

Guilford Township

**THE CENTRAL INDIANA
TRANSIT PLAN**

YOUR INPUT, YOUR TRANSIT.



FINAL REPORT

February 2020



Table of Contents

Contents

1. Introduction	1
1.1. Planning Context	1
1.2. Study Goals.....	1
1.3. Study Area	2
1.4. Planning Process.....	2
1.5. Regional Transit Studies	2
2. Transit Planning Concepts	5
3. Population, Employment, and Commuting	7
3.1. Population Characteristics	7
3.2. Employment and Commuting Patterns.....	10
4. Existing Transit Services.....	13
4.1. Hendricks County LINK.....	13
4.1.1. Funding	14
4.1.2. Performance	15
4.1.3. Guilford Township Trip Patterns.....	17
4.2. Plainfield Connector.....	20
4.2.1. Funding	20
4.2.2. Performance	21
4.2.3. Ridership Patterns.....	22
4.3. Other Transportation Services	26
4.3.1. My Freedom Vouchers.....	26
4.3.2. Commuter Connect.....	26
5. Public and Stakeholder Input.....	28
5.1. Stakeholder Interviews	28
5.2. Public Survey	29
5.3. Transit Advisory Team.....	31
5.4. Public Meetings.....	33
6. Preliminary Alternatives	35

6.1.	Guilford Township Transit System Budget.....	35
6.2.	Guilford Township Transit Plan Objectives	35
6.3.	Preliminary Alternatives.....	36
7.	Alternatives Evaluation	42
7.1.	Financial Factors.....	42
7.2.	Service Factors	44
7.3.	Input from the Public	45
7.4.	Evaluation Results	46
8.	Recommended Transit Network.....	48
8.1.	Fixed Route Recommendations	48
8.2.	Other Recommended Services.....	48
8.3.	Estimated Costs	50
8.4.	Estimated Benefits	50
8.5.	Summary	51
	Appendix A – Demographic, Employment, and Commuting Maps.....	52
	Appendix B - Guilford Township-Plainfield Transit Advisory Team.....	60
	Appendix C - Public Meeting Summary	62
	Appendix D - Expanded Demand-Response Service.....	73
	Appendix E - Glossary of Acronyms	77

List of Tables

Table 1.	Household Population by Income.....	8
Table 2.	LINK Performance, 2018	16
Table 3.	LINK Trip Counts by Origin/Destination City or Town, September 2019.....	18
Table 4.	Plainfield Connector Performance, 2018.....	21
Table 5.	Passenger Commute Times.....	22
Table 6.	Top Plainfield Connector Passenger Requests.....	22
Table 7.	Commuter Connect Participation	27
Table 8.	Projected Transit Tax Revenue	35

Table 9. Financial Factors Alternatives 1-4 43

Table 10. Service Factors Alternatives 1-4..... 44

Table 11. Public Alternative Preference per Coin Allocation Exercise 46

Table 12. Recommended Transit Network Financial and Service Factors 51

Table 13. Demand-Response Operating Costs/Outputs by Year 73

Table 14. Demand-Response Capital Costs by Year 74

Table 15. Total Demand-Response System Cost by Year 74

Table 16. Estimated TNC Partnership Costs 76

Table 17. Total Estimated Cost for Demand-Response Alternative 76

List of Figures

Figure 1. Plainfield and Guilford Township Location Map..... 4

Figure 2. System Objectives - Ridership vs Coverage 5

Figure 3. Route Planning Objectives 6

Figure 4. Population Growth in Hendricks County and Guilford Township, 2010-2018 7

Figure 5. Guilford Township Population Density 9

Figure 6. Commuting Patterns in and out of Guilford Township..... 10

Figure 7. Guilford Township Employment Density 11

Figure 8. Commuting Patterns of Guilford Township Residents 12

Figure 9. Hendricks and Morgan County Transit Organizations 13

Figure 10. LINK Vehicle 14

Figure 11. Hendricks/Morgan County Transit Operating Expenses 15

Figure 12. Hendricks County LINK Origins and Destinations - Plainfield Addresses 19

Figure 13. Plainfield Connector Vehicle 20

Figure 14. Plainfield Connector Origins and Destinations - Plainfield Addresses 23

Figure 15. North Plainfield Connector Ridership by Stop 24

Figure 16. South Plainfield Connector Ridership by Stop 25

Figure 17. Commuter Connect Vanpool Vehicle 27

Figure 18. Suburban Transit Planning Workshop 32

Figure 19. Public Meeting Presentation 33

Figure 20. Transit Alternative Network 1 37

Figure 21. Transit Alternative Network 2 39

Figure 22. Transit Alternative Network 3 41

Figure 23. Recommended Guilford Township Transit Network 49

Figure 24. Percent of Population below Poverty Level, Guilford Township..... 53

Figure 25. Percent of Zero Vehicle Households (ZVH), Guilford Township 54

Figure 26. Older Adult (65+) Population Density, Guilford Township 55

Figure 27. Where Employees Live who Work in Census Tract 2109 56

Figure 28. Where Employees Live who Work in Census Tract 2108.02 57

Figure 29. Where Employees Live who Work in Census Tract 2106.07 58

Figure 30. Where Employees Work who Live in Guilford Township 59

1. INTRODUCTION

1.1. PLANNING CONTEXT

The Indianapolis Metropolitan Planning Organization (IMPO) initiated the Guilford Township Transit Plan to investigate the feasibility of expanded public transit within the local community and to consider a system connection with Indianapolis. The plan is based on data analysis and public feedback for determining an effective service plan for the area, including recommendations on modes of service, potential ridership, system funding, network routing, and service parameters.

This final report is provided as a chapter of the Central Indiana Transit Plan, ensuring that regional and suburban connections are considered. The Central Indiana Transit Plan is used by the IMPO and its member jurisdictions to guide transit service development as new sources of public transit revenue are established.

The Marion County element of the Central Indiana Transit Plan was developed in 2014 and was approved by the voters and the City of Indianapolis in 2016 and 2017, with new service rolling out in 2018. IndyGo, the public transit provider for Indianapolis and Marion County, has launched the Red Line bus rapid transit service and expanded the days and hours of fixed route bus service over the past year. Additional service improvements are scheduled for construction and implementation over the next five years.

1.2. STUDY GOALS

Guilford Township is one of the Central Indiana townships and counties authorized under Indiana Code 8-25-2 to conduct a voter referendum on establishing a dedicated local source for revenue for public transit. Other jurisdictions allowed to conduct referenda under the statute are Hamilton, Hancock, Johnson, Delaware, and Madison Counties, and their respective townships.

The purpose of this study is to develop a realistic and effective transit plan that responds to the specific needs and opportunities of Plainfield and Guilford Township. The plan is intended to provide a clear vision for the public to consider in the event Guilford Township goes forward with a transit funding referendum. The following goals have been established to meet this purpose:

- Goal 1: Assess mobility opportunities and challenges of expanding transit service in Guilford Township/Plainfield
- Goal 2: Inform Guilford Township/Plainfield residents about their options and tradeoffs, and collect community input
- Goal 3: Prepare a transit plan for Guilford Township to present to voters in November 2020

1.3. STUDY AREA

The study area of the Guilford Township Transit Plan is shown in **Figure 1**. It includes all of Guilford Township and all of the Town of Plainfield, including areas of the town that extend beyond the township to the north and west.

1.4. PLANNING PROCESS

The IMPO procured the services of HNTB and its subcontractor, RLS & Associates, Inc. to support the development of the Guilford Township Transit Plan. The IMPO transit planning team launched the planning process in October 2019. Baseline demographic information was compiled and a review of previous transit studies for the region was conducted.

As existing conditions were being defined, the IMPO initiated the public involvement process by forming the Plainfield-Guilford Township Transit Advisory Team. A list of Advisory Team members is included in **Appendix B**. A public survey was conducted in November 2019 and stakeholder interviews were conducted with local groups and agencies involved with public transportation. Information gathered during these interviews and the survey was compiled to provide a description of existing transit service and mobility needs in the study area.

Drawing from the baseline data on demographics, existing system characteristics, and public input from interviews and surveys, the study team developed a draft transit network and service plan concepts for review with the Transit Advisory Team. Following this review, four transit system options were presented to the public for input in January 2020. Based on this input, the plan was finalized, and the results are presented in this report.

1.5. REGIONAL TRANSIT STUDIES

This report details specific recommendations for a transit service in Guilford Township as part of the Central Indiana Transit Plan, but Guilford Township has historically been included in many other regional transit studies such as the Coordinated Human Services Transportation Plan, the Indianapolis MPO's 2045 Long-Range Transportation Plan, and Central Indiana Regional Rural and On-Demand Transportation Study.

