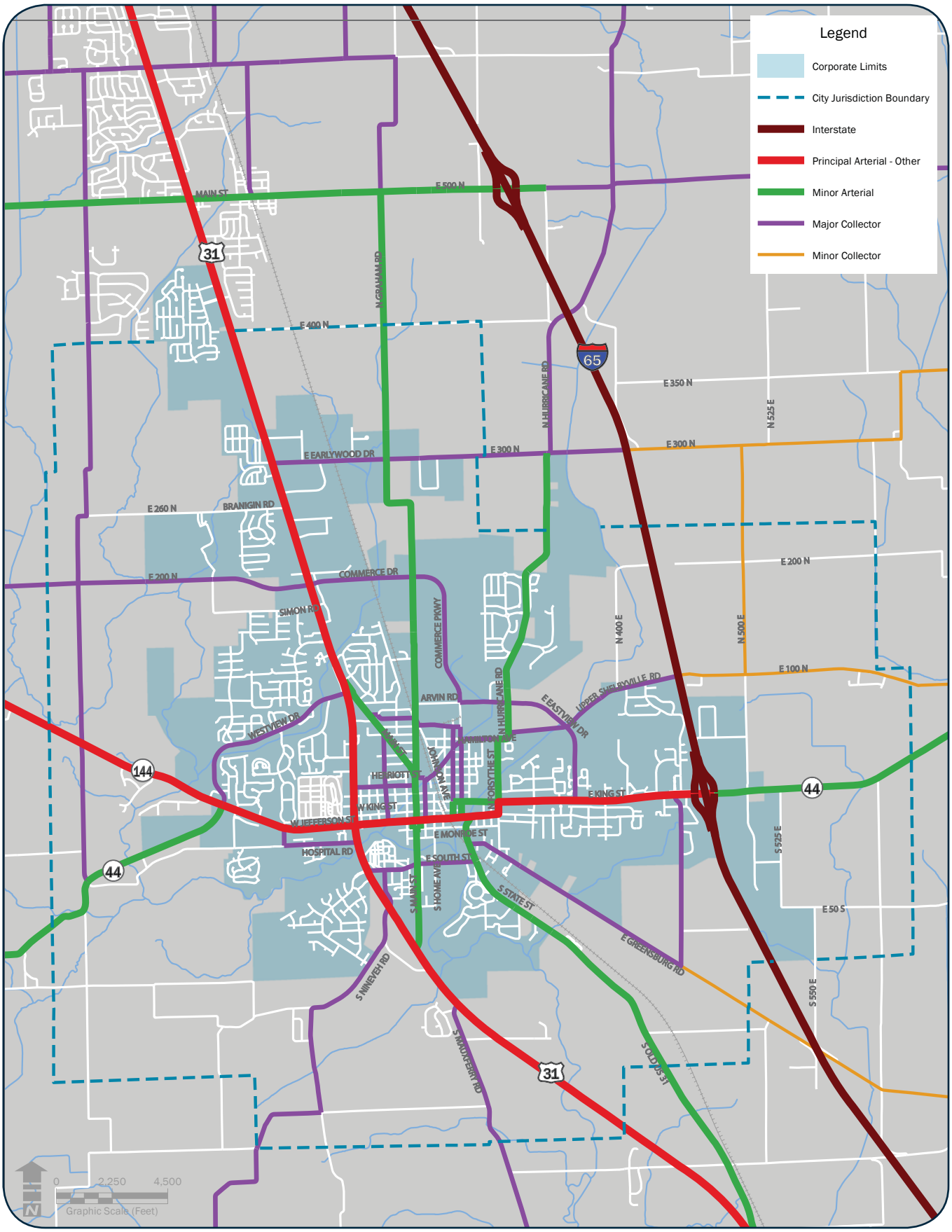
Minor Arterials are similar to principal arterials, but are spaced more frequently and serve trips of moderate length. Spacing of minor arterials is two to three miles in suburban areas and less in rural areas. Minor arterials connect most cities and larger towns and provide connectivity between principal arterials. Graham Road in and north of Franklin is a minor arterial.

Major Collectors gather traffic from the local roads and connect them to the arterial network. They provide a balance between access to land and corridor mobility. Major collectors provide connectivity to traffic generators not already on the arterial system, such as schools, parks and major employers. Westview Drive is an example of a major collector.

Minor Collectors are similar to major collectors, but are used for shorter trips. They provide traffic circulation in lower-density developed areas and connect rural areas to higher-class roadways. County Road 100 N east of I-65 is an example of a minor collector.

Local Roads make up the largest percentage of roadways in most networks. Their primary function is to provide access to land. Trips are short, lower speeds prevail, and cut-through traffic may be discouraged. All remaining roads that are not arterials or collectors are considered local roads. Local roads are not part of the system of roads that is eligible for federal funding, in most cases.

EXISTING FUNCTIONAL CLASSIFICATION MAP



NETWORK MODELING AND ANALYSIS

OVERVIEW

The primary purpose of the travel demand analysis was to provide insights into traffic impacts and capacity needs for the City of Franklin as it undergoes large-scale household and employment growth. The traffic analysis was developed by forecasting specific land development, and then using a travel demand model built specifically for this project to generate trips, distribute trips, assign estimated vehicle flows to the various road network scenarios, and then compute performance measures.

This section documents the development of a TransCAD travel demand model for the City of Franklin, and an evaluation of traffic conditions under various transportation and land use scenarios. The project study area includes the city of Franklin, surrounding adjacent areas in Johnson County, and includes I-65, US 31 and SR 144 corridors. Any summary statistics cited within the Network Modeling and Analysis section pertain to the study area highlighted with the light blue dashed boundary in the graphic on the following page. The travel model covers a wider area than the project's study area, such that it can include the entire I-65 corridor within Johnson County and fully include road and traffic zone coverage for Franklin, Needham, Clark, and Pleasant Townships. Greenwood and Whiteland are also included in the modeled area. The design of the modeled area was based on analysis conducted with the 2009 Central Indiana Household Travel Survey, such that it covers more than 90% of the trip destinations reported from city of Franklin households captured in the survey.

Modeling analysis for the Thoroughfare Plan covered multiple alternatives to be tested for 30 year traffic forecasts:

- Base Year 2015 (for model calibration purposes)
- Base Year 2017
- No Build Future (2035 and 2045)
- Several Future Roadway Scenarios (described in detail later)

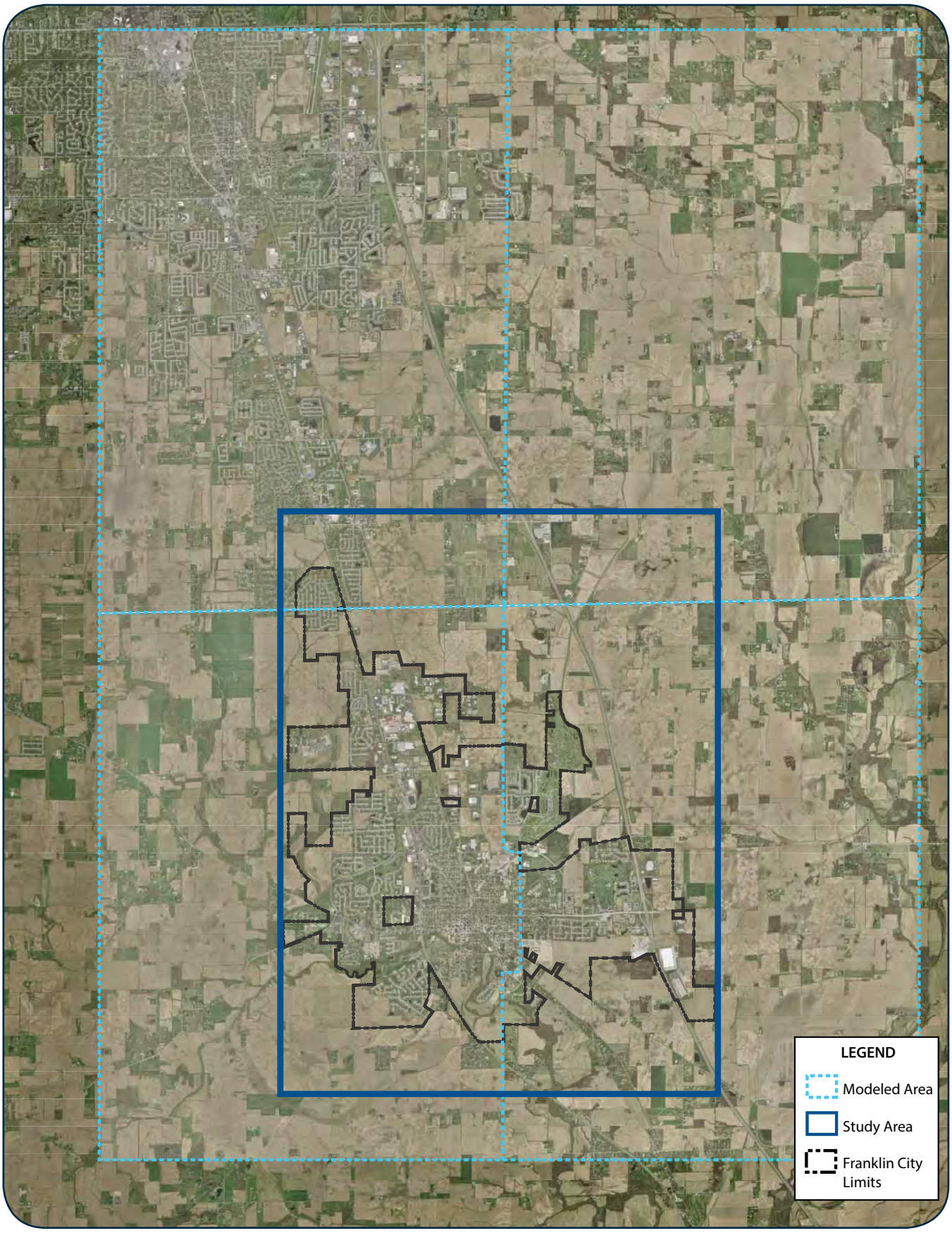
TRAVEL DEMAND MODEL

A TransCAD (Version 7.0) travel demand model was developed by Convergence Planning to facilitate travel demand modeling analysis in this project. A separate technical memorandum covers the model, validation, and assumptions in more detail.

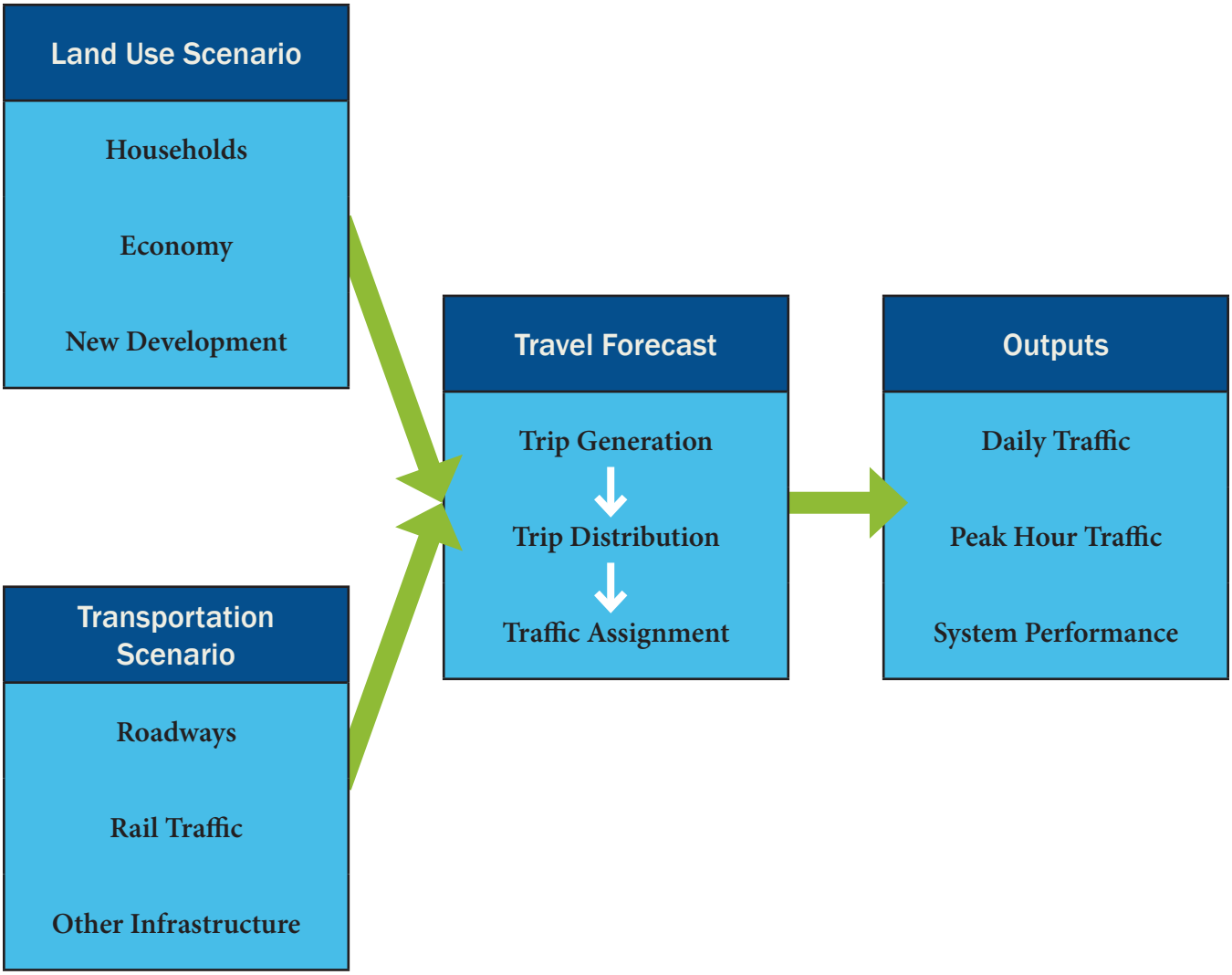
BASIC MODEL COMPONENTS

The Franklin travel model is a conventional travel demand model that is similar in structure and methodology to other current area-wide models used for traffic forecasting, and relies upon the Indianapolis Metropolitan Planning Organization's model and Indiana Statewide Travel Demand Model (ISTDM) for data sources on household and commercial travel behavior. It uses aggregate land use/socioeconomic data and road network data to estimate facility-specific roadway traffic volumes and performance.

PROJECT MODEL AND STUDY AREA



THE MODELING PROCESS



ROADWAY NETWORK INFORMATION

The Franklin base model roadway network was developed based on a Johnson County road-centerline GIS layer which covers all roadways in the study area. Detailed roadway information is used in the modeling process. The collected information includes:

- Number of lanes
- Posted speed
- Travel direction
- Functional classification
- Intersection types
- At-grade rail crossings
- Grade separated rail crossings
- Traffic counts

Delays due to traffic signals and other traffic controls use the same methods as in the ISTDM model. See the Travel Demand Model Technical Memorandum for assumptions. The model network also includes at-grade railroad crossings and associated travel time delays (dependent upon RR traffic). The graphic on the following page shows the Franklin base model network and TAZ structure.

TRAFFIC ANALYSIS ZONES

The traffic analysis zones (TAZ) structure directly affects centroid's location and level of detail. In this project, a very detailed sub-block level TAZ was developed according to the land parcel and/or census block boundaries with a total of 1019 internal zones and 17 external connectors. This approach contributes to a better simulation of traffic loading/parking choice in such a compact urban area. Centroid connectors were coded to represent traffic loading and parking options for each zone.

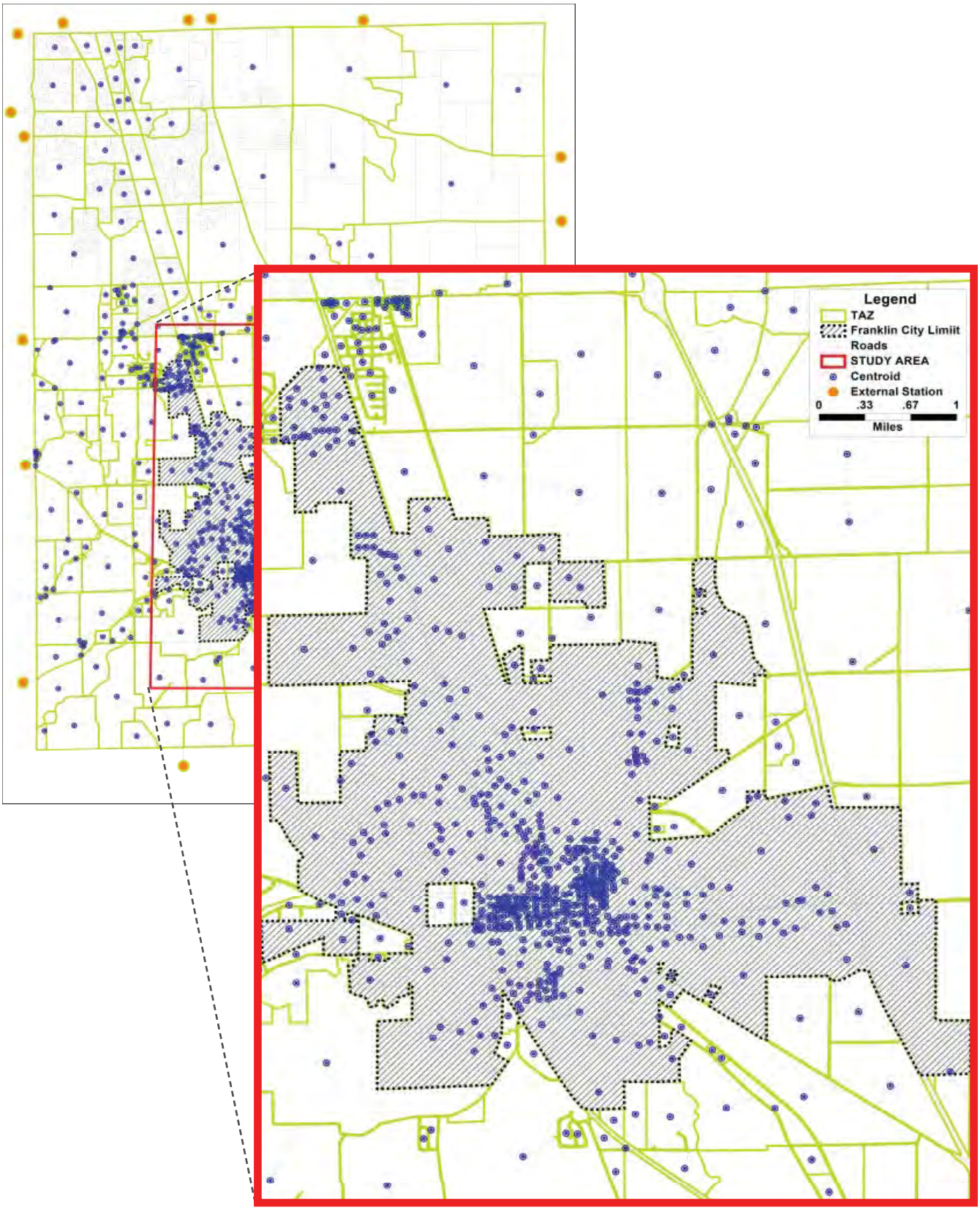
EXTERNAL TRIPS

External trip patterns and modeled growth rates for external trips were derived from INDOT traffic counts and the ISTDM.

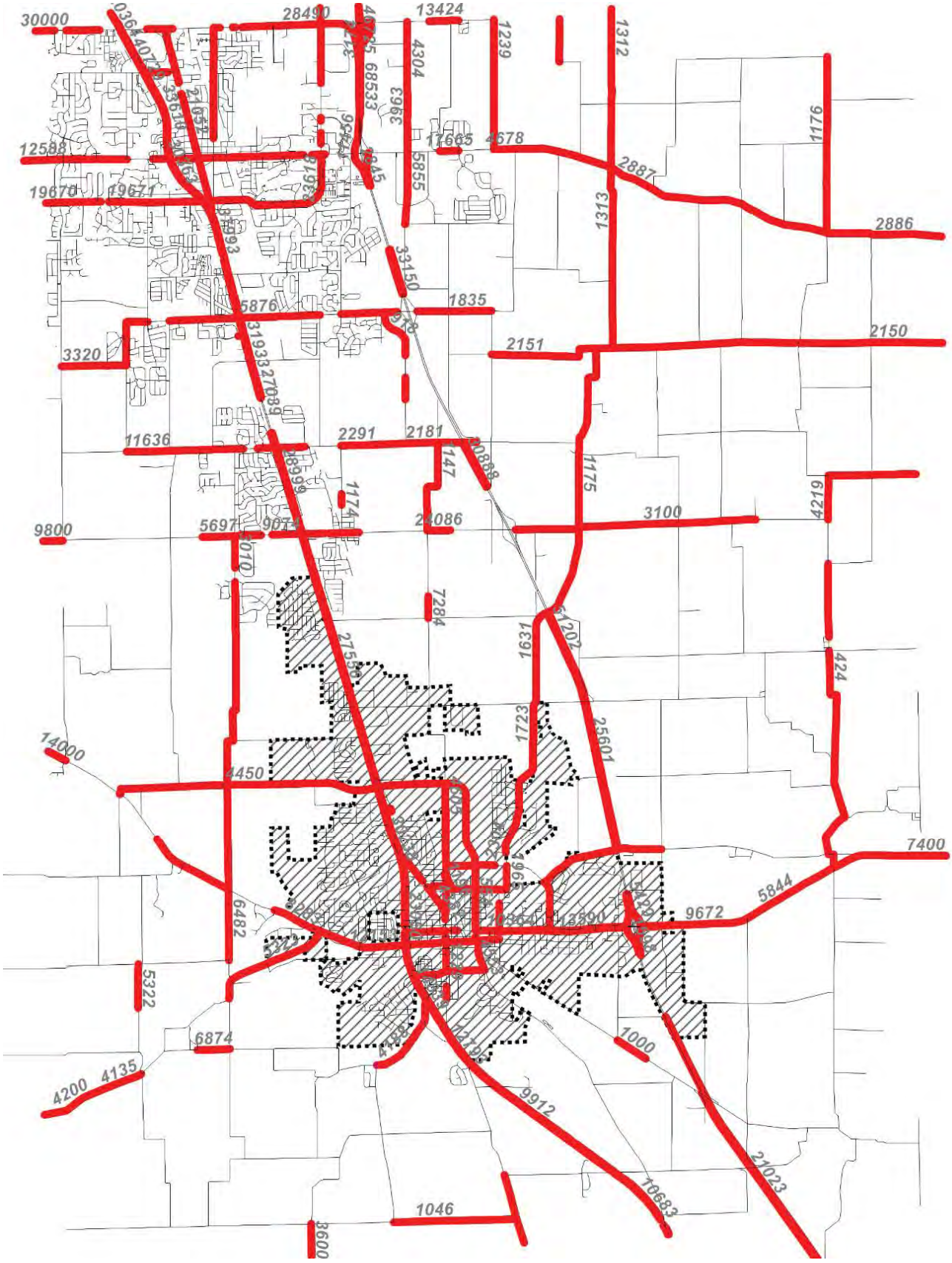
MODEL VALIDATION

An extensive count database was used to validate the model. Count locations are shown on page 39. The count dataset corresponds to 2013-2015 era counts. Since the added travel lanes on I-65, Worthsville Road Interchange, and King/Jefferson projects were not yet open to traffic and the Franklin truck restrictions were being implemented, the model was initially developed to represent conditions up to year 2015. The overall model validation was 23.4 percent RMSE, which is very good. Additional model validation information is contained in the Model Development Technical Memorandum. After model validation, the base year was moved to represent year 2017 using the calibrated 2015 demand with the 2017 roadway network (current conditions).

BASE MODEL TAZ AND NETWORK



MODEL LINKS WITH TRAFFIC DATA FOR MODEL VARIATION



SOCIO-ECONOMIC GROWTH FORECASTS

The Franklin travel demand model takes socio-economic data (allocated to each TAZ) and processes this information in the Trip Generation step. The Census Block level base year employment data was obtained from the 2016 Longitudinal Employer-Household Dynamics (LEHD) data via US Census Bureau. Household and population statistics at the Census Block level were also obtained. Forecasts were based on the Indianapolis MPO 2045 TAZ forecasts. The net growth was allocated to individual traffic zones and added to the base data to form a land use forecast. The MPO growth forecasts for the project's study area are summarized in Table D below.

Table D: Socio-Economic Data and Forecasts Used as Inputs to the Analysis

Franklin Study Area		
	Year	
	2015	2045
Households		
Housing Units	12,345	19,413
Population	31,890	51,454
School Enrollment (K-12)	5,849	8,852
Employment		
Basic (Includes Manufacturing)	4,297	11,771
Service	8,497	20,975
Retail/Food/ Hospitality	2,991	7,717
TOTAL	15,785	40,463

GROWTH ALLOCATION PROCESS

The control totals derived from the Indy MPO 2045 Forecast were allocated to the Franklin model's 1019 internal traffic zones using a technical growth allocation process. For the zones within the Franklin model, but outside the project's study area, the MPO zones and assumptions were used directly. For zones that are internal to the project's study area, a set of growth allocation models were calibrated and applied to predict the likely areas to attract the MPO forecasted growth.

Unique growth allocation models were calibrated for:

- Housing
- Retail Employment
- Service Employment
- Basic Employment (mostly industrial/light industrial)

Within the individual growth allocation models, each vacant parcel is competing for growth using a measure of "Economic Utility". The relative utility for a household or employer to locate in a particular parcel is influenced by:

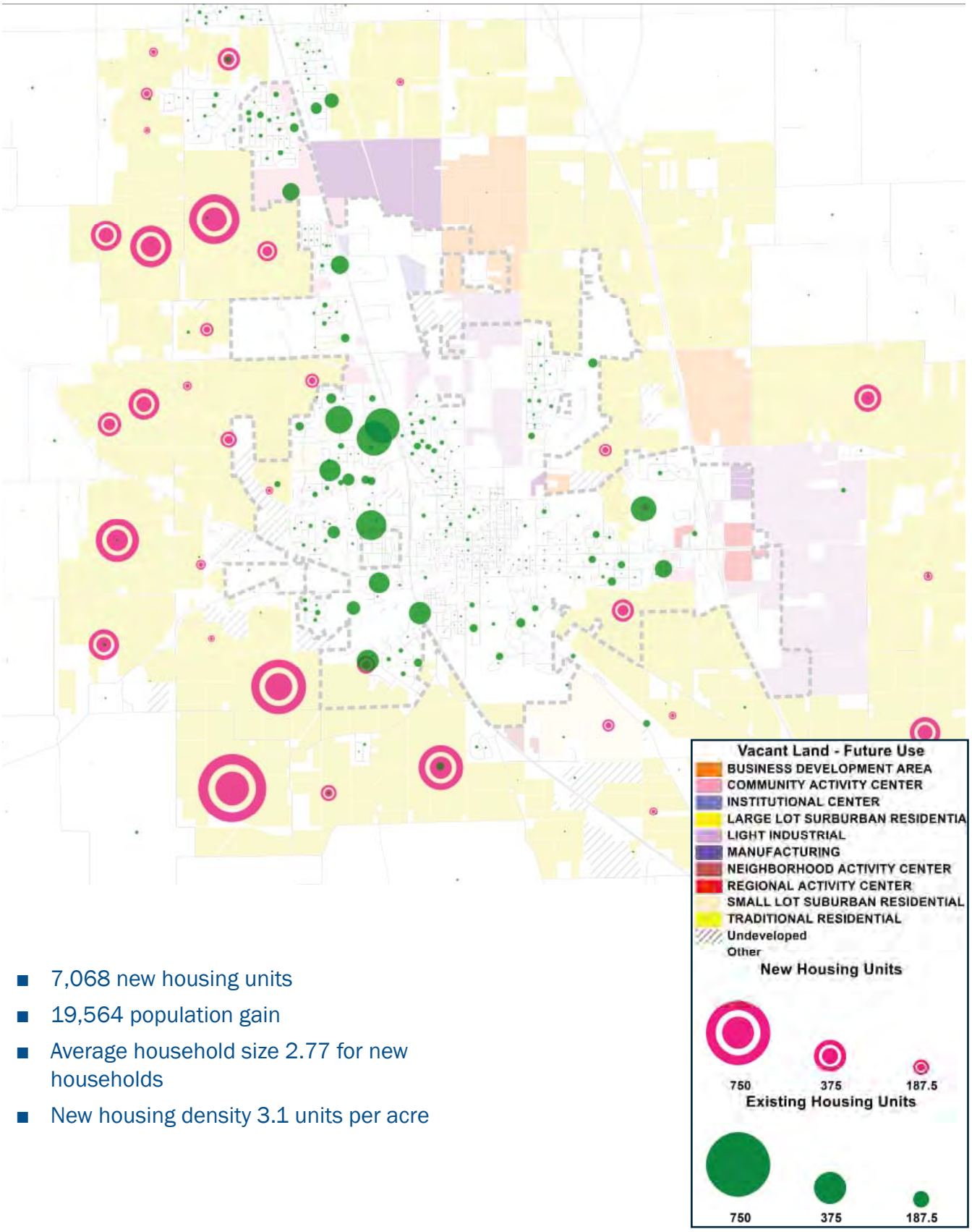
- Accessibility to Jobs
- Accessibility to Workers
- Accessibility to Retail
- Travel time to nearest interchange
- Travel time to Indianapolis
- Proximity to similar land uses
- Parcel size
- Land cost

And Constrained by:

- Land uses defined by the Comprehensive Plan
- Maximum densities
- Floodplain

Results of this process are illustrated on the next two pages.

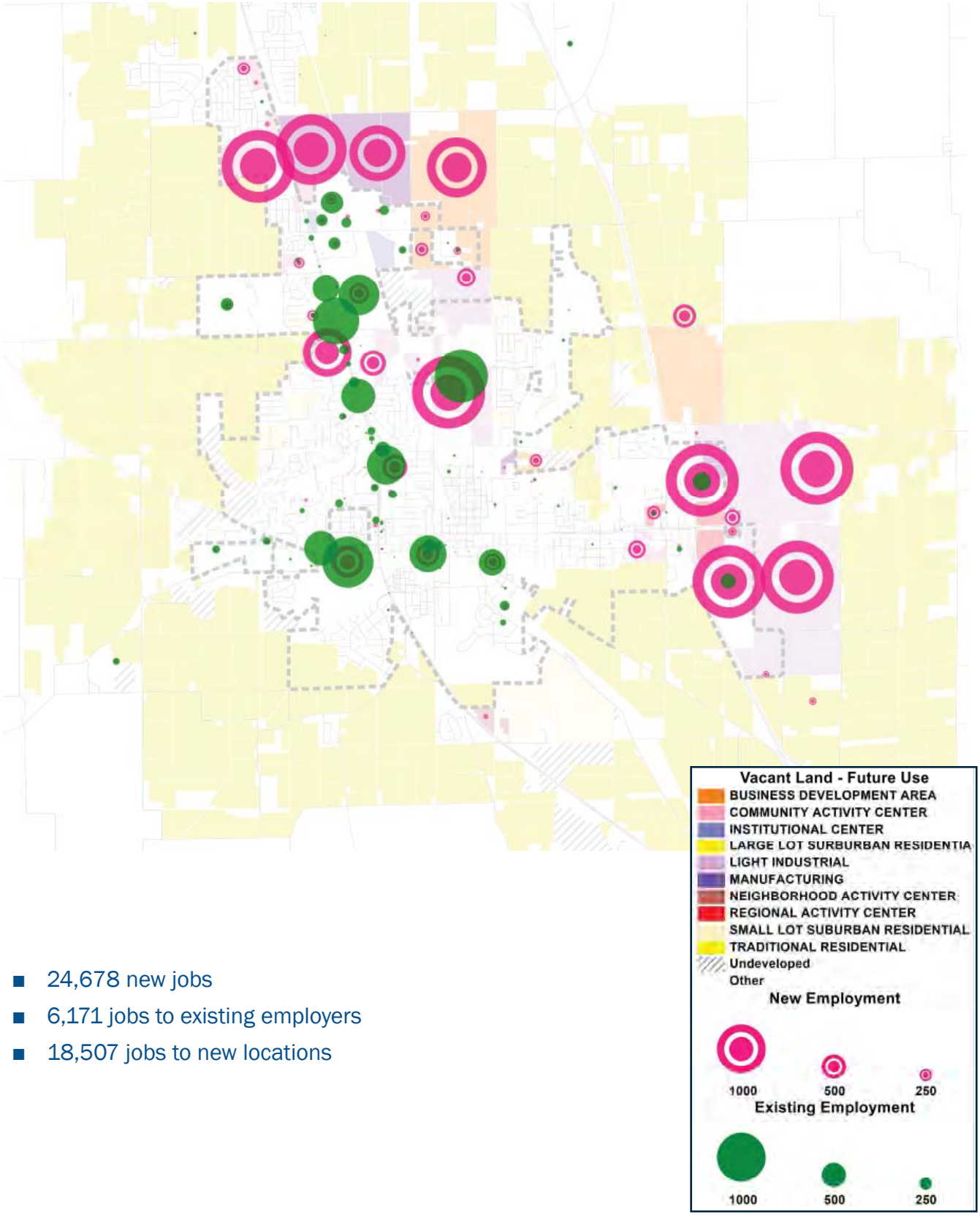
HOUSING GROWTH 2015-2045



- 7,068 new housing units
- 19,564 population gain
- Average household size 2.77 for new households
- New housing density 3.1 units per acre

Please refer to the Travel Demand Model technical memorandum for more details on the allocation process and results.

EMPLOYMENT GROWTH 2015-2045



- 24,678 new jobs
- 6,171 jobs to existing employers
- 18,507 jobs to new locations

Please refer to the Travel Demand Model technical memorandum for more details on the allocation process and results.

MODELING ANALYSIS RESULTS

NETWORK SCENARIOS

The traffic analysis involved coding and running each of the following roadway scenarios as shown on page 46 and summarized below:

Current Conditions, 2017

- I-65 Added Lanes
- Worthsville Road Interchange

Future No Build, 2045 (Existing roadway configuration plus committed projects)

- All of 2017 network, plus;
- Brookhaven Drive connection to Commerce Parkway
- King Street improvements
- Near-term roundabout projects

Build Scenario 1, 2045

- Future no-build assumptions, plus;
- New I-65 interchange at 300N
- Improvements to Earlywood/300N corridor (remains 2-lanes)

Build Scenario 2, 2045

- Future no-build assumptions, plus;
- Graham Road improvement and realignment
- 14th Street and Arvin Drive connection
- Added lanes on Commerce Parkway between Arvin Drive and Graham Street
- New road connection between Westview Drive and CR 100 E
- Improvements to 200 N between SR 144 and US 31
- Long-term roundabout projects

Full Build Scenario 3, 2045

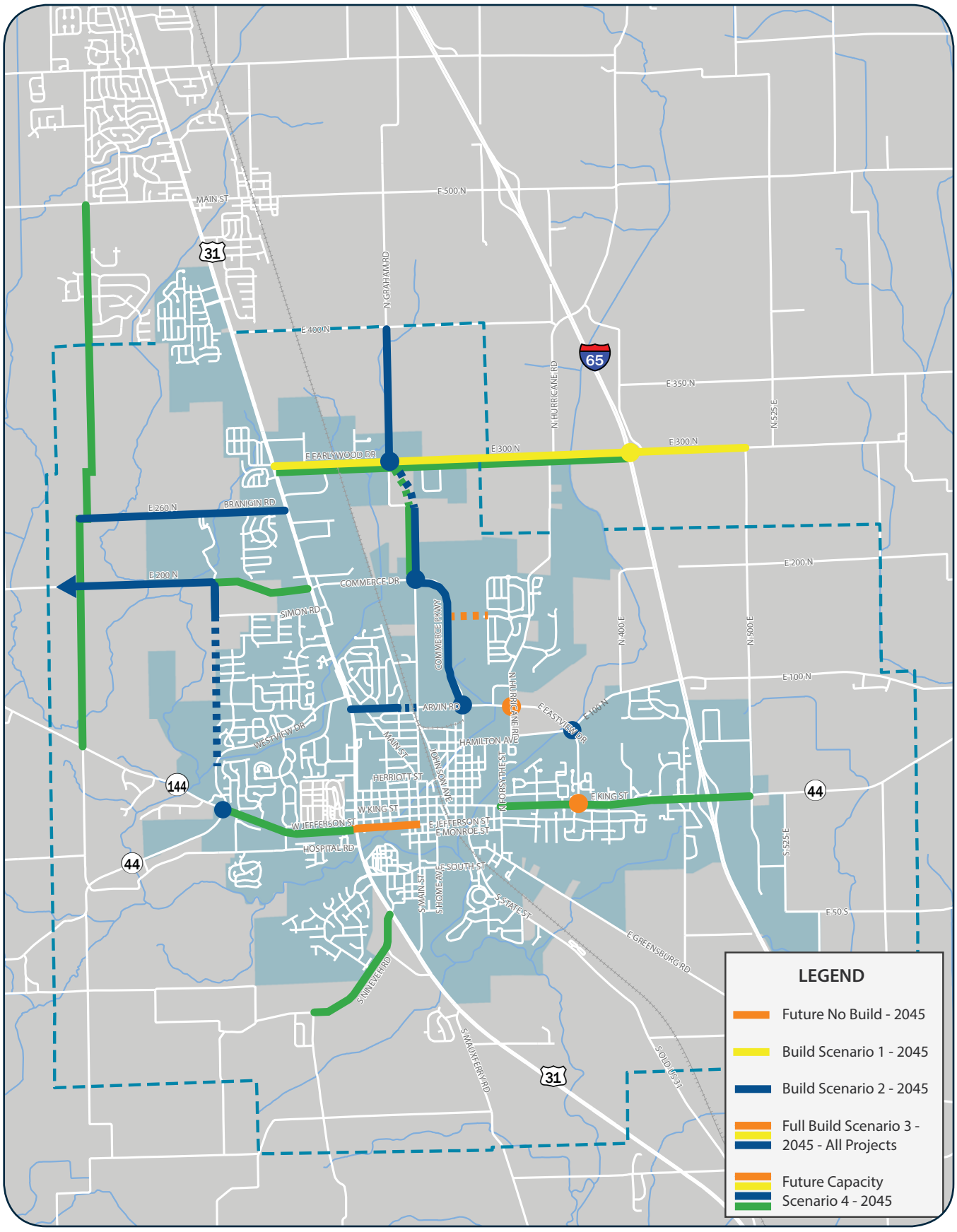
- Future no-build assumptions, plus;
- Build scenario 1 projects
- Build scenario 2 projects

Full Build Scenario 4, 2045

- Future no-build assumptions, plus;
- Build scenario 1 and 2 projects
- Additional lanes on King St. from Forsythe St. to Bartram Pkwy
- Additional lanes on Jefferson St. from US 31 to Westview Drive
- Additional lanes on Earlywood/300N from US 31 to I-65
- Additional lanes on Graham from Commerce to Earlywood Drive
- Additional lanes on Commerce Drive from 100 E to US 31
- Additional lanes on Jim Black Road from SR44 to Upper Shelbyville Road
- Additional lanes on Nineveh Road from city limits to US 31
- Upgrade 500 E from Upper Shelbyville Road to CR 300N
- Four lanes on Centerline Rd from SR 44 to Whiteland Road

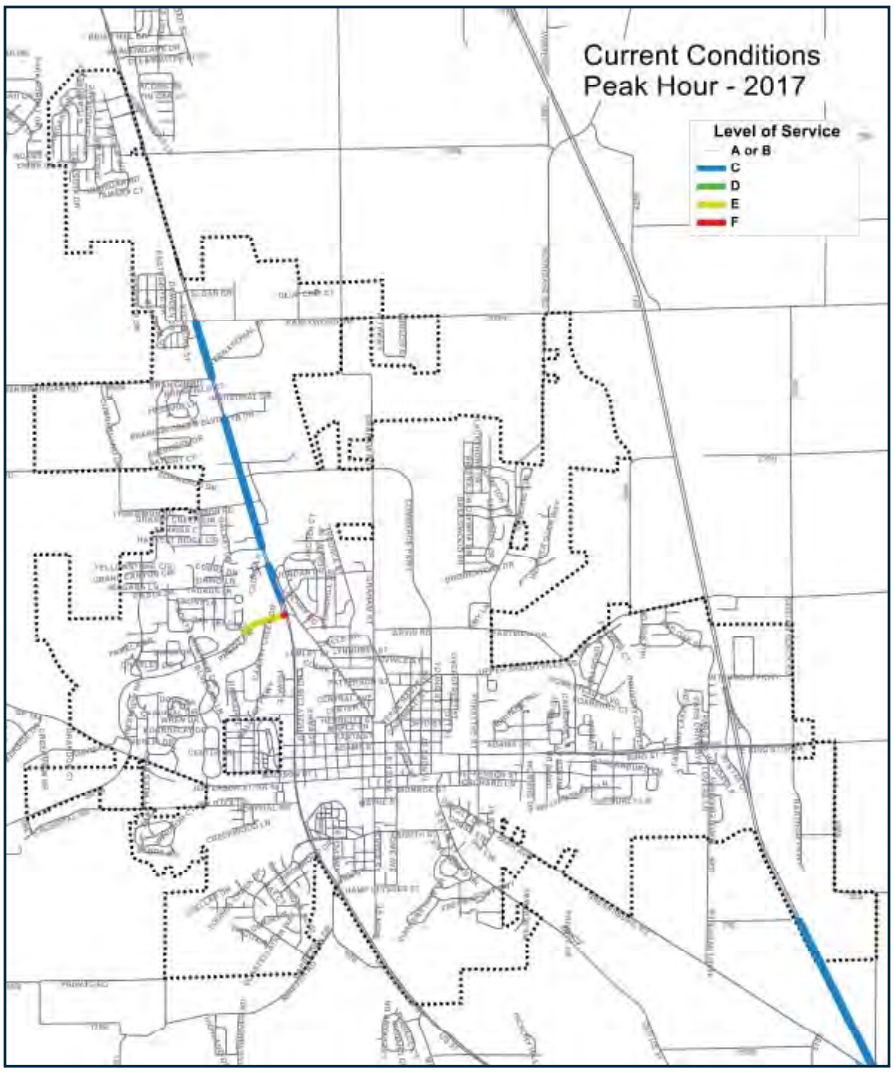
Modeling results for each scenario are shown on the pages that follow.

NETWORK SCENARIOS



CURRENT CONDITIONS - PEAK HOUR LEVEL OF SERVICE

Snapshot: Current Conditions	
Daily Vehicle Trips	
Total	208,614
Daily Vehicle Miles Traveled (VMT)	
Total	759,783
Average Trip Length	3.64
Daily Vehicle Hours Traveled (VHT)	
Total	16,990
Average Trip Duration	4.89
Daily Vehicle Delay Hours	
Total	1,447.7
Average Delay Per Vehicle	.42
Average Speed	44.7
Deficient Lane Miles	1.30



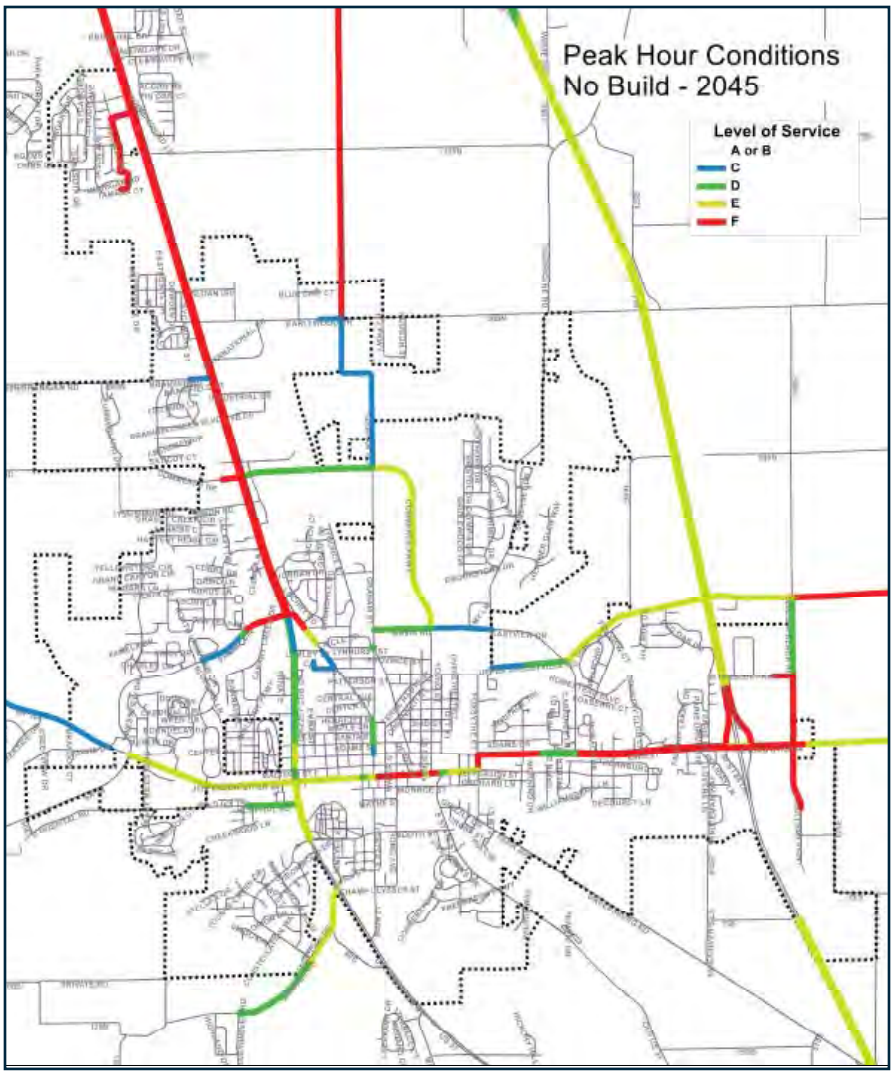
Current Conditions Include:

- I-65 Added Lanes
- Worthsville Road Interchange

With recently completed roadway improvements in Franklin and on I-65, traffic is flowing freely on most of the roadway system. Problem areas exist during the peak hours on Westview Drive at US 31. Also, congestion is worsening along the US 31 corridor north of Westview Drive.

FUTURE NO BUILD - PEAK HOUR LEVEL OF SERVICE

Snapshot: Future No Build	
Daily Vehicle Trips	
Total	474,244
Daily Vehicle Miles Traveled (VMT)	
Total	1,551,557
Average Trip Length	3.27
Daily Vehicle Hours Traveled (VHT)	
Total	44,499
Average Trip Duration	5.63
Daily Vehicle Delay Hours	
Total	10,408.5
Average Delay Per Vehicle	1.32
Average Speed	34.9
Deficient Lane Miles	38.57



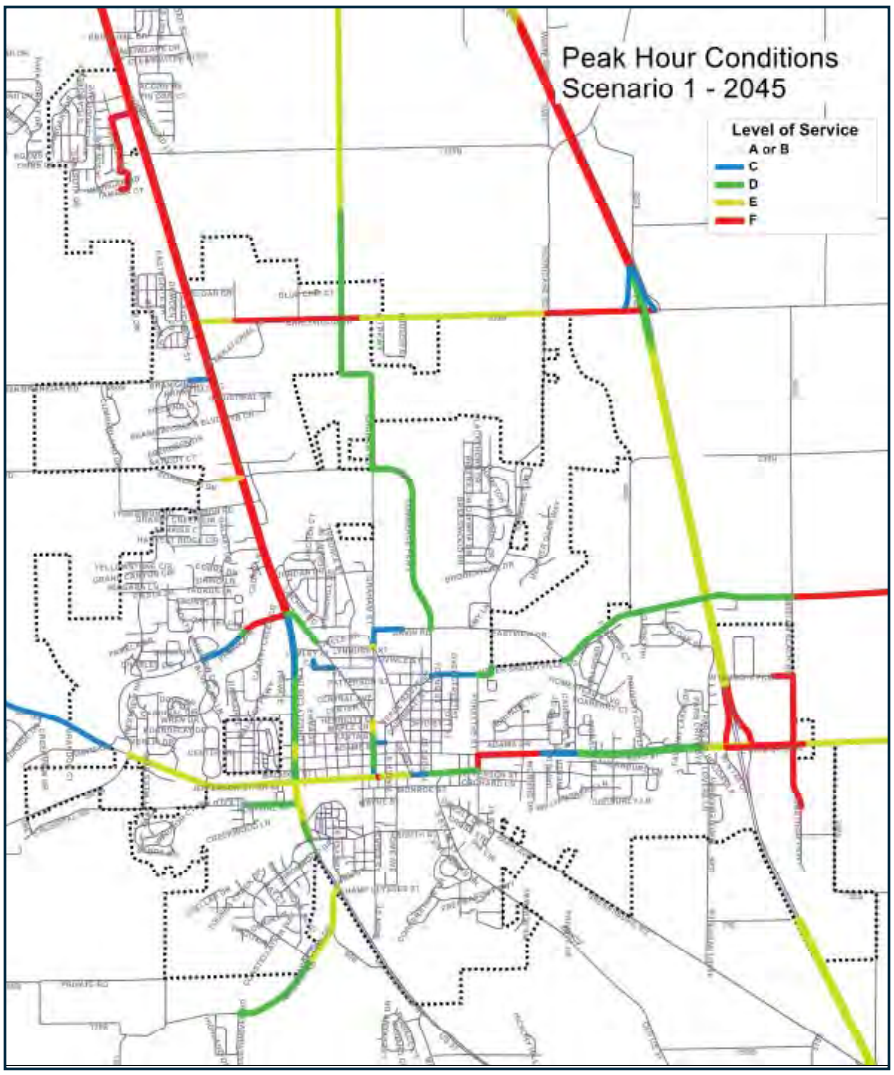
Future No Build Conditions Include:

- All of 2017 network, plus;
- Brookhaven Drive connection to Commerce Parkway
- King Street improvements
- Near-term roundabout projects

With land development picking up pace again in Johnson County, a tremendous amount of growth is expected in the Franklin area. Housing growth will be very strong on the west side of Franklin and even to the east of I-65. Forecasts show large concentrations of new jobs in the industrial parks on Commerce Dr. and I-65. Significant job growth is expected in the northern areas designated for industrial development in the comprehensive plan. Job growth is expected to catch up with past and future housing growth and will affect commuting patterns. Workers will be commuting into the Franklin area to a much larger degree. The 30 year forecast, without any additional roadway improvements, is for severe congestion on all major corridors.

SCENARIO 1 - PEAK HOUR LEVEL OF SERVICE

Snapshot: Scenario 1	
Daily Vehicle Trips	
Total	473,611
Daily Vehicle Miles Traveled (VMT)	
Total	1,547,200
Average Trip Length	3.27
Daily Vehicle Hours Traveled (VHT)	
Total	42,722
Average Trip Duration	5.41
Daily Vehicle Delay Hours	
Total	9,0229.9
Average Delay Per Vehicle	1.14
Average Speed	36.2
Deficient Lane Miles	40.32



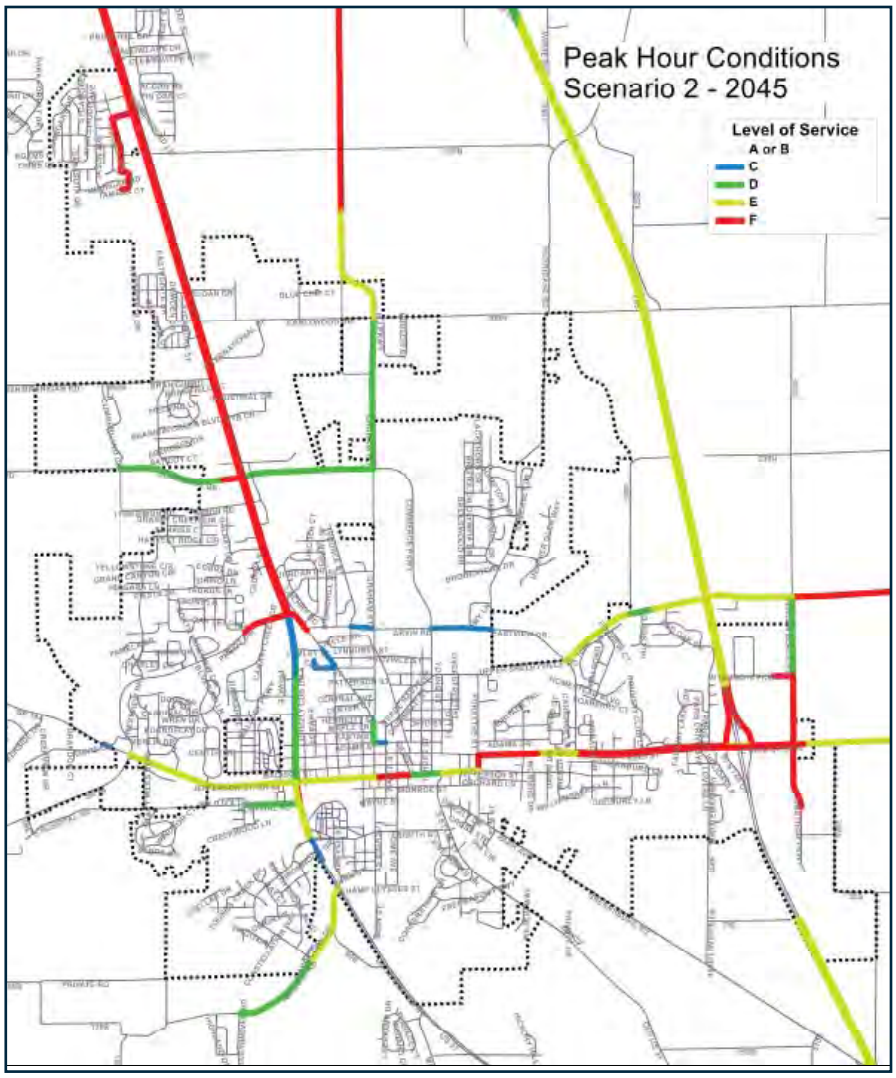
Scenario 1 Conditions Include:

- Future no-build assumptions, plus;
- New I-65 interchange at 300N
- Improvements to Earlywood/300N corridor (remains 2-lane)

Scenario 1 envisions a new I-65 interchange at 300N and overall corridor upgrades between US 31 and the interstate. Traffic forecasts show very strong demand for this interchange. However, it is clear that there would be many unmet needs elsewhere around the transportation network. When viewed in an economic context, this scenario will provide sufficient user benefits to offset the financial investment by a factor of 5:1 and is estimated to create nearly 1,500 additional regional jobs for the area.

SCENARIO 2 - PEAK HOUR LEVEL OF SERVICE

Snapshot: Scenario 2	
Daily Vehicle Trips	
Total	472,909
Daily Vehicle Miles Traveled (VMT)	
Total	1,553,048
Average Trip Length	3.28
Daily Vehicle Hours Traveled (VHT)	
Total	43,567
Average Trip Duration	5.53
Daily Vehicle Delay Hours	
Total	9,934.9
Average Delay Per Vehicle	1.26
Average Speed	35.6
Deficient Lane Miles	38.69



Scenario 2 Conditions Include:

- Future no-build assumptions, plus;
- Graham Road realignment
- 14th Street and Arvin Drive connection
- Added lanes on Commerce Parkway between Arvin Drive and Graham Street
- New road between Westview Drive and CR 100 E
- Improvements to CR 200 N between SR 144 and US 31
- Long-term roundabout projects

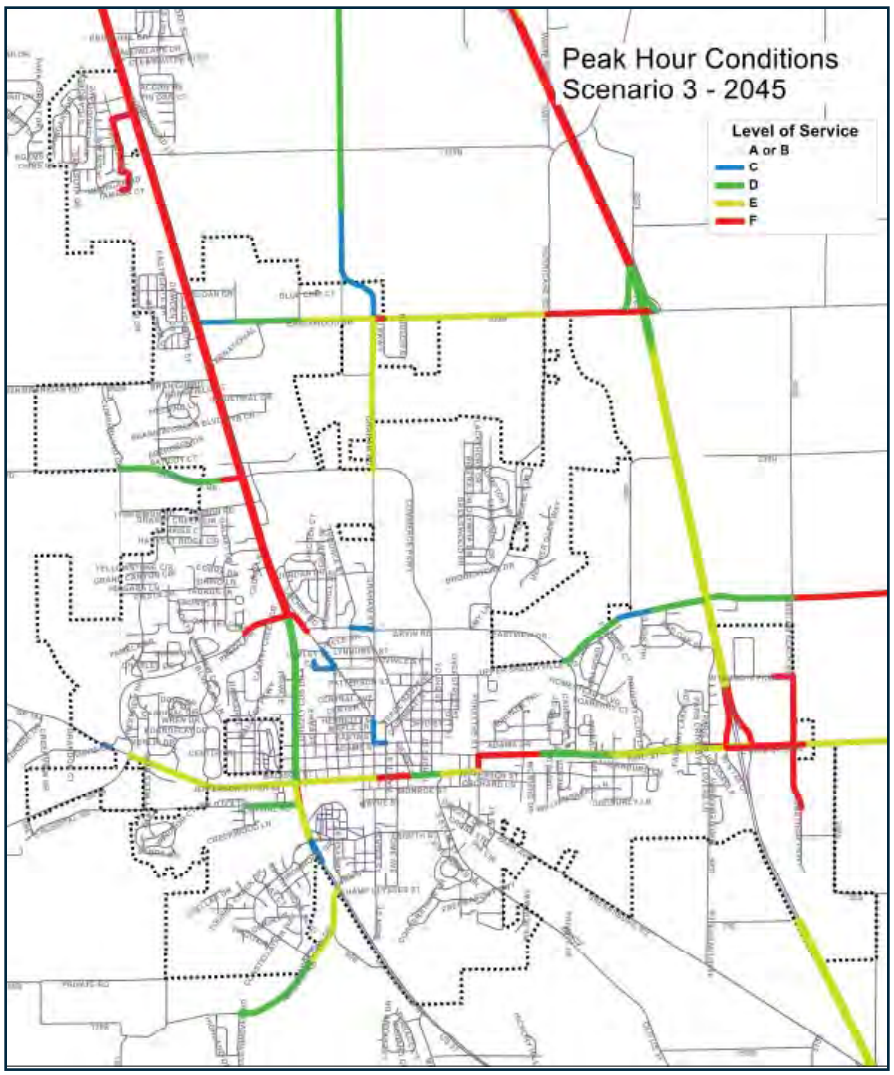
Scenario 2 includes a bundle of local roadway upgrades. Traffic forecasts show that these projects will increase average network speeds and reduce overall vehicle hours of delay. A large number of network deficiencies will still be unmet under this scenario. However, economic analysis shows a very favorable benefit-cost ratio of 8.7 and potential to generate over 1,000 additional regional jobs.

SCENARIO 3 - PEAK HOUR LEVEL OF SERVICE

Snapshot: Scenario 3	
Daily Vehicle Trips	
Total	472,904
Daily Vehicle Miles Traveled (VMT)	
Total	1,553,940
Average Trip Length	3.29
Daily Vehicle Hours Traveled (VHT)	
Total	41,982
Average Trip Duration	5.33
Daily Vehicle Delay Hours	
Total	8,602.9
Average Delay Per Vehicle	1.09
Average Speed	37.0
Deficient Lane Miles	39.93

Scenario 3 Conditions Include:

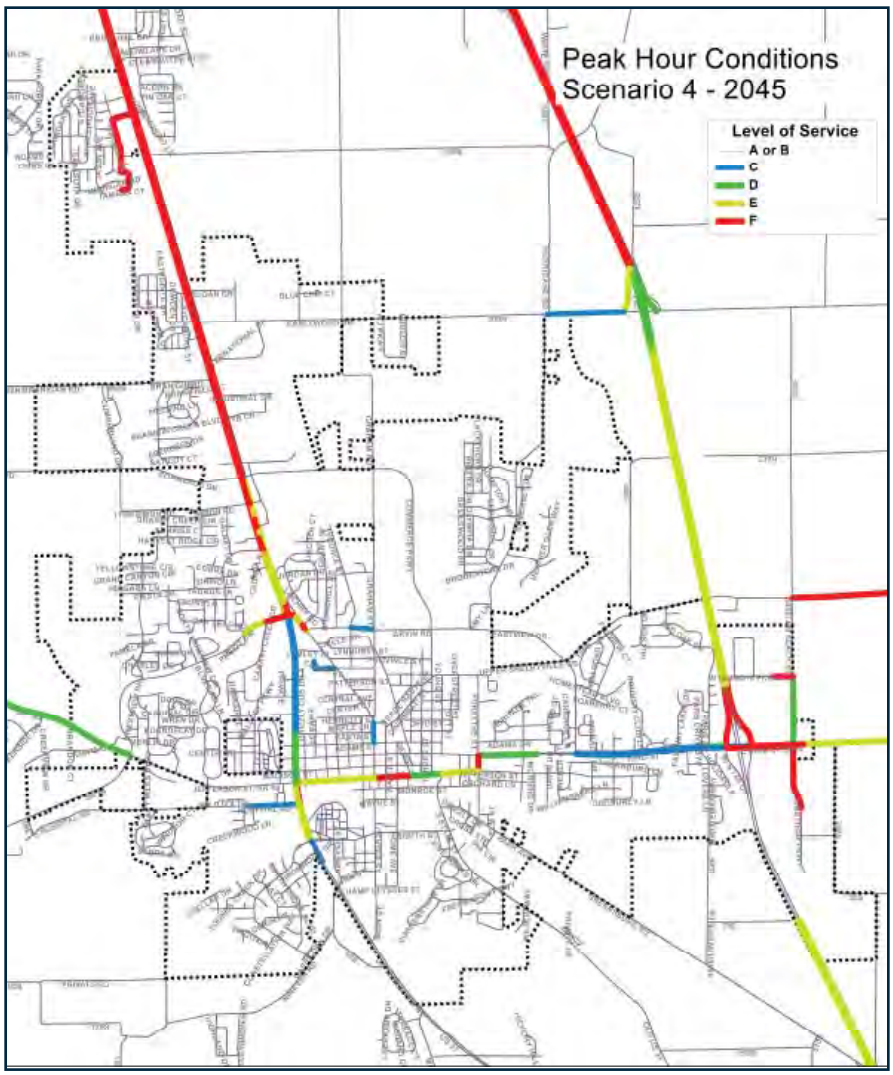
- Future no-build assumptions, plus;
- Build scenario 1 projects
- Build scenario 2 projects



Scenario 3 combines all projects from both Scenarios 1 and 2. Analysis shows that this scenario results in the most overall improvement to the transportation system. Due to the synergy between the mix of projects, the user benefits sum to more than when evaluated separately. The benefit-cost ratio exceeds 6.0 and the regional jobs impact is an estimate of just over 2,500 new jobs. As in the previous scenarios, many roadway deficiencies will remain. These deficiencies form the basis for our recommendations on further roadway capacity projects that will be needed.

SCENARIO 4 - PEAK HOUR LEVEL OF SERVICE

Snapshot: Scenario 4	
Daily Vehicle Trips	
Total	472,904
Daily Vehicle Miles Traveled (VMT)	
Total	1,534,096
Average Trip Length	3.24
Daily Vehicle Hours Traveled (VHT)	
Total	39,415
Average Trip Duration	5.00
Daily Vehicle Delay Hours	
Total	6,925.2
Average Delay Per Vehicle	0.88
Average Speed	38.9
Deficient Lane Miles	28.02



Scenario 4 Conditions Include:

- Future no-build assumptions, plus;
- Build scenario 1 and 2 projects
- Additional lanes on King St. from Forsythe St. to Bartram Pkwy
- Additional lanes on Jefferson St. from US 31 to Westview Drive
- Additional lanes on Earlywood/300N from US 31 to I-65
- Additional lanes on Graham from Commerce to Earlywood Drive
- Additional lanes on Commerce Drive from 100 E to US 31
- Additional lanes on Jim Black Road from SR44 to Upper Shelbyville Road
- Additional lanes on Nineveh Road from city limits to US 31
- Upgrade 500 E from Upper Shelbyville Road to CR 300N
- Four lanes on Centerline Rd from SR 44 to Whiteland Road

Scenario 4 includes all short, medium (scenarios 1 and 2) and recommended long-term capacity projects. Analysis shows that this scenario results in substantial improvements to system-wide performance statistics versus the no-build conditions. This scenario provides a solution to the remaining local capacity deficiencies shown in Scenario 3, with the exception of downtown Franklin. Scenario 4 does not address capacity deficiencies on INDOT facilities (US 31 and I-65).

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COMPARISON OF MODELED SCENARIOS

Table E: Comparison of Modeled Scenarios							
Year	2017	2017	2045	2045	2045	2045	2045
Network	Current	Current plus Increased Railroad Traffic	No Build	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Daily Vehicle Trips	208,614	205,909	474,244	473,611	472,909	472,904	472,904
Daily VMT							
Interstate	309,690	205,317	481,405	483,540	478,863	493,743	502,928
Principal Arterial	236,086	227,734	459,097	439,147	456,253	442,584	447,769
Minor Arterial	94,419	105,157	240,376	306,318	263,482	311,427	291,735
Collector	72,788	71,096	219,655	178,793	208,149	170,929	168,800
Local	46,800	46,607	151,024	139,403	146,301	135,258	122,863
Total	*759,783*	*755,910*	*1,551,557*	*1,547,200*	*1,553,048*	*1,553,940*	*1,534,096*
Average Trip Length	3.64	3.67	3.27	3.27	3.28	3.29	3.24
Daily VHT							
Interstate	4,174	4,110	7,354	7,327	7,297	7,587	7,837
Principal Arterial	5,432	5,239	13,175	12,238	12,446	11,721	11,245
Minor Arterial	2,449	2,678	7,783	8,979	8,295	8,968	7,863
Collector	2,584	2,534	7,853	6,416	7,351	6,124	5,506
Local	2,351	2,352	8,335	7,761	8,177	7,582	6,965
Total	*16,990*	*16,912*	*44,499*	*42,722*	*43,567*	*41,982*	*39,415*
Average Trip Duration (min.)	4.89	4.93	5.63	5.41	5.53	5.33	5.00
Daily Vehicle Delay Hours							
Interstate	(323.7)	(322.8)	277.9	188.5	258.7	295.5	406.8
Principal Arterial	321.2	322.5	3,117.4	2,622.1	2,811.3	2,363.3	1,746.6
Minor Arterial	254.0	320.5	2,162.6	1,913.3	2,184.8	1,789.1	1,117.6
Collector	408.0	406.8	1,500.8	1,186.8	1,360.2	1,103.4	864.1
Local	788.1	794.4	3,349.8	3,112.2	3,319.9	3,051.6	2,790.1
Total	*1,447.7*	*1,521.4*	*10,408.5*	*9,022.9*	*9,934.9*	*8,602.9*	*6,925.2*
Average Delay Per Vehicle	0.42	0.44	1.32	1.14	1.26	1.09	0.88
Average Speed	44.7	44.7	34.9	36.2	35.6	37.0	38.9

Table E: Comparison of Modeled Scenarios *(continued)*							
Year	**2017**	**2017**	**2045**	**2045**	**2045**	**2045**	**2045**
Network	**Current**	**Current plus Increased Railroad Traffic**	**No Build**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Daily VMT at LOS							
A or B	675,115	707,601	411,824	420,841	453,437	452,669	603,510
C	60,065	19,904	59,824	57,551	30,119	34,558	91,912
D	1,801	25,248	101,715	189,750	117,166	175,617	105,796
E	22,597	205	514,165	365,063	488,575	343,710	288,274
F	205	2,951	464,029	513,995	463,750	547,387	444,604
Deficient Lane Miles							
Interstate			10.55	10.55	10.53	11.09	11.09
Principal Arterial			16.28	15.15	15.78	16.54	12.49
Collector	1.04	1.04	6.09	10.21	7.73	9.42	3.77
Local	0.26	0.26	5.65	4.41	4.65	2.89	0.68
Total	*1.30*	*1.30*	*38.57*	*40.32*	*38.69*	*39.93*	*28.02*
Estimated Cost to Fix (Mil)	$ 1.94	$ 1.94	$ 92.06	$ 93.55	$ 91.72	$ 95.29	$73.37
Accidents							
Fatal	0.40	0.40	0.80	0.80	0.80	0.81	0.81
Injury	124.72	124.58	226.59	228.55	228.11	227.39	223.04
Property Damage	801.05	799.95	1483.00	1477.16	1489.14	1472.95	1454.85
Transit							
Households within 1/4 mile	4,392	4,392	4,451	4,451	4,451	4,451	4,451
Jobs within 1/4 mile	6,078	6,078	7,085	7,085	7,085	7,085	7,085

WALK SCORE/URBAN DESIGN SCORE

Input received from the public meeting and survey conducted in June revealed a strong interest in walkability and pedestrian accessibility. As part of the analysis completed on the road network, a walk score analysis was performed based on existing pedestrian facilities such as trails and sidewalks. The analysis indicated the downtown area bound by Home Avenue, Walnut Street, Wayne Street and Adams Street scored the highest in the city when factors such as density, diversity, design, destination and distance were considered. Detailed analysis of the walk score can be found in the appendix.

LOCAL CONCERNS

Beyond data driven traffic analysis and modeling, input regarding transportation concerns from personal experience as a daily user was solicited from the working group and from the pubic via a public survey and public meeting.

AREAS OF CONCERN FROM WORKING GROUP

- Plan for future growth by supporting with infrastructure – support future land use
- Making connections to key assets in the community
- East – west connectivity
- Think long-range, but be flexible
- Create flexible and workable model
- Create a plan that supports proposed improvements with economic benefit
- Pedestrian connectivity and safety
- Context sensitive solutions and complete streets

AREAS OF CONCERN FROM PUBLIC SURVEY AND MEETING

- Sidewalks need to connect and be improved in many locations
- Top challenges in the future will be increased traffic/congestion, aging and deteriorating infrastructure and increase freight traffic.
- Creating greater connectivity and safety for walking and biking
- Top criteria for selecting transportation projects included:
  - Improving safety
  - Increasing and improving pedestrian facilities
  - Increasing connectivity from residential areas to areas of employment
  - Improving sidewalks and pedestrian facilities was a very common theme
  - Improving street appearance (trees, lights, landscaping, etc.) was a popular improvement

4

TRANSPORTATION PLAN & RECOMMENDATIONS

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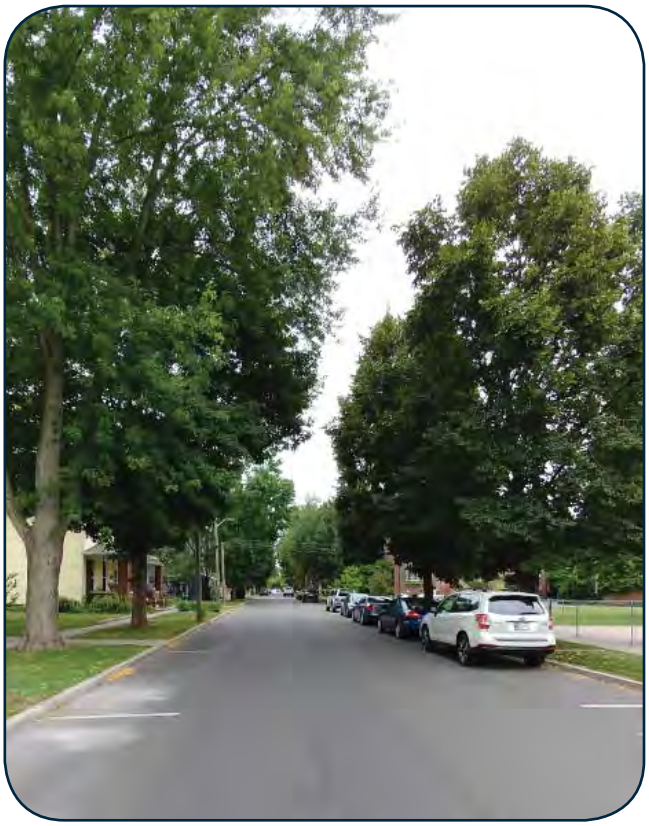
TRANSPORTATION PLAN OUTLINE

The standards and classifications presented within the transportation plan recommendations come into play when a private property owner seeks to expand their property rights (through such actions as subdivision or rezoning petitions) or when a public entity seeks to make an improvement to the public right-of-way. The recommendations contained in this section contain several components, including:

- Thoroughfare classifications
- Right-of-way standards
- Context zones
- Flexible design standards and sections
- Priority improvement considerations
- Priority policy considerations



The elements in this plan address flexible design standards for roads dependent on context zones, such as Home Avenue in the urban context zone.

FUTURE THOROUGHFARE PLAN MAP

The Future Thoroughfare Plan Map lays out the envisioned roadway network for the city. One of the primary purposes of the Future Thoroughfare Plan Map is to provide expectations for right-of-way requirements and flexible street design standards for the main thoroughfares through the city. All classified roadways in the Future Thoroughfare Plan Map will be required to provide a minimum right-of-way dedication and meet certain other standards, such as lane widths, curb/gutter and sidewalk standards depending on the classification and context zone. It is recognized that constraints may exist which make it impossible to meet the requirements and standards laid forth in this plan. In those instances, a case-by-case review will need to be made, utilizing this thoroughfare plan as a guide for prioritizing components and functions of main thoroughfares.

The Future Thoroughfare Plan Map utilizes the same terms as the existing INDOT Functional Classification Map (arterials and collectors) in order to ensure continuity for future funding, as roadways shown in the Future Thoroughfare Plan Map may someday be included on the Functional Classification Map. However, the Future Thoroughfare Plan Map is specifically forward-looking, allowing for the city to plan for changes to its transportation network through the year 2045.

The existing functional classification of city roadways was used as the starting point for developing the Future Thoroughfare Plan Map. State routes, such as US 31 and SR 144 were not classified on the thoroughfare map, as these roads, and their right-of-way, are state jurisdiction. Roadways which warranted a change in classification or were included as a new thoroughfare classification were then evaluated and added to create the Future Thoroughfare Plan Map.

As state roads are not included on the thoroughfare map, it is critical that the city require any new development or redevelopment along these routes to be reviewed and/or approved by INDOT to ensure proper right-of-way dedication. If the city obtains control of these corridors in the future, they will need to be added to the Future Thoroughfare Plan Map to ensure recommendations contained in this plan are applied. Even absent full local control of these corridors, the city should still evaluate creating overlay districts along these major routes to address access control and prevent unnecessary or redundant driveway cuts and improve safety.

Roadway alignments and proposed road segments illustrated on the Future Thoroughfare Plan Map are representations only and do not indicate actual alignments. Detailed surveys and studies will be required for any new right-of-way dedication or new road construction.

Efforts have been made to coordinate other jurisdictional thoroughfare plans and designations. However, if the Franklin Thoroughfare Plan classifications differ with those adopted thoroughfare classifications in other jurisdictions, the classification with the more restrictive design standard should prevail.

INTERCHANGE

As part of the modeling and network analysis of this plan, it was determined that a northern interchange to Franklin will likely be beneficial in the future due to growing density of residential and employment areas between Franklin and Whiteland. Thus, the Future Thoroughfare Plan Map indicates a study area around a potential new interstate interchange around CR 300 N and Interstate 65.

A new interchange could have many benefits for Franklin, including:

- Increase in residential development opportunities
- Increase in access to employment opportunities
- Creating a secondary entrance to industrial areas of Franklin for truck traffic

FUTURE THOROUGHFARE PLAN MAP

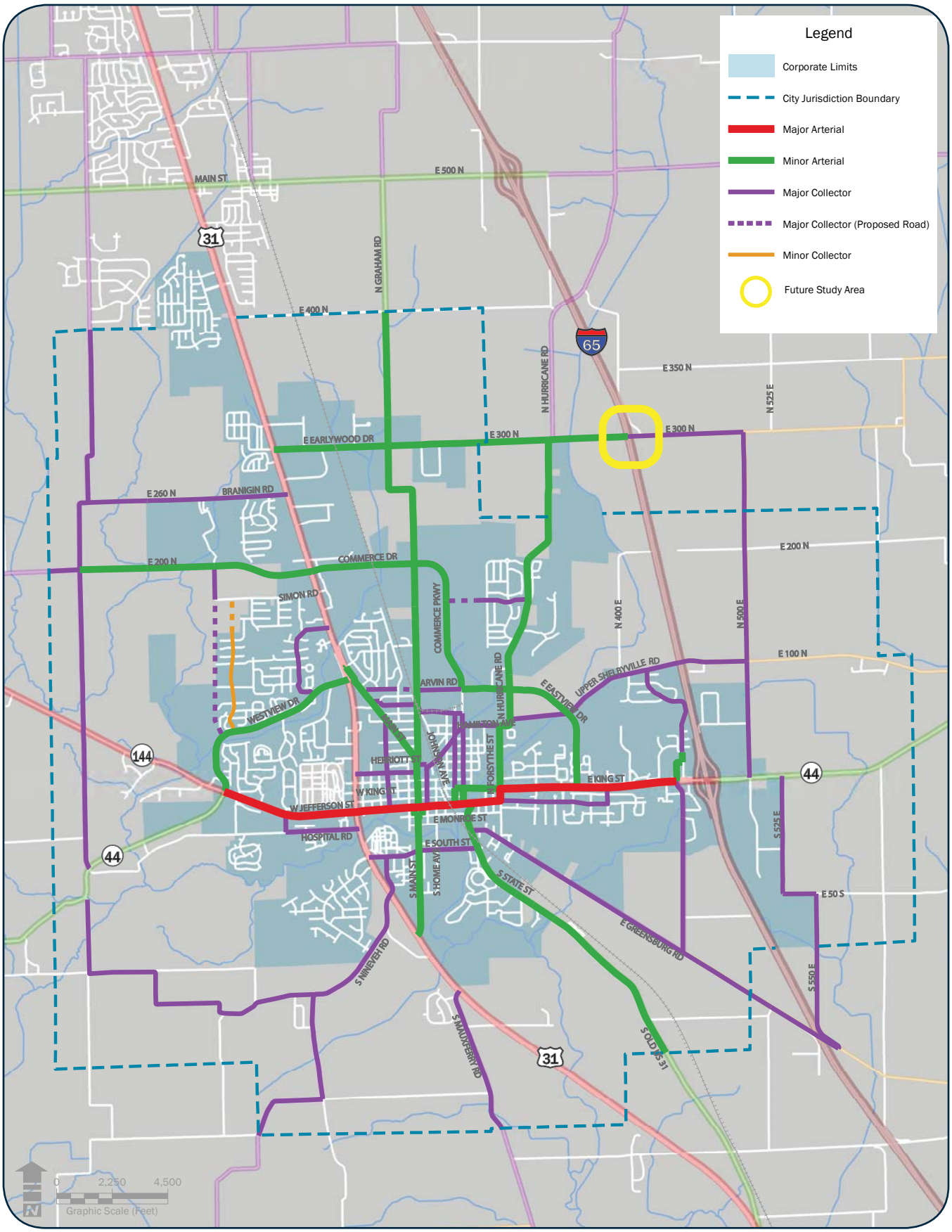
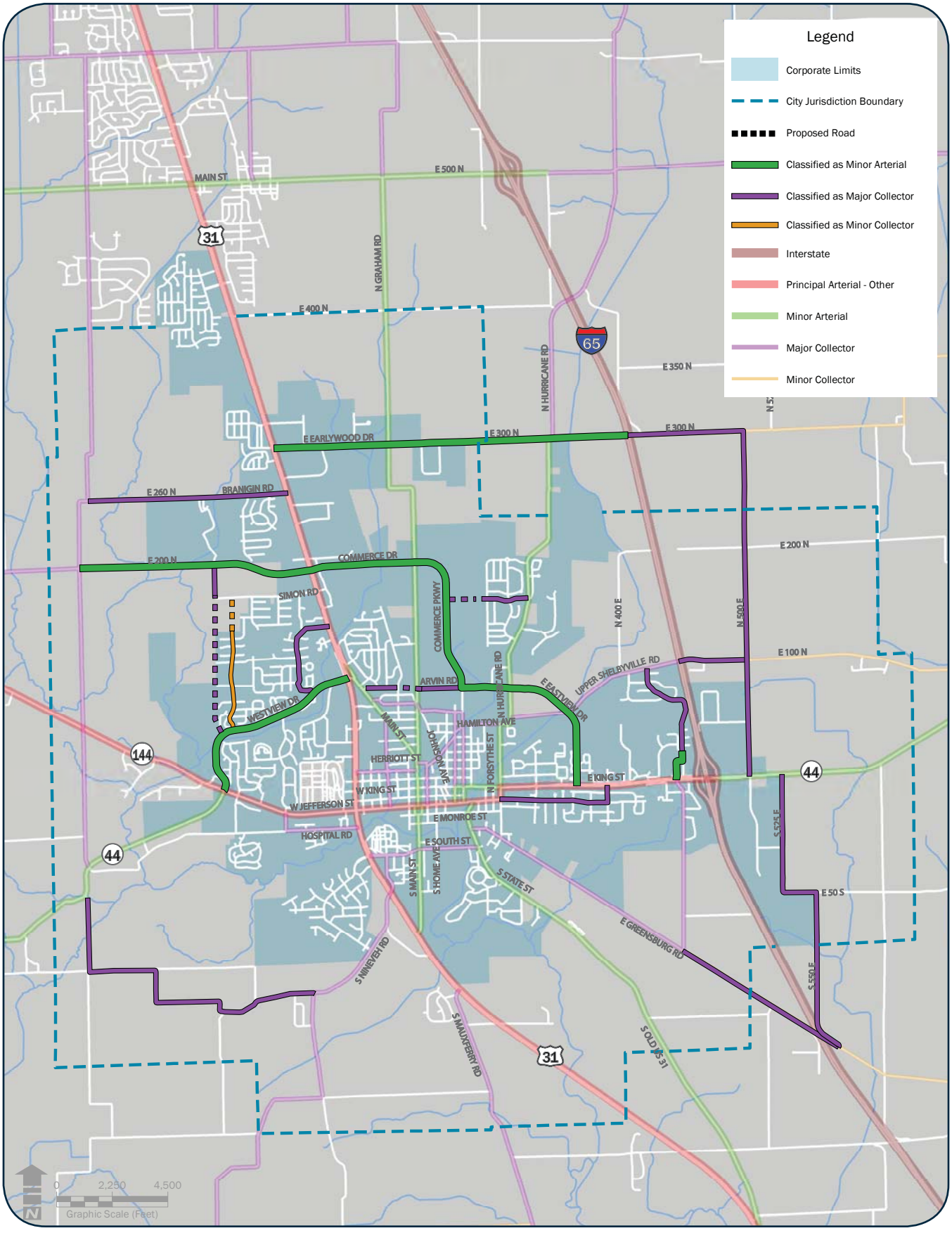


Table F: Proposed Thoroughfares that Differ from Functional Classification				
Roadway	**Location**	**Current Functional Classification**	**Proposed Thoroughfare Designation**	**Approximate Existing ROW**
Branigin Road/CR 260 N	Centerline Road to US 31	Local	Major Collector	45'-50'
CR 200 N	Centerline Road to US 31	Major Collector	Minor Arterial	120’
Commerce Drive	US 31 to Commerce Pkwy.	Major Collector	Minor Arterial	60’-100’
Commerce Parkway/Arvin Rd/Eastview Drive	Commerce Drive to East King Street	Major Collector	Minor Arterial	80'-90'
Brookhaven Drive	Hurricane Road to Commerce Parkway	Local/unbuilt	Major Collector	60'
Arvin Drive/Arvin Dr. Extension/14th Street	Graham Road to Main Street	Local/unbuilt	Major Collector	50’
Earlywood Drive	US 31 to I-65	Major Collector	Minor Arterial	30' - 40'
CR 300 N	I-65 to CR 500 E	Minor Collector	Major Collector	40'
CR 500 E	CR 300 N to CR 100 N	Minor Collector	Major Collector	30' - 40'
CR 100 N	I-65 to CR 500 E	Minor Collector	Major Collector	40'
CR 500 E	CR 100 N to SR 44	Local	Major Collector	30' - 40'
CR 525 E	SR 44 to CR 50 S	Local	Major Collector	30'
CR 50 S	R 525 E to CR 550 E	Local	Major Collector	30'
CR 550 E	CR 50 S to Greensburg Road	Local	Major Collector	25' - 30'
Greensburg Road	I-65 to CR 450 E	Minor Collector	Major Collector	40'
Paris Drive	St. Andrews Ct. to Upper Shelbyville Road	Local	Major Collector	50' - 70'
Paris Drive	King Street to St. Andrews Ct.	Local	Minor Arterial	50’-70’
Jefferson Street	Forsythe Road to Milford Drive	Local	Major Collector	50' - 55'
Milford Drive	Jefferson Street to King Street	Local	Major Collector	50'
Westview Drive	Jefferson Street to US 31	Major Collector	Minor Arterial	80' - 100'
Cumberland Drive/ Cumberland Dr. Extension	Westview Drive to Simon Rd.	Local/unbuilt	Minor Collector	70’
CR 100 E and Future Extension	CR 200 N to Westview Drive	Local/unbuilt	Major Collector	30’
Acorn Boulevard/Oak Leaf Road	Westview Drive to US 31	Local	Minor Collector	50'
CR 125 S	S. Ninevah road to CR 50 E	Local	Minor Collector	25' - 30'
CR 50 E	CR 50 E to CR 100 S	Local	Minor Collector	30'
CR 100 S	Centerline Road to CR 50 E	Local	Minor Collector	30'
Centerline Road	SR 44 to CR 100 S	Local	Minor Collector	30'

DEVIATIONS FROM FUNCTIONAL CLASSIFICATION MAP



RIGHT-OF-WAY STANDARDS

An important function of the thoroughfare plan is to establish right-of-way requirements and standards for the classified thoroughfares in the city. Providing the designated right-of-way allows for the roadway to not only include appropriate design elements for vehicular transportation, but also account for pedestrian and bicycle facilities, buffer zones from traffic and inclusion of utility networks.