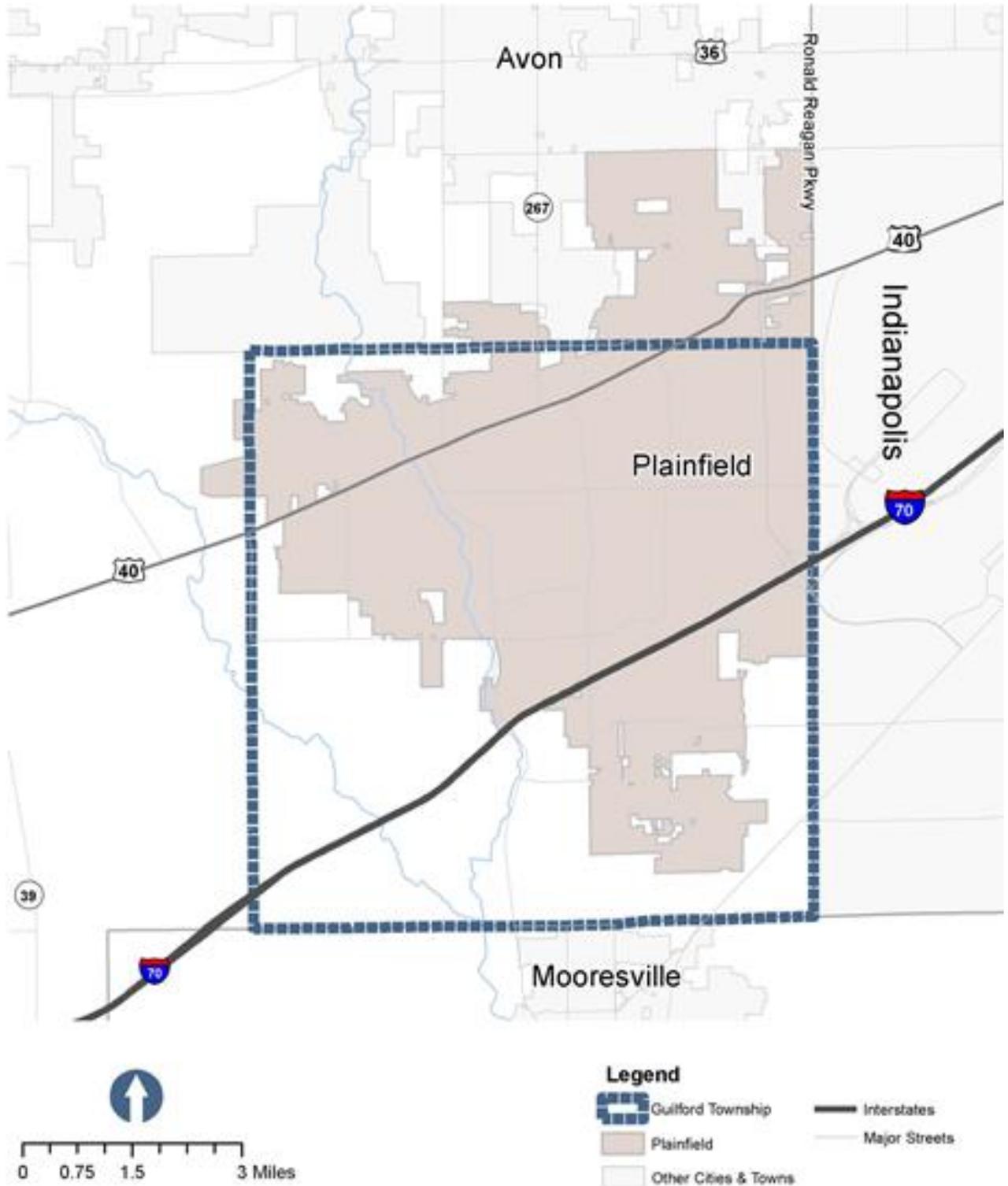
These regional studies help frame this Guilford Township plan by contextualizing the state of transit in Central Indiana and Hendricks County:

- Indianapolis ranked 86th in transit investment per capita in 2016 despite being ranked as the 33rd largest metropolitan region in the country.
- Bus rapid transit was identified as a key service for strengthening Central Indiana's transportation network, and one of the recommended (and now planned) BRT routes will travel nearly to the Marion/Hendricks County line at the Indianapolis International Airport at 10-minute frequency. This is one of three BRT lines planned for Central Indiana.

- Rural, on-demand providers, such as LINK Hendricks County, currently do not have the resources to operate outside of their respective counties.
- Hamilton and Hendricks counties were identified as the two counties with the greatest increase in commuters to and from the respective counties in the current 2045 Long-Range Transportation Plan.

This plan provides a recommendation of what transit could look like in Guilford Township based on public feedback in relation to the current state of transportation projects, needs, and commute patterns.

Figure 1. Plainfield and Guilford Township Location Map

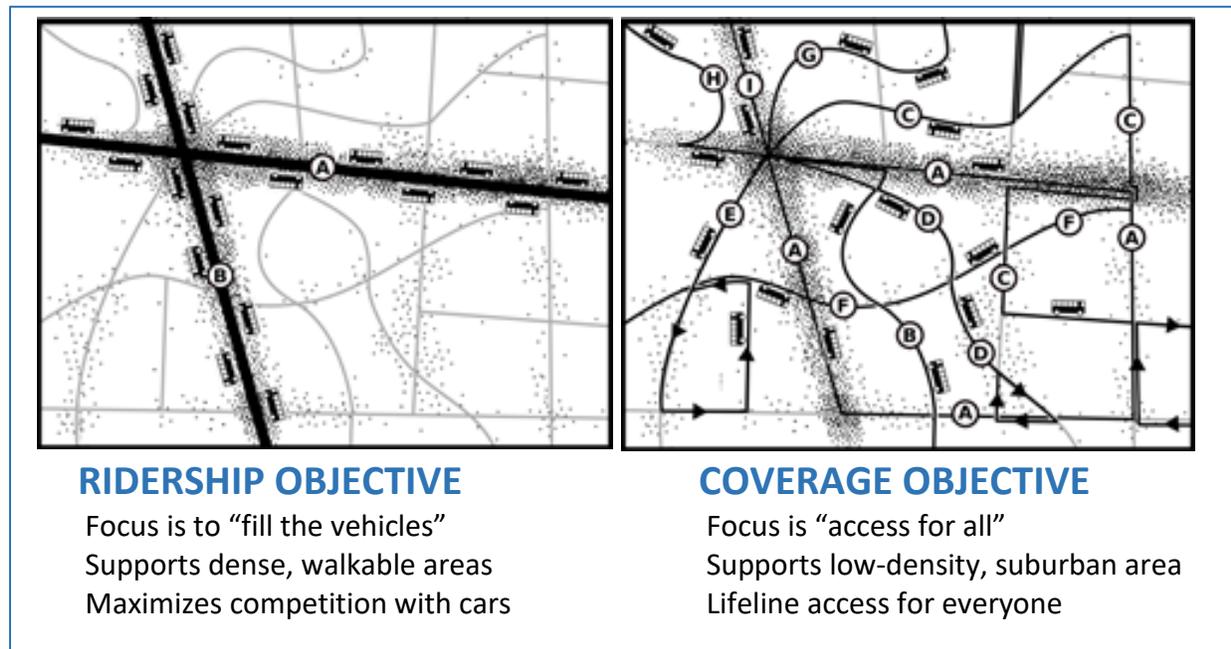


2. TRANSIT PLANNING CONCEPTS

The analysis of transit alternatives requires a basic understanding of system transit planning concepts so that options are realistic, effective, and suitable for meeting the needs of the community. Each meeting of the Transit Advisory Team and each public meeting included a review of transit planning concepts and tradeoffs to provide a basis for plan development. These concepts relate to system objectives, route planning, service levels, and connectivity – all within the context of limited available resources. A summary of the most important transit planning concepts is provided below.

System Objectives in this context refers to the fundamental question of “ridership” versus “coverage.” A ridership objective requires service to be concentrated in the most densely developed, heavily traveled corridors, with minimal or no service in the rest of the service area. A coverage objective requires service to be spread throughout the service area to maximize system access, regardless of the number of riders using the service, and includes non-linear routing and demand-response services. These objectives are illustrated in **Figure 2**. In reality, all transit systems are designed to serve both objectives to some degree. Finding the best balance of these competing objectives is a key element of transit system planning.