The Subdivision Control Ordinance for Franklin already addresses right-of-way and design components for roadways within subdivisions in the city. However, those standards do not extend to all the thoroughfares within the city as identified in this plan. The standards identified within the Subdivision Control Ordinance were used as the starting point and basis for the standards presented in this plan.

It should be noted that the standards below are minimum design standards. The city may require increased standards if necessitated by local conditions.

Table G: Right-Of-Way Requirements

	No. of Lanes	Minimum Right-of-Way	
		Urban	Suburban
Major Arterial	2-4	70’	110’
Minor Arterial	2-4	70’	100’
Major Collector	2	60’	70’
Minor Collector	2	50-60’	60’
Local Road	2	50’	50’

CONTEXT ZONES

The approach to roadway and street design is not the same as it was 15 or 20 years ago. It is now recognized that a major roadway, if designed properly, will look and function much differently in an urban center than in the rural landscape outside the city. Roadways and transportation networks should change their appearance and primary function as they move through a city. As the built and environmental context around a road changes, so should the design of the road. The road should respond to density, residential neighborhoods and commercial centers.

To further considerations of contextual design, two context zones have been identified for the city of Franklin to allow for flexible design standards.

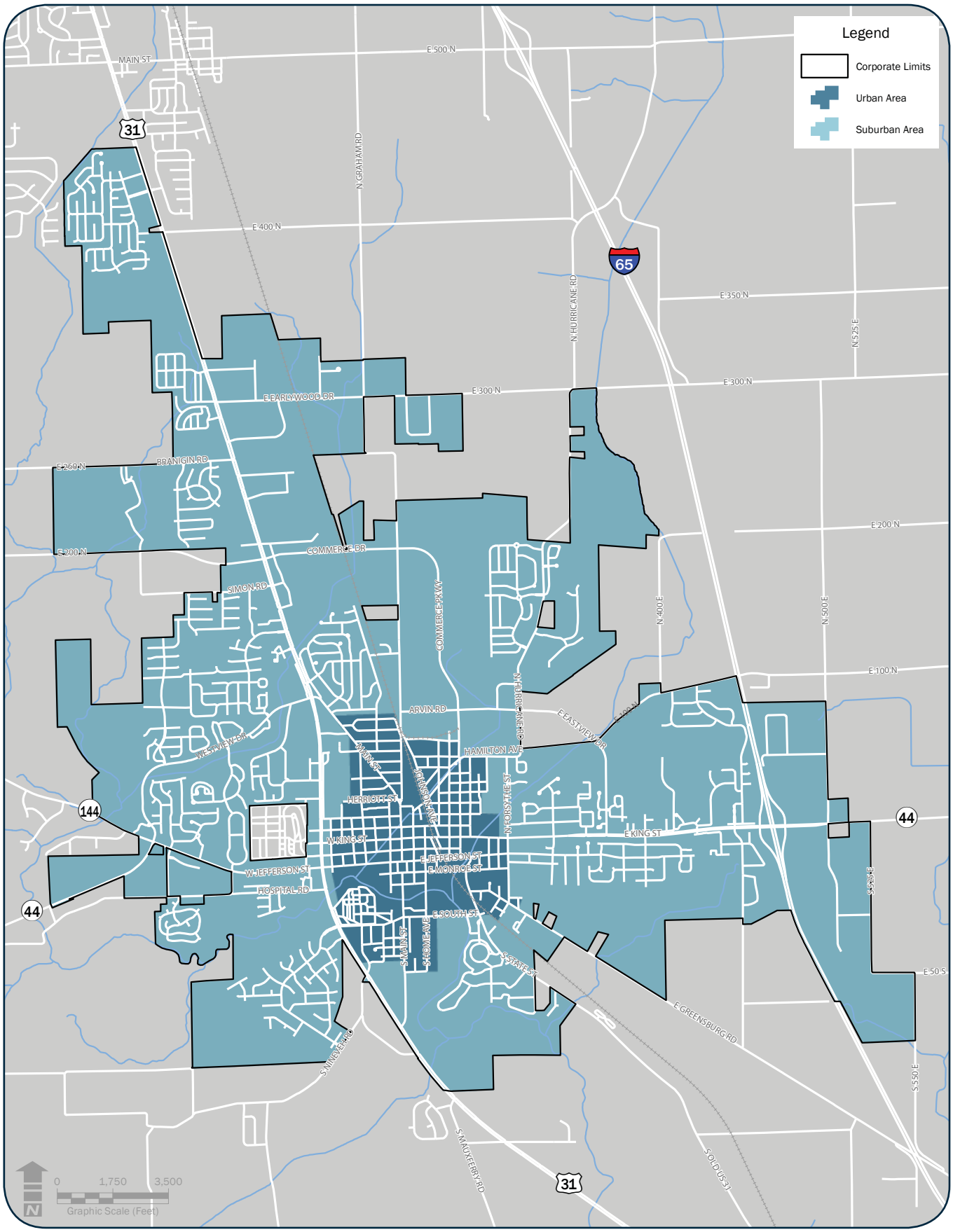
URBAN CONTEXT ZONE

This area is the heart of Franklin and includes the downtown and the historic neighborhoods and development surrounding the downtown. Right-of-way within this zone is constrained with very little room for any expansion. This zone also contains two- to three-story buildings which comprise the historic downtown of Franklin. Buildings and homes are typically built right up to the right-of-way line or with minimal setback with on-street and rear oriented parking options. Pedestrian connectivity is critical within this zone.

SUBURBAN CONTEXT ZONE

This zone is comprised of the majority of the remaining developed portions of Franklin, including residential neighborhoods. Commercial development is typically setback from the edge of the road with parking in front, unlike the downtown core. Housing types and densities are mixed within this zone.

CONTEXT ZONE MAP



FLEXIBLE DESIGN STANDARDS

Today's transportation networks must take into account much more than just how best to accommodate the automobile and vehicular traffic. As evidenced by the public input response, alternative modes of transportation such as walking and bicycling are becoming more and more important to transportation networks, especially those within cities.

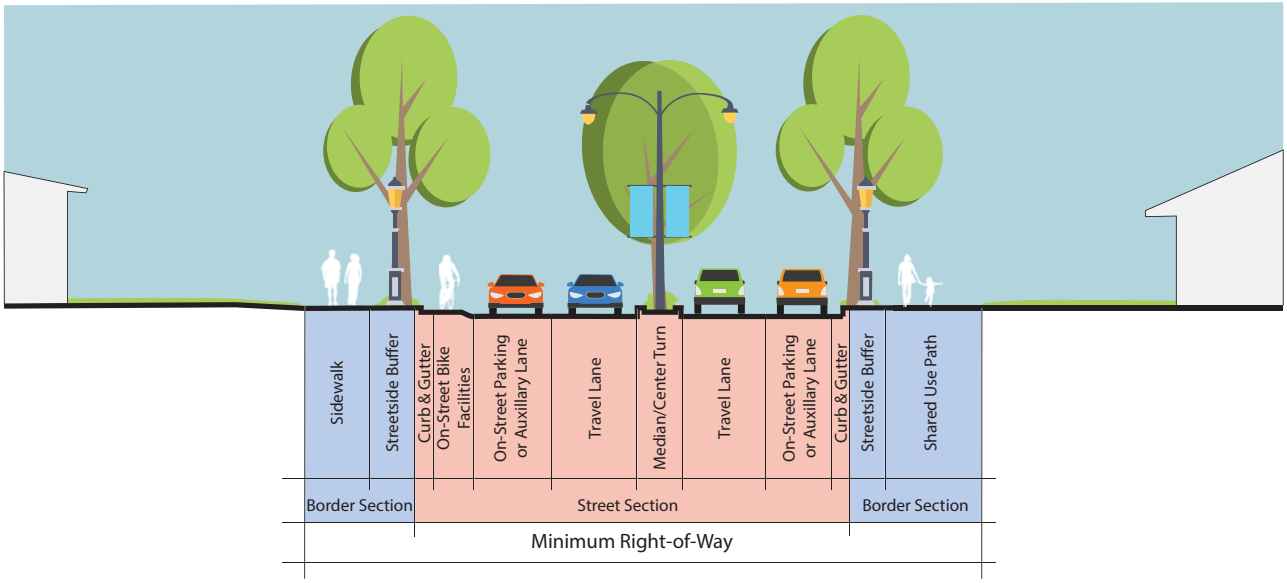
As described previously, a major roadway will function and appear different in a downtown commercial center than in a suburban residential area. Unfortunately, traditional roadway standards and sections do not always account for other users and these context sensitive variations.

The flexible design matrix presented in Table H provides flexible design standards for major thoroughfares in the city of Franklin according to the previously described context zones. This allows each roadway to be designed, built and updated in a way that responds to the surrounding environmental context and addresses the needs of varied users of the transportation network.

The table is broken into key components, as listed below and illustrated in the two images on the following page.

- Right-of-way
- Border section
- Street section
- On-street bike facilities

ELEMENTS OF AN STREET IN SUBURBAN CONTEXT ZONE



ELEMENTS OF AN STREET IN URBAN CONTEXT ZONE

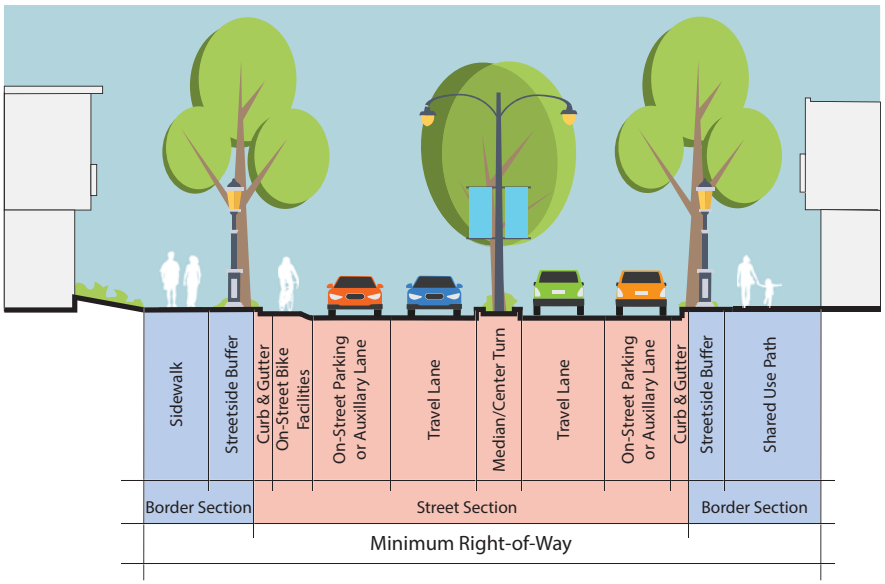


Table H: Flexible Design Matrix

	Major Arterial		Minor Arterial		Major Collector		Minor Collector		Local
	Urban	Suburban	Urban	Suburban	Urban	Suburban	Urban	Suburban	Urban / Suburban
Minimum Right of Way	70’	110’	70’	100’	60’	70’	50’	60’	50’
Border Section									
Sidewalk Width	8' min.	6' min.	6' min.	6' min.	5’ min.	5’ min.	5’ min.	5’ min.	5’ min.
Shared Use Path Width (opt.)	8' min.	8’ min.	8' min.	8’ min.	8’ min.	8’ min.	8’ min.	8’ min.	8’ min.
Streetside Buffer Width	5' min.	8' min.	5' min.	8' min.	5’ min.	5’ min.	5’ min.	5’ min.	5’ min.
Street Section									
Travel Lanes	2-4	2-4	2-4	2-4	2	2	2	2	2
Travel Lane Width	11' min.	12' min.	11' min.	12’ min.	10’ min.	11’ min.	10’ min.	10’ min.	10’ min.
Auxiliary Lanes (opt.)	11' min.	12' min.	11' min.	12' min.	10’ min.	11’ min.			
On-Street Parking (opt.)					7’ min.	8’ min.	7’ min.	8’ min.	8’ min.
Medians (opt.)		6'-20'		6'-20'		2’-16’			
Center Turn (opt.)	14’ min.	14’-16’	14’ min.	14’ min.	14’-16’	14’-16’			
Center Turn w/ Medians (opt.)		14’-20’		14’20’		14’-16’			
Curb and Gutter	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical/ Rolled	Vertical/ Rolled	Vertical/ Rolled
Target Speed (MPH)	35	35-45	30	30-40	30	30-40	30	30	25
On-Street Bike Facilities (optional)									
Sharrow									Yes
Bike Lane							5’	5’	4’
Bike Lane (with on-street parking)							6’	6’	5’
Buffered Bike Lane			8'	8’	8’	8’	8’	8’	
Protected Bike Lane	11'	11'	11'	11'	11’	11’			

Note: Sidewalks and/or shared use paths to be installed on both sides of a street
The horizontal gutter pan cannot be included in the required bike lane width
The horizontal gutter pan can be included in the required width for on-street parking

PRIORITY COMPONENTS

While the standards presented in Table H represent ideal minimums for the given context, it is recognized that existing right-of-way constraints may make it impossible to fit every possible design component into every street section. For example, a major collector with an 80 feet of right-of-way will not accommodate two lanes of traffic, two bike lanes, a center median/ center turn lane, off-street parking on both sides of the street, a sidewalk, a multi-use path, and a wide streetside buffer. Some of these design components have to be prioritized above others.

Table I below identifies design components that may have differing priorities depending on the type of thoroughfare designation and context zone. Higher priority components are more appropriate for the thoroughfare designation, while lower priority elements may be relinquished in cases of constrained or insufficient right-of-way. This table, in conjunction with the standards in Table H should be used to determine appropriate roadway standards when existing right-of-way or other site constraints prevents full implementation of the standards.

Table I: Priority Components

	Major and Minor Arterials		Major and Minor Collectors	
	Urban	Suburban	Urban	Suburban
Street Section (curb to curb)				
Number of Travel Lanes	Medium	High	Low	Medium
Width of Travel Lanes	High	High	Low	Medium
Vehicular Capacity	High	High	Medium	Medium
Accommodate Large Vehicles	Medium	High	Low	High
Medians	Low	Medium	Low	Medium
Bicycle Facilities	Medium	Medium	High	High
On-Street Parking	Medium	Medium	High	Low
Border Section (curb to right-of-way line)				
Wide sidewalks	High	Low	High	Low
Multi-use trails	Low	Medium	Medium	High
Site furnishings and amenities	High	Low	High	Low
Street trees	Medium	High	High	High
Other Components				
Access Management	High	High	Medium	Medium
Interconnected Streets	High	High	High	High

High Priority Medium Priority Low Priority

ROADWAY SECTIONS

EXAMPLE SECTIONS

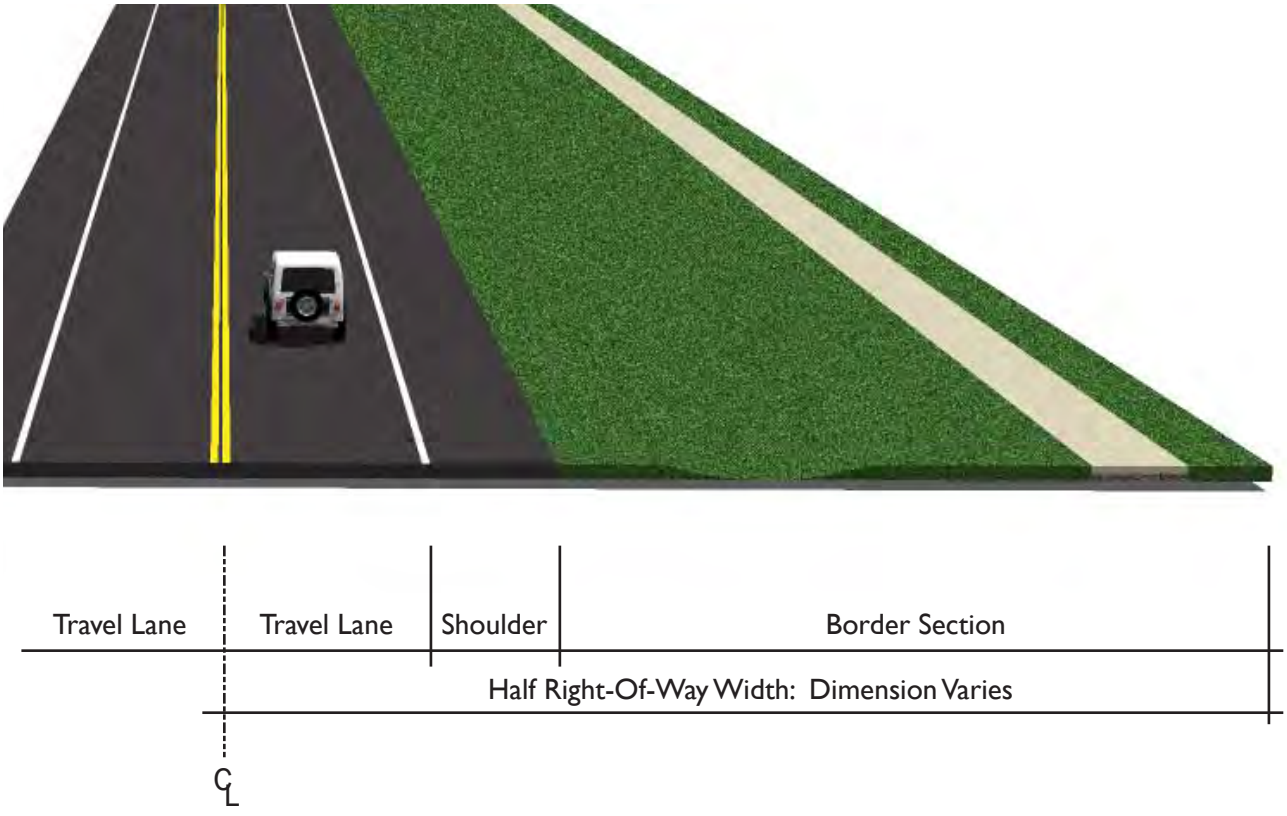
The sections on the following pages correspond to the flexible design standards from Table H on page 67. It is important to note that these sections are not meant to illustrate the typical or minimum required section. These sections illustrate some potential components of the table per each type of thoroughfare. Detailed dimensions have not been provided, except for the minimum right-of-way, which is an established standard as part of this plan. The city of Franklin construction design standards contain the minimum geometric design requirements for roadway construction in the city.

INTERIM SECTION

It is recognized that the example sections illustrated on the following pages and described in the flexible design standards matrix may not always be feasible dependent on development pressures and fiscal constraints. The interim section illustrates how roadways may initially be constructed in a developing area that does not yet warrant the full section detailed in this plan.

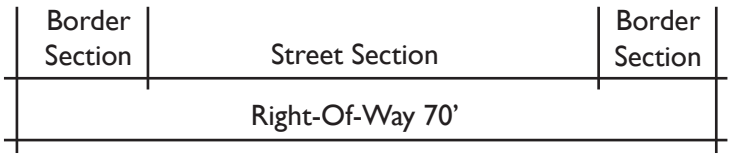
This section essentially allows for temporary construction of a shoulder and drainage swale in lieu of a curb and gutter and stormwater infrastructure. However, this section still preserves the full right-of-way, to allow for the construction of the full section in the future. Pedestrian facilities, such as sidewalks or multi-use paths should also still be constructed in a manner which allows for future conversion of the roadways to the full recommended section.

INTERIM ROADWAY SECTION

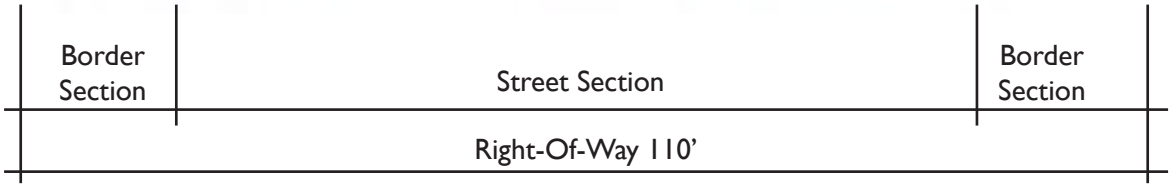


MAJOR ARTERIALS - EXAMPLES

URBAN

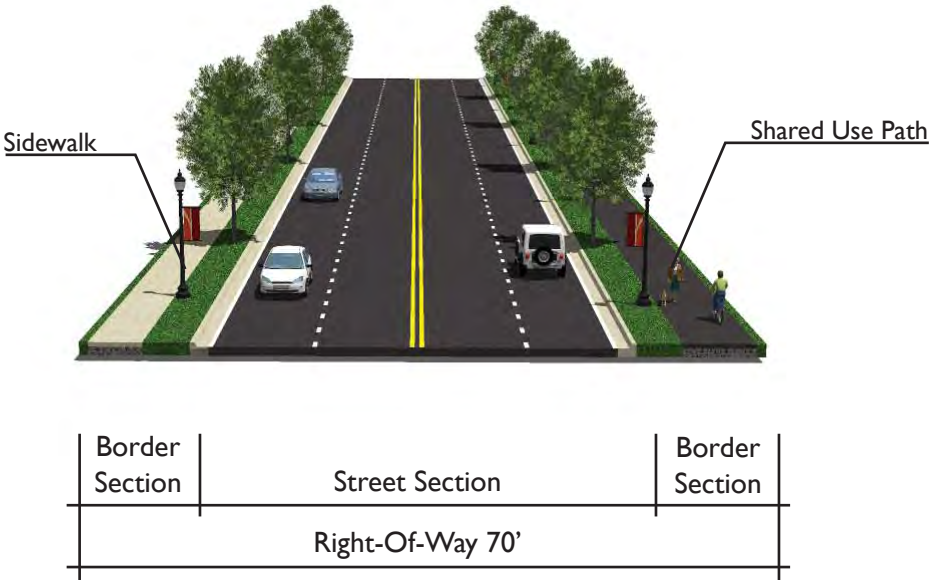


SUBURBAN

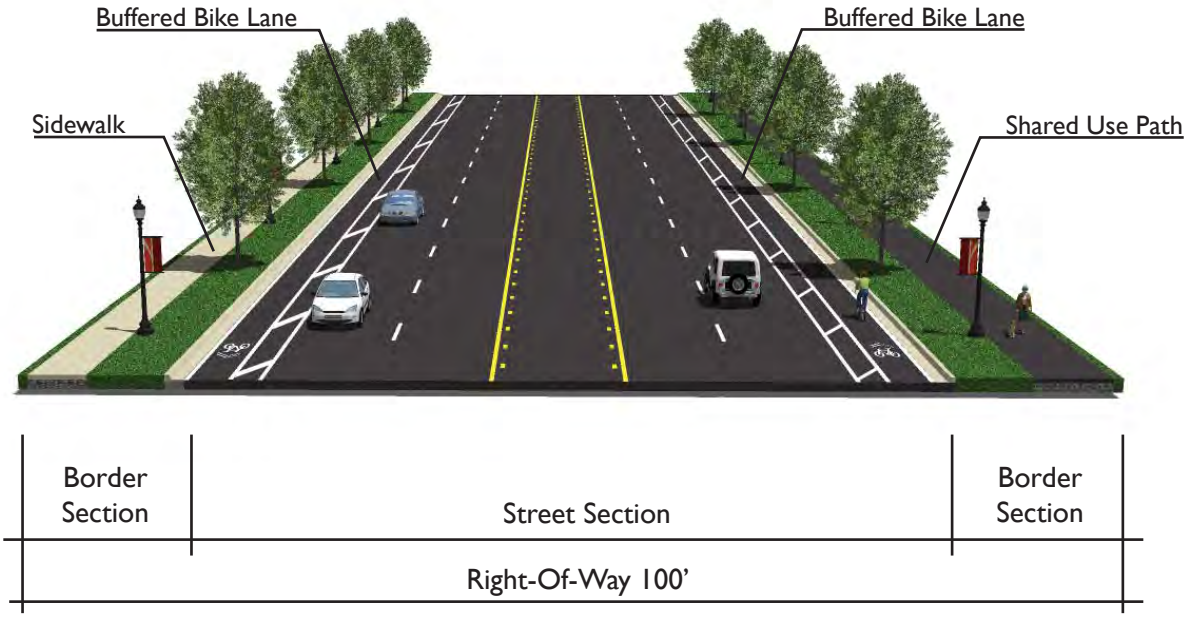


MINOR ARTERIALS - EXAMPLES

URBAN

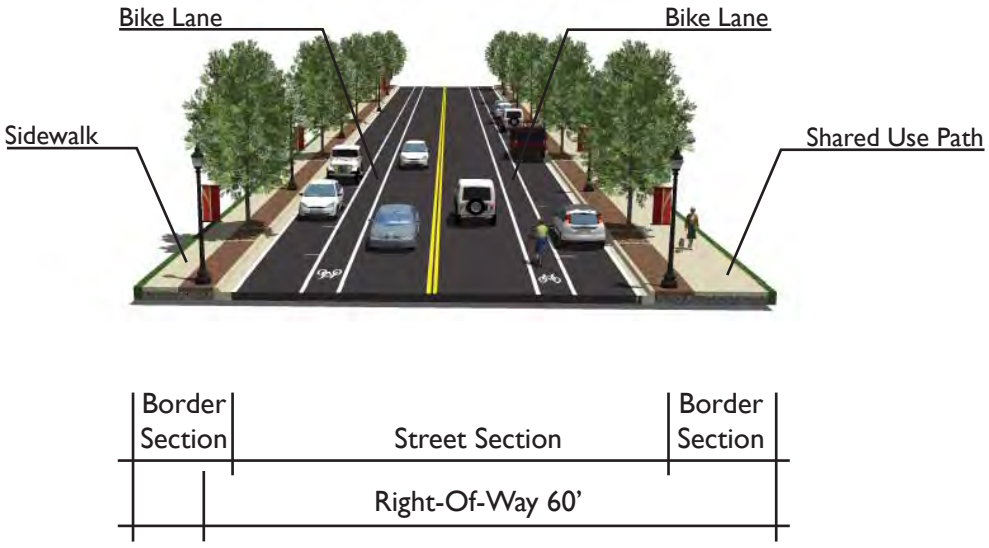


SUBURBAN

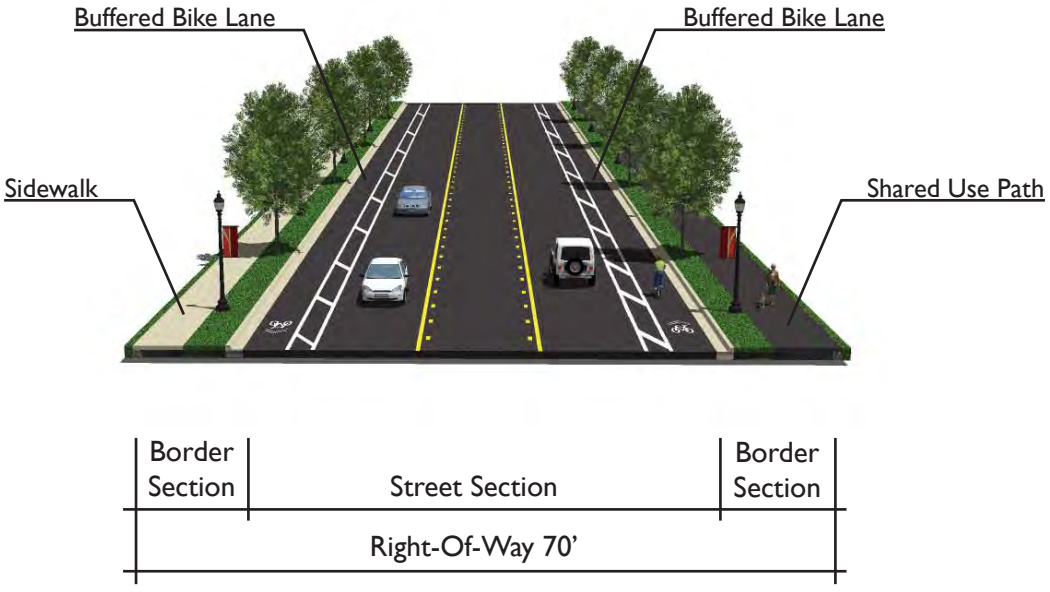


MAJOR COLLECTORS

URBAN



SUBURBAN



MINOR COLLECTORS

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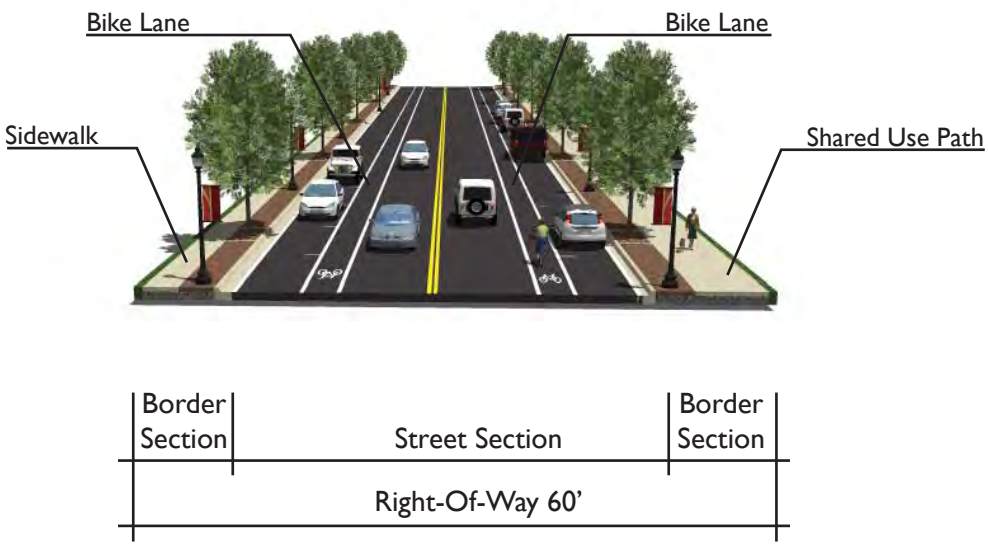

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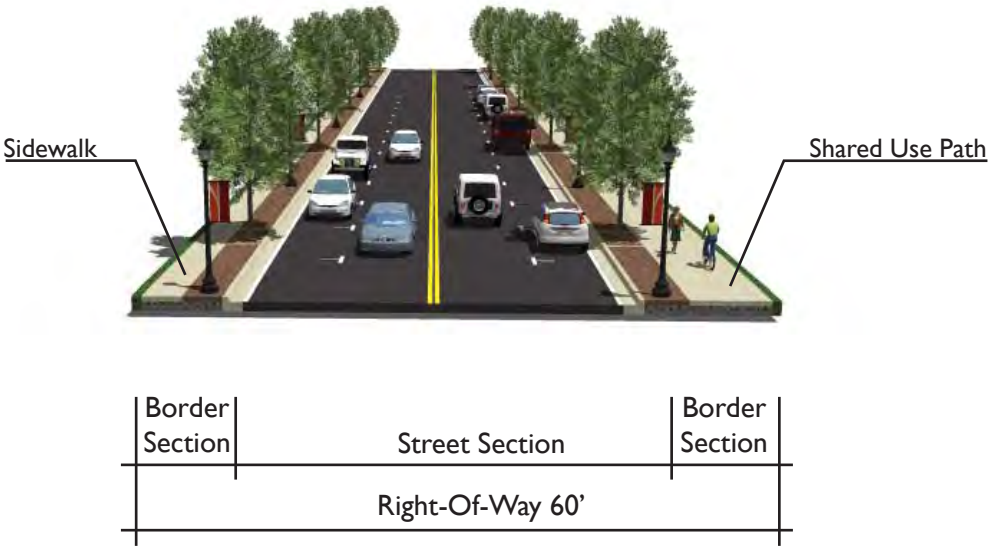


POTENTIAL IMPROVEMENTS

Potential improvements for consideration by the city are listed based on evaluation of existing conditions, network analysis, input from the working group, input from stakeholders and review of previous plans. The improvements were then organized into three categories: short-term, medium-term, and long-term. Short-term improvements are those proposed within the next five to ten years, Medium-term improvements are those likely between 10 and 20 years, and long-term improvements are those likely beyond 20 years. Beyond physical improvements, policy changes were also identified.

The Implementation Section identifies some of those improvements as critical path improvements, which will have immediate impacts on the city, or set the stage for additional improvements.

PASER ROADS WITH POOR RATING

During the development of Franklin's thoroughfare plan, the current Pavement Surface Evaluation and Rating (PASER) for city roads was reviewed. The evaluation was completed in 2017. As part of this evaluation, a maintenance plan was also proposed through 2021 with specific roads targeted for maintenance each year to improve their PASER rating. Roads which had a PASER rating of four or lower at the end of this maintenance plan period, and which are also proposed as main thoroughfares were identified and illustrated in Table J. A rating of four or lower indicates roads in poor condition.

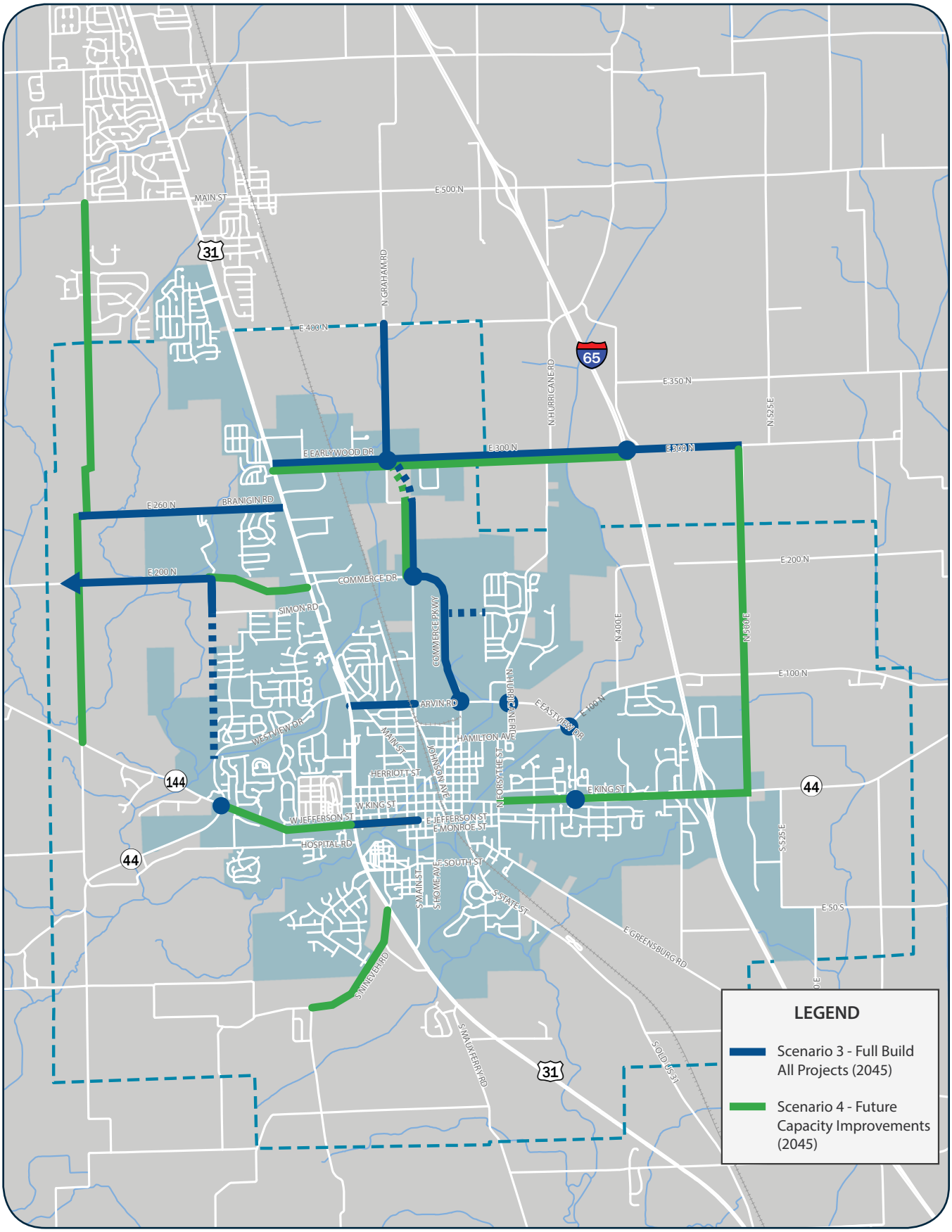
IMPROVEMENTS IDENTIFIED THROUGH NETWORK MODELING ANALYSIS

Chapter three described the modeling analysis performed as part of this plan. The graphic on the following page highlights the location of improvements utilized within the modeling analysis. These improvements have been incorporated into the short, medium and long-term lists on the following pages as appropriate.

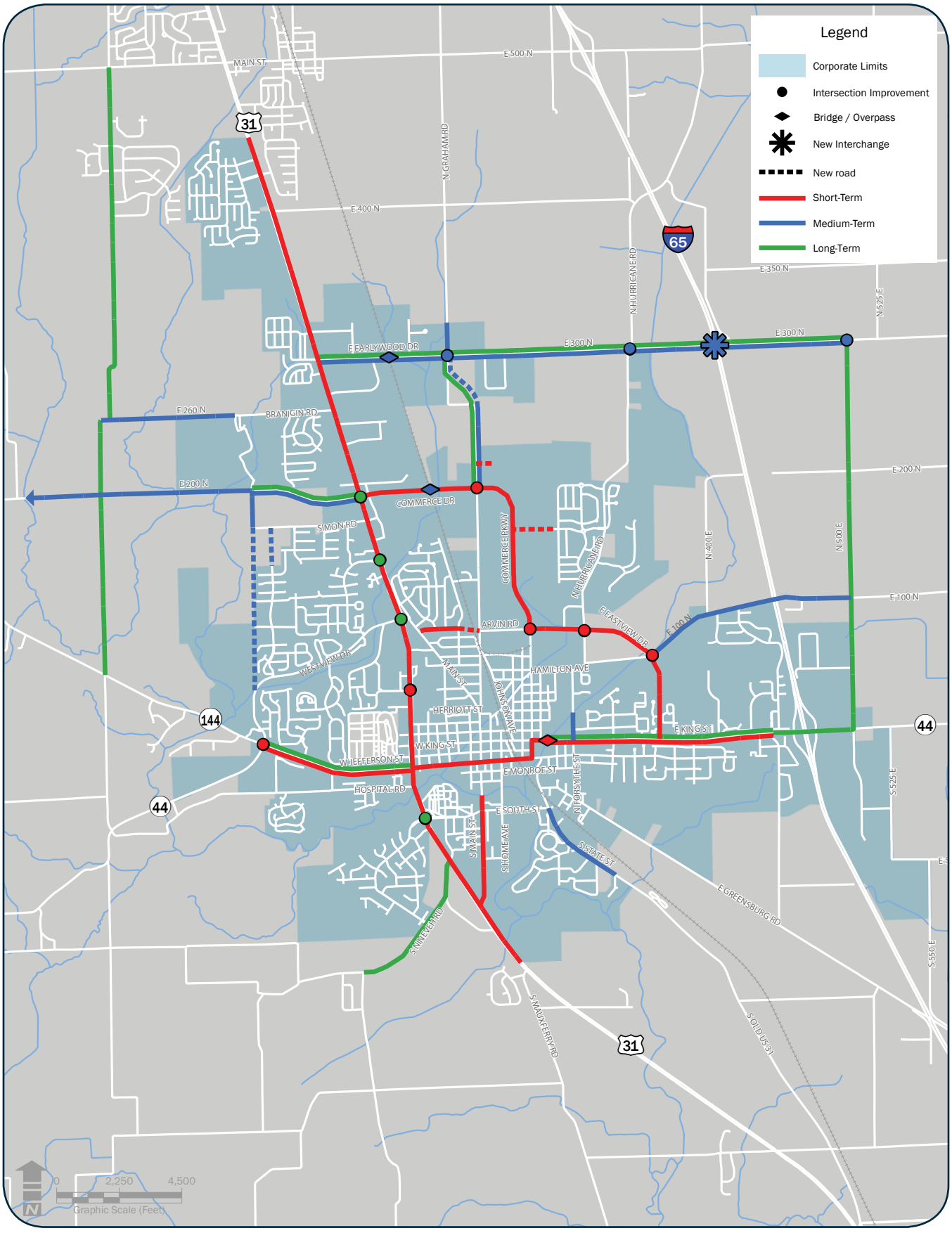
Table J: Low PASER Thoroughfares - 2022

Roadway	Location	Proposed Thoroughfare Designation
CR 200 N	Portions west of US 31	Minor Arterial
CR 260 N/Branigin Road	West of Cumberland Drive	Major Collector
CR 300 N/Earlywood Drive	East of Hudson Street	Minor Arterial
CR 100 N/Upper Shelbyville Rd.	East of Eastview Drive	Major Collector
Paris Drive	North of St. Andrews Drive	Major Collector
CR 500 E	North of McClain Drive	Major Collector
Yandes Street	North of Bennett Street	Major Collector
Acorn Road	Between Ebony Lane and Cobra Drive	Major Collector
Cumberland Drive	Between Branigin Road and Simon Road	Major Collector
Jefferson Street	Between Morning Drive and Milford Drive	Major Collector

PROPOSED IMPROVEMENTS PER MODELING ANALYSIS



RECOMMENDED COMPREHENSIVE IMPROVEMENTS



SHORT-TERM IMPROVEMENTS (0-7 years)

- Reconstruction of Jefferson Street between US 31 and Forsythe Street, including pedestrian facilities
- Reconstruction of King Street between Forsythe Street and Fairway Lakes Drive, including pedestrian facilities
- Reconstruction of East Jefferson Street bridge at Hurricane Creek
- Intersection improvements including a roundabout at Eastview Drive and Upper Shelbyville Road
- New roadway to service Linville Business Park off of Graham Road north of Commerce Parkway
- Extension of Brookhaven Drive between Bridlewood Drive and Commerce Parkway
- Intersection improvements including a roundabout at Arvin Drive and Commerce Parkway
- Reconstruction of South Main Street between Young's Creek bridge and US 31, including pedestrian facilities
- Intersection improvements, including a roundabout at Jefferson Street and Westview Drive
- Intersection improvements, including a roundabout at Graham Road and Commerce Drive
- Extension of Arvin Drive between Graham Road and Younce Street
- Improve capacity of Commerce Parkway between Arvin Drive and Graham Street
- Congestion mitigation along US 31 within city limits in partnership with INDOT
- Pedestrian improvements at Mallory Parkway and US 31
- Urban trail and pedestrian improvements along West Jefferson Street between Westview Drive and the Johnson County Fairgrounds
- Pedestrian trail along Eastview Drive, Arvin Drive and Commerce Parkway

MEDIUM-TERM IMPROVEMENTS (7+ years)

- New I-65 interchange at CR 300N
- Improve capacity of Earlywood Drive/CR 300 N between I-65 and US 31, including roundabouts at Graham Road and Hurricane Road
- Improve capacity of Earlywood Drive/ CR 300 N between I-65 and CR 500 E, including roundabout at CR 500 E
- Improve capacity of Graham Road between Commerce Drive and Earlywood Drive
- Realign Graham Road on the north and south of Earlywood Drive
- Extension of CR 100 E between CR 200 N and Westview Drive
- Improve capacity of CR 200 N between SR 144 and US 31
- Provide grade-separated railroad crossing at Earlywood Drive
- Provide grade-separated railroad crossing at Commerce Drive
- Provide pedestrian improvements along Forsythe Street between Franklin Greenway Trail and King Street
- Provide pedestrian improvements along State Street/Old US 31 between Wilson Way and South Street
- Improve roads identified in Table J, Low PASER Thoroughfares - 2022

LONG-TERM IMPROVEMENTS (20+ Years)

- Add lanes on King Street from Forsythe Street to Bartram Parkway
- Add lanes on Jefferson Street from US 31 to Westview Drive
- Add lanes on Commerce Drive from CR 100 E to US 31
- Add lanes on Jim Black Road from SR 44 to Upper Shelbyville Rd
- Add lanes on Nineveh Road from city limits to US 31
- Upgrade CR 500 E from Upper Shelbyville Rd to 300N
- Create safe pedestrian crossings and facilities to destinations along US 31
  - Main Street
  - Commerce Drive
  - South Street
  - Acorn Road
  - Mallory Parkway

FUTURE CONCEPTS FOR FURTHER CONSIDERATION:

- Freeway upgrade on US 31 (similar to SR 37 Fishers/Noblesville project)
- A west bypass by implementing a significant upgrade (4 lanes) on Centerline Road from SR 44 to Whiteland Road
- If a west bypass created, also add a connector to US 31 from Centerline Road

RECOMMENDED POLICY

- Update INDOT roadway classifications as needed to ensure funding eligibility for future roadway projects
- Pursue discussions with INDOT regarding a future interchange at CR 300 N/ Earlywood Drive. Future actions may include a feasibility study and an interchange justification study
- Update city ordinances to reflect the language and standards set forth in this plan
- Evaluate adopting traffic impact fees
- Update city ordinances to require traffic impact studies according to the thresholds and standards of the Indiana Department of Transportation's Applicant's Guide to Traffic Impact Studies
- Create a complete streets ordinance
- Develop a bike and pedestrian plan, incorporating the trail network as a component
- Develop a sidewalk inventory and improvement plan
- Evaluate a formal access management policy for US 31, Earlywood Drive, King Street, CR 500 E and CR 200 N
- Evaluate a formal access management policy for the truck route, including Eastview Drive, Arvin Drive, Commerce Parkway and Commerce Drive
- Pursue discussions with CSX regarding grade separated rail crossings at Commerce Drive or Earlywood Drive
- Evaluate intersection improvements at Cincinnati Street/Johnson Avenue/Ohio Street
- Amend the future land use map in the comprehensive plan

5

ECONOMIC IMPACT

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INTRODUCTION

When evaluating the impact of infrastructure improvements within the area many considerations must be taken into account. These include future travel times, traffic volumes, traffic safety, congestion expectations and impacts to multi-modal travel methods. One other area of interest, however, is the impact that future transportation networks and growth projections will have on the economic conditions of the community. Some of those economic impacts relate directly to planned transportation improvements within the community. Others are related to the projected growth which is a foundational component of the transportation modeling which helps determine what future transportation improvements will be needed to provide an effective transportation network for the community.

This chapter begins to look at both the direct economic benefits of different transportation network scenarios outlined in this study and the projected growth model that informed those scenarios. The direct benefit analysis includes a benefit-cost analysis related to travel time, vehicle costs and direct regional economic impact related to those savings. The growth model analysis is based on the Indianapolis Metropolitan Planning Organization's regional growth model that identifies future population and job growth which allows for a projection of the types and sizes of buildings that may be constructed in the future. Ultimately each of these components examine the effect that transportation policy, programming, projects and activities will have on the overall economy for the Franklin area. These impacts were part of the rationale for the recommendations developed as part of this plan.

BENEFIT-COST ANALYSIS

A benefit-cost analysis examine the effect of a transportation policy, program, project, activity or event on the economy for a given area. The focus of analysis can range from a project-level, a metro area or state level. For the Franklin Thoroughfare Plan an economic impact analysis for scenarios containing bundles of roadway projects has been performed. Benefit-cost analysis differs from economic impact analysis in that it also accounts for non-economic benefits for system users (such as the effects on personal travel time savings, safety and improvements in the quality of life). For the city of Franklin, we have adapted INDOT's Major Corridor Benefit Analysis System (MCIBAS) to provide both an economic impact and benefit-cost analysis resource that can be used to inform decision makers during the planning process. A growing number of transportation agencies are making use of economic analysis in the decision-making process. The hope is that Franklin can use this information at each stage in the transportation planning and decision-making process:

- Vital information for public policy discussions
- Vision, performance measures, performance targets and other strategic planning
- Identification of project needs, selection and prioritization through the MPO's planning process
- Competition for INDOT funding, TIGER grants
- Project-level analysis for determining the most feasible and effective alternatives

INDIANA'S MCIBAS SYSTEM

Under INDOT's MCIBAS system, user benefits that accrue over the useful life of a project are used to offset cost estimates of infrastructure improvements. Descriptions of long-term benefits, cost-effectiveness and business attraction potential provide model users the ability to evaluate project concepts as a focused set of investments supporting transportation and the Indiana economy. The analysis methodology uses various components of the Major Corridor Investment Benefit Analysis System (MCIBAS). These include a travel demand model (developed for Franklin), NET_BC, and REMI (an economic model). The MCIBAS system has evolved into a sophisticated, but user-friendly, Excel spreadsheet application. The system works as described on the following page.

INDIANA'S MCIBAS MODELING DETAILS

- Travel demand model outputs, indicating miles of travel and hours of travel by autos and trucks and trip purpose are used to monetize travel time, operating, accident and vehicle emissions costs.
- Costs (time, operating, accident and emissions) grow as more traffic is generated from new land development. This represents a growing stream of "roadway user" costs into the future.
- The impact of the traffic growth depends on the roadway network capacity added for each scenario. So, scenarios with more roadway capacity will result in less congestion (fewer vehicle hours per vehicle miles traveled) and potentially lower costs for the users.
- The stream of costs for each scenario is compared against the stream of costs for the no-build scenario. The difference between the cost streams represent a "user benefit" when the cost of a build scenario is less than the cost of no-build. The cost streams use a 25 year window.
- User benefits (time, operating, accident and emissions) are split into three categories based on mode: truck, business automobile, and non-business automobile. MCIBAS is especially sensitive to impacts on trucking, since these are direct business costs. The user benefits are also represented as a stream of benefits into the future.
- The user benefits for commercial trip purposes (truck and business auto) are assigned to specific economic sectors based on each industry classification's sensitivity to transportation costs (manufacturing is more sensitive to transportation costs than medical services) and passed into the Indiana REMI model.
- The REMI model is a sophisticated input-output model that considers the industry structure of a particular region, as well as transactions between industries. Changes that affect industry sectors that are highly interconnected to the rest of the economy will often have a greater economic impact than those for industries that are not closely linked to the regional economy.
- The REMI model output reveals changes in gross regional product, real personal income, and employment for a given network scenario. These are the long-term economic impacts of each of the network scenarios. It should be noted that the economic impacts are regional, so a set of projects in Franklin may benefit the wider region and entire impact will not be in solely Franklin.
- With respect to the employment impact, employment is in terms of job-years, defined as full employment for one person for 2080 hours in a 12-month span. The terms "jobs" and "job years" are used interchangeably in terms of economic modeling. So, a gain of one long term job that lasts 25 years is 25 job-years. Because this may be confusing, we also express this in terms of annual average jobs, which in our example would be one job.
- Construction jobs created directly by the roadway projects are not included in the analysis because they have a very short-term impact.
- In the final step of MCIBAS, the economic impact, combined with direct user benefits, is compared against the project costs for a given scenario, providing a benefit-cost ratio and a net present value.

GENERAL SUMMARY OF RESULTS

MCIBAS output results for the roadway scenarios tested as part of the Thoroughfare Plan are shown below. Selected economic analysis results are also summarized within each scenario result summary. The benefit-cost ratios are highly dependent on the estimated project costs and the timing of the expenditures. For this analysis, only rough project costs were estimated and it is likely that these will change when a more detailed cost estimate is generated. Costs and benefits are both discounted to 2015 (using a 7 percent discount rate recommended in FHWA guidance) so benefits occurring in distant years will be significantly discounted.

The main conclusion that can be drawn from the analysis is that the roadway scenarios or combinations of scenarios are all viable (benefit/cost ratio greater than one) and economically beneficial to the region. Typically, any roadway improvement scenario where the benefit/cost ratio is higher than 2.0 is considered to be an outstanding public investment. All scenarios considered for the thoroughfare plan exceed this threshold. Scenario 3 emerges with the highest benefit-cost ratio and economic impact, but Scenario 4 has the most overall benefit. It should be noted that all of Scenario 3 projects are included in Scenario 4, and the additional projects included in scenario 4 are assumed to be built near the end of the analysis period. Thus, the standing of Scenario 4 would likely improve if the analysis was expanded to 35-40 years instead of 25.

Table K: Franklin Thoroughfare Plan Model Scenarios Benefit-Cost Analysis Summary

	Network Scenario			
	1	2	3	4
Costs				
Estimated Scenario Project Costs	$29.64	$33.88	$63.52	$130.73
Benefits				
Time Savings	$64.51	$71.39	$138.61	$190.05
Operating Cost Savings	$14.48	$37.04	$52.55	$40.28
Accident Cost Savings	$11.43	$12.79	$24.70	$23.34
Emissions Cost Savings	$4.71	$6.52	$11.45	$11.02
Economic Impact	$44.59	$35.02	$81.20	$86.34
Total Benefit	$139.71	$162.75	$308.51	$351.04
Benefit-Cost				
Ratio (benefit/cost)	**4.71**	**4.80**	**4.86**	**2.69**
Net Present Value (benefit minus cost)	$110.07	$128.87	$244.99	$220.31
Regional Employment Impact				
Job-Years (25 year total)	1,496	1,051	2,598	2,467
Average Annual Job Gain over no-build scenario	60	42	104	99

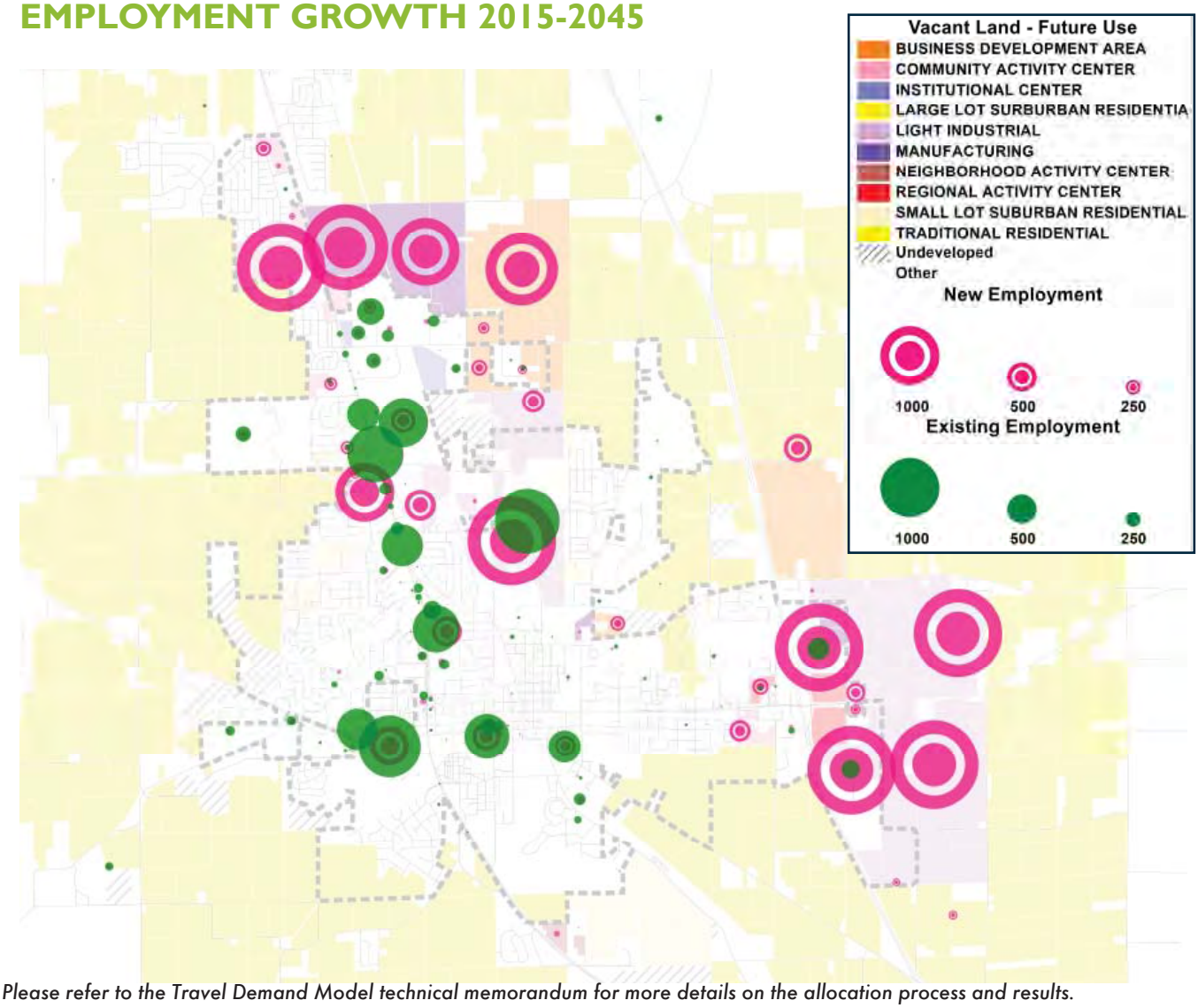
Note: all benefits and costs are expressed as the net present value (millions in 2015 dollars), unless noted otherwise.

PROJECTED GROWTH MODEL

The Indianapolis Metropolitan Planning Organization (MPO) serves as the regional transportation planning agency for Indianapolis and the surrounding suburban communities (including the city of Franklin). The MPO, as part of its ongoing planning efforts, maintains a growth model for the region that looks at, among other things, projected population and employment growth. These growth projections served as one of the main base assumptions of the modeling work that was completed as part of this study.

In analyzing the MPO's projected employment growth over the 2045 period, there are certain geographic areas that are anticipated to experience the majority of this anticipated growth. Locations of anticipated growth are identified by the red target areas on the Employment Growth 2015-2045 graphic below. Each of the red target areas identifies the magnitude of growth related to the relative geographies on the map. Projected employment growth data was gathered as part of the overall modeling effort which is outlined in further detail in Section 3.

EMPLOYMENT GROWTH 2015-2045



Please refer to the Travel Demand Model technical memorandum for more details on the allocation process and results.

These areas are related to each other geographically in a manner that allows for the identification of four general employment growth areas within and around the city of Franklin. These areas are identified in the Economic Growth Areas graphic on page 87. Future land uses for these areas are determined by the Long-Term Future Land Use Map from the 2013 Franklin Comprehensive Plan on page 88.

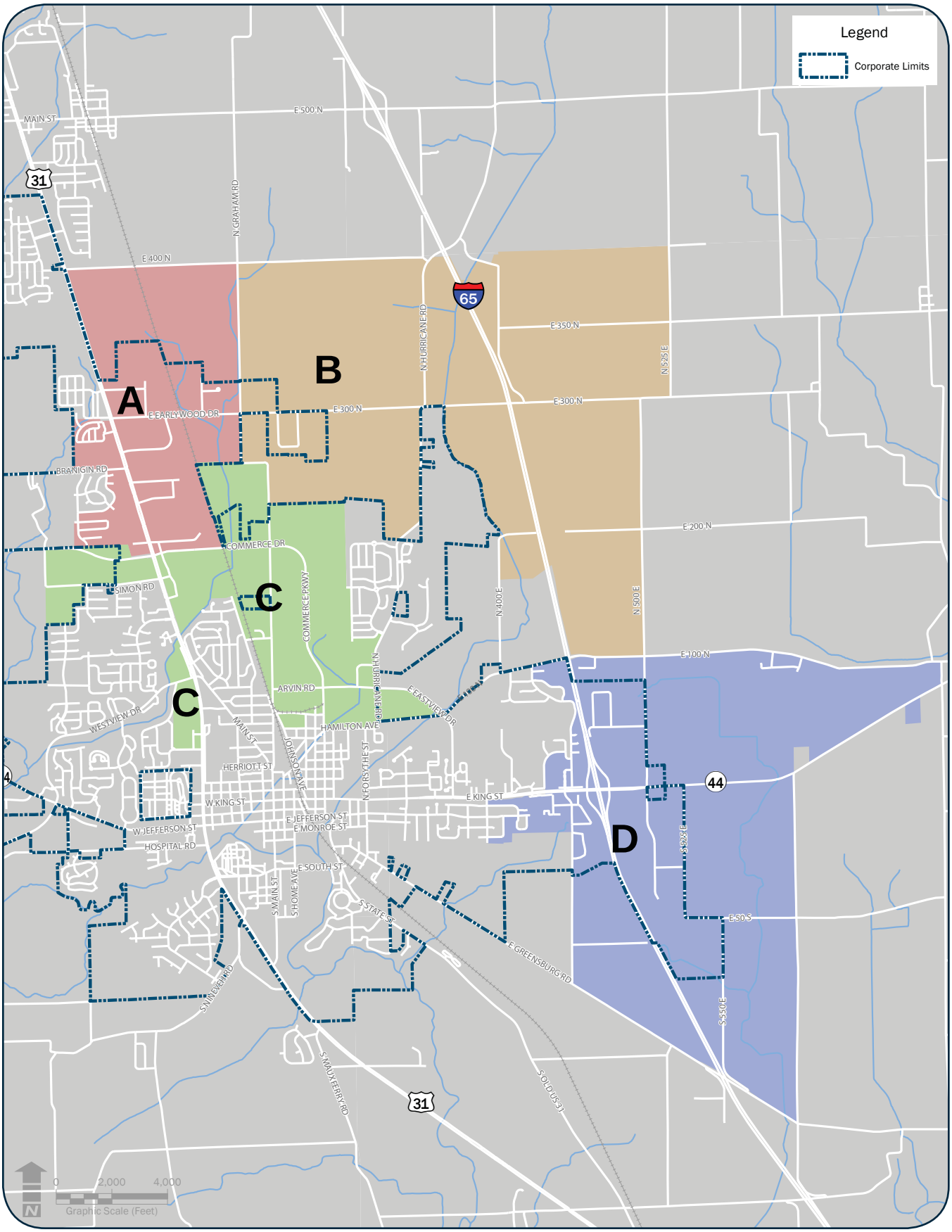
Growth Area A includes the area of US 31 around Earlywood Drive. The area primarily contains retail and office development. Much of this area is currently located within the corporate limits of the city of Franklin. However, there are areas north of the corporate limits around CR 400 N which are also included in this boundary. The long-term future land use map identifies the desired future land uses in this boundary as commercial uses along the US 31 corridor and manufacturing uses further east of the US 31 corridor.

Growth Area B includes areas primarily outside the current corporate limits of the city of Franklin. These areas include the northern Interstate 65 corridor as well as projected industrial growth north of the corporate limits long Hurricane Road and CR 300 N. This area is influenced by the Whiteland Road interchange on Interstate 65. It is also influenced by the additional interchange that has been modeled at part of this analysis at CR 300 N. Based on the positive impacts that this potential interchange has on the overall traffic patterns within Franklin, it has been recommended that the addition of this interchange be pursued as a long-term strategy. It is projected that employment growth will occur in areas both east and west of Interstate 65. The western part of this growth area is identified in the comprehensive plan as a mix of office and light industrial areas in the future. The majority of this area, however, falls outside of the area currently contained within the Long-Term Future Land Use Map.

Growth Area C looks at the area primarily along the central part of US 31 within corporate limits as well as the existing office and industrial development along Commerce Parkway. There are parts of this area that are outside the current corporate limits, however, the majority of this property exists within the current boundaries of Franklin. The Long-Term Future Land Use Map identifies the area east of US 31 as commercial and those west of US 31 as a blend of office and light manufacturing.

Growth Area D is centered around the existing State Road 44/King Street interchange along Interstate 65. It includes the existing mix of uses west of the current interchange as well as the existing and projected growth area east of the current interchange. This is the most diverse of the areas regarding projected long-term future land use in the comprehensive plan. The area around the interchange is projected to be a mix of retail and office uses. The southwest part of the area is identified as residential. The east side of the interstate is mostly light industrial but the eastern most parts of the area are identified as agricultural.

ECONOMIC GROWTH AREAS



LONG-TERM FUTURE LAND USE MAP (2013 COMPREHENSIVE PLAN)

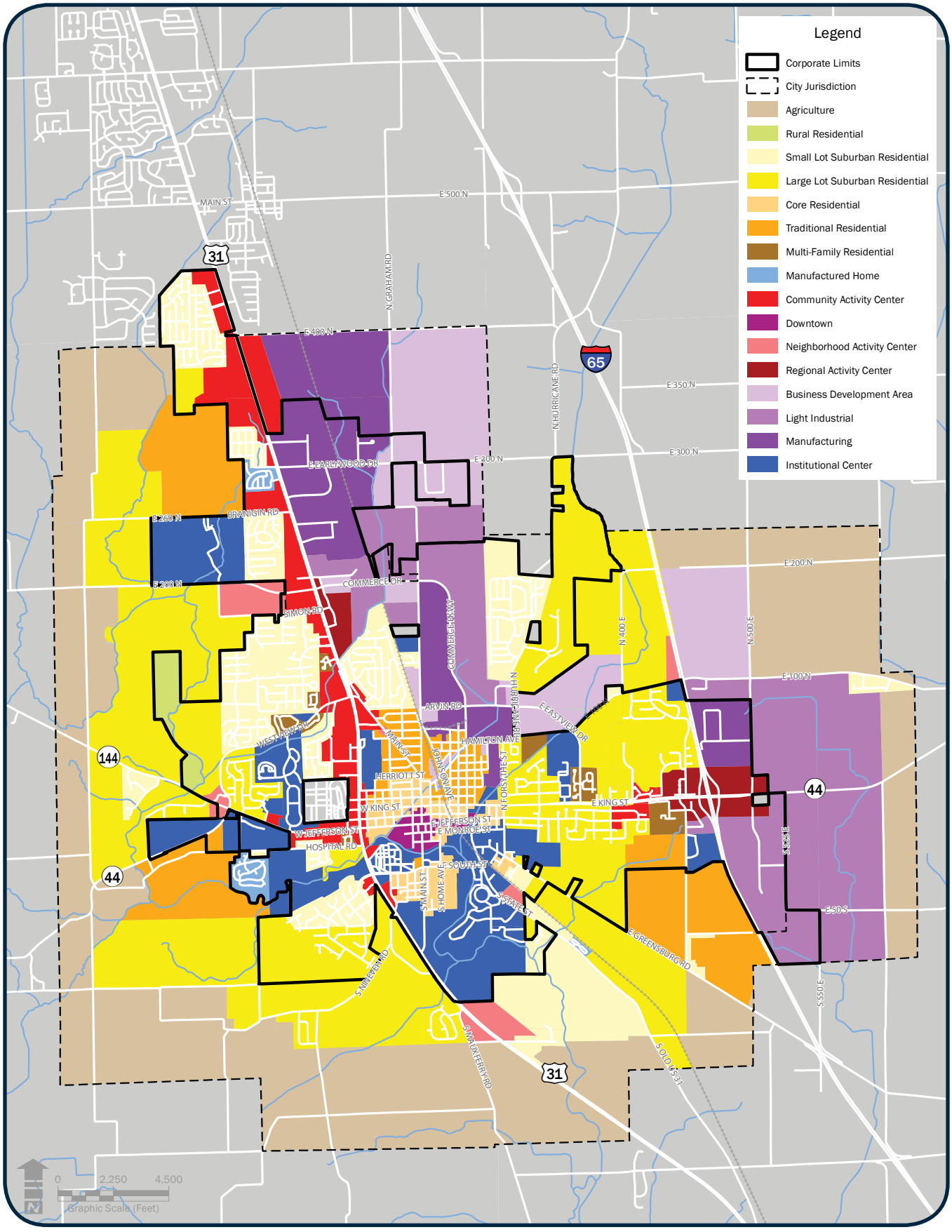


Table L identifies the MPO's projected employment growth within these growth areas between the base year of 2015 and the future interval years of 2035 and 2045. The job growth is broken down by three job type classifications: retail, service and basic. Retail includes the variety of retail sales uses. Service includes commercial services as well as associated office uses including front office manufacturing uses. Basic jobs generally include industrial and light manufacturing uses.

The table identifies that significant growth is anticipated between 2015 and 2035, however, an even greater growth rate is projected between 2035 and 2045. Several factors likely influence the reasoning behind these projections.

One significant factor is the expected continued growth of central Indiana overall. Growth within the region has been significant over the past 40 years, but this growth has not been evenly distributed geographically. A significant amount of this growth has occurred in the northern part of the region. From 1970 to 2016, Hamilton County has grown by over 260,000 people. Marion County has grown by nearly 150,000 people. Hendricks County has grown by approximately 106,000 people and Johnson County has grown by nearly 100,000 people. While slower than other areas, there has been a significant amount of growth within Johnson County. It is worth noting that in 1970 the population of Johnson County was higher than that of Hamilton County. As the region continues to grow in the future, it is possible that annual growth rates as a percent of total population in some regional counties may even outpace Hamilton County. This potential shift may be a result of changing market conditions and demands, more limited development opportunities north of Indianapolis, the cost of development relative to areas around the metro area or the nature of development constraints within areas around the region.

Table L: Projected Future Employment (Based on MPO Growth Model)

	Basic Employment			Retail Employment			Service Employment			Total Employed		
Growth Area	2015	2035	2045	2015	2035	2045	2015	2035	2045	2015	2035	2045
A	1754	2398	4086	66	157	351	259	527	975	*2079*	*3082*	*5412*
B	137	220	443	0	0	0	10	726	1841	*147*	*946*	*2284*
C	1023	1393	2368	165	394	887	67	940	2312	*1255*	*2727*	*5567*
D	569	1460	3764	177	759	2004	39	1369	3446	*785*	*3588*	*9214*
Totals	*3483*	*5471*	*10661*	*408*	*1310*	*3242*	*375*	*3562*	*8574*	*4266*	*10343*	*22477*

As it relates to non-residential growth, there are several factors which will likely influence the speed and nature of regional development in the future. These can include, but are not limited to; consumer preferences, changing service and product delivery models, automation, advancement in technology and patterns of telecommuting. For this reason, it would be challenging to accurately project job growth 30 years into the future, especially at the local level. These projections remain appropriate for long-term infrastructure planning, especially at a regional level, but are more difficult to use in assessing short-term local community economic impacts. In utilizing projected employment growth for the purpose of assessing community economic impact, it is appropriate to limit the projection to a 10-year period. Table M annualizes the MPO's projected employment growth for 2035 to allow for a 2025 estimate to be created. This 10-year period has a greater likelihood of accurately identifying realistic employment growth patterns for the area around Franklin.

Knowing the projected employment growth for the area, it is possible to translate jobs into potential building square footage for each employment category. In order to do this, a combination of logarithmic equations and average rate multipliers identified in The Institute of Traffic Engineers Trip Generation Manual were utilized. This manual relates daily traffic data for individual use types to the number of employees and the square footage of specific developments and buildings. Table N identifies this translation of employment numbers into an estimated potential building square footage. It is important to note that these are estimates based on estimated data. For this reason, the actual building construction may differ greatly from this projection over the next ten years. Table N is intended only to create an understanding of the potential order of magnitude of construction that might be expected based on the estimated employment growth.

Table M: Estimated 10 Year Employment Growth Projections (2015 to 2025)

Growth Area	Basic Employment	Retail Employment	Service Employment	Total Employed
A	322	46	134	*502*
B	42	0	358	*400*
C	185	115	437	*736*
D	446	291	665	*1402*
Totals	*994*	*451*	*1594*	*3039*

Table N: Estimated 10 Year Non-Residential Building Square Footage Growth Projections (2015 to 2025)

Growth Area	Basic Employment Square Footage	Retail Employment Square Footage	Service Employment Square Footage	Total Square Footage
A	193,000	22,000	40,000	*255,000*
B	25,000	0	107,000	*132,000*
C	111,000	56,000	130,000	*298,000*
D	267,000	141,000	200,000	*608,000*
Totals	*596,000*	*219,000*	*478,000*	*1,293,000*

Using these building square footages, some assumptions can be made about the order of magnitude of the assessed value that may be created as a result of this construction. These calculations are estimates only and take into account factors like base assessment rates. These do not factor in such items as depreciation factors, variable rate adjustments, potential tax abatement and other factors that can impact the actual rate applied for the purposes of creating assessment evaluations for taxing purposes.

Table O identifies the estimated real property assessment values that are related to the square footages identified in Table N. This analysis assumes that land values in the area are already factored into the existing assessed values for properties. This is likely not the case for areas that are not currently served by utilities or are currently used for agricultural purposes. While there will likely be an additional increase as a result of increases in land value based on future development, the majority of assessed value growth will be a result of construction improvements. For that reason, this analysis focuses on the real property improvements only. These estimates are included in Table O.

Table O: Estimated 10 Year Non-Residential Assessed Value Growth Projections (2015 to 2025)

Growth Area	Basic Employment Improvement Assessed Value	Retail Employment Improvement Assessed Value	Service Employment Improvement Assessed Value	Total Assessed Value
A	$8,694,000	$1,760,000	$2,613,000	*$13,067,000*
B	$1,120,000	$0	$6,981,000	*$8,102,000*
C	$4,995,000	$4,480,000	$8,512,000	*$17,987,000*
D	$12,028,000	$11,280,000	$12,968,000	*$36,276,000*
Totals	*$26,838,000*	*$17,520,000*	*$31,073,000*	*$75,431,000*

Notes and Assumptions

This is a working draft and all numbers are subject to change upon completed review.

Assessed Valuation numbers are based on a non-scientific assessment of typical per square foot assessed values of similar existing regional development types.

All numbers are based on projected development trends over the next 10 years. Actual development may vary significantly from these estimates based on a variety of factors including, but not limited to, changes in market conditions, development factors in other geographic locations that impact the area of study, the level of aggressiveness of development incentive including the expansion and provision of public utilities, financial incentive packages, etc.

Multipliers have been pulled from the assessment tables approved by the Indiana Department of Local Government Finance. They are intended to represent the value of a property based on what it could reasonably sell for in the current market. Assessment numbers identified in this plan are not intended to represent an actual construction cost for the proposed facilities.

It is useful to compare the projected assessed valuation to the current assessed valuation for each growth area. Following is a list of the increase in assessed valuation in the 10-year period between 2015 and 2025, and the associated percentage increase over the base.

- Growth Area A - $13,067,000 (12 percent)
- Growth Area B - $8,102,000 (30 percent)
- Growth Area C – $17,987,000 (14 percent)
- Growth Area D – $36,276,000 (28 percent)

While Growth Area B is projected to have the greatest percentage increase over the base, the largest assessed value growth is by far within Growth Area D. Overall, within these areas, it is estimated that as much as $75 million in assessed value growth may occur within the 10 year period based on the MPO's growth projections. This would represent a 19 percent overall assessed value increase within all growth areas.

Overall, if the projected employment growth numbers identified by the MPO become reality, the city of Franklin stands to experience significant economic development opportunity moving forward. Some of this growth may take place regardless of future transportation improvements in the area, however, having an efficient and safe local and regional transportation network will certainly help the community maximize its considerable economic development potential.

6

IMPLEMENTATION PLAN

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PRIORITY STRATEGIES

The Transportation Plan Recommendations section contains a robust list of short, medium and long-term improvements and policy recommendations based on traffic modeling, community input, working group feedback and review of current and previous planning efforts. However, there are several projects and policies which should be considered priority strategies due to their impact on the city or their ability to lay the groundwork for other identified recommendations. Not all of these priority strategies are short-term. Some may be long-term, but require action in the short-term to ensure success. The priority strategies are identified below.

POLICY

- Update INDOT roadway classifications as needed to ensure funding eligibility for future roadway projects
- Pursue discussions with INDOT regarding a future interstate interchange at CR 300 N/ Earlywood Drive. Future actions may include a feasibility study and an interchange justification study.
- Evaluate adopting traffic impact fees
- Update city ordinances to require traffic impact studies according to the thresholds and standards of the Indiana Department of Transportation's Applicant's Guide to Traffic Impact Studies
- Develop a bike and pedestrian plan, incorporating the trail network as a component

IMPROVEMENTS

Complete improvements currently funded and scheduled for construction including:

- Reconstruction of Jefferson Street between US 31 and Forsythe Street, including pedestrian facilities
- Reconstruction of King Street between Forsythe Street and Fairway Lakes Drive, including pedestrian facilities
- Reconstruction of East Jefferson Street bridge at Hurricane Creek
- Intersection improvements including a roundabout at Eastview Drive and Upper Shelbyville Road
- New roadway to service Linville Business Park off of Graham Road north of Commerce Parkway
- Extension of Brookhaven Drive between Bridlewood Drive and Commerce Parkway
- Intersection improvements including a roundabout at Arvin Drive and Commerce Parkway
- Reconstruction of South Main Street between Young's Creek bridge and US 31, including pedestrian facilities
- Intersection improvements, including a roundabout at Jefferson Street and Westview Drive
- Intersection improvements, including a roundabout at Graham Road and Commerce Drive
- Pedestrian improvements at Mallory Parkway and US 31
- Urban trail and pedestrian improvements along West Jefferson Street between Westview Drive and the Johnson County Fairgrounds
- Pedestrian trail along Eastview Drive, Arvin Drive and Commerce Parkway

Pursue improvements in partnership with INDOT including:

- Feasibility of a new I-65 interchange at CR 300N
- Congestion mitigation along US 31 within city limits

Pursue targeted pedestrian improvements, including:

- Pedestrian improvements along Forsythe Street between Franklin Greenway Trail and King Street
- Pedestrian improvements along State Street/ Old US 31 between Wilson Way and South Street

Plan for the following improvements, as development continues to occur and population continues to increase:

- Improve capacity of CR 200 N between SR 144 and US 31 as a connector to the future I-69 corridor
- Improve capacity of Graham Road between Commerce Drive and Earlywood Drive
- Realign Graham Road on the north and south of Earlywood Drive
- Extend and improve capacity of CR 100 E between CR 200 N and Westview Drive
- Improve capacity of Earlywood Drive/CR 300 N between I-65 and US 31, including roundabouts at Graham Road and Hurricane Road

IMPROVEMENT ESTIMATES

Probable opinion of project costs have been provided for the identified improvements as a means of assisting the city in allocating resources and planning for future improvements. It is important to note that these are preliminary estimates for planning purposes only. Detailed cost estimates will need to be developed once detailed project scope and requirements are established.

Short-Term Improvements - Probable Construction Costs	
Improvement	**Probable Cost**
Reconstruction of Jefferson Street between US 31 and Forsythe Street, including pedestrian facilities	-
Reconstruction of King Street between Forsythe Street and Fairway Lakes Drive, including pedestrian facilities	-
Reconstruction of East Jefferson Street bridge at Hurricane Creek	-
Intersection improvements including a roundabout at Eastview Drive and Upper Shelbyville Road	$1.5 to $1.7 million
New roadway to service Linville Business Park off of Graham Road north of Commerce Parkway	-
Extension of Brookhaven Drive between Bridlewood Drive and Commerce Parkway	-
Intersection improvements including a roundabout at Arvin Drive and Commerce Parkway	$1.5 to $1.7 million
Reconstruction of South Main Street between Young's Creek bridge and US 31, including pedestrian facilities	$3.5 to $3.7 mil
Intersection improvements, including a roundabout at Jefferson Street and Westview Drive	$1.1 to $1.3 million
Intersection improvements, including a roundabout at Graham Road and Commerce Drive	-
Extension of Arvin Drive between Graham Road and Younce Street	$1.4 to $1.6 million
Improve capacity of Commerce Parkway between Arvin Drive and Graham Street	$6 to $7 million
Congestion mitigation along US 31 within city limits in partnership with INDOT	-
Pedestrian improvements at Mallory Parkway and US 31	$750,000 to $850,00
Urban trail and pedestrian improvements along West Jefferson Street between Westview Drive and the Johnson County Fairgrounds	$1.7 to $1.9 million
Pedestrian trail along Eastview Drive, Arvin Drive and Commerce Parkway	$2.2 to $2.4 million

Medium-Term Improvements - Probable Construction Costs	
Improvement	**Probable Cost**
New I-65 interchange at CR 300N	$30-40 million
Improve capacity of Earlywood Drive/CR 300 N between I-65 and US 31, including roundabouts at Graham Road and Hurricane Road	$18.5 to $19.5 million
Improve capacity of Earlywood Drive/CR 300 N between I-65 and CR 500 E, including roundabout at CR 500 E	$5 to $5.5 million
Improve capacity of Graham Road between Commerce Drive and Earlywood Drive	$6 to $6.5 million
Realign Graham Road on the north and south of Earlywood Drive	$4.5 to $5 million
Extension of CR 100 E between CR 200 N and Westview Drive	$10 to $10.5 million
Improve capacity of CR 200 N between SR 144 and US 31	$14 to $16 million
Provide grade-separated railroad crossing at Earlywood Drive	
Provide grade-separated railroad crossing at Commerce Drive	$7 to $8 million
Provide pedestrian improvements along Forsythe Street between Franklin Greenway Trail and King Street	$600,000 to $700,000
Provide pedestrian improvements along State Street/Old US 31 between Wilson Way and South Street	$1 to $1.3 million
Improve roads identified in Table J, Low PASER Thoroughfares - 2022	Undetermined

Long-Term Improvements - Probable Construction Costs	
Improvement	**Probable Cost**
Add lanes on King Street from Forsythe Street to Bartram Parkway	$16 to $18 million
Add lanes on Jefferson Street from US 31 to Westview Drive	$9 to $11 million
Add lanes on Commerce Drive from CR 100 E to US 31	$6 to $7 million
Add lanes on Jim Black Road from SR 44 to Upper Shelbyville Rd	$6 to $7 million
Add lanes on Nineveh Road from city limits to US 31	$9 to $11 million
Upgrade CR 500 E from Upper Shelbyville Rd to 300N	$11 to $13 million
Create safe pedestrian crossings and facilities to destinations along US 31 ■ Main Street ■ Commerce Drive ■ South Street ■ Acorn Road	$350,000 to $400,000 per crossing ($1.4 to $1.6 million total)
Freeway upgrade on US 31 (similar to SR 37 Fishers/Noblesville project)	Undetermined
A west bypass by implementing a significant upgrade (4 lanes) on Centerline Road from SR 44 to Whiteland Road	$37 to $41 million
If a west bypass created, also add a connector to US 31 from Centerline Road	$8 to $10 million

APPENDIX

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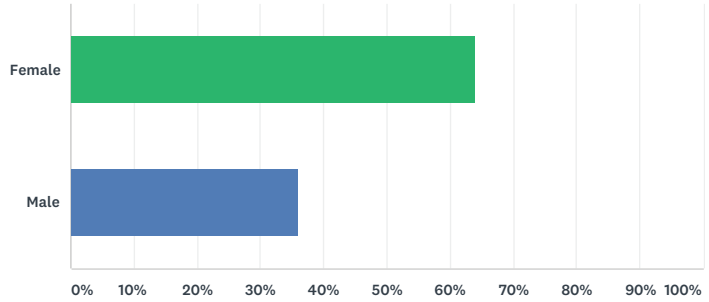
TABLE OF CONTENTS

Q1 What is your gender?

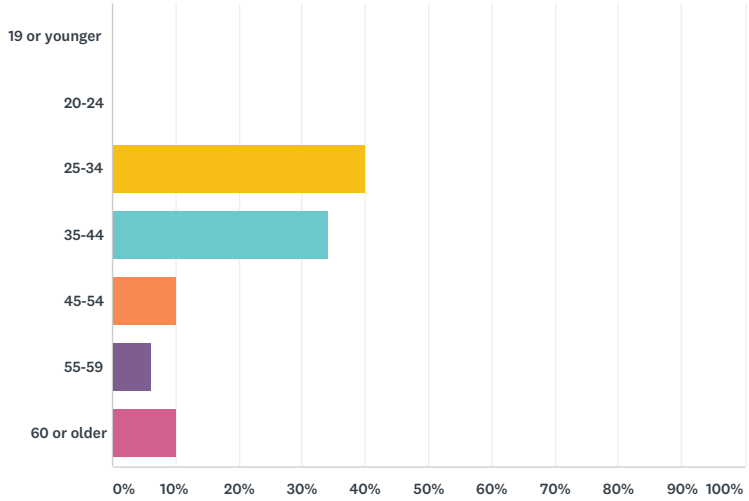
Answered: 50 Skipped: 0



ANSWER CHOICES	RESPONSES	
Female	64.00%	32
Male	36.00%	18
TOTAL		50

Q2 Which category below includes your age?