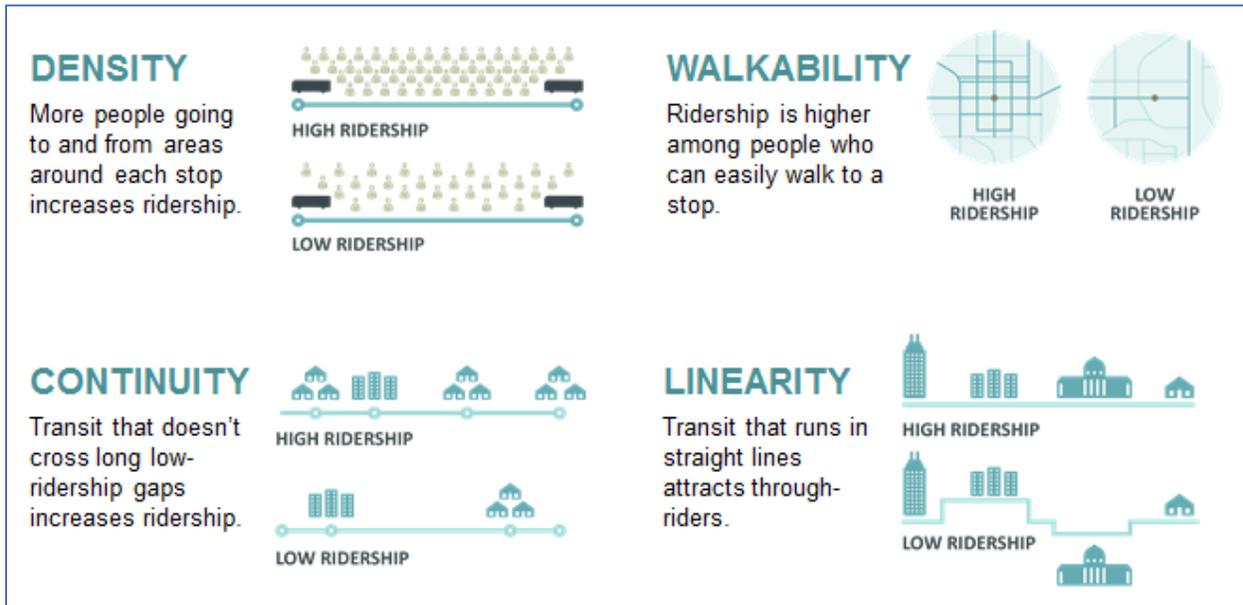
Figure 2. System Objectives - Ridership vs Coverage



Source: Images from “Human Transit,” by Jarrett Walker, December 11, 2011

Route Planning refers to the actual path chosen for the vehicle to travel. Higher ridership is achieved by routes that travel through dense areas with good pedestrian access using a direct path that connects locations of high demand. These concepts are illustrated in **Figure 3**.

Figure 3. Route Planning Objectives



Source: Images from “Human Transit,” by Jarrett Walker, December 11, 2011

Service Level relates to the frequency and span (period of the day) that service is provided. High frequency service typically refers to 10-minute or similar headways (times between vehicles). At this frequency, riders know a vehicle will arrive soon so they do not need a schedule. Low frequency service can be headways of an hour or more. Span is determined by the number of hours a day transit service is provided, which can make all the difference for employment centers operating with multiple work shifts.

Connectivity in this context relates to the ability to move beyond the service area of the transit service, either by route extensions outside the service area or by linking with transfer points to adjacent services. An example of connectivity is the link between the Plainfield Connector and IndyGo Route 8 at the Bridgeport Road transit stop in Marion County.

These transit planning factors are a consideration in the development and evaluation of all transit alternatives, whether they be fixed route, demand responsive, or a combination of both. The ability to balance these factors effectively to achieve system goals must be done within the constraint of available resources.

3. POPULATION, EMPLOYMENT, AND COMMUTING

3.1. POPULATION CHARACTERISTICS

Guilford Township and Plainfield represent a fast-growing suburban community on the southwestern edge of the Indianapolis metropolitan area, as shown in **Figure 1**. Guilford Township and Plainfield have experienced rapid development in recent decades, both in residential population and business activity. The community has leveraged its proximity to the Indianapolis International Airport by developing adjacent areas of land for logistics and warehousing. As a result, the area is home to dozens of employers that collectively employ tens of thousands of individuals who commute into the area from outside of the township.

Figure 4 shows population growth trends in Hendricks County since 2010. Guilford Township’s population, currently 33,659, has increased by 20.5 percent since 2010. Plainfield’s population has trended parallel to Guilford Township, growing by 23.7 percent in the same period, to 34,386. The community has grown more rapidly than Hendricks County, whose total population increased from 145,912 to 163,758, or 14.5 percent, from 2010 to 2018. Over the eight-year period, growth in Plainfield’s population accounted for 31.3 percent of the county’s total growth, and growth in Guilford Township accounted for 27.1 percent of the county’s growth.

Figure 4. Population Growth in Hendricks County and Guilford Township, 2010-2018

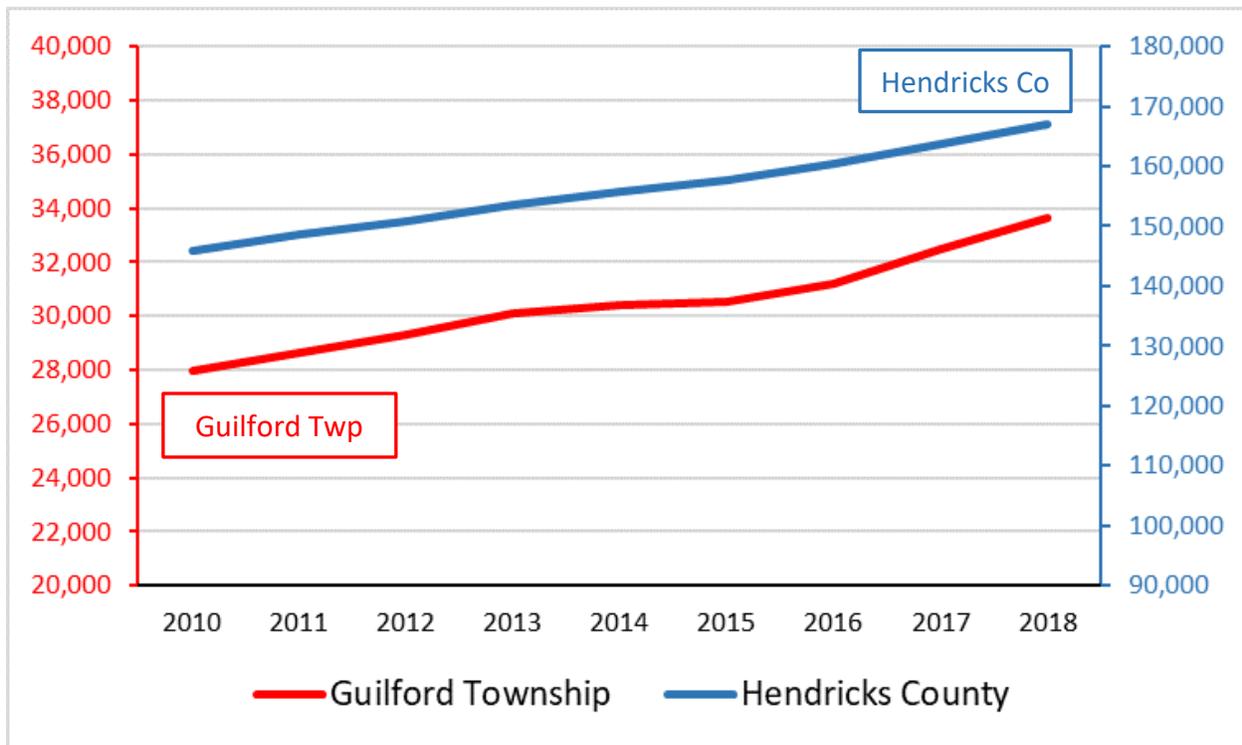


Figure 5 shows population density by Census block group in Guilford Township and Plainfield. The map includes block groups that lie wholly or partially within Plainfield’s boundaries. The highest levels of population density are located close to the town’s historic downtown core and southeast of the downtown.

The Town of Plainfield has a median household income of \$62,171 (compared to \$64,944 for Central Indiana) and a poverty rate of 8.6 percent (compared to 13.8 percent for Central Indiana). The average household income is higher, at \$81,248. **Table 1** shows the range and distribution of average household income in the study area.