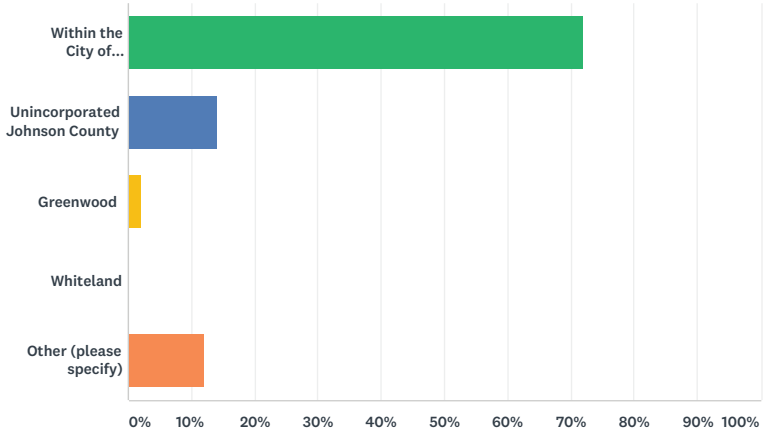
Answered: 50 Skipped: 0



ANSWER CHOICES	RESPONSES	
19 or younger	0.00%	0
20-24	0.00%	0
25-34	40.00%	20
35-44	34.00%	17
45-54	10.00%	5
55-59	6.00%	3
60 or older	10.00%	5
TOTAL		50

Q3 Where do you live?

Answered: 50 Skipped: 0

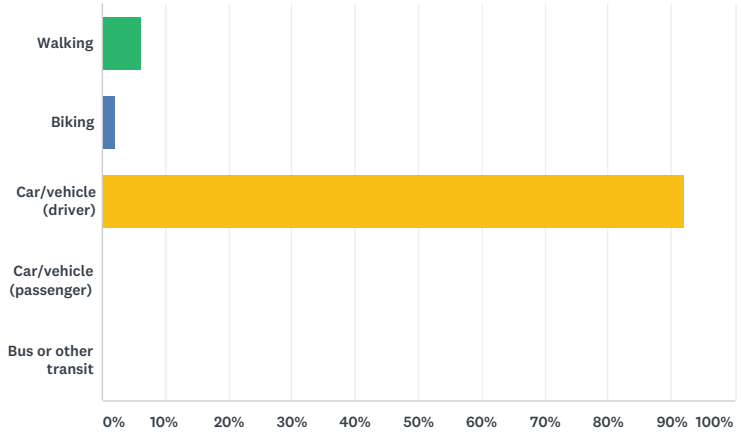


ANSWER CHOICES	RESPONSES	
Within the City of Franklin	72.00%	36
Unincorporated Johnson County	14.00%	7
Greenwood	2.00%	1
Whiteland	0.00%	0
Other (please specify)	12.00%	6
TOTAL		50

#	OTHER (PLEASE SPECIFY)	DATE
1	Bargersville	7/7/2017 9:30 AM
2	Brown County	6/12/2017 5:16 PM
3	Indy, but work in Franklin	6/12/2017 11:46 AM
4	Southern Indianapolis	6/12/2017 11:35 AM
5	Indianapolis	6/12/2017 8:39 AM
6	Mooresville	6/12/2017 8:28 AM

Q4 What is your primary mode of transportation?

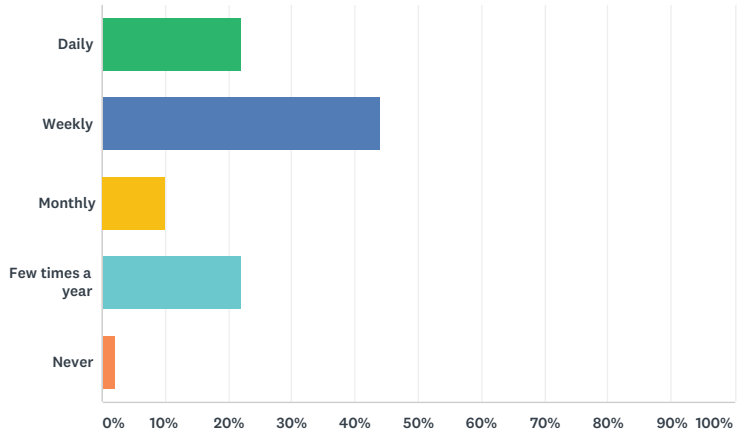
Answered: 50 Skipped: 0



ANSWER CHOICES	RESPONSES	
Walking	6.00%	3
Biking	2.00%	1
Car/vehicle (driver)	92.00%	46
Car/vehicle (passenger)	0.00%	0
Bus or other transit	0.00%	0
TOTAL		50

Q5 How often do you use the city's trail network?

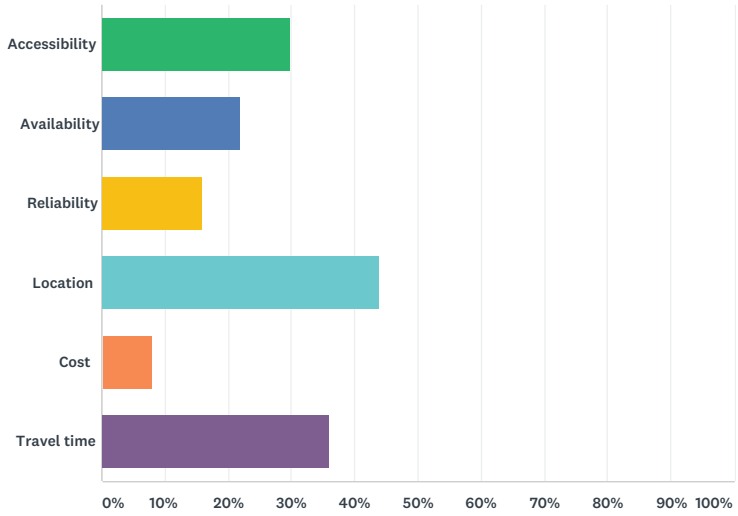
Answered: 50 Skipped: 0



ANSWER CHOICES	RESPONSES	
Daily	22.00%	11
Weekly	44.00%	22
Monthly	10.00%	5
Few times a year	22.00%	11
Never	2.00%	1
TOTAL		50

Q6 What best determines the mode of transportation you use?

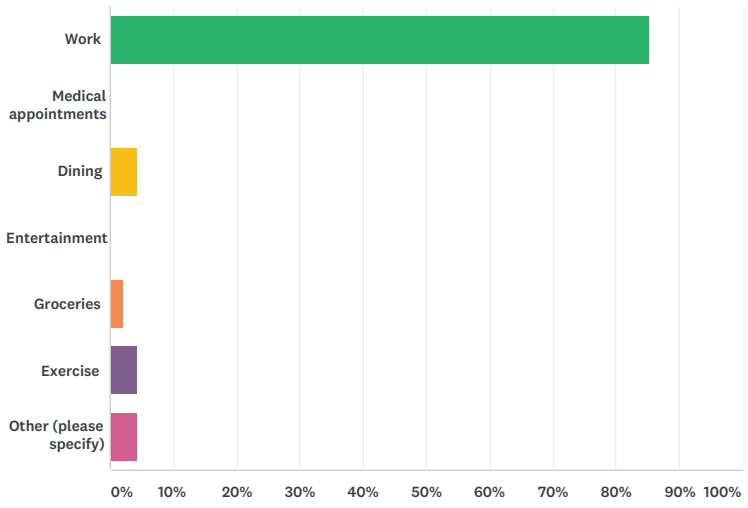
Answered: 50 Skipped: 0



ANSWER CHOICES	RESPONSES	
Accessibility	30.00%	15
Availability	22.00%	11
Reliability	16.00%	8
Location	44.00%	22

Q7 What is your PRIMARY destination for daily and/or weekly transportation from your home?

Answered: 47 Skipped: 3

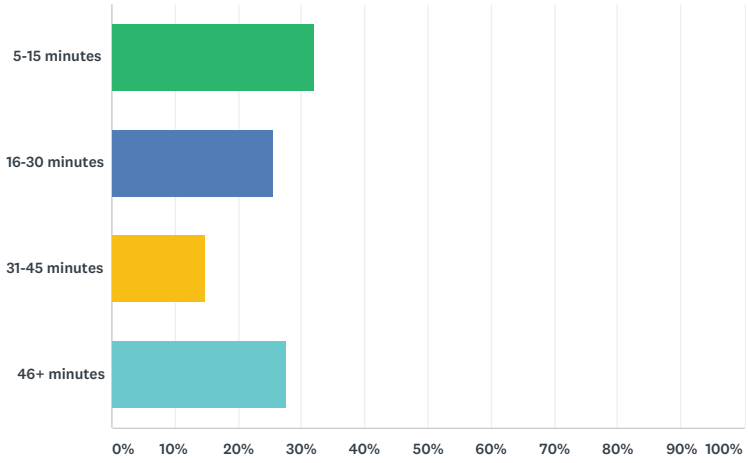


ANSWER CHOICES	RESPONSES	
Work	85.11%	40
Medical appointments	0.00%	0
Dining	4.26%	2
Entertainment	0.00%	0
Groceries	2.13%	1
Exercise	4.26%	2
Other (please specify)	4.26%	2
TOTAL		47

#	OTHER (PLEASE SPECIFY)	DATE
1	Errands	6/12/2017 5:18 PM
2	library and parks	6/12/2017 8:53 AM

Q8 Approximately how much TOTAL TIME (in minutes) do you spend traveling to and from your PRIMARY destination?

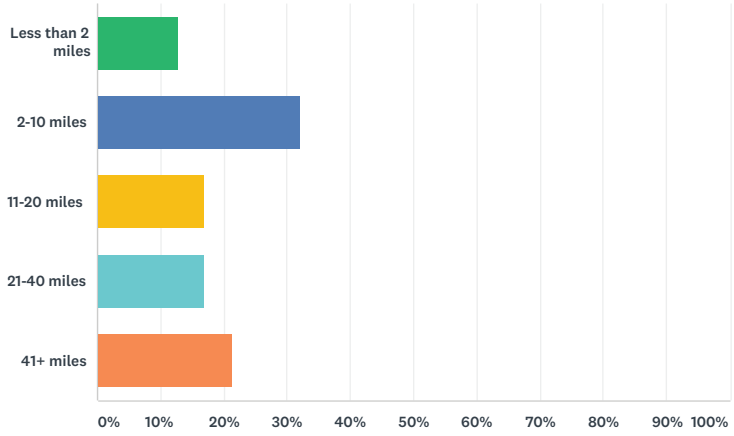
Answered: 47 Skipped: 3



ANSWER CHOICES	RESPONSES	
5-15 minutes	31.91%	15
16-30 minutes	25.53%	12
31-45 minutes	14.89%	7
46+ minutes	27.66%	13
TOTAL		47

Q9 Approximately how many TOTAL MILES do you travel to and from your PRIMARY destination?

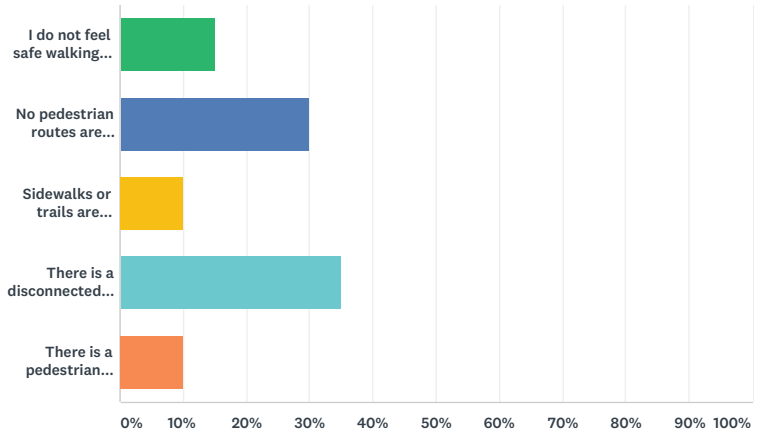
Answered: 47 Skipped: 3



ANSWER CHOICES	RESPONSES	
Less than 2 miles	12.77%	6
2-10 miles	31.91%	15
11-20 miles	17.02%	8
21-40 miles	17.02%	8
41+ miles	21.28%	10
TOTAL		47

Q10 If you travel less than two (2) miles to and from your PRIMARY destination, please indicate your perception of the pedestrian route(s) available to you.

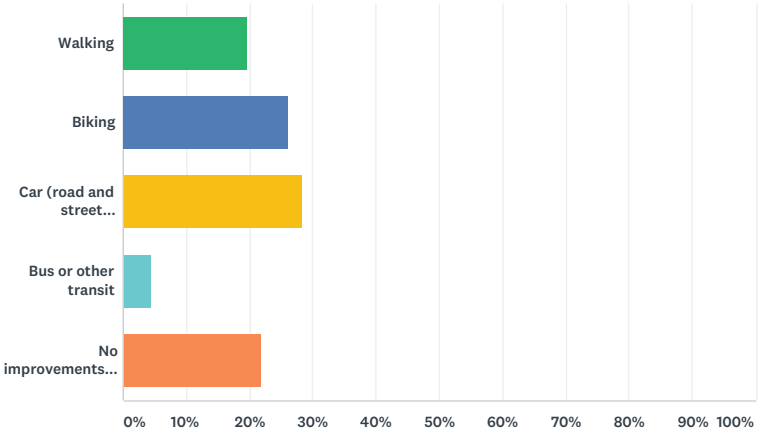
Answered: 20 Skipped: 30



ANSWER CHOICES	RESPONSES	
I do not feel safe walking or biking	15.00%	3
No pedestrian routes are available to my destination	30.00%	6
Sidewalks or trails are nearby, but no comfortable route to my destination	10.00%	2
There is a disconnected, but comfortable pedestrian route	35.00%	7
There is a pedestrian route which completely connects to my destination	10.00%	2
TOTAL		20

Q11 Which mode of transportation do you wish were available and/or improved to reach your PRIMARY destination?

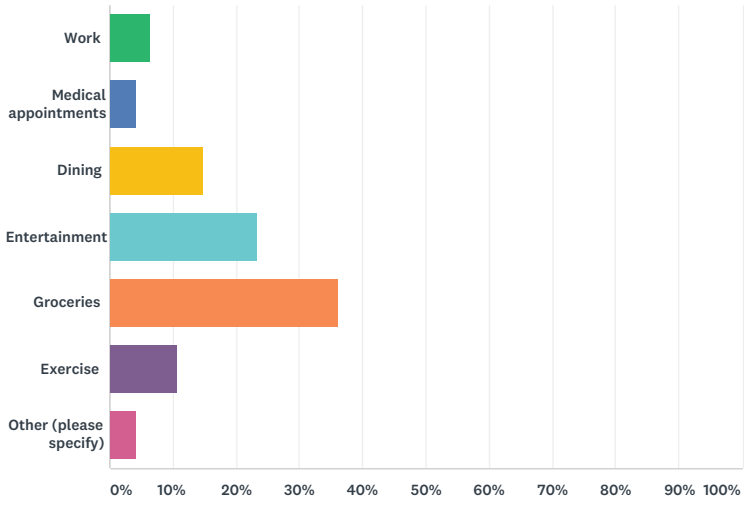
Answered: 46 Skipped: 4



ANSWER CHOICES	RESPONSES	
Walking	19.57%	9
Biking	26.09%	12
Car (road and street improvements)	28.26%	13
Bus or other transit	4.35%	2
No improvements necessary	21.74%	10
TOTAL		46

Q12 What is the most common SECONDARY destination for your daily and/or weekly transportation from your home?

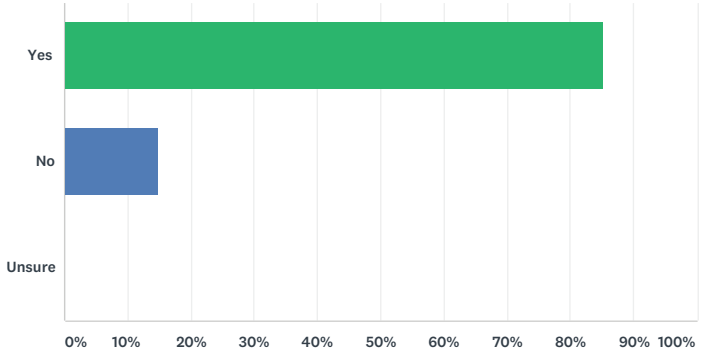
Answered: 47 Skipped: 3



ANSWER CHOICES	RESPONSES	
Work	6.38%	3
Medical appointments	4.26%	2
Dining	14.89%	7
Entertainment	23.40%	11
Groceries	36.17%	17
Exercise	10.64%	5
Other (please specify)	4.26%	2
TOTAL		47

Q13 Would you ride a bicycle and/or walk more to your PRIMARY or SECONDARY destinations if bicycle/pedestrian pathways were available or improved to your destination?

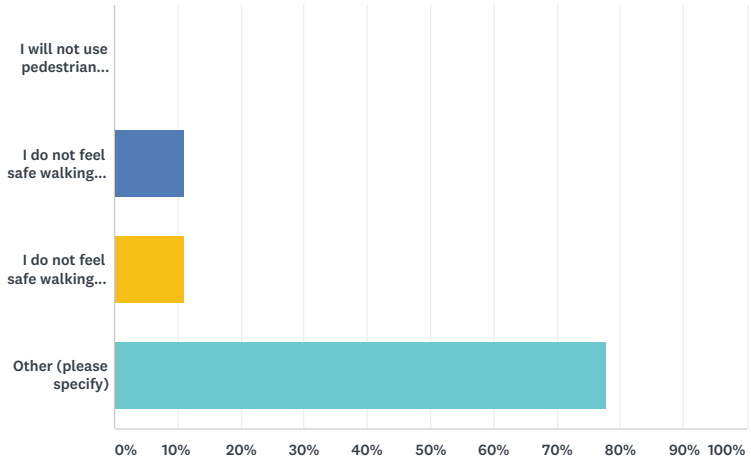
Answered: 47 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes	85.11%	40
No	14.89%	7
Unsure	0.00%	0
TOTAL		47

Q14 If you answered no to question 13 above, please indicate why.

Answered: 9 Skipped: 41



ANSWER CHOICES	RESPONSES	
I will not use pedestrian routes due to medical condition, distance or personal preference	0.00%	0
I do not feel safe walking or biking due to potential crime	11.11%	1
I do not feel safe walking or biking due to proximity to traffic	11.11%	1
Other (please specify)	77.78%	7
TOTAL		9

#	OTHER (PLEASE SPECIFY)	DATE
1	I love close enough. Walkways are sufficient	6/20/2017 10:18 AM
2	I need to transport either my child or groceries--car is needed.	6/12/2017 11:50 AM
3	Answered yes	6/12/2017 9:37 AM
4	i don't have a basket on my bike to carry groceries	6/12/2017 8:58 AM
5	I have to take several items with me and would not be able to take them on a bike or carry them walking.	6/12/2017 8:48 AM
6	I live close enough. Walkways are sufficient.	6/9/2017 9:44 AM
7	N/A	6/9/2017 7:30 AM

Q15 Please name any specific intersections or roadway segments you avoid. Please state why you avoid these areas.

Answered: 28 Skipped: 22

ANSWER CHOICES	RESPONSES	
Area/Intersection 1	100.00%	28
Area/Intersection 2	53.57%	15
Area/Intersection 3	17.86%	5
Area/Intersection 4	10.71%	3

#	AREA/INTERSECTION 1	DATE
1	North Main/North Morton - not enough lanes for traffic and lights are poorly timed	6/20/2017 10:27 AM
2	Main St/US 31 - Congestion	6/20/2017 10:22 AM
3	Sidewalks along Adams/east side of Water - sidewalks are bumpy and crumbling	6/20/2017 10:19 AM
4	44 and Forsythe - so dangerous!	6/20/2017 10:16 AM
5	State Street/Old 31 - no sidewalks	6/20/2017 10:14 AM
6	King St. Sidewalk - no sidewalk buffer	6/20/2017 10:08 AM
7	Lovers lane and 44	6/13/2017 7:49 AM
8	Directly in front of Jeff Street Pub - racist/aggressive patrons	6/12/2017 4:40 PM
9	US 31 and Main St	6/12/2017 10:20 AM
10	Arvin Rd & Upper Shelbyville Rd - needs a light and trail on Arvin Rd in this stretch	6/12/2017 9:22 AM
11	Main Street and US 31	6/12/2017 9:02 AM
12	144 west of 31. i feel like the sidewalks could use some help.	6/12/2017 9:02 AM
13	Crossing US 31 - very few cross walks/side walks	6/12/2017 8:58 AM
14	cross over in front of Lowe's, no one understands how to use it	6/12/2017 8:53 AM
15	31 and Eastview (by the old Kroger) - people run lights all the time	6/12/2017 8:51 AM
16	I cross 31 b/c I am a cyclist but it does feel dangerous to me even with stop lights	6/12/2017 8:49 AM
17	Jefferson Street and 31- back ups at light during peak traffic between 4 and 5:30 pm and 7:30 and 9 am. often sit through 3-4 light	6/12/2017 8:33 AM
18	Centerline Road/144	6/12/2017 8:32 AM
19	US 31 pretty much everywhere	6/12/2017 8:12 AM
20	N Main and N Morton. Not enough lanes for traffic and lights are poorly timed.	6/9/2017 9:54 AM
21	Main St north across 51. Congesetion.	6/9/2017 9:48 AM
22	Sidewalks along Adams/East side of Water. Sidewalks bumpy, crumbling	6/9/2017 9:45 AM
23	44 & Forsyths. So dangerous!	6/9/2017 9:41 AM
24	State Street/Old 31. No sidewalks.	6/9/2017 9:37 AM
25	King St sidewalk. No sidewalk buffer.	6/9/2017 7:32 AM
26	King & Forsythe streets Traffic backup	6/7/2017 11:16 AM
27	US31 and Westview Dr, congestion	6/6/2017 9:57 PM
28	31 & Main Street	6/6/2017 8:39 PM

#	AREA/INTERSECTION 2	DATE
1	Yandes St. (bricked section) - not smooth and narrow	6/20/2017 10:27 AM
2	Yandes north of Jeff. St - bricks and bumps	6/20/2017 10:22 AM
3	Monroe and Jackson - nobody stops!	6/20/2017 10:16 AM
4	US 31 through Franklin - too many stoplights	6/20/2017 10:08 AM
5	31 - cannot walk or bike, which means no access to groceries without a car	6/12/2017 4:40 PM
6	US 31 and Jefferson St	6/12/2017 10:20 AM
7	Near the old police station and Johnson County Community Foundation - no shoulder and very busy 4 way stop	6/12/2017 9:22 AM
8	W Jefferson and US 31	6/12/2017 9:02 AM
9	31 between the old kroger and jefferson. congested, and the lights that are close together at the old kroger are usually a mess going home from work.	6/12/2017 9:02 AM
10	Yandes St (bricked section). Not smooth and narrow.	6/9/2017 9:54 AM
11	Yandees north of Jeff St. Bricks and bumps.	6/9/2017 9:48 AM
12	Monroe & Jackson. Nobody stops!	6/9/2017 9:41 AM
13	31 through Franklin. Too many stoplights.	6/9/2017 7:32 AM
14	Jefferson & Forsythe streets Traffic backup	6/7/2017 11:16 AM
15	31 & Schoolhouse	6/6/2017 8:39 PM

#	AREA/INTERSECTION 3	DATE
1	Alleys between Jeff and E. Madison, Hurricane and Yandes - bad condition, traffic due to business	6/20/2017 10:22 AM
2	Jefferson St. sidewalk from Walnut - no buffer to 31	6/20/2017 10:08 AM
3	Jefferson street into downtown - unsupervised groups of young people catcalling or shouting racist epithets	6/12/2017 4:40 PM
4	Allesy b/w Jeff & E Madison, Hurricane & Yandees. Bad condition, traffci due to business	6/9/2017 9:48 AM
5	Jeff St. sidewalks from Walnut to 31. No sidewalk buffer.	6/9/2017 7:32 AM

#	AREA/INTERSECTION 4	DATE
1	Graham Road - 90 degree turns	6/20/2017 10:08 AM
2	Jefferson headed out toward 65/Grace UMC (no bike/pedestrian lanes)	6/12/2017 4:40 PM
3	Graham Rd. 90deg turns	6/9/2017 7:32 AM

Q16 Please rate the overall quality of each of the existing transportation infrastructure systems in the city of Franklin:

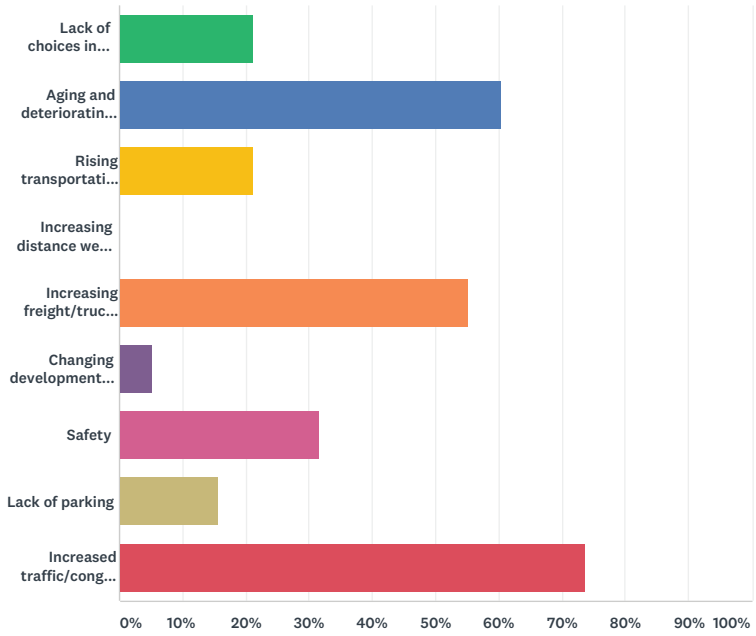
Answered: 38 Skipped: 12

	POOR	FAIR	GOOD	EXCELLENT	TOTAL
Roads and streets	5.26% 2	28.95% 11	63.16% 24	2.63% 1	38
Public transportation	38.89% 14	47.22% 17	13.89% 5	0.00% 0	36
Pedestrian facilities (sidewalks, crosswalks, multi-use paths, etc.)	13.16% 5	31.58% 12	55.26% 21	0.00% 0	38
Bicycle facilities (on/off street bike lanes, multi-use paths, etc.)	18.42% 7	47.37% 18	31.58% 12	2.63% 1	38
Traffic control (signs and signals)	5.41% 2	59.46% 22	35.14% 13	0.00% 0	37

#	ADDITIONAL COMMENTS?	DATE
1	Trails are great, but sidewalks are poor condition, causing people to walk in streets	6/20/2017 10:27 AM
2	Synchronization	6/20/2017 10:11 AM
3	Public transportation connecting to an IndyGo bus would make this so much better of a place tolivr	6/12/2017 4:40 PM
4	I live in a neighborhood with side walks but they are not all ada accessible - steps or uneven surface make it difficult to travel on wheels	6/12/2017 8:58 AM
5	not all sidewalks connect, need sidewalks along 31	6/12/2017 8:53 AM
6	you could do better labeling where trails cross the roads so out of town drivers are more aware.	6/12/2017 8:33 AM
7	Trails are great but sidewalks are poor condition causing people to walk on streets.	6/9/2017 9:54 AM
8	Syncronization	6/9/2017 7:35 AM

Q17 In your opinion, what will be the three (3) MOST significant transportation challenges in our city in the next 25 years?

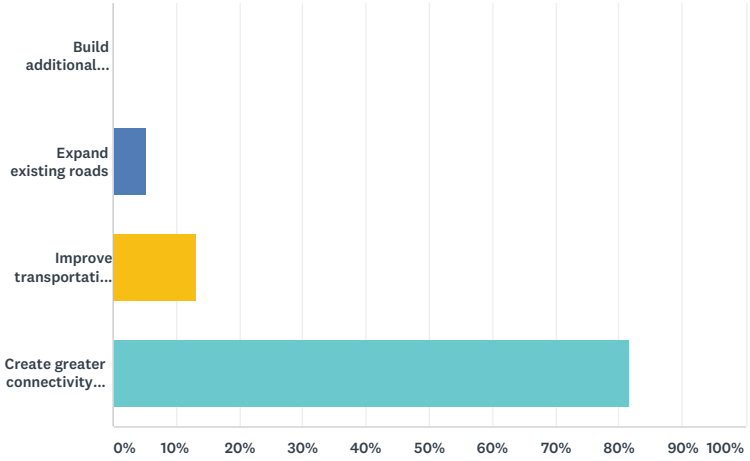
Answered: 38 Skipped: 12



ANSWER CHOICES	RESPONSES	
Lack of choices in destinations served	21.05%	8
Aging and deteriorating infrastructure	60.53%	23
Rising transportation costs	21.05%	8
Increasing distance we have to travel	0.00%	0
Increasing freight/truck traffic on our roadways	55.26%	21
Changing development patterns	5.26%	2
Safety	31.58%	12
Lack of parking	15.79%	6
Increased traffic/congestion/delay	73.68%	28
Total Respondents: 38		

Q18 Which of the following options do you feel is the best to increase the overall quality of life in the community?

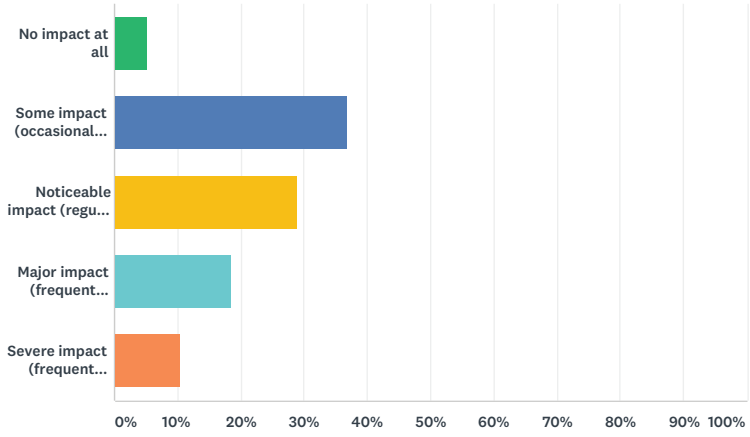
Answered: 38 Skipped: 12



ANSWER CHOICES	RESPONSES	
Build additional roads	0.00%	0
Expand existing roads	5.26%	2
Improve transportation options	13.16%	5
Create greater connectivity and safety for walking and biking	81.58%	31
TOTAL		38

Q19 Future railroad traffic is expected to increase through the city; how big of an impact do you think the railroad traffic will have on YOUR travel through the city?

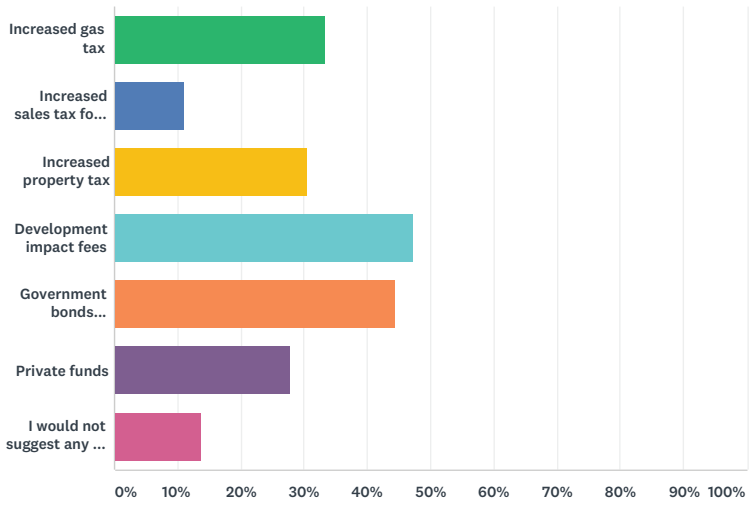
Answered: 38 Skipped: 12



ANSWER CHOICES	RESPONSES	
No impact at all	5.26%	2
Some impact (occasional delays)	36.84%	14
Noticeable impact (regular delays, but not alternate route sought)	28.95%	11
Major impact (frequent delays with alternate routes sought)	18.42%	7
Severe impact (frequent delays with no alternate routes possible)	10.53%	4
TOTAL		38

Q20 If additional funding for transportation improvements were needed, would you support any of the following?

Answered: 36 Skipped: 14



ANSWER CHOICES	RESPONSES	
Increased gas tax	33.33%	12
Increased sales tax for transportation projects	11.11%	4
Increased property tax	30.56%	11
Development impact fees	47.22%	17
Government bonds (borrowing money)	44.44%	16
Private funds	27.78%	10
I would not suggest any of the above	13.89%	5
Total Respondents: 36		

Q21 Given limited funding, which criteria do you think should be a priority when selecting transportation projects?

Answered: 38 Skipped: 12

	NOT IMPORTANT	SOMEWHAT IMPORTANT	IMPORTANT	VERY IMPORTANT	TOTAL
Supports economic development	2.70% 1	18.92% 7	45.95% 17	32.43% 12	37
Improves safety	0.00% 0	2.63% 1	28.95% 11	68.42% 26	38
Reduces congestion	5.56% 2	16.67% 6	44.44% 16	33.33% 12	36
Increases capacity for vehicular traffic	11.43% 4	45.71% 16	31.43% 11	11.43% 4	35
Increases bicycle facilities (bike lanes, paths)	0.00% 0	19.44% 7	41.67% 15	38.89% 14	36
Increases and improves pedestrian facilities (sidewalks, paths)	0.00% 0	5.26% 2	34.21% 13	60.53% 23	38
Improves travel choices	0.00% 0	30.56% 11	52.78% 19	16.67% 6	36
Increases connectivity and access to the places we live and work	0.00% 0	5.26% 2	55.26% 21	39.47% 15	38
Reduces energy consumption/pollution	0.00% 0	18.42% 7	34.21% 13	47.37% 18	38
Improves freight movement	2.78% 1	47.22% 17	38.89% 14	11.11% 4	36

#	ADDITIONAL COMMENTS?	DATE
1	the environmental impact is so important - please consider this!	6/12/2017 9:01 AM

Q22 If you only had $100 to invest on funding transportation improvements, how would you allocate your funds to the following projects? (please indicate a dollar amount from 0-100 for each item. The total amount for all items should total $100)

Answered: 38 Skipped: 12

	$0	$10	$20	$30	$40	$50	$60	$70	$80	$90	$100	TOTAL
Sidewalk	9.38% 3	37.50% 12	40.63% 13	6.25% 2	0.00% 0	6.25% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	32
On street bike lanes	35.71% 10	42.86% 12	14.29% 4	3.57% 1	0.00% 0	0.00% 0	3.57% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	28
Greenways/multi-use paths	6.90% 2	48.28% 14	31.03% 9	10.34% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	3.45% 1	0.00% 0	0.00% 0	29
Public transportation	29.63% 8	33.33% 9	29.63% 8	0.00% 0	0.00% 0	3.70% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	3.70% 1	27
Maintaining existing facilities	0.00% 0	53.85% 14	26.92% 7	7.69% 2	3.85% 1	7.69% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	26
Building new streets and roadways	66.67% 14	23.81% 5	9.52% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	21
Safety improvements on existing streets	3.85% 1	46.15% 12	30.77% 8	15.38% 4	0.00% 0	0.00% 0	3.85% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	26
Improvements in street appearance (trees, lights, landscaping, etc.)	10.00% 3	60.00% 18	10.00% 3	0.00% 0	0.00% 0	6.67% 2	0.00% 0	3.33% 1	0.00% 0	3.33% 1	6.67% 2	30
Above grade railroad crossings (overpasses)	29.17% 7	50.00% 12	8.33% 2	4.17% 1	4.17% 1	4.17% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	24
Greater access to Interstate 65	62.50% 15	37.50% 9	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	24

Q23 Think of a time you have visited another town or city. Did you notice anything transportation related that you would like to see in Franklin?

Answered: 25 Skipped: 25

#	RESPONSES	DATE
1	Warning light at ped crossing. Light flashes when ped gets close to warn drivers (especially when visibility is low at crossing)	6/20/2017 10:28 AM
2	Wider, safe paths - look good - roundabouts	6/20/2017 10:24 AM
3	I've seen public art on trails and near streets. Also more room for bikes on streets.	6/20/2017 10:16 AM
4	Appearance - Public Art!! Mural, sculpture, landscape, local	6/20/2017 10:13 AM
5	Brick streets, charm, safe sidewalks with buffer	6/20/2017 10:10 AM
6	Actual stop light at pedestrian and bike crosswalks	6/13/2017 7:52 AM
7	Consistent affordable public transportation (not an Access Johnson County shuttle that runs infrequently and is difficult to use)	6/12/2017 4:43 PM
8	more roundabouts	6/12/2017 2:59 PM
9	Access side roads on 31 to keep turns to a minimum, more roundabouts at intersections	6/12/2017 9:04 AM
10	bike lanes for days.	6/12/2017 9:04 AM
11	Bike lanes and better ability to access town as a pedestrian.	6/12/2017 9:01 AM
12	More bike lanes	6/12/2017 8:53 AM
13	More Roundabouts - keep traffic moving!	6/12/2017 8:52 AM
14	more safe pedestrian crosswalks	6/12/2017 8:45 AM
15	More flashing lights and yellow paint at cross walks (similar to bloomington, in and iowa city, ia area	6/12/2017 8:36 AM
16	Public transportation and connectivity for sidewalks and trails	6/12/2017 8:34 AM
17	Bike share in the downtown area	6/12/2017 8:16 AM
18	Warning light at ped crossing. Light flashes when ped gets close to warn drivers (especially when visibility is low at crossing)	6/9/2017 9:56 AM
19	Wider, safer paths. Look good. Round-a-bouts	6/9/2017 9:50 AM
20	I've seen public art on trails and near streets. Also more room for bieks on streets.	6/9/2017 9:42 AM
21	Appearance - Public Art!! Mural, sculpture, landscape; local	6/9/2017 7:38 AM
22	Brick streets, charm, safe sidewalks with buffer	6/9/2017 7:34 AM
23	Taxis, über, or some type of public transport even if only available on the weekends.	6/6/2017 10:01 PM
24	"Michigan-left" turning movements for 31 with limited access to improve traffic flow & safety.	6/6/2017 9:11 PM
25	Limited access on 31	6/6/2017 8:50 PM

Q24 What other comments or suggestions do you have related to transportation within the City of Franklin?

Answered: 16 Skipped: 34

#	RESPONSES	DATE
1	People who have sidewalks in front of homes must maintain property to not obstruct sidewalks	6/20/2017 10:28 AM
2	Overgrown, abandoned homes restricting sidewalks!	6/20/2017 10:24 AM
3	Shouldn't make street appearance improvements at expense of mature trees and strucures	6/20/2017 10:19 AM
4	Public art, landscaping, limited commercial signage, general appearance - not limited to eastside. Use of local companies and individuals to accomplish this.	6/20/2017 10:13 AM
5	Keep Yandes St. Brick - Preserve our historical charm	6/20/2017 10:10 AM
6	More green space	6/12/2017 5:24 PM
7	We need a better way in to Indianapolis, especially through public transportation	6/12/2017 4:43 PM
8	Public transportation is complicated for a smaller town, but it gives accessibility to so many - a great opportunity to be creative to maximize ability for those who live in Franklin to get around town	6/12/2017 9:01 AM
9	get trails that run out to the country so the small surrounds towns are not forgotten (health issues are usually greater in rural populations)	6/12/2017 8:36 AM
10	Would love to see art incorporated into crosswalk design (paint), unique benches, etc. to foster placemaking	6/12/2017 8:16 AM
11	People who have sidewalks in front of home must maintain property to not abstruct sidewalks.	6/9/2017 9:56 AM
12	Overgrown, abandoned homes restricting sidewalks	6/9/2017 9:50 AM
13	Public art, landscaping, limited commercial signage, general aperance - not limited to eastside. Use of local companies and ?? to accomoplish this	6/9/2017 7:38 AM
14	Keep Yandres St. brick. Preserve our historical charm.	6/9/2017 7:34 AM
15	The US31 corridor looks awful, specifically the north end. Needs improvement as this is one of the main corridors into town.	6/6/2017 10:01 PM
16	Close Schoolhouse road- make it a Michigan left	6/6/2017 8:50 PM

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WALK SCORE/URBAN DESIGN SCORE

Input received from the public meeting and survey conducted in June revealed a strong interest in walkability and pedestrian accessibility. Identifying essential qualities of urban places that contribute to the reduced reliance on auto travel has been a popular research topic. Planners now have a good understanding of how these urban design elements contribute and how they can be described by way of various "D" elements. This section is dedicated to identifying the appropriate set of "D" elements that are relevant to the City of Franklin and then find practical variables to describe each element. Selection of variables to describe each of the "D" elements was done by first reviewing what other areas have used and then adapting those to match the unique situation of the Franklin area and the modeling data available. The selected 5D elements are listed here:

- Density - dwellings or jobs per acre
- Diversity - mix of land uses in an area
- Design of the urban environment
- Destinations - proximity to area activity centers
- Distance to Transit stations and services

Consideration was given to the availability of data, ability of each variable to describe the D element, presumably with relevant effect on vehicular trip making, and the ability to make a connection to the travel demand model data. The following section describes each of the variables that were chosen as the result of this process.

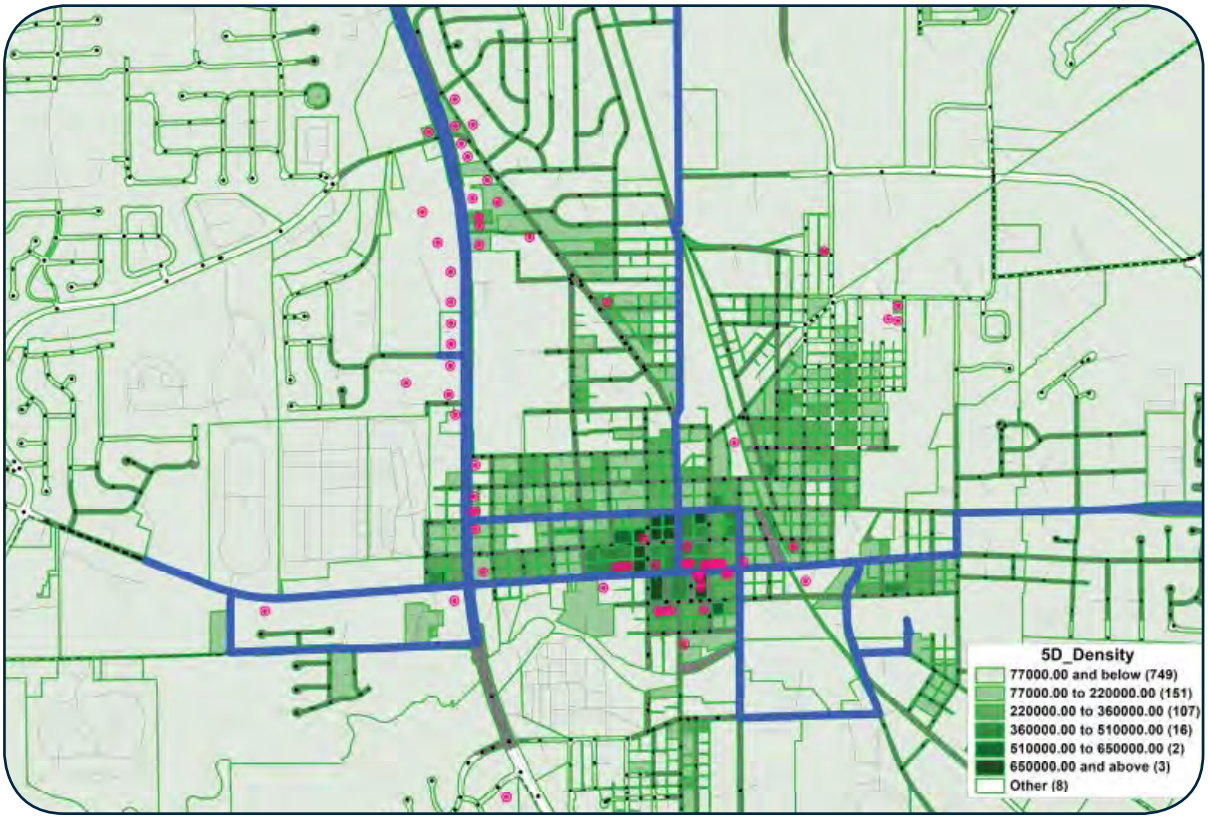
DENSITY VARIABLES

Density variables are used to measure the intensity of activity within a certain geographic space. Areas with higher levels of density and intensity are thought to make vehicular travel more costly (time and parking cost) and more conducive to transit or non-motorized travel. Typical variables used to measure this quality of an area are household density and employment density. Both are readily computed for a given TAZ, and use simple variables of households per square mile and employment per square mile. These are computed directly from TAZ variables, and results for the Franklin area are shown in the density, household and employment graphic on the following page. Results for each variable show increasing density values in areas that would be described as "traditional", "neo-traditional", or are in places where "smart growth" has been promoted.

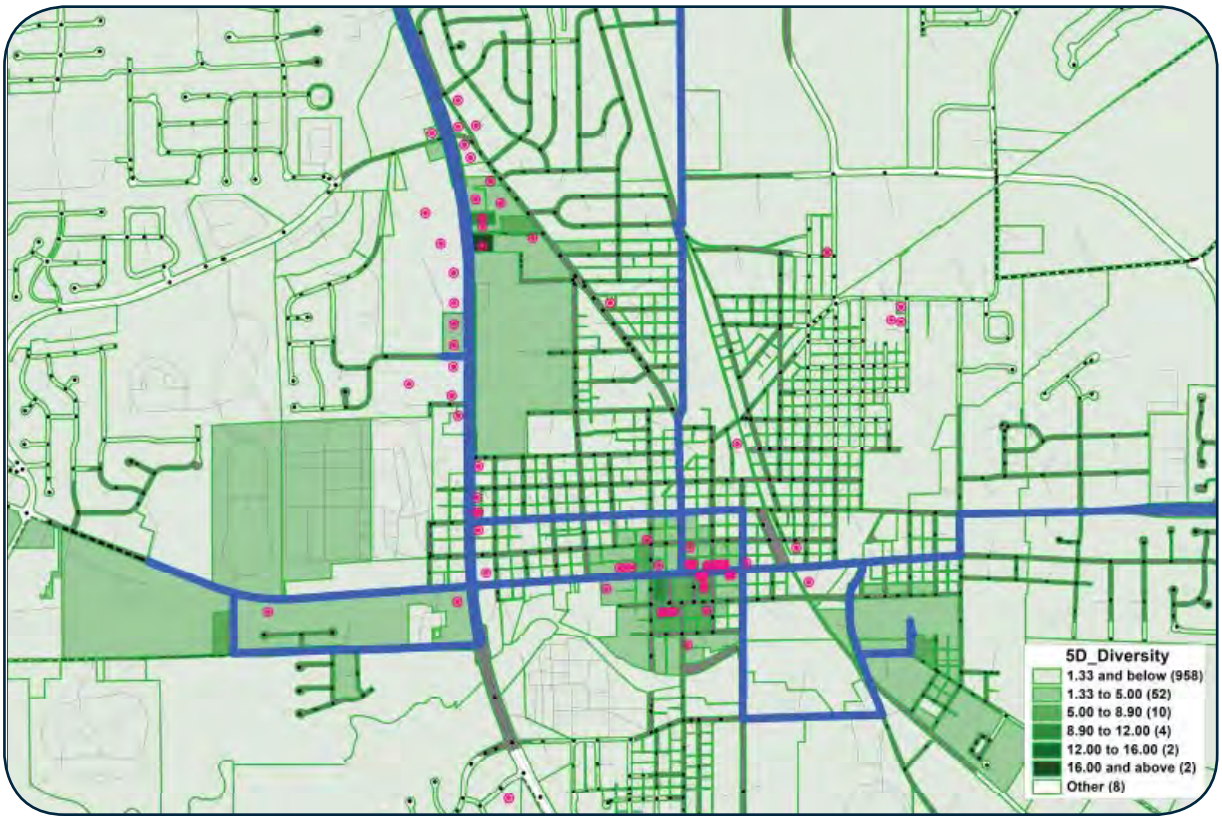
DIVERSITY VARIABLES

Diversity variables measure the degree to which land uses are segregated. Urban design elements which promote the mixing of residential and employment are known to contribute to shorter and potentially fewer vehicular trips. The level of diversity is often measured using a jobs/housing ratio. In places where there is a large degree of land use segregation, the ratio is either very low or very high. For the Franklin area, jobs/housing ratio was judged to be a legitimate variable which is simple to compute using model data for any scenario. Results for the Franklin area are shown in diversity graphic on the following page.

5D VARIABLE - DENSITY, HOUSEHOLDS AND EMPLOYMENT



5D VARIABLE - DIVERSITY



DESIGN VARIABLES

Design variables describe aspects of the urban network. These measures describe the degree to which the urban network is interconnected, grid-like, and more conducive or inviting to walking/bicycling. Development of the right mix of design variables, and the practical aspects of producing them was extensive. In the end, three variables emerged:

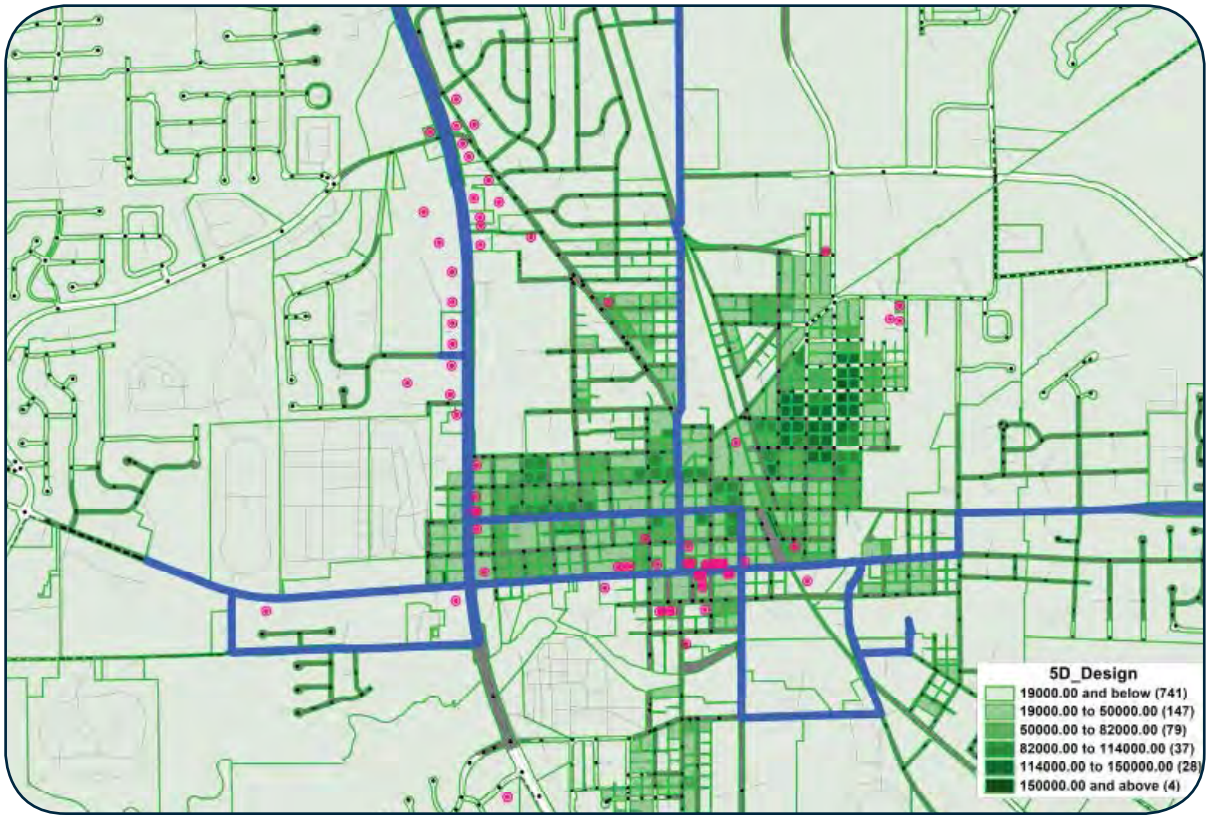
- Walkability – which is described as the percentage of streets within a TAZ that are walkable. "Walkable" links are identified with a selection set of low functional class, low speed, low volume roads. Then a ratio is computed using walkable link distances vs. the sum for all links in a TAZ.
- Blockface – this is a geometric measure of the average blockface size within a zone. Average blockface is a very good measure of how grid-like the street network is. A tight urban street grid pattern will yield blockface values that are very low. A more open, and less connected, street pattern will yield blockface values that are much higher. The more connected the network, the presumption is that walk or bike trips can be more efficient. This same arrangement has the opposite effect on vehicular travel, adding intersection delays, so it serves as a deterrent to auto travel.
- Street Density - this is another geometric measure that is simply the centerline miles of streets within a given TAZ divided by the land area of the TAZ in square miles. The street density variable complements the other two design variables

The three sub-elements are combined into a single design score. Results from applying these measures for the Franklin area are shown in the design graphic on the following page.

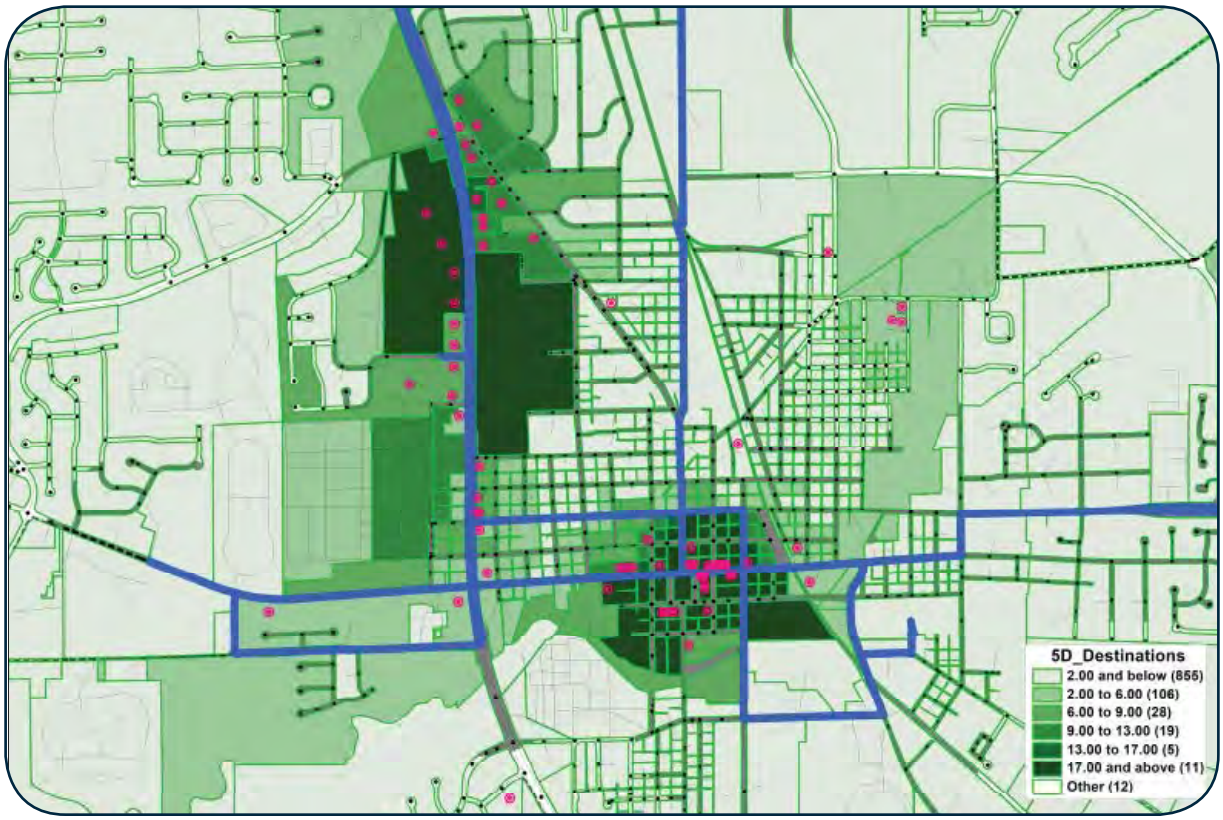
DESTINATION VARIABLES

Destination variables describe the level of vibrancy of an area. In other words, is there somewhere to go or something to do via a walking trip? If so, then many trip purposes (e.g. work, shopping, or entertainment) can be accomplished without a car trip. The variable must be sensitive to the types of land uses that are close enough for a non-motorized trip to be more likely chosen over an auto trip. For this effort, destinations were measured using two variables; 1) number of commercial establishments within a 1/4 mile walk, 2) the number of retail jobs within a 1/4 mile walk. Both are ways of describing the vibrancy of an area. Initially, these variables were tested using different distance thresholds of ½ mile and 1/3 mile, but the 1/4 mile threshold allowed for a more realistic differentiation among the TAZs. Results for the Franklin area are shown in the destination graphic on the following page.

5D VARIABLE - DESIGN



5D VARIABLE - DESTINATION



DISTANCE TO TRANSIT VARIABLES

Distance to transit variables are used to describe the degree to which the area is served by transit. Two measures were selected for this D element. The first is a walk access to transit variable which is literally a measure of how easy it is to walk to transit. This is computed by summing up the "walkable" road miles within a 10 minute walk radius of each transit stop and computing a ratio of that mileage to the total centerline mileage of the TAZ. The easier it is to walk to transit service, the more likely it is that a trip will be made by transit instead of by auto. The second variable is an accessibility via transit measure. This is computed by calculating the transit accessible destinations using the same definition of "destinations" used in the previous variable. It is intended to be used as a simple indicator of what other locations can be accessed via transit. The underlying assumption is that transit can be a competitive substitute for auto travel with increasing levels of accessibility. Results for the Franklin area are shown in the distance to transit graphic on the following page.

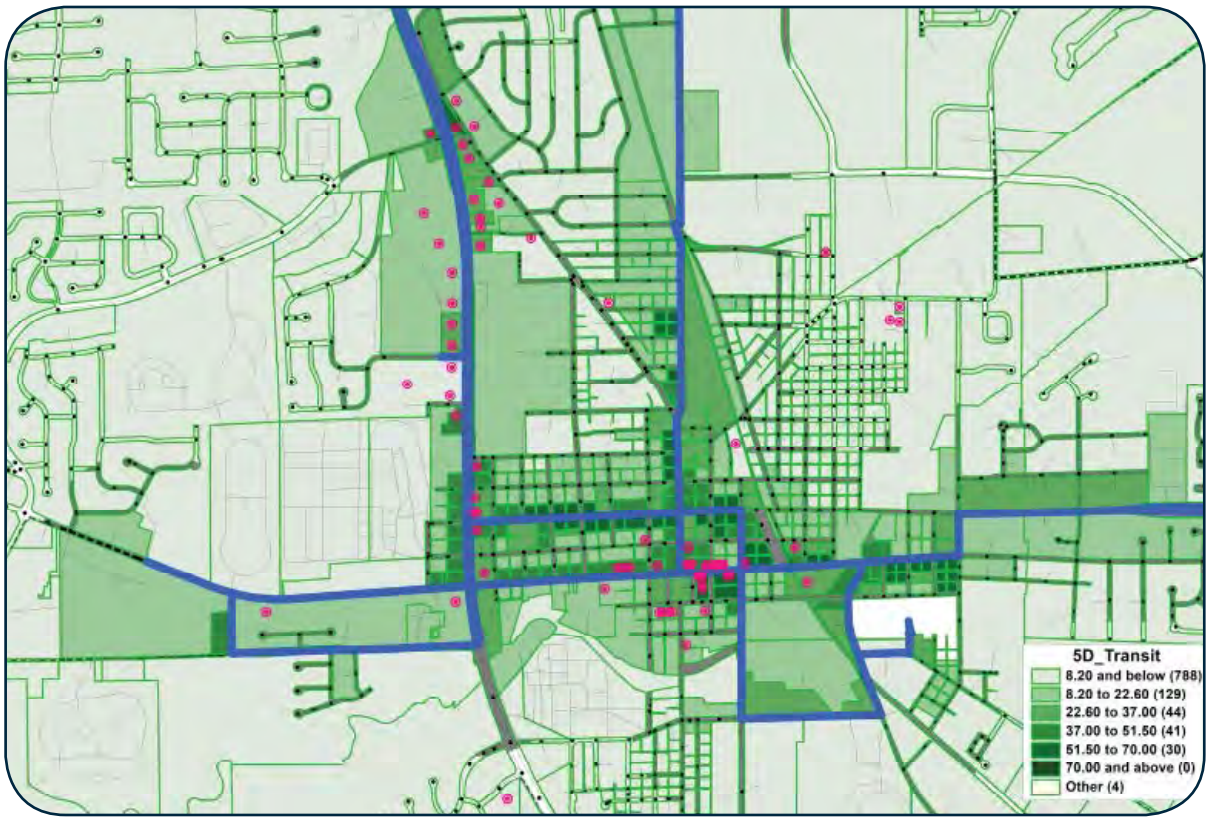
PUTTING IT ALL TOGETHER

The variables chosen to describe the 5D elements are consistent with those being used elsewhere, and are practical to compute using the Franklin travel demand model. When taken together, they appear to provide an accurate representation of places around the Franklin area that have more traditional or smart growth features. When the scores are aggregated and normalized, the result is an overall "Walk Score" as illustrated in the final walk score graphic on the following page.

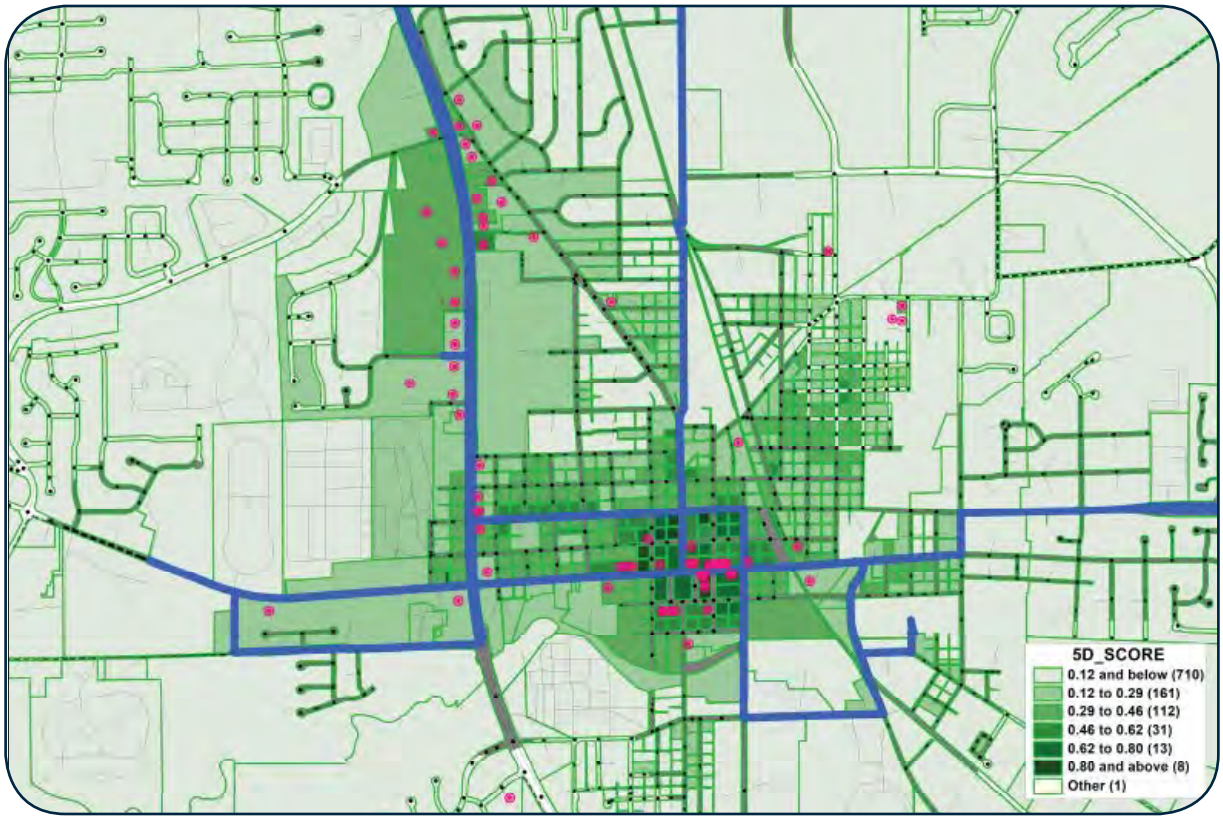
CONCLUSIONS

The 5D post-processor used in conjunction with the travel model can be used to compare growth scenarios for an entire study area, city jurisdiction areas, or specific development areas on multiple development sites scattered throughout an analysis area. Area-wide analyses include comprehensive assessments of development patterns over a large, relatively homogeneous area, or a large area consisting of multiple communities. "Growth scenarios" can comprise comparisons of existing versus future conditions, comparisons of "trend" versus "smart-growth" scenarios, and/or comparisons of several alternative community plans or specific plans. The Thoroughfare Plan project did not evaluate alternative development policies and their effect on transportation infrastructure, thus each of the scenarios tested to date have yielded nearly identical Walk Scores for each TAZ. However, this toolkit can be used in subsequent Comprehensive and specific planning exercises in the future.