Table 1. Household Population by Income

2019 Household Income Brackets	Household Population	% Household Population
Less than \$25,000	1,492	9%
\$25,000-\$49,999	2,959	18%
\$50,000-\$74,999	2,667	16%
\$75,000-\$99,999	1,595	10%
\$50,000-\$99,999	4,262	26%
\$100,000-\$199,999	2,871	18%
\$200,000 or Greater	447	3%

Source: Esri Community Analyst

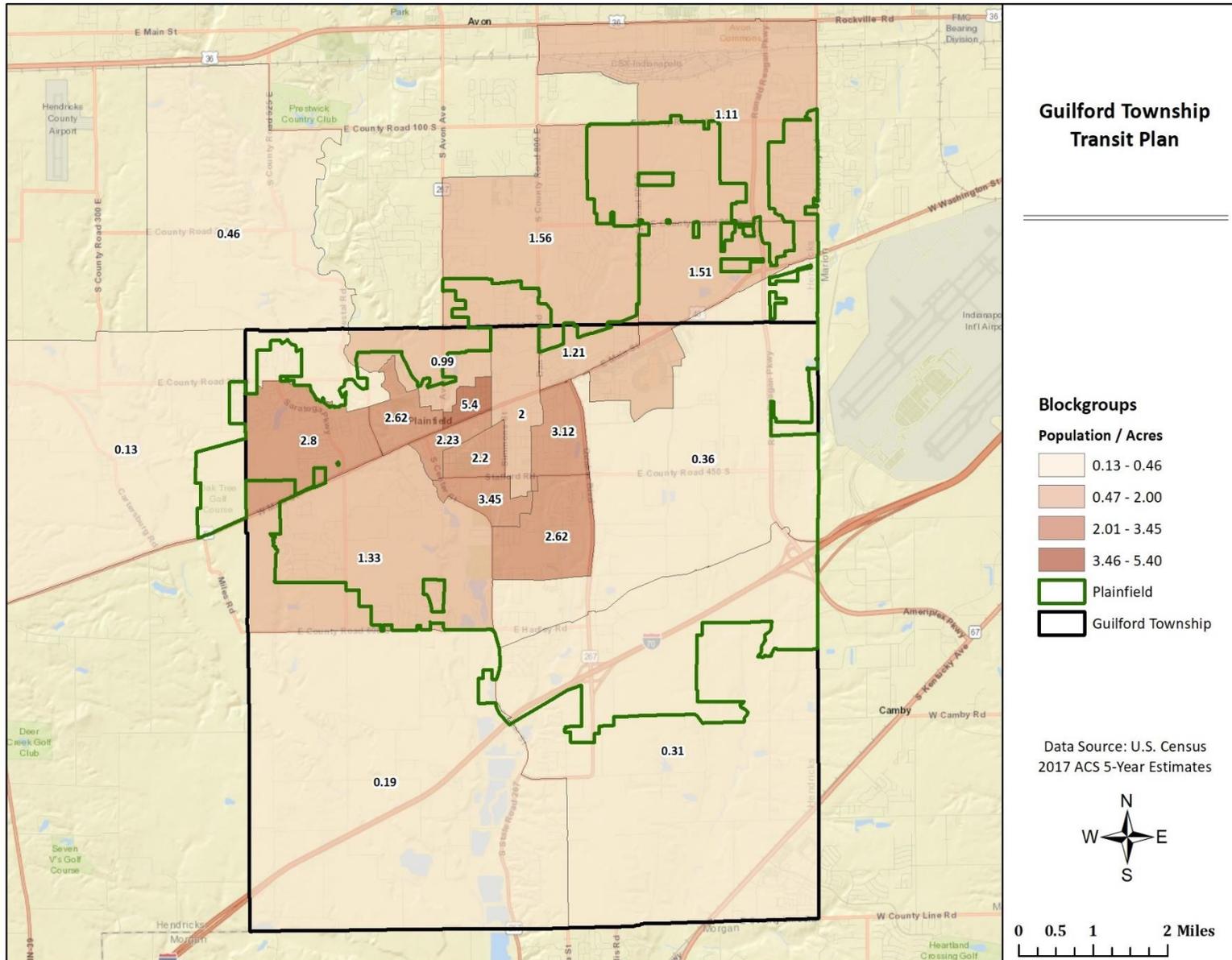
Figure 24 in **Appendix A** displays poverty rates by block group in Guilford Township. Moderate rates of households in poverty (5.4 percent to 15.8 percent) are present in the town’s downtown core, north of U.S. Highway 40. Higher rates of households in poverty (15.9 percent to 22.6 percent) are present on the east side of the town, clustered around the U.S. 40 corridor.

The number of zero-car households in Guilford Township is displayed in **Figure 25** in **Appendix A**. One Census block group, located in the Plainfield downtown area, has a significantly higher rate of zero-car households (18.3 percent) than all other block groups. The rate is also significantly higher than the percentage of zero-car households for the entire region, at 6.6 percent.

Figure 26 in **Appendix A** provides a map of older adult (people age 65 or older) population density in Guilford Township. The highest densities of older adults reside directly to the east and southeast of downtown Plainfield.

GUILFORD TOWNSHIP TRANSIT PLAN

Figure 5. Guilford Township Population Density



3.2. EMPLOYMENT AND COMMUTING PATTERNS

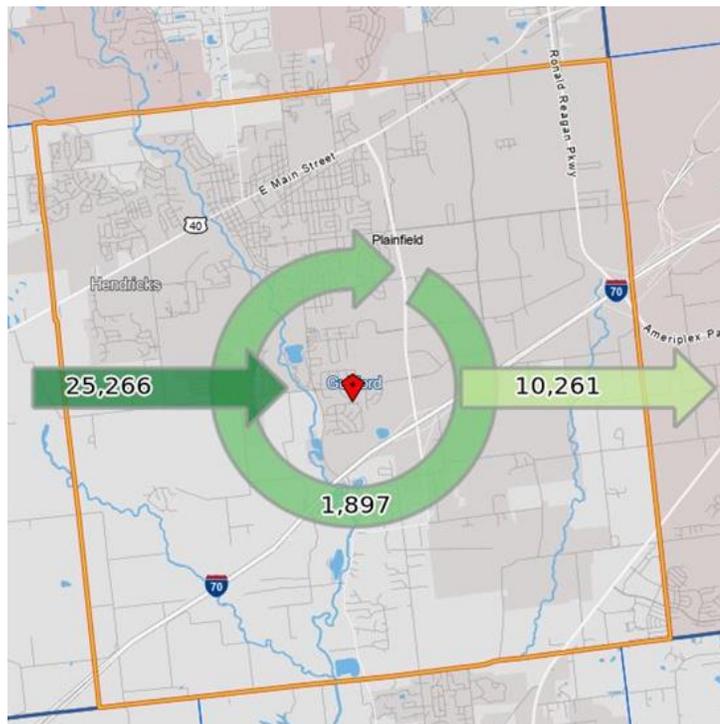
Statistics on the residential locations of the employees commuting to the Plainfield area were obtained from the U.S. Census Longitudinal Employer-Household Dynamics (LEHD) Program. Plainfield and Guilford Township experience high volumes of commute inflow and outflow, as shown in **Figure 6**. There are 25,266 individuals who work in Guilford Township for their primary jobs but reside outside of the township. Of the working residents of Guilford Township, 10,261 work outside the township. Only 1,897 residents (16%) both live and work in the township.

Figure 7 displays employment density for Guilford Township Census tracts. Three Census tracts in the study area are locations of moderate to high densities of jobs (1.20 to 4.36 jobs per acre). Most employed residents of Guilford Township rely on their car, truck, or van to get to work (93.3 percent). Of the 93.3 percent that use a car, truck, or van, 85.8 percent drive alone while 7.5 percent carpool. Taxicab, motorcycle, or other means accounted for 1.4 percent of modes workers choose to get to work, while 1.2 percent of workers walked. Bicycles are used by 0.1 percent of Guilford Township workers and public transportation is estimated at 0.0 percent. Just over 4 percent of workers work from home.

There are 27,163 primary jobs held by employees coming to Guilford Township. Thirty-five percent of these employees commute less than ten miles to their primary job. Another 35 percent of employees commute 10 to 24 miles to their primary job. Over 10,000 employees are commuting from northeast for their primary jobs in Guilford Township; 37.5 percent of these employees are coming from Indianapolis.