5D VARIABLE - DISTANCE TO/VIA TRANSIT

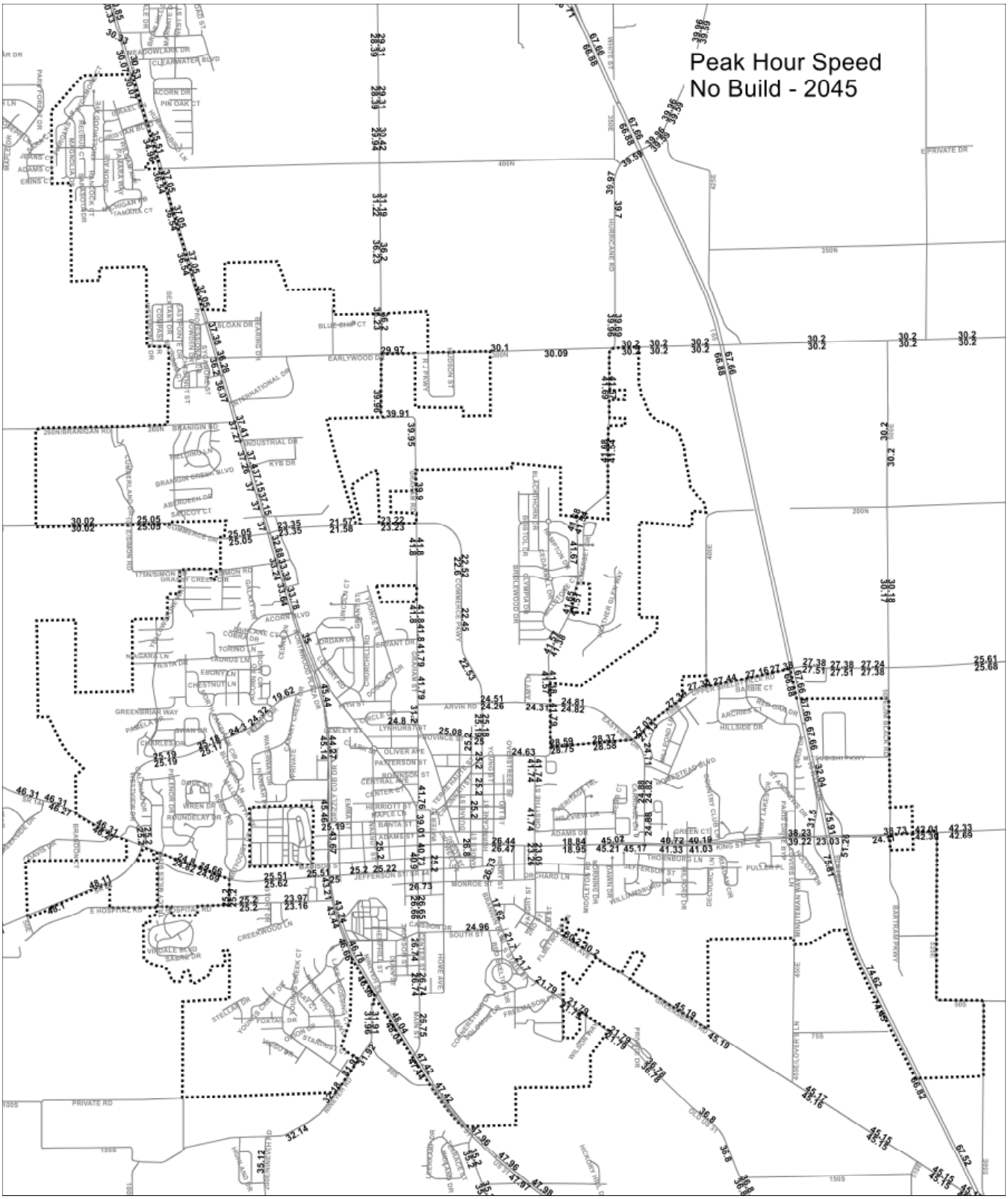


5D VARIABLE - FINAL WALK SCORE RESULTS



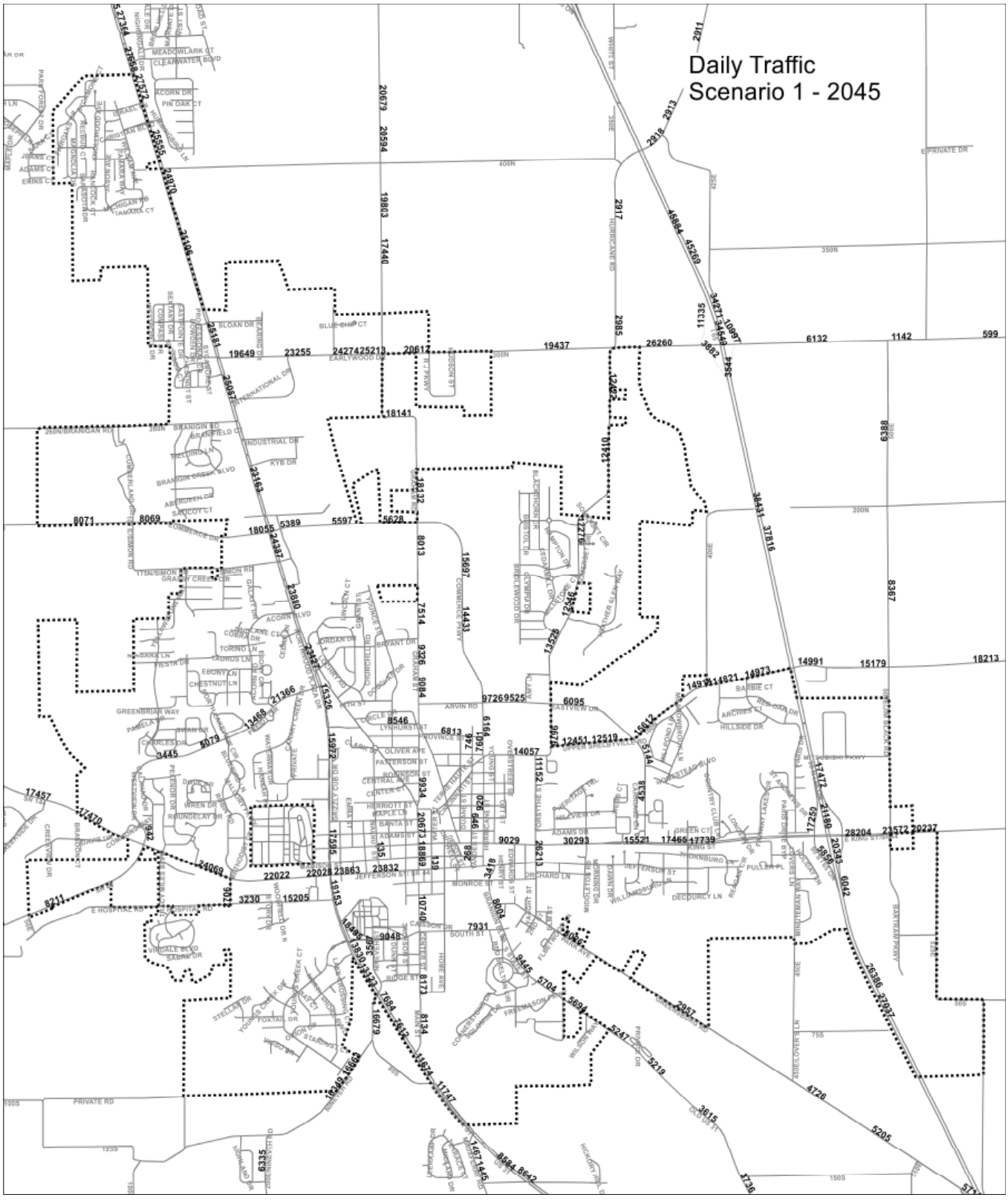

2017 Base Year - Daily Traffic

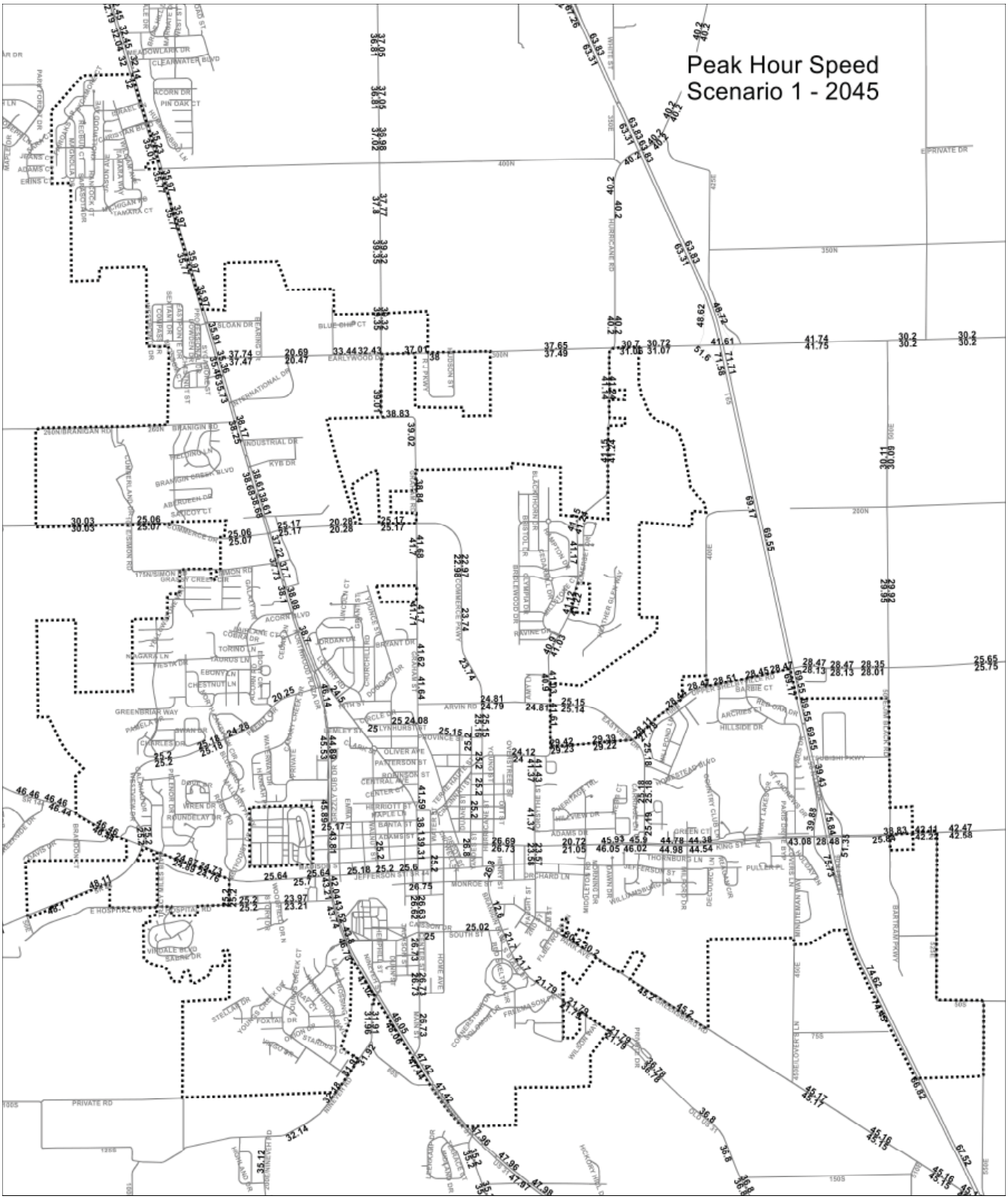

2017 Base Year - Daily Trucks

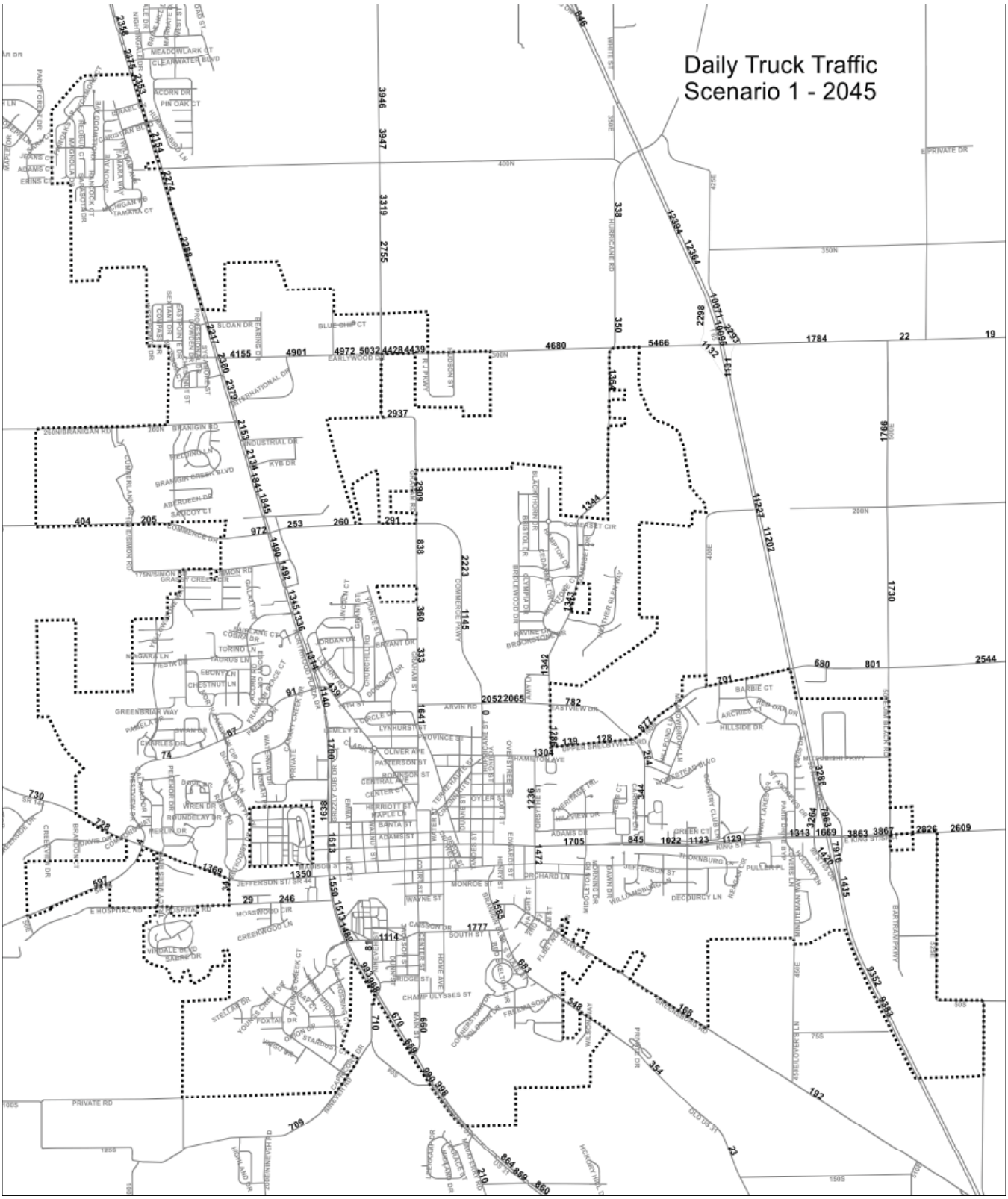

Peak Hour Speed
No Build - 2045

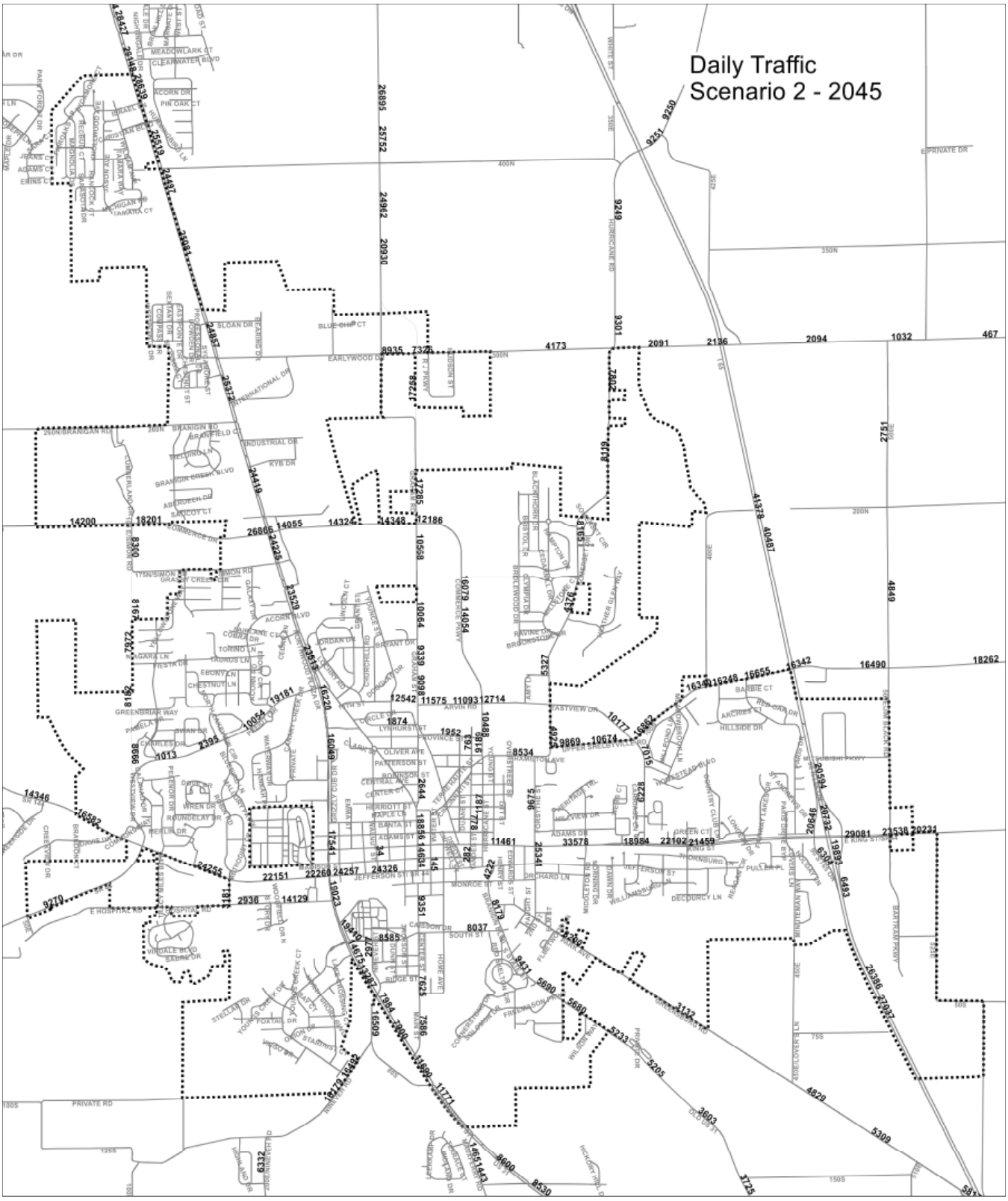

2045 No-Build - Daily Traffic

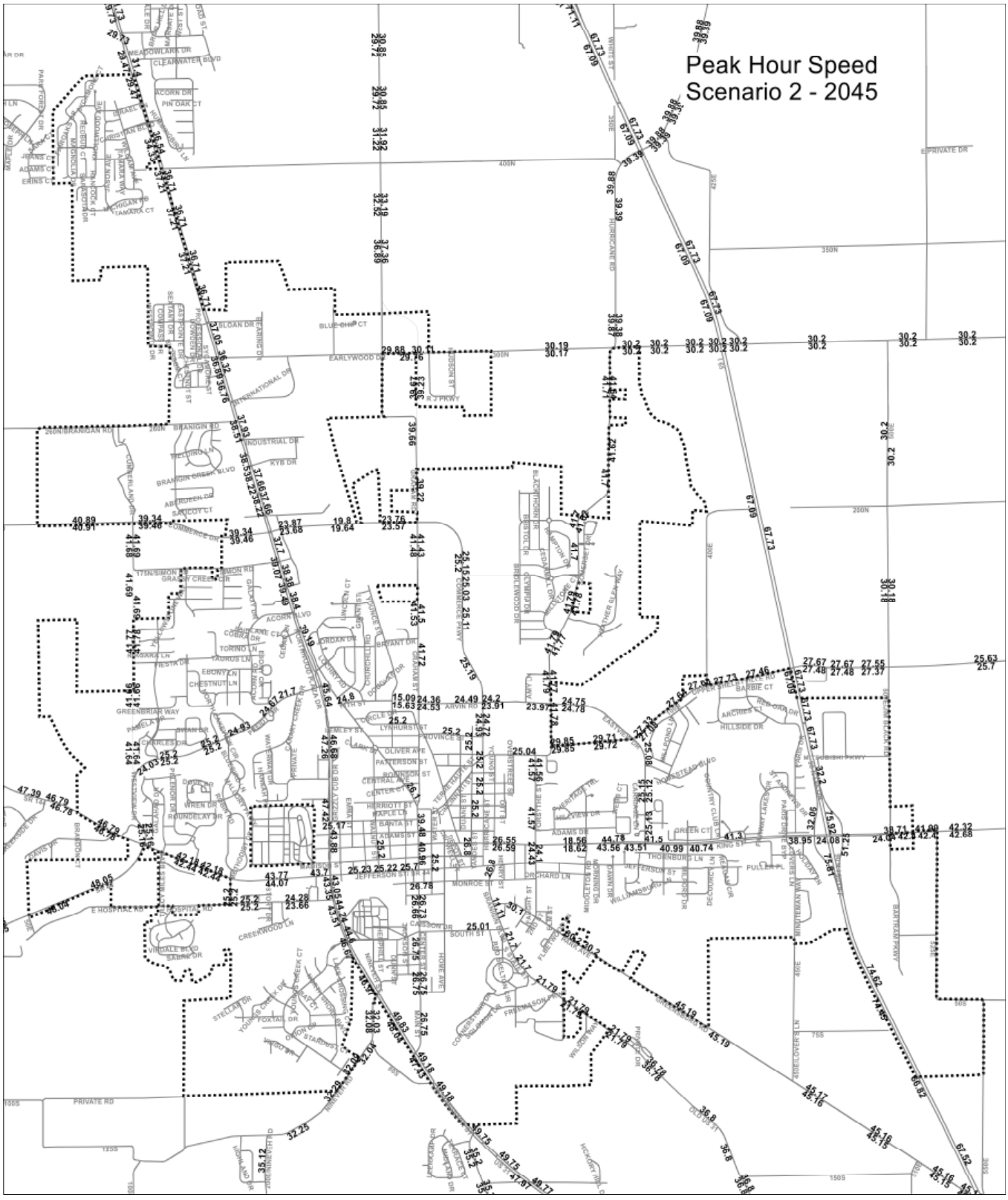

2045 No-Build - Daily Trucks

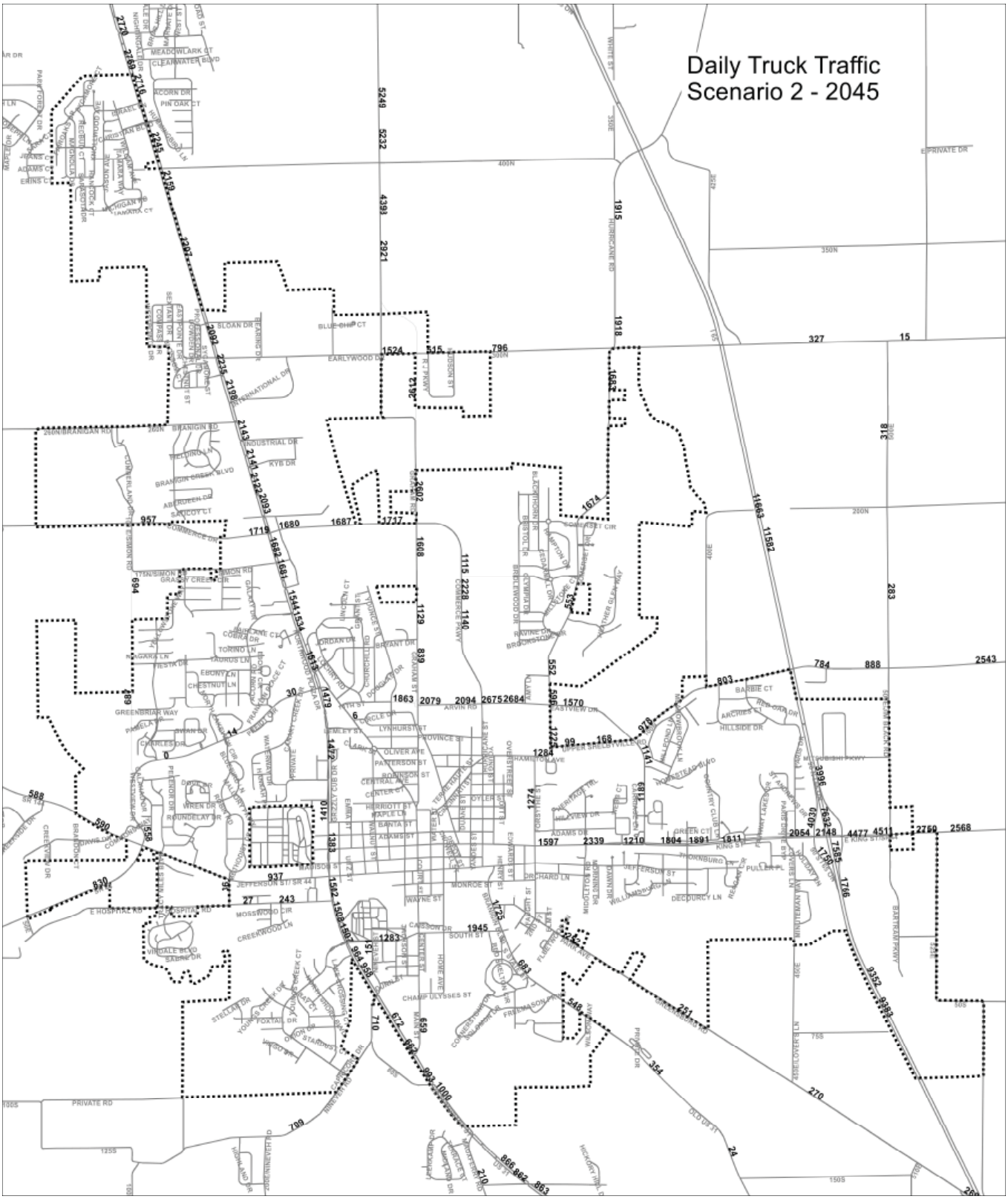

Daily Traffic
Scenario 1 - 2045

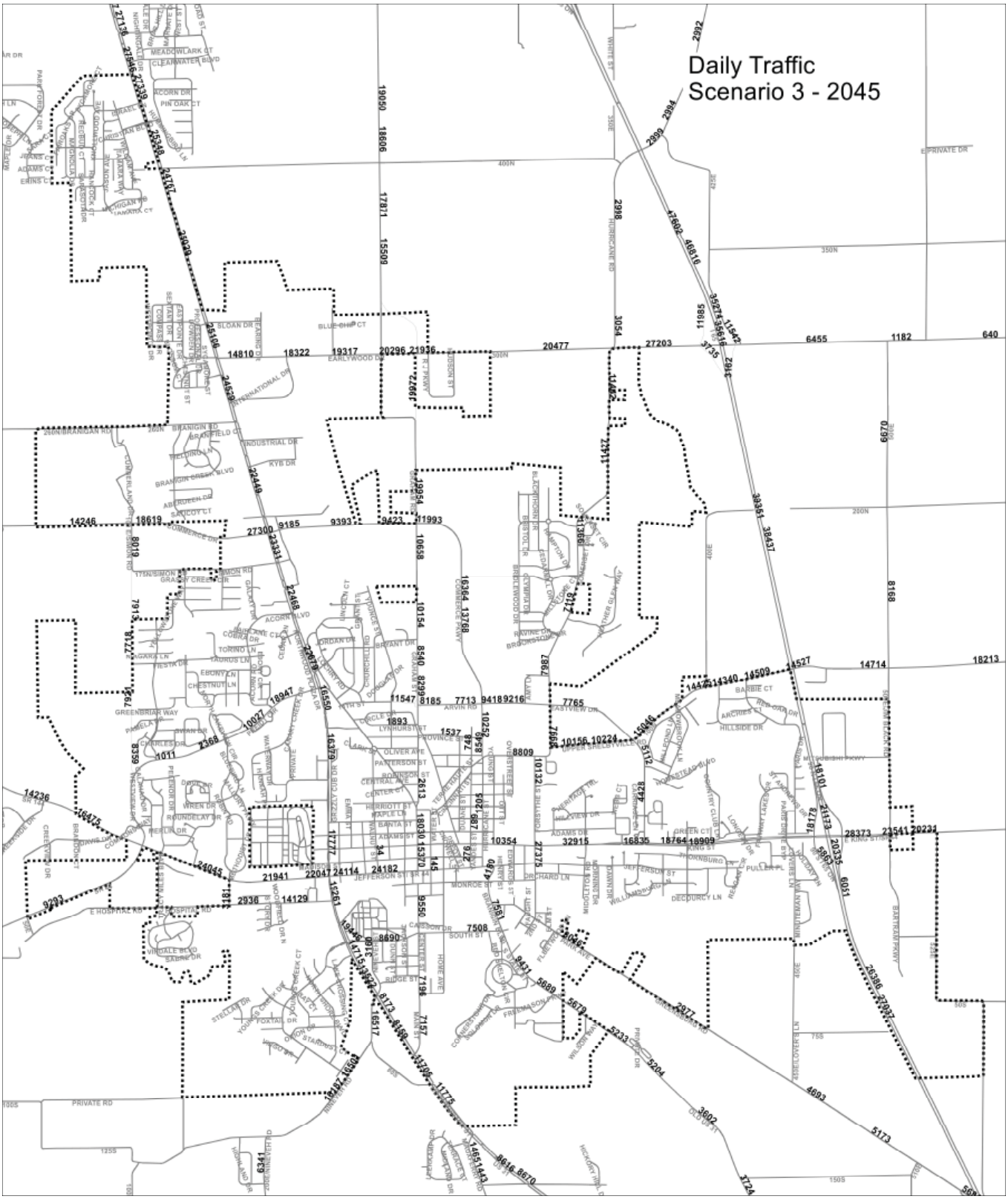

Peak Hour Speed
Scenario 1 - 2045

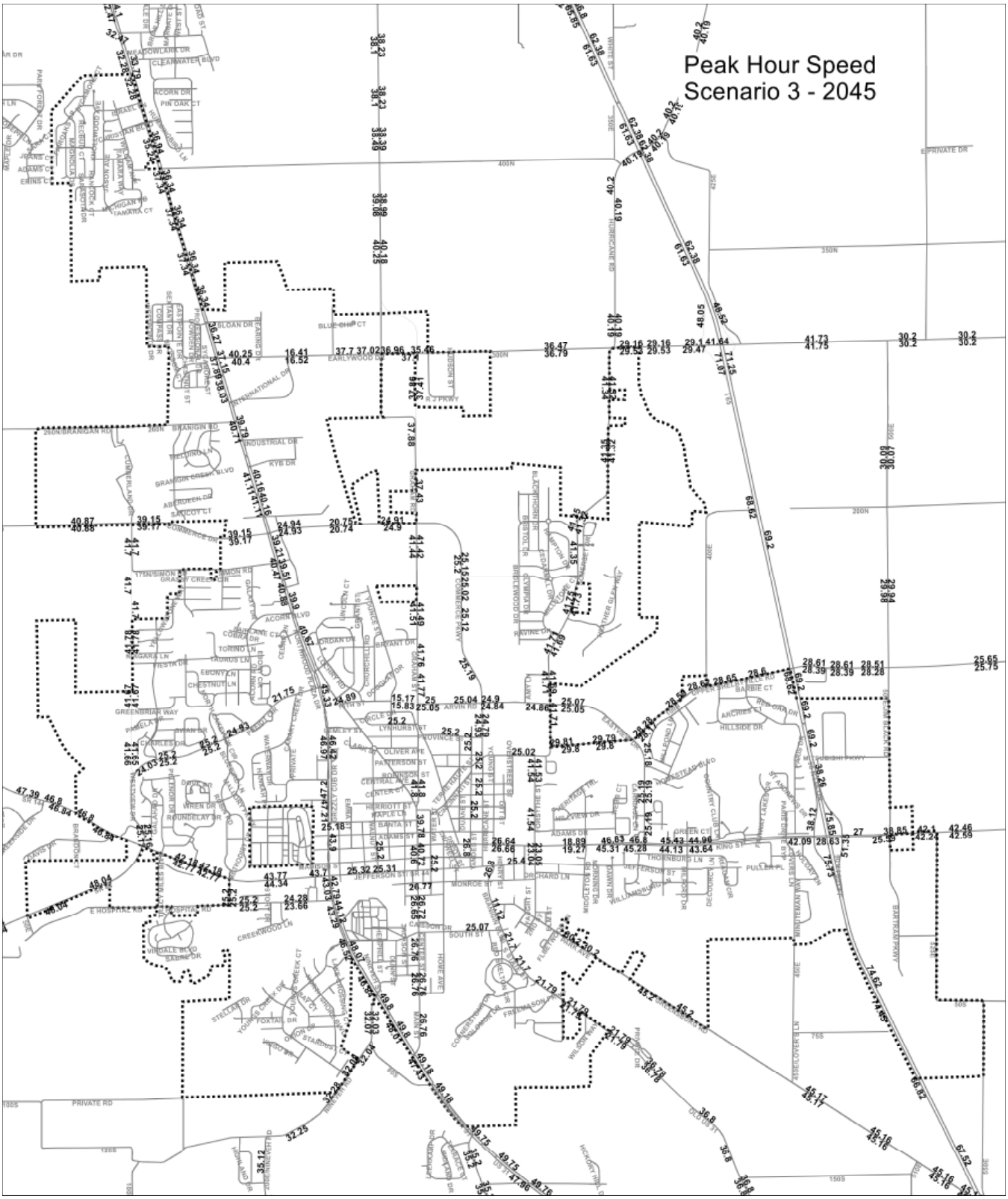

Daily Truck Traffic
Scenario 1 - 2045

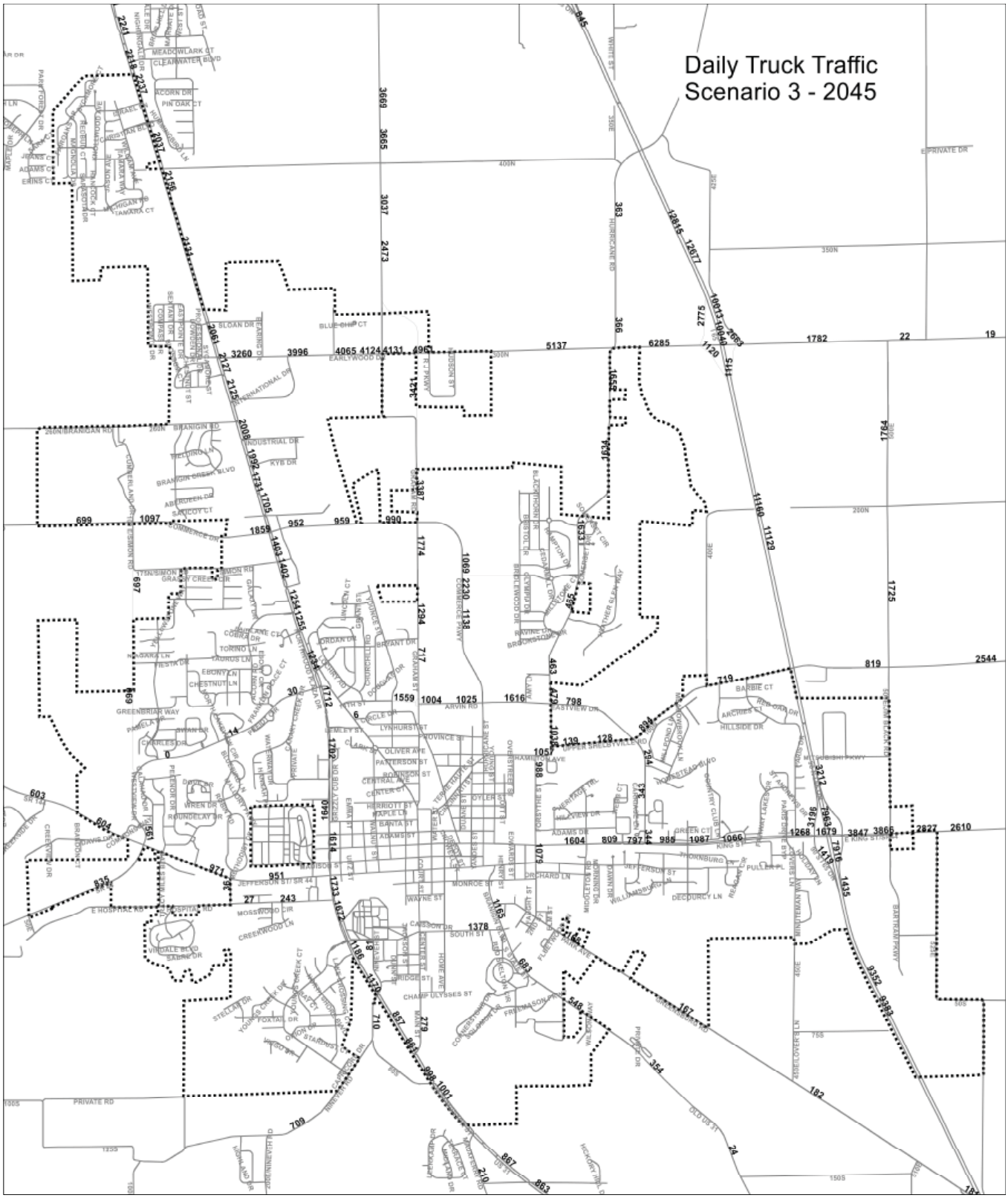

Daily Traffic
Scenario 2 - 2045

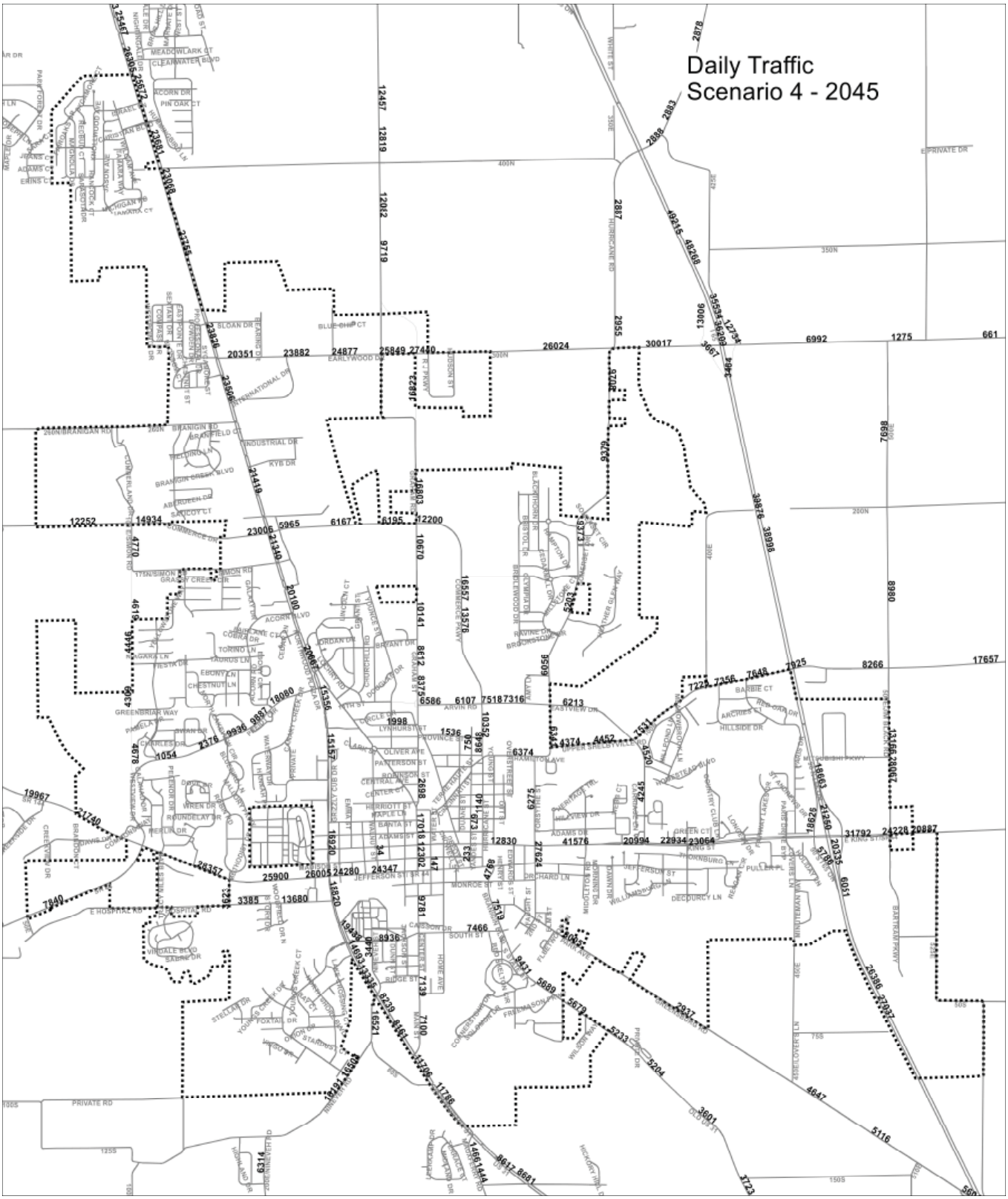

Peak Hour Speed
Scenario 2 - 2045

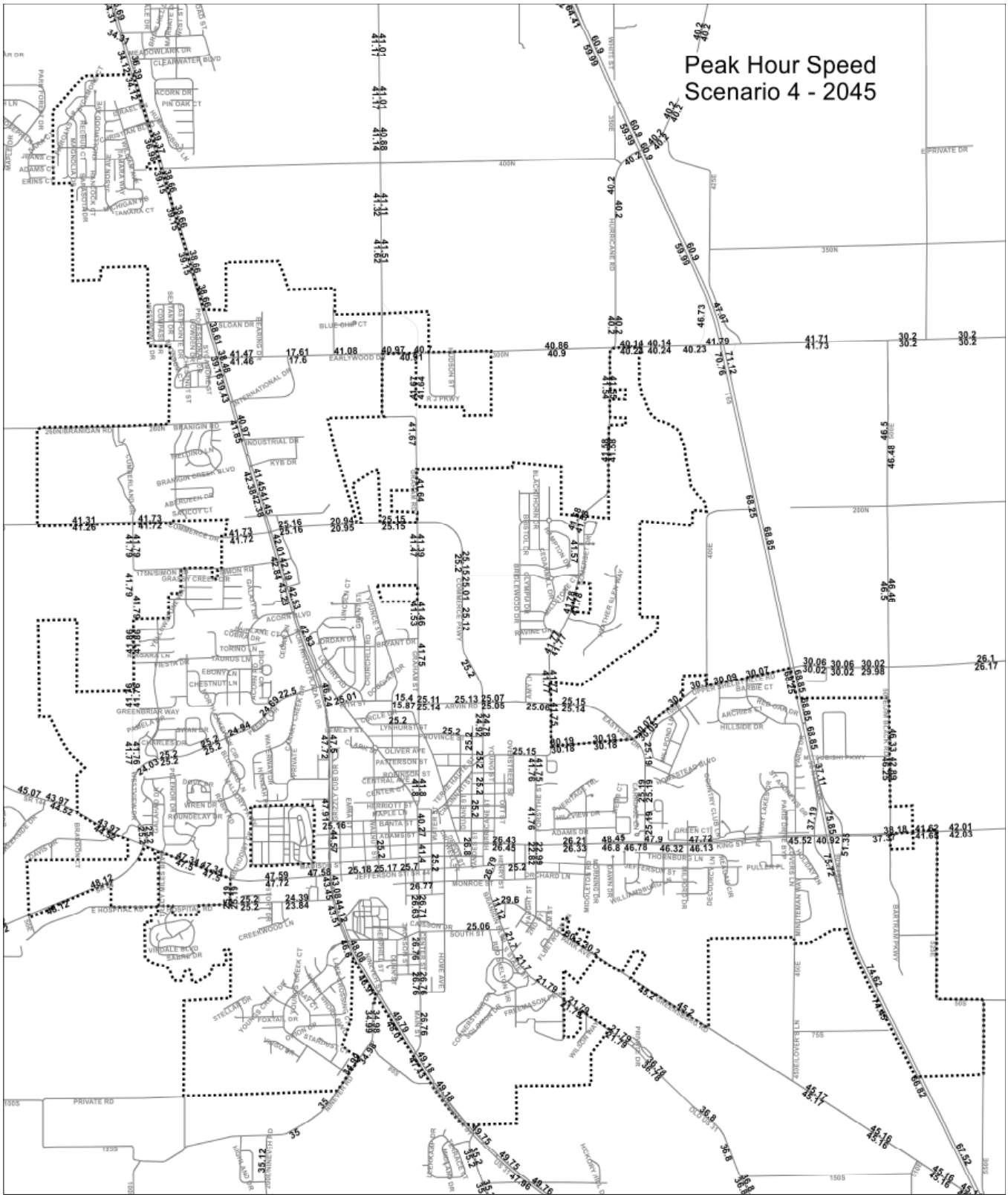

Daily Truck Traffic
Scenario 2 - 2045

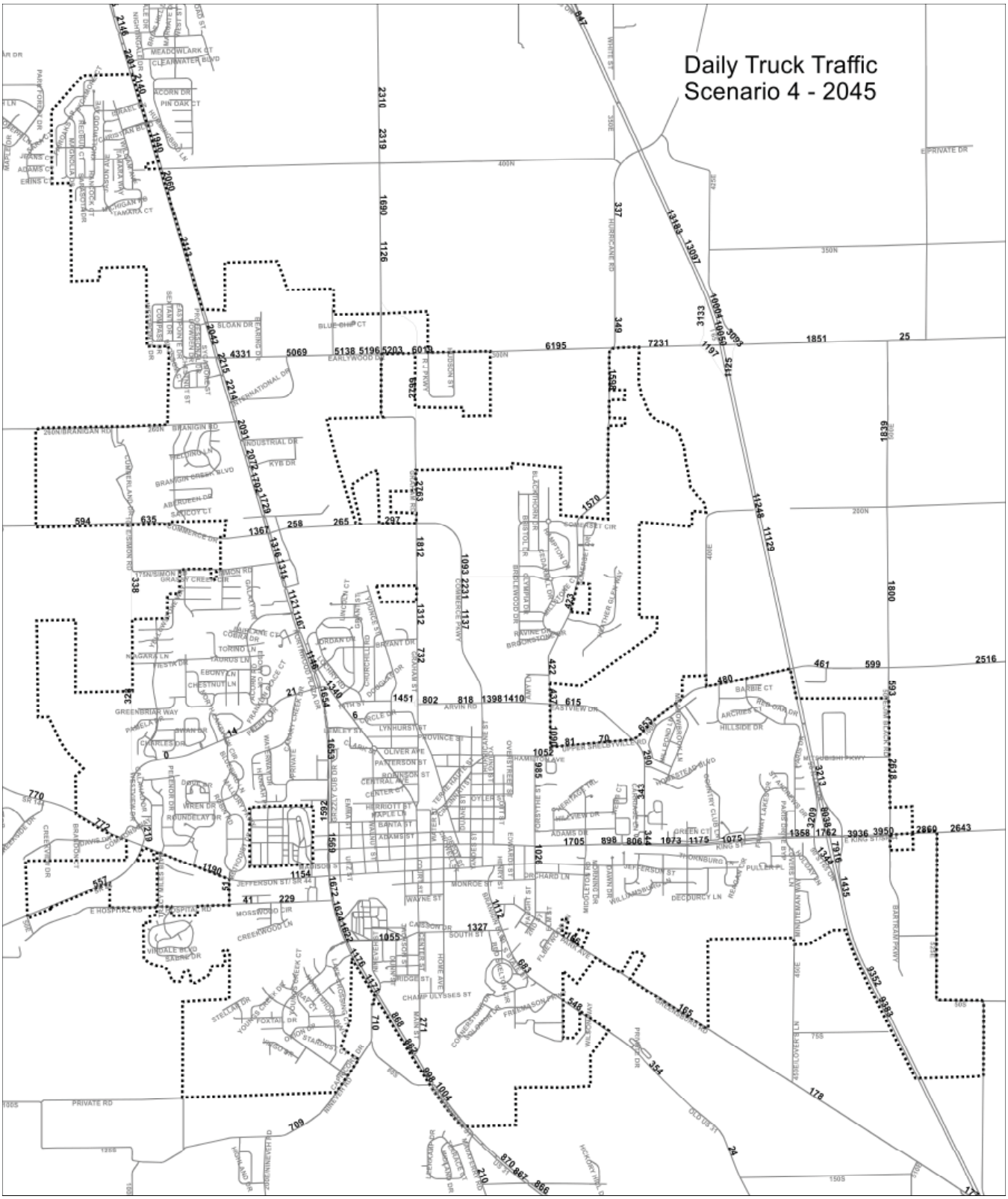

Daily Traffic
Scenario 3 - 2045


Peak Hour Speed
Scenario 3 - 2045


Daily Truck Traffic
Scenario 3 - 2045


Daily Traffic
Scenario 4 - 2045


Peak Hour Speed
Scenario 4 - 2045


Daily Truck Traffic
Scenario 4 - 2045

INDOT

SIMPLIFIED ECONOMIC ANALYSIS TOOL
PROJECT ANALYSIS RESULTS SUMMARY

Project: Economic impacts of Franklin Thoroughfare Plan Projects
Analyzer Name: Dean Munn, Convergence Planning LLC
Analysis Date: 8/14/2017
Run Date: 8/14/2017
Model Run File Name: 2045 Build Network Scenario 1

PROJECT PERFORMANCE

OTHER PERFORMANCE MEASURES

Daily Vehicle-Hours of Delay (DVHD) Savings	1,502
Annual Reduction in Total Accidents	13
Annual Reduction in Fatal Accidents	0

A: NON-BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$64.5	$2.6
Vehicle Oper Cost Savings (Non-Business)	$14.5	$0.6
Acc Cost Savings (Non-Bus & Non-Economic)	$11.4	$0.5
Emissions Cost Savings	$4.7	$0.2

B: BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Business)	$20.8	$0.8
Vehicle Oper Cost Savings (Business)	$4.8	$0.2
Accident Cost Savings (Business)	$1.6	$0.1

C = A + B DIRECT USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings	$85.4	$3.4
Vehicle Operating Cost Savings	$19.3	$0.8
Accident Cost Savings	$13.0	$0.5
Emissions Cost Savings	$4.7	$0.2
Residual Value at End of Analysis	$0.0	
TOTAL DIRECT USER BENEFITS	$122.3	
USER BENEFIT-COST RATIO	4.1	
NET PRESENT VALUE (mil. 2015$)	$92.7	

D: LONG-TERM ECONOMIC IMPACTS	25-Year Total	Annual Average
Gross Regional Product (mil. 2015$)	$135.1	$5.4
Real Personal Income (mil. 2015$)	$133.2	$5.3
Employment (job-years)	1,496	60

Notes: Economic Impacts do not include short-term effect of construction and are calculated using simplified method.

E = A + D USER AND ECONOMIC BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$64.5	$2.6
Vehicle Oper Cost Savings (Non-Business)	$14.5	$0.6
Acc Cost Savings (Non-Bus & Non-Economic)	$11.4	$0.5
Emissions Cost Savings	$4.7	$0.2
Real Per Income (Bus Cost Savings & Attract)	$44.6	$1.8
Residual Value at End of Analysis	$0.0	
TOTAL USER AND ECONOMIC BENEFITS	$139.7	
BENEFIT-COST RATIO with economic benefits	4.7	
NET PRESENT VALUE (mil. 2015$)	$110.0	

INDOT

SIMPLIFIED ECONOMIC ANALYSIS TOOL
PROJECT ANALYSIS RESULTS SUMMARY

Project: Economic impacts of Franklin Thoroughfare Plan Projects
Analyzer Name: Dean Munn, Convergence Planning LLC
Analysis Date: 8/14/2017
Run Date: 8/14/2017
Model Run File Name: 2045 Build Network Scenario 2

PROJECT PERFORMANCE

OTHER PERFORMANCE MEASURES

Daily Vehicle-Hours of Delay (DVHD) Savings	1,566
Annual Reduction in Total Accidents	10
Annual Reduction in Fatal Accidents	0

A: NON-BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$71.4	$2.9
Vehicle Oper Cost Savings (Non-Business)	$37.0	$1.5
Acc Cost Savings (Non-Bus & Non-Economic)	$12.8	$0.5
Emissions Cost Savings	$6.5	$0.3

B: BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Business)	$12.9	$0.5
Vehicle Oper Cost Savings (Business)	$6.7	$0.3
Accident Cost Savings (Business)	$1.6	$0.1

C = A + B DIRECT USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings	$84.3	$3.4
Vehicle Operating Cost Savings	$43.7	$1.7
Accident Cost Savings	$14.4	$0.6
Emissions Cost Savings	$6.5	$0.3
Residual Value at End of Analysis	$0.0	
TOTAL DIRECT USER BENEFITS	$148.9	
USER BENEFIT-COST RATIO	4.4	
NET PRESENT VALUE (mil. 2015$)	$130.2	

D: LONG-TERM ECONOMIC IMPACTS	25-Year Total	Annual Average
Gross Regional Product (mil. 2015$)	$88.9	$3.6
Real Personal Income (mil. 2015$)	$91.0	$3.6
Employment (job-years)	1,051	42

Notes: Economic Impacts do not include short-term effect of construction and are calculated using simplified method.

E = A + D USER AND ECONOMIC BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$71.4	$2.9
Vehicle Oper Cost Savings (Non-Business)	$37.0	$1.5
Acc Cost Savings (Non-Bus & Non-Economic)	$12.8	$0.5
Emissions Cost Savings	$6.5	$0.3
Real Per Income (Bus Cost Savings & Attract)	$35.0	$1.4
Residual Value at End of Analysis	$0.0	
TOTAL USER AND ECONOMIC BENEFITS	$162.8	
BENEFIT-COST RATIO with economic benefits	4.8	
NET PRESENT VALUE (mil. 2015$)	$128.9	

INDOT

SIMPLIFIED ECONOMIC ANALYSIS TOOL
PROJECT ANALYSIS RESULTS SUMMARY

Project: Economic impacts of Franklin Thoroughfare Plan Projects
Analyzer Name: Dean Munn, Convergence Planning LLC
Analysis Date: 8/14/2017
Run Date: 8/14/2017
Model Run File Name: 2045 Build Network Scenario 3

PROJECT PERFORMANCE

OTHER PERFORMANCE MEASURES

Daily Vehicle-Hours of Delay (DVHD) Savings	4,141
Annual Reduction in Total Accidents	19
Annual Reduction in Fatal Accidents	0

A: NON-BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$138.6	$5.5
Vehicle Oper Cost Savings (Non-Business)	$52.5	$2.1
Acc Cost Savings (Non-Bus & Non-Economic)	$24.7	$1.0
Emissions Cost Savings	$11.5	$0.5

B: BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Business)	$30.4	$1.2
Vehicle Oper Cost Savings (Business)	$10.5	$0.4
Accident Cost Savings (Business)	$2.3	$0.1

C = A + B DIRECT USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings	$169.0	$6.8
Vehicle Operating Cost Savings	$63.0	$2.5
Accident Cost Savings	$27.0	$1.1
Emissions Cost Savings	$12.2	$0.5
Residual Value at End of Analysis	$0.0	
TOTAL DIRECT USER BENEFITS	$271.2	
USER BENEFIT-COST RATIO	4.3	
NET PRESENT VALUE (mil. 2015$)	$208.8	

D: LONG-TERM ECONOMIC IMPACTS	25-Year Total	Annual Average
Gross Regional Product (mil. 2015$)	$85.3	$3.4
Real Personal Income (mil. 2015$)	$81.2	$3.2
Employment (job-years)	2,598	104

Notes: Economic Impacts do not include short-term effect of construction and are calculated using simplified method.

E = A + D USER AND ECONOMIC BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$138.6	$5.5
Vehicle Oper Cost Savings (Non-Business)	$52.5	$2.1
Acc Cost Savings (Non-Bus & Non-Economic)	$24.7	$1.0
Emissions Cost Savings	$11.5	$0.5
Real Per Income (Bus Cost Savings & Attract)	$81.2	$3.2
Residual Value at End of Analysis	$0.0	
TOTAL USER AND ECONOMIC BENEFITS	$308.5	
BENEFIT-COST RATIO with economic benefits	4.9	
NET PRESENT VALUE (mil. 2015$)	$245.0	

INDOT

SIMPLIFIED ECONOMIC ANALYSIS TOOL
PROJECT ANALYSIS RESULTS SUMMARY

Project: Economic impacts of Franklin Thoroughfare Plan Projects
Analyzer Name: Dean Munn, Convergence Planning LLC
Analysis Date: 9/7/2017
Run Date: 9/6/2017
Model Run File Name: 2045 Build Network Scenario 4

PROJECT PERFORMANCE

OTHER PERFORMANCE MEASURES

Daily Vehicle-Hours of Delay (DVHD) Savings	4,241
Annual Reduction in Total Accidents	41
Annual Reduction in Fatal Accidents	0

A: NON-BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$190.0	$7.6
Vehicle Oper Cost Savings (Non-Business)	$40.3	$1.6
Acc Cost Savings (Non-Bus & Non-Economic)	$23.3	$0.9
Emissions Cost Savings	$11.0	$0.4

B: BUSINESS USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Business)	$42.5	$1.7
Vehicle Oper Cost Savings (Business)	$6.8	$0.3
Accident Cost Savings (Business)	$3.1	$0.1

C = A + B DIRECT USER BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings	$232.6	$9.3
Vehicle Operating Cost Savings	$47.1	$1.9
Accident Cost Savings	$26.4	$1.1
Emissions Cost Savings	$11.0	$0.4
Residual Value at End of Analysis	$0.0	
TOTAL DIRECT USER BENEFITS	$317.1	
USER BENEFIT-COST RATIO	2.4	
NET PRESENT VALUE (mil. 2015$)	$176.9	

D: LONG-TERM ECONOMIC IMPACTS	25-Year Total	Annual Average
Gross Regional Product (mil. 2015$)	$210.8	$8.4
Real Personal Income (mil. 2015$)	$214.5	$8.6
Employment (job-years)	2,467	99

Notes: Economic Impacts do not include short-term effect of construction and are calculated using simplified method.

E = A + D USER AND ECONOMIC BENEFITS (mil. 2015$)	25-Year Total	Annual Average
Travel Time Savings (Non-Business)	$190.0	$7.6
Vehicle Oper Cost Savings (Non-Business)	$40.3	$1.6
Acc Cost Savings (Non-Bus & Non-Economic)	$23.3	$0.9
Emissions Cost Savings	$11.0	$0.4
Real Per Income (Bus Cost Savings & Attract)	$86.3	$3.5
Residual Value at End of Analysis	$0.0	
TOTAL USER AND ECONOMIC BENEFITS	$351.0	
BENEFIT-COST RATIO with economic benefits	2.7	
NET PRESENT VALUE (mil. 2015$)	$220.3	

Socio-economic Growth Forecasts

The Franklin travel demand model takes socio-economic data (allocated to each TAZ) and processes this information in the Trip Generation step. The Census Block level base year employment data was obtained from the 2016 Longitudinal Employer-Household Dynamics (LEHD) data via US Census Bureau. Household and population statistics at the Census Block level were also obtained. Forecasts were based on the Indianapolis MPO 2045 TAZ forecasts. The net growth was allocated to individual traffic zones and added to the base data to form a land use forecast. The MPO growth forecasts for the project's study area are summarized below.

Socio-Economic Data and Forecasts Used as Inputs to the Analysis

Franklin Study Area

	Year	
HOUSEHOLDS	**2015**	**2045**
HOUSING UNITS	12,345	19,413
POPULATION	31,890	51,454
SCHOOL ENROLLMENT (K-12)	5,849	8,852

EMPLOYMENT	**2015**	**2045**
BASIC (Includes Manufacturing)	4,297	11,771
SERVICE	8,497	20,975
RETAIL/FOOD/HOSPITALITY	2,991	7,717
TOTAL	15,785	40,463

Growth Allocation Process

The control totals derived from the Indy MPO 2045 Forecast were allocated to the Franklin model's 1019 internal traffic zones using a technical growth allocation process. For the zones within the Franklin model, but outside the project's study area, the MPO zones and assumptions were used directly. For zones that are internal to the project's study area a set of growth allocation models were calibrated and applied to predict the likely areas to attract the MPO forecasted growth.