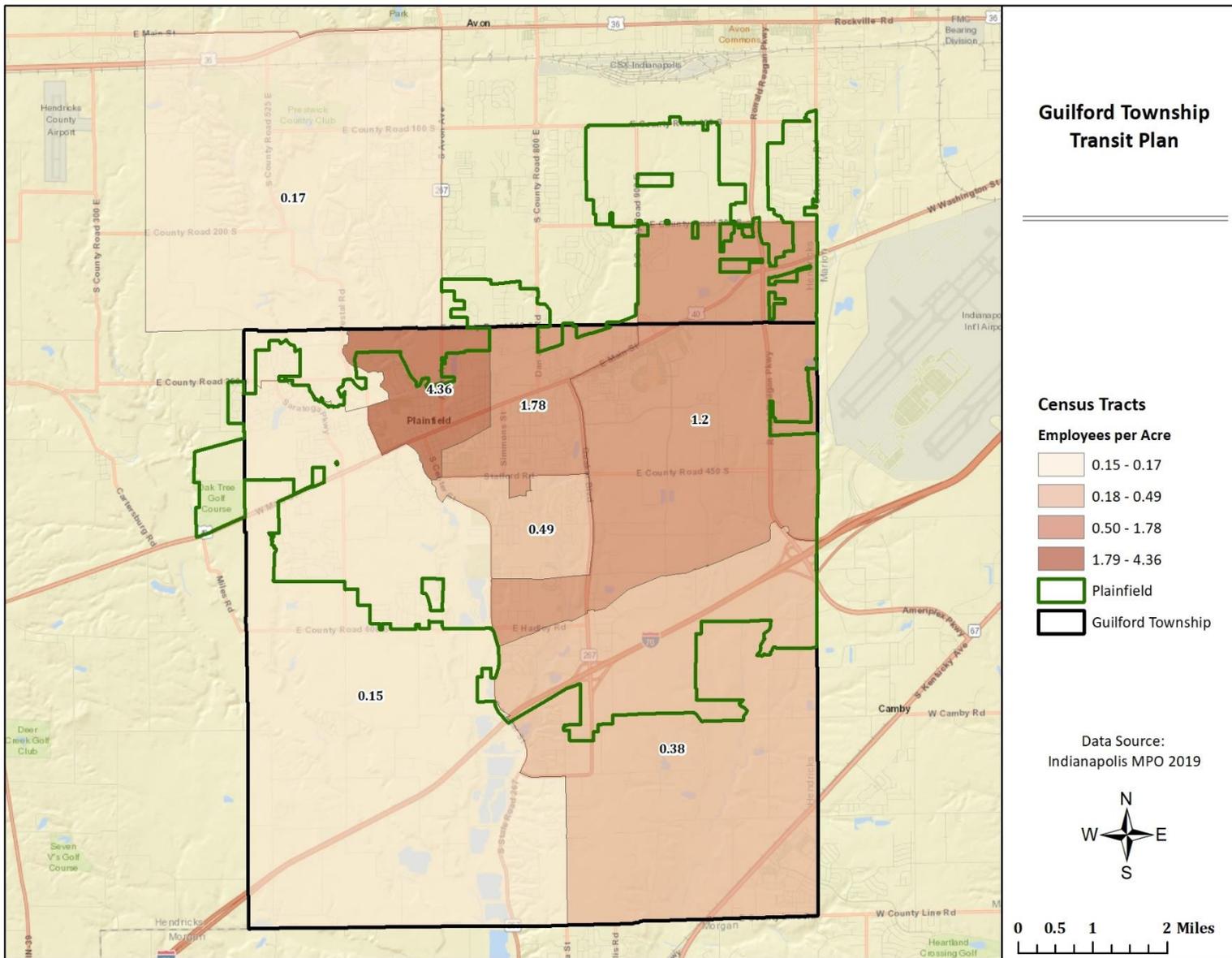
Of the 12,158 employed Guilford Township residents, 36 percent commute to primary jobs that are ten miles or less away from their homes. Forty-five percent have commutes of ten to 24 miles. Most of these commuters travel to the Indianapolis area for work. Seventy-one percent of residents are commuting north, northeast, or east, as shown in **Figure 8**.

Figure 6. Commuting Patterns in and out of Guilford Township



Source: <https://onthemap.ces.census.gov/>

Figure 7. Guilford Township Employment Density



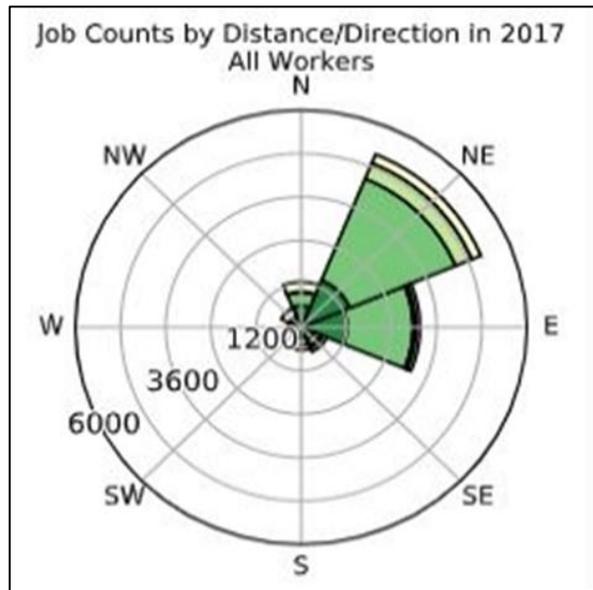
The Census tract with the highest density of employment is located in the vicinity of the historic center of the Town of Plainfield (Tract 2109). There are 4.36 jobs per acre within this Census tract. **Figure 27** in **Appendix A** provides a map of the residential locations of individuals who work in this area. The largest group of individuals resides in Plainfield or the immediate vicinity. Larger clusters of employees also reside north of U.S. 40/Washington Street around the Hendricks-Marion County line, and on the Indianapolis west side in the area bordered by Interstate 465, Lynhurst Road, 10th Street, and Washington Street.

Figure 28 in **Appendix A** displays the residential locations of individuals commuting to the Census tract directly east of downtown Plainfield (Tract 2108.02). Most of these employees reside in Plainfield and the immediate vicinity. A relatively small number of these employees commute to this area from outside Guilford Township.

Figure 29 in **Appendix A** displays the residential locations of individuals commuting to the Census tract that is roughly within the northeast quadrant of Guilford Township, with some land within Plainfield that is just north of the township boundary (Tract 2106.07). This tract is larger than the previous two tracts and has 19,360 jobs. This area is the location of the majority of the area’s warehousing and logistics industry. Employees commute from a wide variety of locations throughout Plainfield, Indianapolis and other communities.

Figure 30 in **Appendix A** displays the work locations of Guilford Township residents. A large concentration of Guilford Township residents is employed in the downtown Indianapolis area. Other areas with high concentrations of commuters from Guilford Township are Avon, Danville, and at or near the Indianapolis International Airport.

Figure 8. Commuting Patterns of Guilford Township Residents



Source: <https://onthemap.ces.census.gov/>

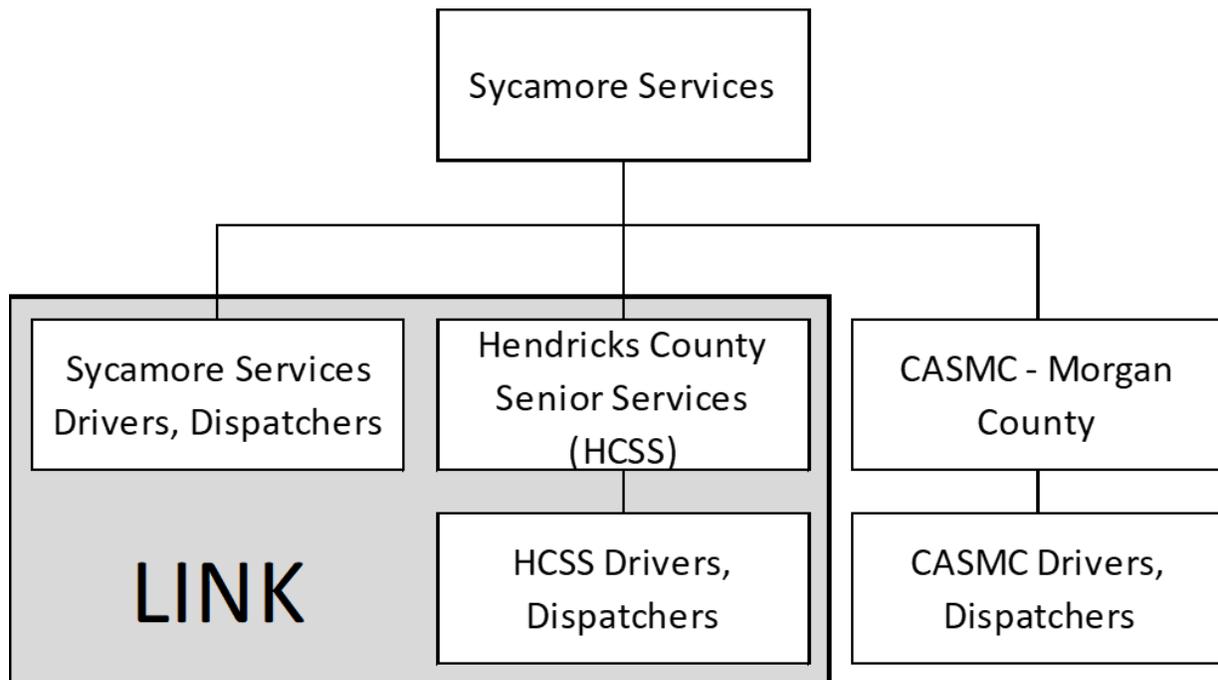
4. EXISTING TRANSIT SERVICES

4.1. HENDRICKS COUNTY LINK

Hendricks County LINK provides demand-response, origin-to-destination transportation to the general public in Hendricks County. LINK is a partnership of two non-profit organizations, Sycamore Services and Hendricks County Senior Services (HCSS). Sycamore Services is a provider of services to adults and children with intellectual and developmental disabilities in Central Indiana and Evansville. HCSS offers supportive services and programs for older adults in Hendricks County.

Sycamore Services operates public transportation under a pass-through arrangement with Hendricks County, a subrecipient of Federal Transit Administration (FTA) grants and Indiana Public Mass Transportation Fund (PMTF) dollars through the Indiana Department of Transportation (INDOT). Hendricks County LINK operates a portion of the Hendricks County public transit service through a Memorandum of Understanding (MOU) with Sycamore Services. Sycamore Services holds a similar MOU with Coordinated Aging Services of Morgan County (CASMC), which operates public transit in Morgan County. **Figure 9** provides an organization chart for the Hendricks and Morgan County transit programs.

Figure 9. Hendricks and Morgan County Transit Organizations



The LINK fleet consists of 29 wheelchair-accessible small transit vehicles and vans (see **Figure 10**). Approximately 15 vehicles are operated by Sycamore Services, and 14 are operated by HCSS. HCSS operates the LINK reservations and dispatching center. Customers request rides by calling HCSS between 8:00 AM and 4:00 PM, Monday through Friday. HCSS uses transit scheduling software for HCSS or Sycamore Services vehicles. Rides are provided from 6:00 AM to 6:00 PM, Monday through Friday.

Figure 10. LINK Vehicle



The service area for LINK is Hendricks County, meaning that all customer trips

must have origins and destinations within the county. Customers are required to request rides at least 24 hours in advance. Rides are provided in a shared ride, curb-to-curb fashion, with drivers picking up at the curb in front of the customer’s home or destination. Door-to-door assistance may be provided by drivers to customers who need reasonable assistance beyond the curb. The “shared ride” nature of the service means customer pick-ups may be scheduled so that multiple customers ride the vehicle at the same time.

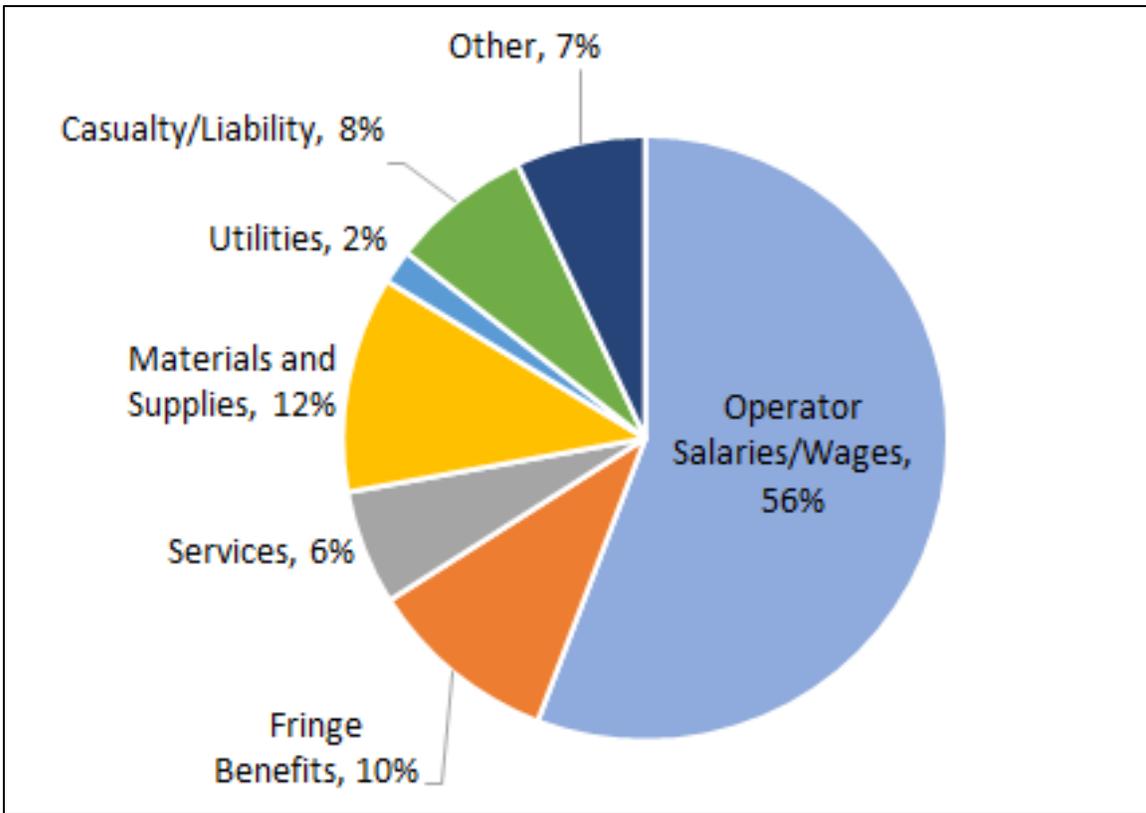
4.1.1. FUNDING

LINK is funded through the FTA Formula Grants for Rural Areas (49 U.S. Code § 5311) program, which provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000. The federal share is 80 percent for capital projects, 50 percent for operating assistance. INDOT administers Section 5311 funding for all rural sub-recipients, including Hendricks County. LINK also receives grants for the purchase of vehicles through the FTA Grants for Buses and Bus Facilities Program (49 U.S. Code § 5339).

The total amount of Hendricks/Morgan County operating expenses was \$1,200,124 in 2018. LINK expenses made up \$845,237, or 70.4 percent, of the two-county program’s budget. A breakdown of 2018 operating expenses is provided in **Figure 11**.

The revenue sources for LINK include the Section 5311 grant, passenger fares, and matching funds for the grant. The grant and matching funds support net operating expenses after passenger fares are deducted from total revenues. Matching support is provided by state PMTF funding, Medicaid transportation revenue, United Way, county governments, Older Americans Act Title III-B funding administered by CICOA Aging and In-Home Solutions, and private donations.

Figure 11. Hendricks/Morgan County Transit Operating Expenses



4.1.2. PERFORMANCE

As a demand-responsive transit system, Hendricks County LINK service fulfills a county-wide need for a service that is available to all. Traditional measures of transit system performance focus on the amount of service provided for the resources expended, assigning positive performance ratings to services that are highly efficient on a cost-per-trip basis. These types of performance measures could imply that demand-responsive service is less valuable than fixed route service, but they do not serve the same purpose. Demand responsive service provides public transportation to areas that are cost-prohibitive for fixed-route public transit or to individuals unable to access fixed-route transit due to a disability.

Cost Efficiency is the amount of public transportation service produced for the community in relation to the resources expended. This measure attempts to answer the question, “How many resources were expended per unit of public transit service?” Units of service produced are measured in terms of service outputs such as vehicle hours or vehicle miles. Resources expended include labor, materials, and services. The smaller the amount of resources expended to produce a unit of service, the greater the resource efficiency of the public transportation service.