Unique growth allocation models were calibrated for:

- Housing
- Retail Employment
- Service Employment
- Basic Employment (mostly industrial/light industrial)

Within the individual growth allocation models, each vacant parcel is competing for growth using a measure of "Economic Utility". The relative utility for a household or employer to locate in a particular parcel is:

Influenced by:

- Accessibility to Jobs
- Accessibility to Workers
- Accessibility to Retail
- Travel time to nearest interchange
- Travel time to Indianapolis
- Proximity to similar land uses
- Parcel size
- Land cost

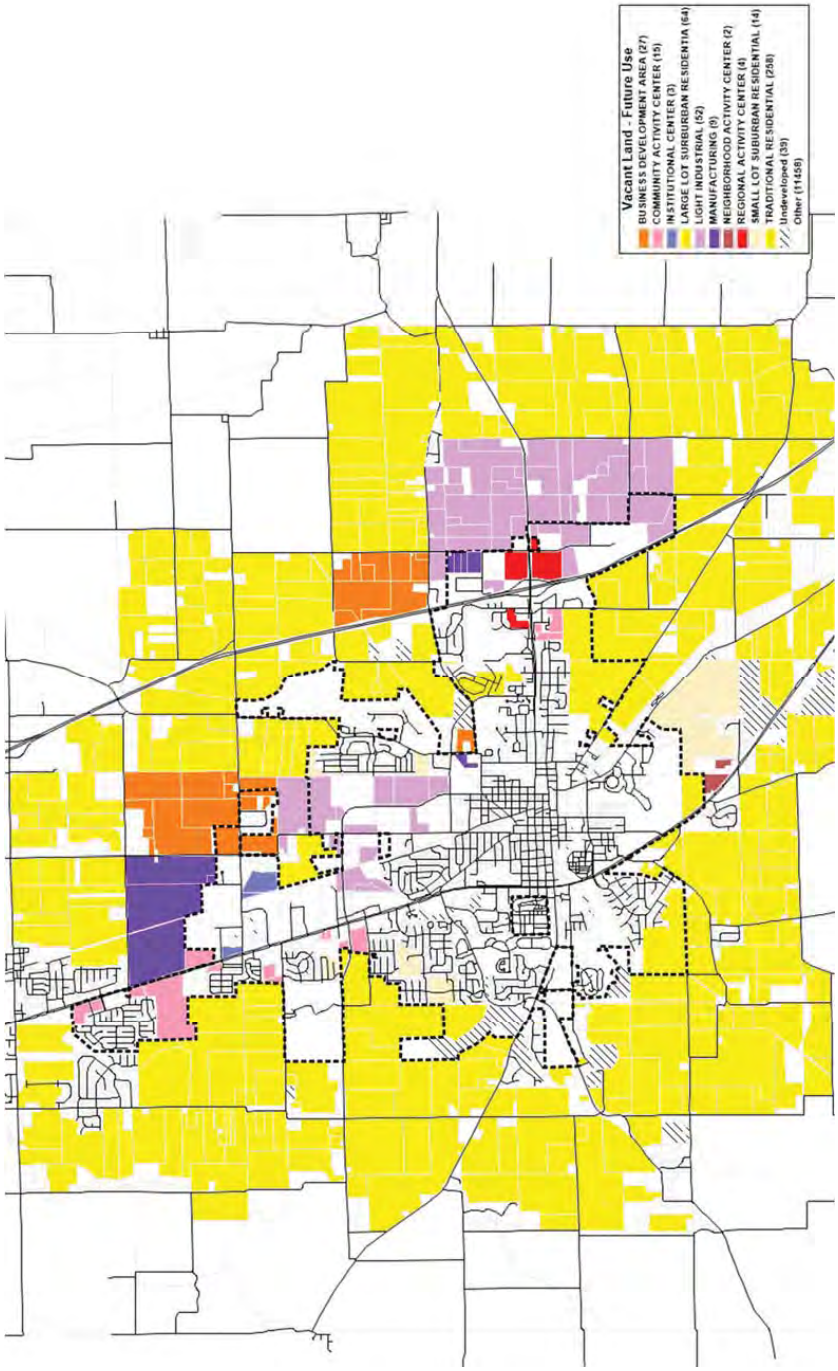
And Constrained by:

1. Land uses allowed by the Comprehensive Plan
2. Maximum densities
3. Floodplain

Each of the abovementioned items were developed from local GIS data resources; such as the Johnson County Assessor Parcel layer, the MPO model network and TAZ files, or the Franklin model network.

After the economic utility is computed for each parcel, then growth is allocated to parcels using a probability (or growth share) using the following:

Parcel's Share of Total Growth = Parcel's economic utility for a particular land use / Sum of all economic utility for a particular land use.



Future Land Uses Identified by the Comprehensive Plan

Technical Procedure for Weighting Economic Utility Elements

The Franklin growth allocation process used a Neural Network technique for estimating the relative importance of each of the variables (via numerical weights) used in the computation of the economic utility for a given land parcel for a given land use. Neural network techniques are a form of artificial intelligence that identify patterns in data that are useful for forecasting. Neural networks are commonly used in the business world for a wide range of applications; from credit worthiness of customers, to marketing analyst to predict future sales, to economic cycles and stock market prices. Neural networks have the ability to learn by example, they can be trained to recognize the image a face by showing it many examples of a face or to predict future stock prices by feeding it historical stock prices.

Neural networks perform these particular tasks by using the following procedure:

I. We present the network with training examples, which consist of a pattern of activities for the input units together with the desired pattern of activities for the output units.

II. We determine how closely the actual output of the network matches the desired output.

III. We change the weight of each connection so that the network produces a better approximation of the desired output.

Neural networks are very effective when lots of examples must be analyzed, or when a structure in these data must be analyzed but a single algorithmic solution is impossible to formulate. Neural networks are use as computational tools for examining data and developing models that help to identify patterns or structures in the data. The data used to develop these models is known as training data. Once a neural network has been trained, and has learned the patterns that exist in that data, it can be applied to new data. The training data must contain numeric information on both the inputs and the outputs to generate a model. The model is then repeatedly trained with this data until it learns to represent these relationships correctly. For a given input pattern or data, the network produces an output (or set of outputs), and this response is compared to the known desired response of each neuron. Correction and changes are made to the weights of the network to reduce the errors before the next pattern is presented. The weights are continually updated in this manner until the total error across all training patterns is reduced below some pre-defined tolerance level. We call this learning algorithm as backpropagation.

Process of a backpropagation

I. Forward pass, where the outputs are calculated and the error at the output units calculated.

II. Backward pass, the output unit error is used to alter weights on the output units. Then the error at the hidden nodes is calculated (by back-propagating the error at the output units through the weights), and the weights on the hidden nodes altered using these values.

The main steps of the back propagation learning algorithm are summarized below:

Step 1: Input training data.

Step 2: Hidden nodes calculate their outputs.

Step 3: Output nodes calculate their outputs on the basis of Step 2.

Step 4: Calculate the differences between the results of Step 3 and targets.

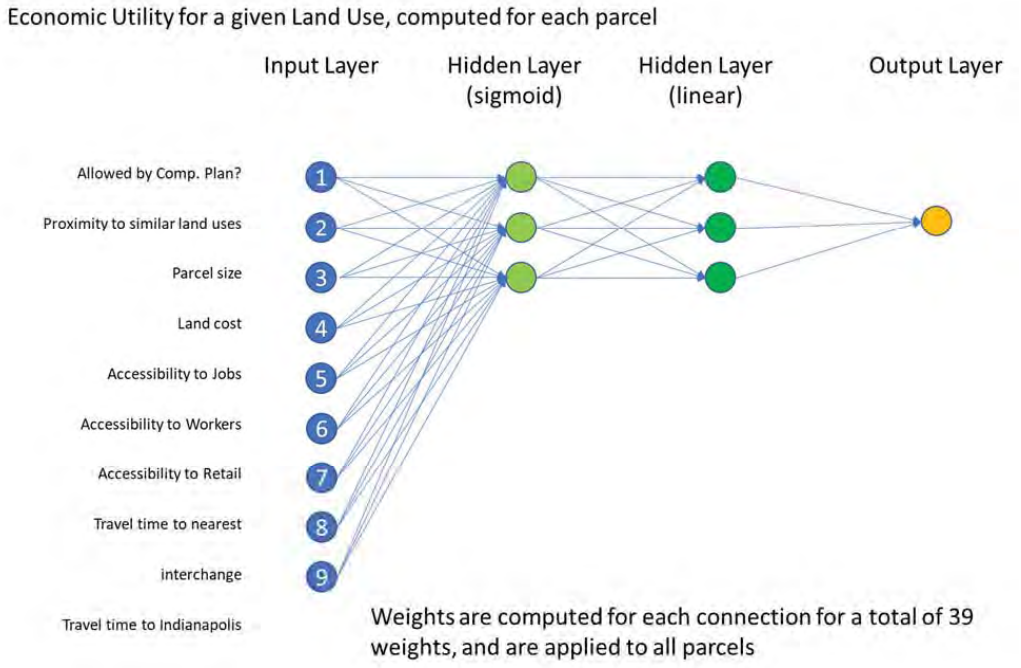
Step 5: Apply the first part of the training rule using the results of Step 4.

Step 6: For each hidden node, n, calculate d(n). (derivative)

Step 7: Apply the second part of the training rule using the results of Step 6.

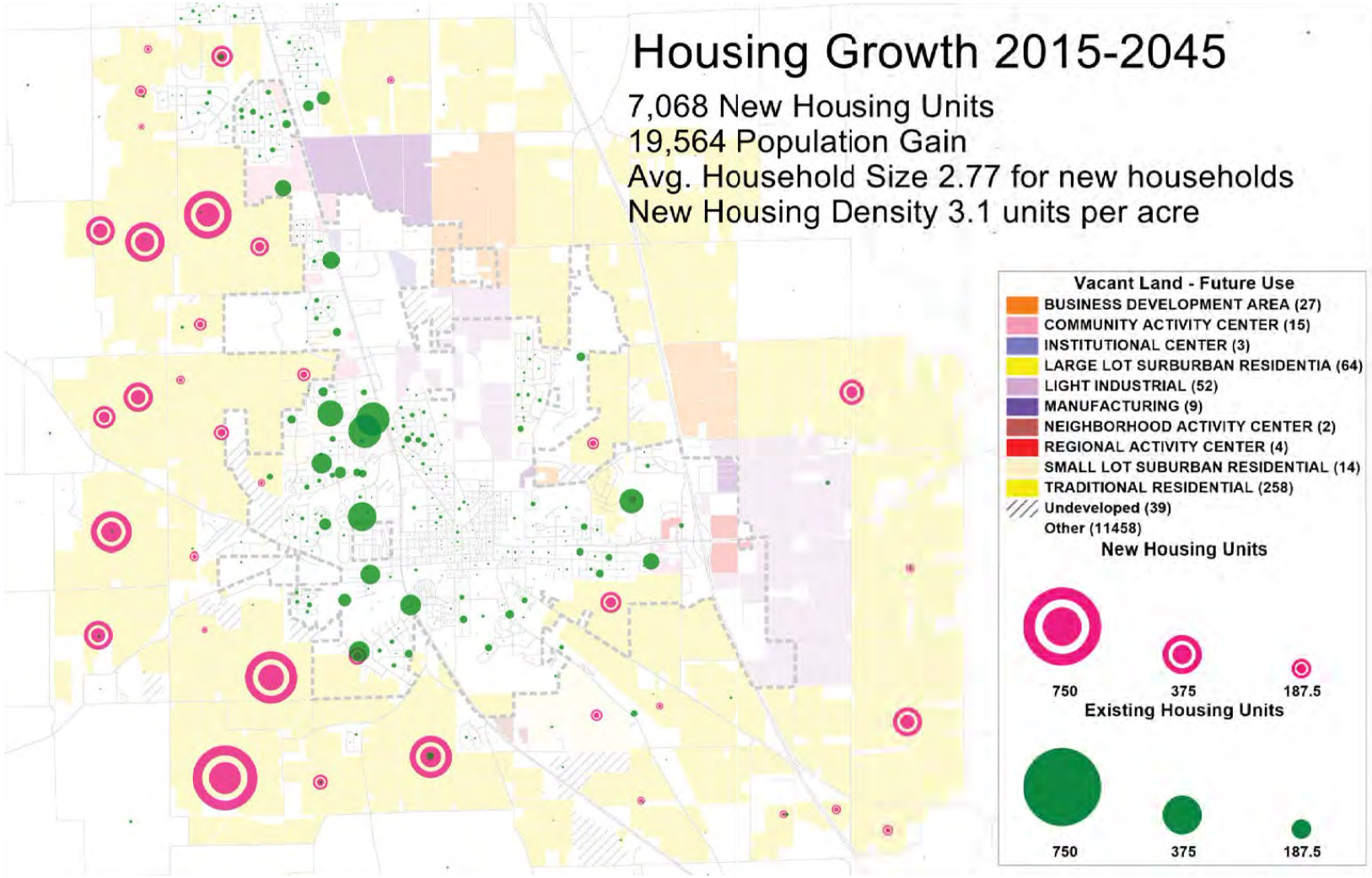
Steps 1 through 3 are often called the forward pass, and steps 4 through 7 are often called the backward pass. Hence, the name: back-propagation. For each data pair to be learned a forward pass and backwards pass is performed. This is repeated over and over again until the error is minimized.

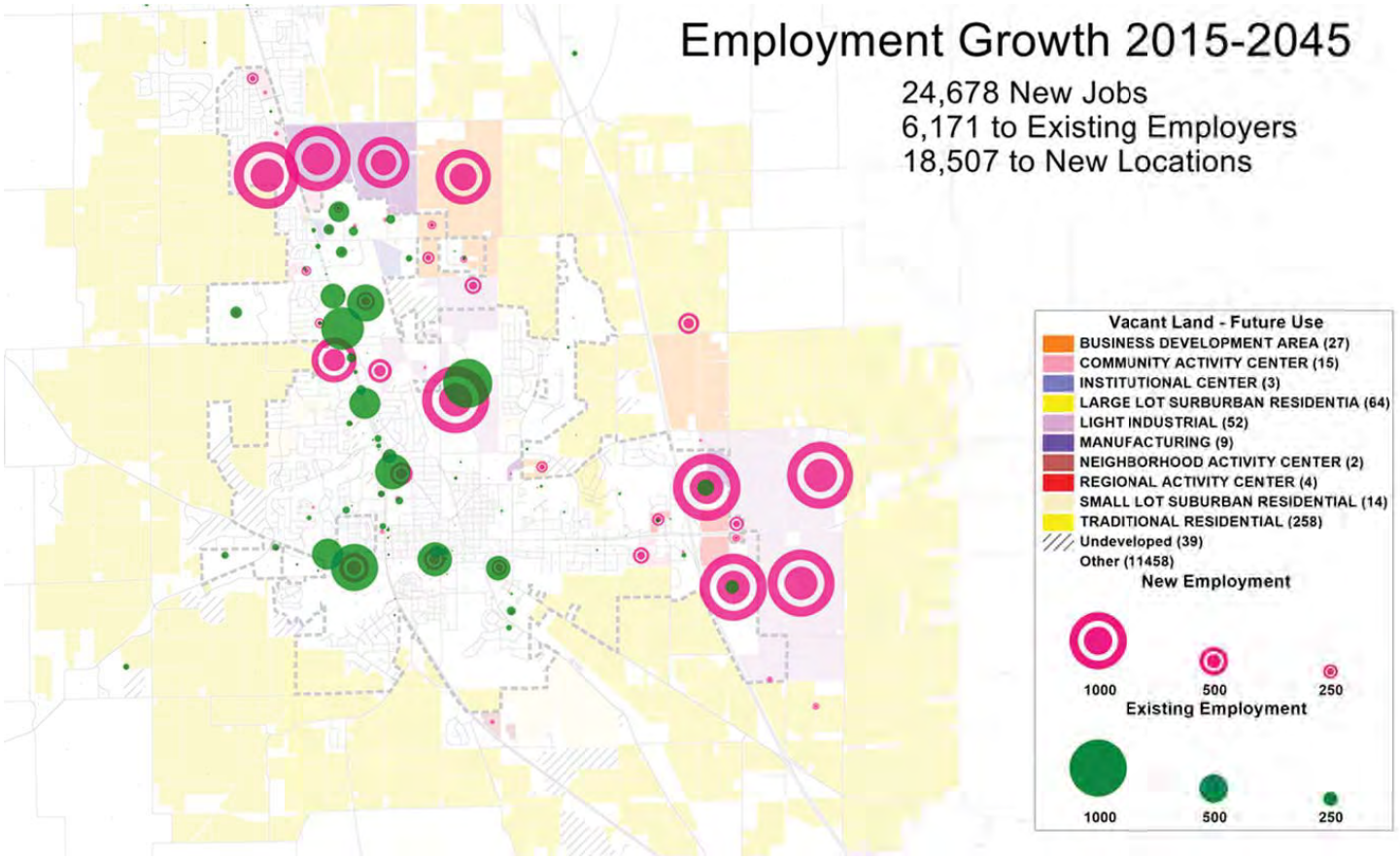
The neural network structure used in the Franklin growth allocation model is illustrated below.



Initial weights were set to random values, then four neural network models were trained using existing land use patterns for housing, retail employment, service employment, and basic employment separately. The other training inputs were obtained from the travel model

network or other local GIS layers mentioned previously. The neural network training process involved thousands of iterations until a final set of weights emerged. Once each of the neural network model's weights were estimated, then they were used in the computation of economic utility for each parcel for a given land use type. The economic utility values were then used to compute the share of growth that each parcel is predicted to receive. Summarized housing and employment growth allocation results are shown in the next two pages.


Housing Growth 2015-2045
7,068 New Housing Units
19,564 Population Gain
Avg. Household Size 2.77 for new households
New Housing Density 3.1 units per acre
Vacant Land - Future Use
BUSINESS DEVELOPMENT AREA (27)
COMMUNITY ACTIVITY CENTER (15)
INSTITUTIONAL CENTER (3)
LARGE LOT SURBURBAN RESIDENTIA (64)
LIGHT INDUSTRIAL (52)
MANUFACTURING (9)
NEIGHBORHOOD ACTIVITY CENTER (2)
REGIONAL ACTIVITY CENTER (4)
SMALL LOT SUBURBAN RESIDENTIAL (14)
TRADITIONAL RESIDENTIAL (258)
Undeveloped (39)
Other (11458)
New Housing Units
750
375
187.5
Existing Housing Units
750
375
187.5


Employment Growth 2015-2045
24,678 New Jobs
6,171 to Existing Employers
18,507 to New Locations
Vacant Land - Future Use
BUSINESS DEVELOPMENT AREA (27)
COMMUNITY ACTIVITY CENTER (15)
INSTITUTIONAL CENTER (3)
LARGE LOT SURBURBAN RESIDENTIA (64)
LIGHT INDUSTRIAL (52)
MANUFACTURING (9)
NEIGHBORHOOD ACTIVITY CENTER (2)
REGIONAL ACTIVITY CENTER (4)
SMALL LOT SUBURBAN RESIDENTIAL (14)
TRADITIONAL RESIDENTIAL (258)
Undeveloped (39)
Other (11458)
New Employment
1000
500
250
Existing Employment
1000
500
250

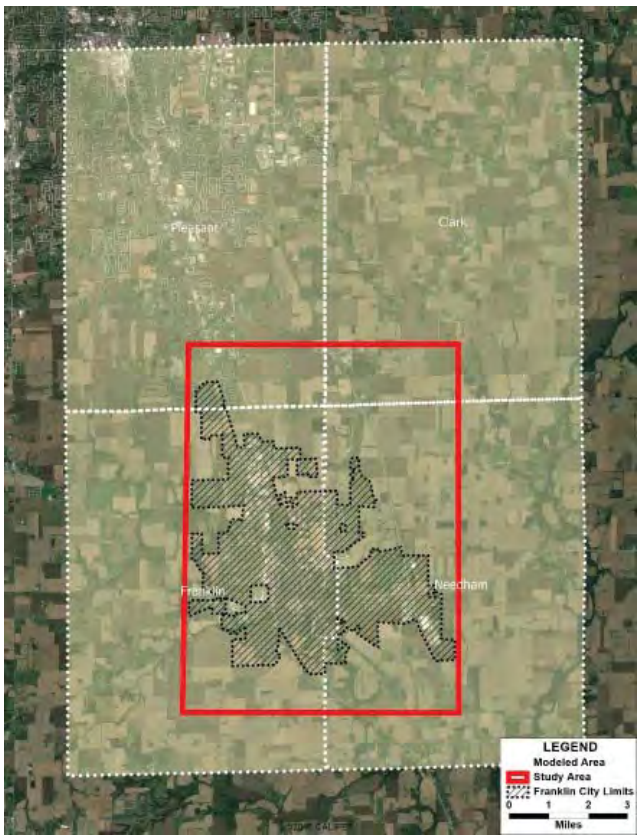
Network Modeling and Analysis

Overview

The primary purpose of the travel demand analysis was to provide insights into traffic impacts and capacity needs for the City of Franklin as it undergoes large-scale household and employment growth. The traffic analysis was developed by forecasting specific land development, and then using a travel demand model built specifically for this project to generate trips, distribute trips, assign estimated vehicle flows to the various road network scenarios, and then compute performance measures.

This section documents the development of a TransCAD travel demand model for the City of Franklin, and an evaluation of traffic conditions under various transportation and land use scenarios. The project study area (see **Figure 1**) includes the City of Franklin, surrounding adjacent areas in Johnson County, and includes I-65, US 31, and SR144 corridors. Any summary statistics cited within the Network Modeling and Analysis section pertain the study area highlighted with the red boundary in Figure 1. The travel model actually covers a wider area, such that it can include the entire I-65 corridor within Johnson County and fully includes road and traffic zone coverage for Franklin, Needham, Clark, and Pleasant Townships. Greenwood and Whiteland are included in the modeled area. The design of the modeled area was based on analysis conducted with the 2009 Central Indiana Household Travel Survey, such that it covers more than 90% of the trip destinations reported from City of Franklin households captured in the survey.

Figure 1: Project Model and Study Area



The Thoroughfare Plan's modeling analysis covered multiple alternatives to be tested for 30 year traffic forecasts:

- Base Year 2015 (for model calibration purposes)
- Base Year 2017
- No Build Future (2035 and 2045)
- Several Future Roadway Scenarios (described in detail later)

Base Model Development

A TransCAD (Version 7.0 travel demand model was developed by Convergence Planning to facilitate travel demand modeling analysis in this project. This section introduces the base model development.

Basic Model Components

The Franklin travel model is a conventional travel demand model that is similar in structure and methodology to other current area-wide models used for traffic forecasting, and relies upon the Indianapolis Metropolitan Planning Organization and Indiana Statewide Travel Demand Model (ISTDM) for data sources on household and commercial travel behavior. It uses aggregate land use/socioeconomic data and road network data to estimate facility-specific roadway traffic volumes and performance.

The model applies sequential steps:

- Trip Generation. This initial step translates household and employment data into person trip ends using trip generation rates established during model calibration. Household and commercial vehicle trip generation rates were derived from the Indy MPO model data sources.

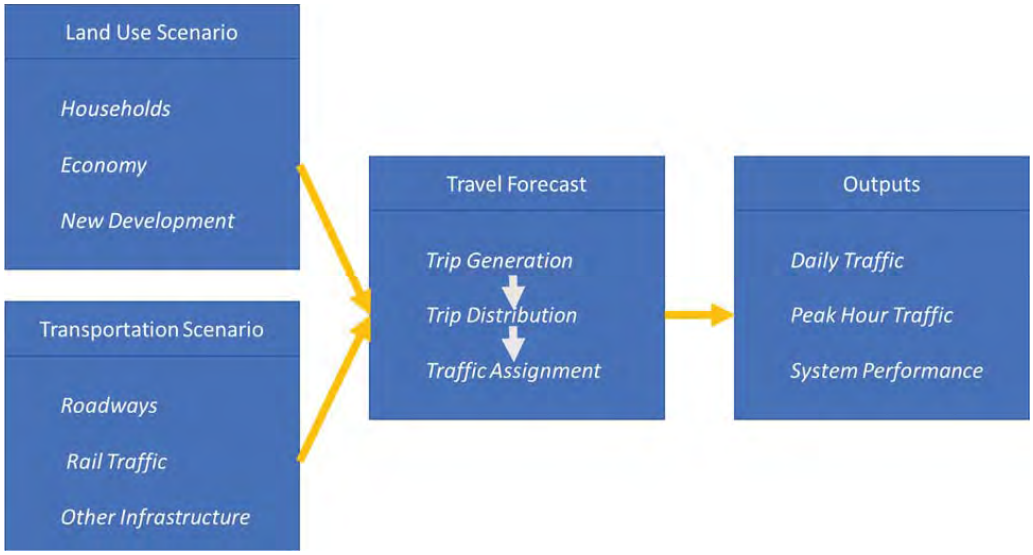
- External Trips. This step accounts for trips that pass through the study area without making a stop. For the Franklin Thoroughfare Plan, I-65, US 31, and SR 144 trips (and other combinations with other major roads) are of particular interest. External trips are discussed in a section below.

- Trip Distribution. The second general step estimates how many trips travel from one subarea of the region (defined as "transportation analysis zones") to any other zone. The distribution is based on the number of trip ends generated in each of the two zones, and on factors that relate the likelihood of travel between any two zones to the travel time between the two zones. Household and commercial vehicle trip distribution is driven by a set of friction factor curves. The friction factors are borrowed directly from the ISTDM model.

- Trip Assignment. In this final step, vehicle trips from one zone to another are assigned to specific travel routes between the zones. The assignments to roads consider the effects of traffic congestion. The model steps listed above are conducted at the daily time scale, and then AM and PM factors are used to forecast trips by purpose and time of day. AM and PM hourly factors were derived from the INDOT's 2009 NHTS Add-On household survey, and from local traffic count data.

A feedback loop is used to pass congested speeds back through the modeling steps so that the trip distribution component produces results that are consistent with modeled congestion for a given scenario.

Figure 2: Modeling Process



Network & Traffic Analysis Zones (TAZ)

The roadway network is an essential element in a network model. The Franklin base model network was developed based on a Johnson County road-centerline GIS layer which covers all roadways in the study area. To have a thorough knowledge of roadway attributes, Convergence Planning reviewed Indy MPO and INDOT data sources and aerials to collect detailed roadway information which have been coded into the network. The collected information includes:

- number of lanes
- posted speed
- travel direction
- functional classification
- intersection types
- at-grade rail crossings
- grade separated rail crossings
- traffic counts

The traffic analysis zones (TAZ) structure directly affects centroid's location and level of detail. In this project, a very detailed sub-block level TAZ was developed according to the land parcel and/or Census Block boundaries with a total of 1019 internal zones and 17 external connectors. This approach contributes to a better simulation of traffic loading/parking choice in such a compact urban area. Centroid connectors were coded to represent traffic loading and parking options for each zone.

Delays due to traffic signals and other traffic controls use the same methods as in the ISTDM model. The model network also includes at-grade railroad crossings and associated travel time delays (dependent upon RR traffic). Road delays at each rail crossing are estimated using the following method:

- Likelihood of encountering a train during each hour at each crossing (rail traffic, train length, train speed)
- Road vehicle traffic during each hour at this location
- Two classes of vehicles – no delay, delayed and wait. Based on the probability of encountering a train
- Estimate the impact on delayed vehicles using train characteristics. Aggregate vehicle hours and then compute an average delay
- A link travel time penalty (average delay per vehicle per day) is added to the model network for each crossing

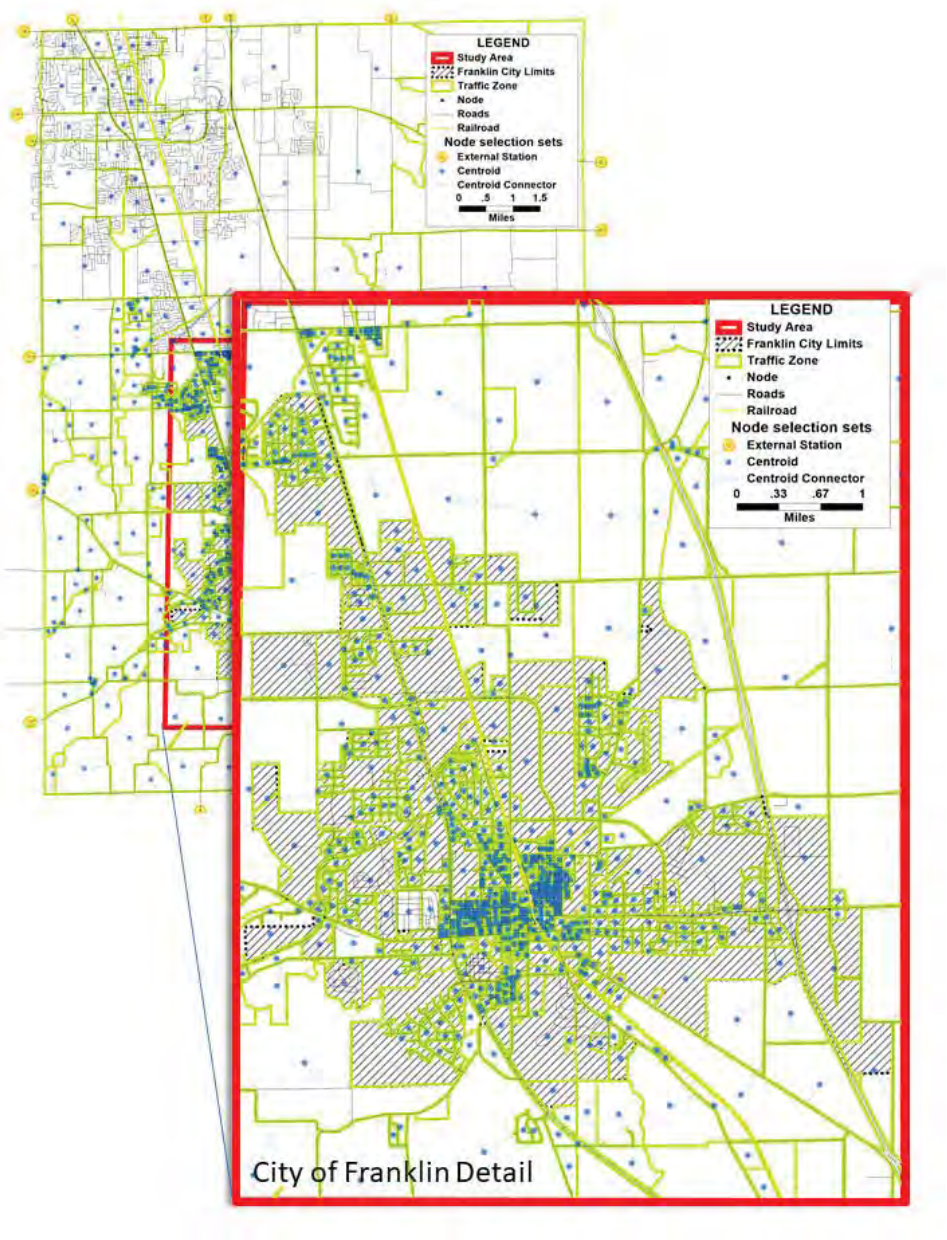
The base year model assumes 6 trains per day. Each future year assumes that this will grow to 16 trains per day, keeping all other train characteristics the same as in the base year (train speeds and lengths).

Roadway Speeds and Capacities

Network capacities vary by the functional classification and number of lanes. The Franklin model's capacities are shown below. These were derived from the ISTDM capacity methodology, but simplified so that roadway geometric inputs were not required. Likewise for travel speeds, these were based on the ISTDM methodology and were applied using an adjustment to the posted speeds. The speed adjustments account for the actual travel times on roadway links after accounting for impacts of intersections and mid-block driveways on travel speeds.

Classification	FC	FHWA FC	AB Hourly per Lane	AB Daily per Lane	Speed Adj
Interstate	1	11	2100	16000	6.57
Other Freeway	2	12	2000	15000	5.42
Principal Arterial	3	14	1400	11000	-1.81
Minor Arterial	4	16	1300	10000	-3.19
Major Collector	5	17	1250	9900	-4.02
Minor Collector	6	17	1250	9600	-4.83
Local	7	19	1125	8600	-9.65
Centroid Connector	99	99	20000	200000	0.00

Figure 3: Base Model TAZ and Network



External Travel

External stations are shown in Figure 3 above (orange dots). Each corresponds to a link in the ISTDM model, and a sub-area analysis process was used to extract the External Station trips for the base year and forecast years. Forecasts were interpolated from the INDOT forecasts to derive 2015, to 2035 and 2045 growth rates.

External trips are added to the internal-internal and internal-external/external-internal trip tables created directly with the Franklin model trip distribution structure.

Table 1: 2017 External Station Vehicle Base 2015 Trips

External TAZ	Location	Autos	Trucks
2000	I-65 at Johnson/Bartholomew Line	25050	17000
2001	US 31 at Johnson/Bartholomew Line	25524	1726
2002	Mauxferry Rd	807	89
2003	Nineveh Rd	2161	240
2004	SR 44 West	1509	168
2005	SR 144 West	12600	1400
2006	Whiteland Rd West	8820	980
2007	Smith Valley Rd	17703	1967
2008	Main St. Greenwood	6120	680
2009	County Line Rd West	27000	3000
2010	US 31 at Johnson/Marion Line	36656	4072
2011	Emerson Ave	16566	1840
2012	I-65 at Johnson/Marion Line	37219	26687
2013	E. Rocklane Rd	786	87
2014	Clark School Rd	576	64
2015	SR 44 East at Johnson/Shelby Line	1575	175
2016	N. Franklin Rd at Johnson/Marion Line	265	29

Trip Generation and Distribution

The Franklin model's trip generation procedure uses household trip generation rates taken from the Indianapolis MPO travel demand model, but collapses the trip purposes and market segmentation into a simplified format. The MPO trip generation rates are derived from the 2009 Central Indiana Household Travel Survey. Truck trip rates (and external truck trips) are taken directly from the Indiana Statewide Travel Demand Model. Household trip generation rates are shown below.

Franklin Trip Generation Rates					
Trip Purpose	**Household Auto Ownership**	**Household Size**			
		1 Person	**2 Persons**	**3 Persons**	**4 Persons**
Home Based Work	0 Vehicles	0.14	0.48	0.67	0.81
Home Based Work	1 Vehicle	0.71	0.98	1.09	1.23
Home Based Work	2 Vehicles	0.81	1.62	2.00	1.91
Home Based Work	3+ Vehicles	0.99	2.03	2.38	2.79
Home Based Other	0 Vehicles	1.78	3.27	5.38	8.83
Home Based Other	1 Vehicle	1.87	3.91	5.51	8.97
Home Based Other	2 Vehicles	1.89	3.75	5.48	10.55
Home Based Other	3+ Vehicles	1.98	3.54	5.18	8.71
Non-Home Based	0 Vehicles	0.96	1.55	1.20	1.53
Non-Home Based	1 Vehicle	0.97	1.56	1.31	2.76
Non-Home Based	2 Vehicles	1.08	1.64	2.00	3.17
Non-Home Based	3+ Vehicles	1.22	1.77	2.16	2.79
Note: Home Based Other includes Shopping, K-12 School, and University Trips					

The Franklin model uses a gravity type trip distribution model and is based on friction factor tables calibrated by trip purpose. The friction factors are derived from the 2009 National Household Travel Survey, Indiana Add-on. Friction factors are shown in the table below.

Gravity Model Parameters

Travel Time in Minutes	HBW	HBO	NHB	Truck
0	1606942	853462	157035	8809
1	1621942	859462	168042	9657
2	1636942	861462	177233	10612
3	1647970	861962	184836	12288
4	1650640	861800	190797	14303
5	1639527	850499	195644	16204
6	1610682	828174	197496	17978
7	1581554	781350	195675	19690
8	1525249	719836	191168	21018
9	1442543	614632	178400	22559
10	1275589	449000	143391	23177
11	1039155	322797	105142	23432
12	760262	228383	73548	23608
13	448614	159019	57855	23637
14	258182	108965	45057	23505
15	160961	73481	34741	22970
16	121956	48766	26521	22714
17	102121	31850	20044	21972
18	85086	20471	14998	20969
19	70539	12949	11111	19955
20	58187	8061	8149	19197
21	47759	4938	5918	18565
22	39004	2977	4928	17863
23	31695	1767	4087	17049
24	25627	1032	3377	16388
25	20618	593	2779	15593
26	16505	335	2277	15023
27	13147	187	1859	14417
28	10419	102	1511	13909
29	8217	55	1224	13409
30	6634	29	987	12835

Note: this table is truncated at 30 minutes, but the model allows for times up to 120 minutes

Model Validation

The ultimate test of a travel demand model is its ability to accurately predict traffic volumes on the transportation system. Therefore, in many areas traffic counts are the primary data parameter used for model validation. As discussed below, a number of checks are used to compare the model's simulated link values with the traffic counts.

Error statistics reported and used for diagnosing the possible sources of model errors include:

- percent root mean square errors (% RMSE),
- systemwide average error,
- mean loading errors and percentage errors, and
- total VMT errors and percentage errors.

Actual traffic counts available for the Franklin study area are shown in Figure 5. The base year network model for Franklin was validated by comparing the differences between observed daily traffic counts and assigned model daily volumes on the network links. System-wide validation statistics were broken out by roadway functional classification and volume-group range. The process resulted in a well-validated model, that complies with FHWA and INDOT guidelines regarding goodness of fit. See table and figure below.

Functional Classification	%RMSE	%Error	%VMT error	FHWA Error Standard
Interstate	17.7%	4.2%	0.2%	7.0%
Major Arterial	12.3%	-0.5%	0.7%	15.0%
Minor Arterial	25.1%	-2.9%	-3.3%	15.0%
Collector	31.5%	3.1%	1.3%	25.0%
Local	135.1%	-51.9%	-37.4%	50.0%
Volume Group (Daily)	%RMSE	%Error	%VMT error	FHWA Error Standard
Under 1000	53.3%	11.6%	-0.5%	47%
1000 to 2500	30.6%	5.2%	-1.4%	36%
2500 to 5000	25.6%	0.6%	5.2%	30%
5000 to 10000	19.6%	3.1%	1.9%	24%
10000 to 15000	15.7%	-0.9%	-0.9%	20%
15000 to 25000	16.7%	-2.5%	-2.7%	15%
25000 to 50000	24.5%	-5.7%	-0.7%	10%
Overall Model	23.4%	-1.1%	-0.4%	

Table 2 – Model Validation Statistics

Figure 4 Percent error by link volume compared to FHWA standard

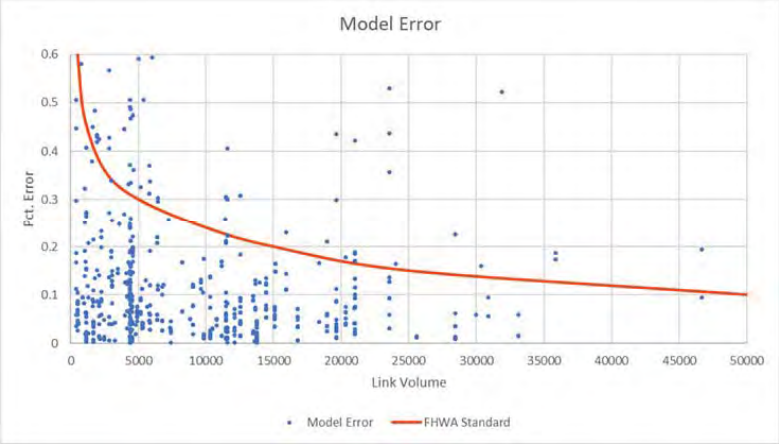
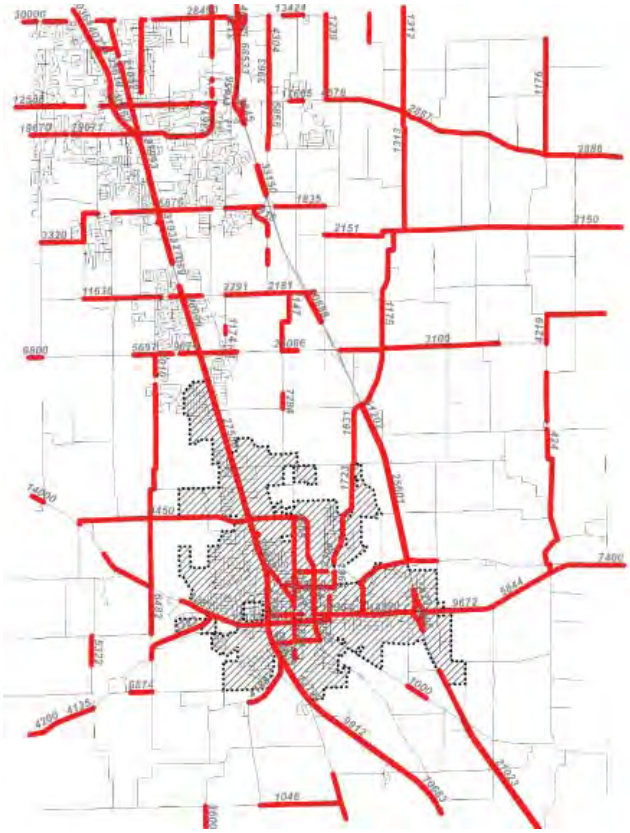
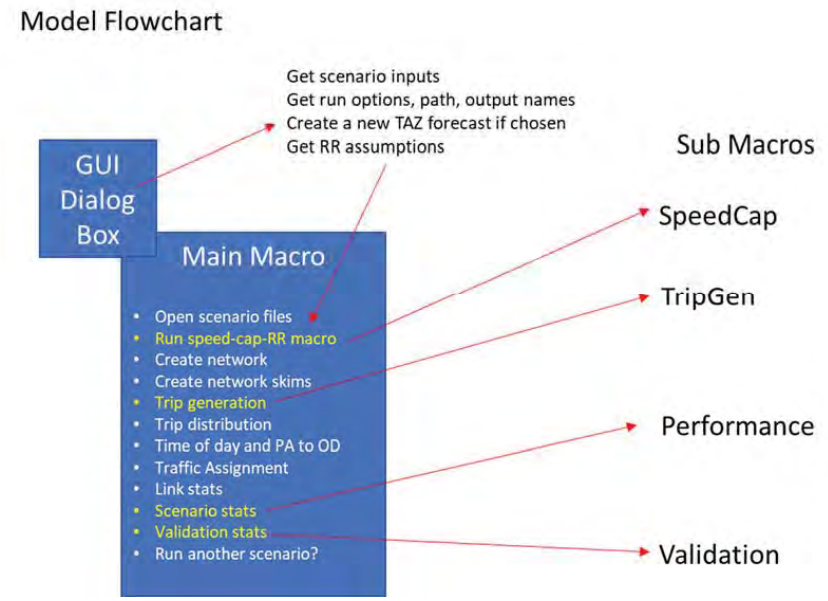


Figure 5 – Model Links with Traffic Data for Model Validation



Model Implementation

The Franklin model is implemented in an automated script and graphical interface within TransCAD using the GIS Developer Kit scripting language. The model procedures are run in sequence to estimate travel demand, roadway traffic, and system performance. The model's main macros are shown in the flow chart below, as well as the main tabs within the graphical user interface (GUI). The GUI allows the model user to choose inputs and conduct model runs without needing knowledge of the underlying scripting environment.



Graphical User Interface (GUI)