Service Effectiveness is the consumption of public transportation service in relation to the amount of service available. This attempts to answer the question, “How much public transportation service was consumed (or revenue received), at an established price, in relation to the amount of service available?” The more service consumption (or passenger revenue) in relation to service output (vehicle miles and hours), the higher the level of service effectiveness.

Cost Effectiveness is the consumption of public transportation services in relation to the resources expended. This attempts to answer, “How many resources were expended per unit of consumption or how much consumption revenue was received per unit of resource expended?” Consumption is measured by passenger boardings or passenger miles. Consumption revenue and resources expended to produce service are measured in terms of dollars. The smaller the amount of resources expended in relation to service consumed or the greater the consumption revenue in relation to dollars expended, the more cost-effective the service.

Table 2 provides estimates of each of these performance measures for LINK in 2018.

Table 2. LINK Performance, 2018

Units of Service	
Passenger Trips	38,300
Revenue Vehicle Hours	22,305
Revenue Vehicle Miles	369,943
Service Area Population	167,009
Operating Cost	\$845,237
Fare Revenue	\$43,463
Cost Efficiency	
Operating Cost/Revenue Vehicle Hour	\$37.89
Operating Cost/Revenue Vehicle Mile	\$2.12
Farebox Recovery Ratio	5.14%
Service Effectiveness	
Boardings per Revenue Vehicle Hour	1.72
Boardings per Revenue Vehicle Mile	0.10
Revenue Hours Per Capita	0.13
Revenue Miles Per Capita	2.22
Passengers Per Capita	0.23
Cost-Effectiveness	
Operating Cost/Passenger Boarding	\$22.07

4.1.3. GUILFORD TOWNSHIP TRIP PATTERNS

Analysis of a one-month trip sample, for September 2019, indicates that LINK provided 4,547 one-way passenger trips in Hendricks County to 281 unduplicated customers. Passengers are counted each time they board a vehicle; each boarding counts as a one-way passenger trip. The origin-destination pairs for the trip sample by city or town are shown in **Table 3**.

There were 1,151 trips that began or ended in Plainfield, or 25.1 percent of all trips. It is noted that Hendricks County LINK has a longstanding practice of providing high numbers of trips to Sycamore Services and Hendricks County Senior Services, both located in Danville. Trips to these destinations account for the high proportion of trips that begin or end in Danville.

One-way passenger trips delivered by LINK that began or ended at a Plainfield address during September 2019 are displayed in **Figure 12**. Each blue dot represents the origin (pick-up) or a destination (drop-off) of a one-way passenger trip. The purple lines connect origins and destinations “as the crow flies” irrespective of the actual path of the vehicle. The inset displays the trip origins and destinations in the U.S. 40 corridor for easier viewing.

Figure 12 is intended to show the overall trip pattern of LINK service rather than the volume of trips for individual origins and destinations. Duplicated trips (i.e. a person riding to Sycamore Services three days per week) are represented by a single line. Likewise, this map does not reflect shared rides, where the driver picked up riders at more than one location on the way to a destination.

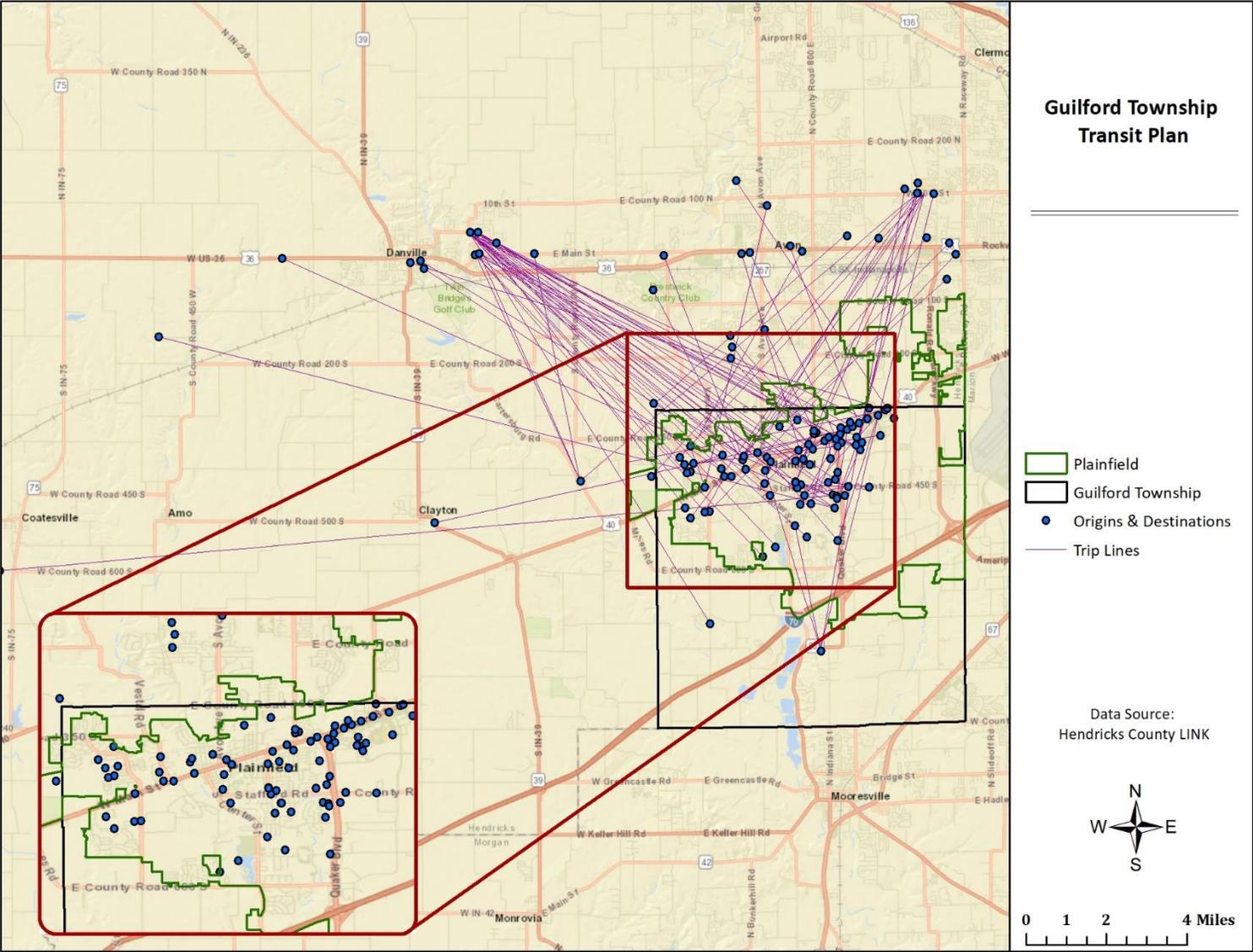
When LINK receives a request for a trip that it is unable to schedule due to capacity constraints, the trip request is denied. LINK tracks and reports trip denials to INDOT on a quarterly basis. However, difficulties with its previous trip scheduling software package have prevented LINK from capturing and recording all trip denial information accurately. LINK implemented new scheduling software in 2019 with improved trip request tracking functionality, which will improve the accuracy of its trip denial records. Trip denial counts are a common method of measuring unmet need for demand-response transportation.

GUILFORD TOWNSHIP TRANSIT PLAN

Table 3. LINK Trip Counts by Origin/Destination City or Town, September 2019

City/Town	Amo	Avon	Brownsburg	Clayton	Coatesville	Danville	Indianapolis	Lizton	Mooresville	North Salem	Pittsboro	Plainfield	Stilesville
Amo						20							
Avon		237	65			321	6			1	2	148	
Brownsburg		79	276			264	6	5			2		
Clayton				3		25						1	
Coatesville						22						1	
Danville	20	353	264	20	11	879	46	16	48	68	56	286	2
Indianapolis		6	6			66						10	
Lizton			5			36							
Mooresville						48							
North Salem		1				36							
Pittsboro		2	10			71							
Plainfield		177		1	1	287	1					227	
Stilesville						2						1	

Figure 12. Hendricks County LINK Origins and Destinations - Plainfield Addresses



4.2. PLAINFIELD CONNECTOR

The Central Indiana Regional Transportation Authority (CIRTA) offers three regional bus routes that connect Indianapolis with suburban industrial parks offering large numbers of entry-level jobs. Two of these routes, the North and South Plainfield Connectors, originate on the far west side of Indianapolis and serve industrial parks located near U.S. 40 in Plainfield. Employees ride IndyGo Route 8 to the bus stop located at West Washington Street and Bridgeport Road, then transfer to one of the Plainfield Connectors. The passenger fare to ride the Plainfield Connector is \$1.00 per one-way trip. See **Figure 13**.

Figure 13. Plainfield Connector Vehicle



4.2.1. FUNDING

The Plainfield Connectors began as Federal Highway Administration (FHWA)/IMPO-funded Congestion Mitigation Air Quality (CMAQ) demonstration projects in 2012 (South Plainfield Connector) and 2015 (North Plainfield Connector). The operating costs for the services are now supported by industrial park-area property owners, who have formed Economic Improvement Districts (EIDs). In an EID, businesses from the area petition the local municipal government to create the district and voluntarily assess themselves in a tax-like manner. They then use the assessment to fund specific projects. In this case, the projects include the connector routes.

CIRTA does not directly operate the Plainfield Connectors but contracts with private transportation providers to operate the routes. CIRTA contracts with the private vendors through a sealed bid process. The private vendors hold turnkey contracts with CIRTA, meaning that they operate the routes using their own fleets and conduct vehicle maintenance. The 2019 rates per vehicle service hour were for \$51.50 (South Plainfield) and \$60.00 (North Plainfield).

CIRTA and the Town of Plainfield have received FHWA Surface Transportation Block Grant (STBG) funds to construct shelters at three Plainfield Connector bus stops: Walmart eCommerce Fulfillment Center (AllPoints Boulevard), Whitaker and Reeves Roads, and 700 Airtech Parkway. A site at the intersection of Perry and Stafford Roads was evaluated for environmental review but is considered too costly to construct at this time. CIRTA anticipates the shelters will be constructed in early 2020.

4.2.2. PERFORMANCE

Performance measures for the North and South Plainfield Connectors are provided in **Table 4**. Service area population and per capita measures are not provided due to the irregular service area of the routes. The listed operating costs are for purchased transportation only. The amounts do not include CIRTA administration and customer service, or the marketing and planning efforts of the EID.

Table 4. Plainfield Connector Performance, 2018

	North Plainfield Connector	South Plainfield Connector
Units of Service		
Passenger Trips	6,954	24,453
Revenue Vehicle Hours	2,560	2,760
Revenue Vehicle Miles	37,709	70,132
Operating Cost	\$149,662	\$178,901
Fare Revenue	\$7,194	\$23,313
Cost Efficiency		
Operating Cost/Revenue Vehicle Hour	\$58.46	\$64.82
Operating Cost/Revenue Vehicle Mile	\$3.97	\$2.55
Farebox Recovery Ratio	4.8%	13.0%
Service Effectiveness		
Boardings per Revenue Vehicle Hour	2.72	8.86
Boardings per Revenue Vehicle Mile	0.18	0.35
Cost-Effectiveness		
Operating Cost/Passenger Boarding	\$21.52	\$7.32

Note: The South Plainfield Connector ran additional days in 2018 to account for added holiday shifts.

4.2.3. RIDERSHIP PATTERNS

CIRTA collects ZIP code data of Plainfield Connector passengers through customer feedback surveys. A July 2018 survey was completed by 71 passengers. Their home ZIP codes are displayed in **Figure 14**. Most passengers reside in the downtown, near north, near east, and east sides of Indianapolis.

Many Plainfield Connector passengers have lengthy total commute times. Typically, passengers ride a local IndyGo bus route to the Julia M. Carson Transit Center in downtown Indianapolis, transfer to IndyGo Route 8, then ride to the Bridgeport Road bus stop on Washington Street, where they transfer to the Plainfield Connector. July 2018 survey respondents indicated the following total one-way commute times. See **Table 5**.

Table 5. Passenger Commute Times

One-Way Commute Time	Passenger Count
Up to 30 minutes	10
31 to 60 minutes	18
1 to 1.5 hours	14
1.5 to 2 hours	24
More than 2 hours	5

Survey respondents were asked to share what service improvements they would like to see to make the Plainfield Connector more effective. The open-ended responses provided by the most respondents are shown in **Table 6**.

Table 6. Top Plainfield Connector Passenger Requests

Response	Passenger Count
Weekend Service	21
Later Service	8
Saturday Service	7

Figure 15 and **Figure 16** show the location and magnitude of passenger boarding counts by stop for the North Plainfield Connector route and the South Plainfield Connector route, respectively, during the month of September 2019. These boarding counts are significantly higher during peak holiday periods as additional seasonal employees make use of the services to access facilities in the region.

GUILFORD TOWNSHIP TRANSIT PLAN

Figure 14. Plainfield Connector Origins and Destinations - Plainfield Addresses

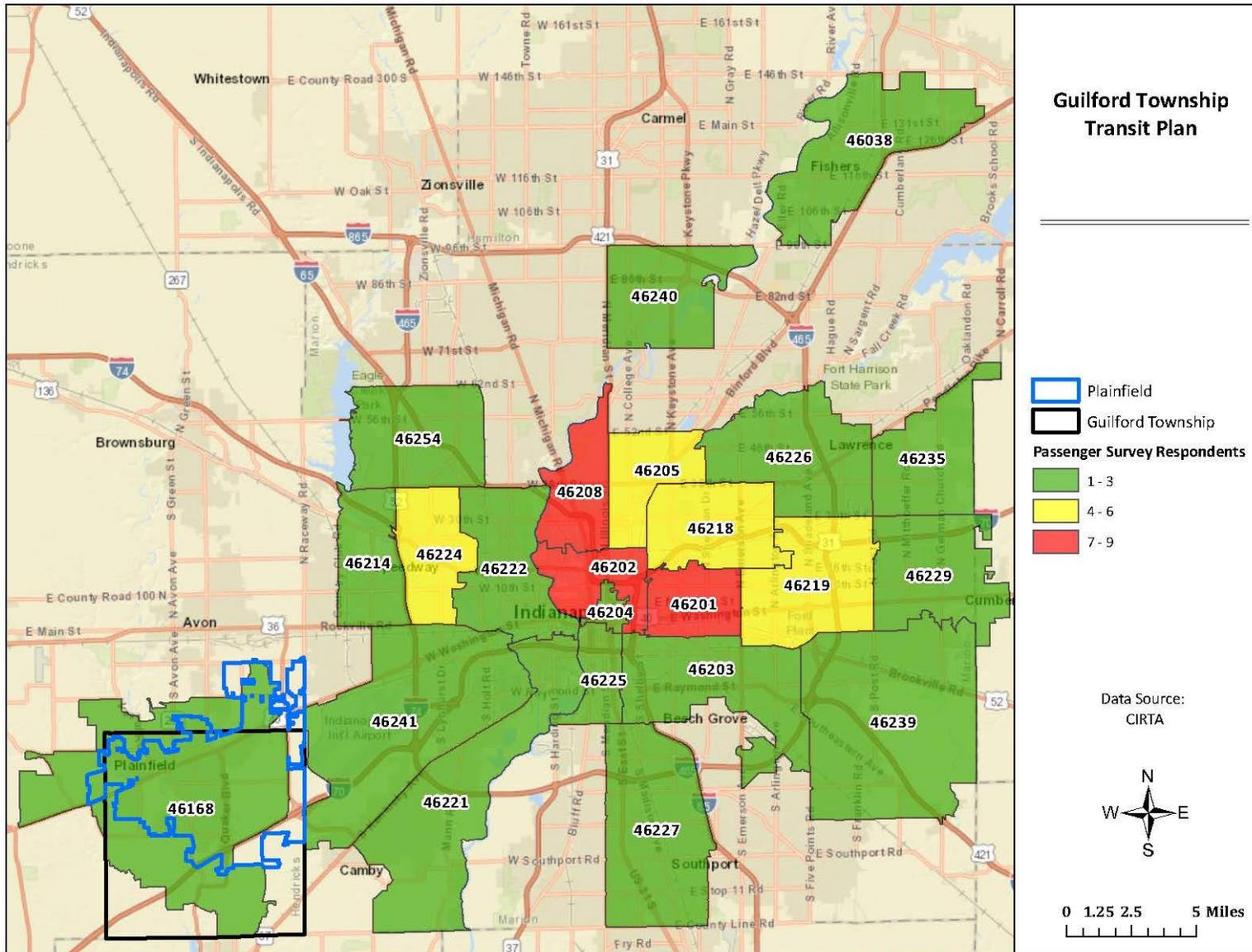


Figure 15. North Plainfield Connector Ridership by Stop

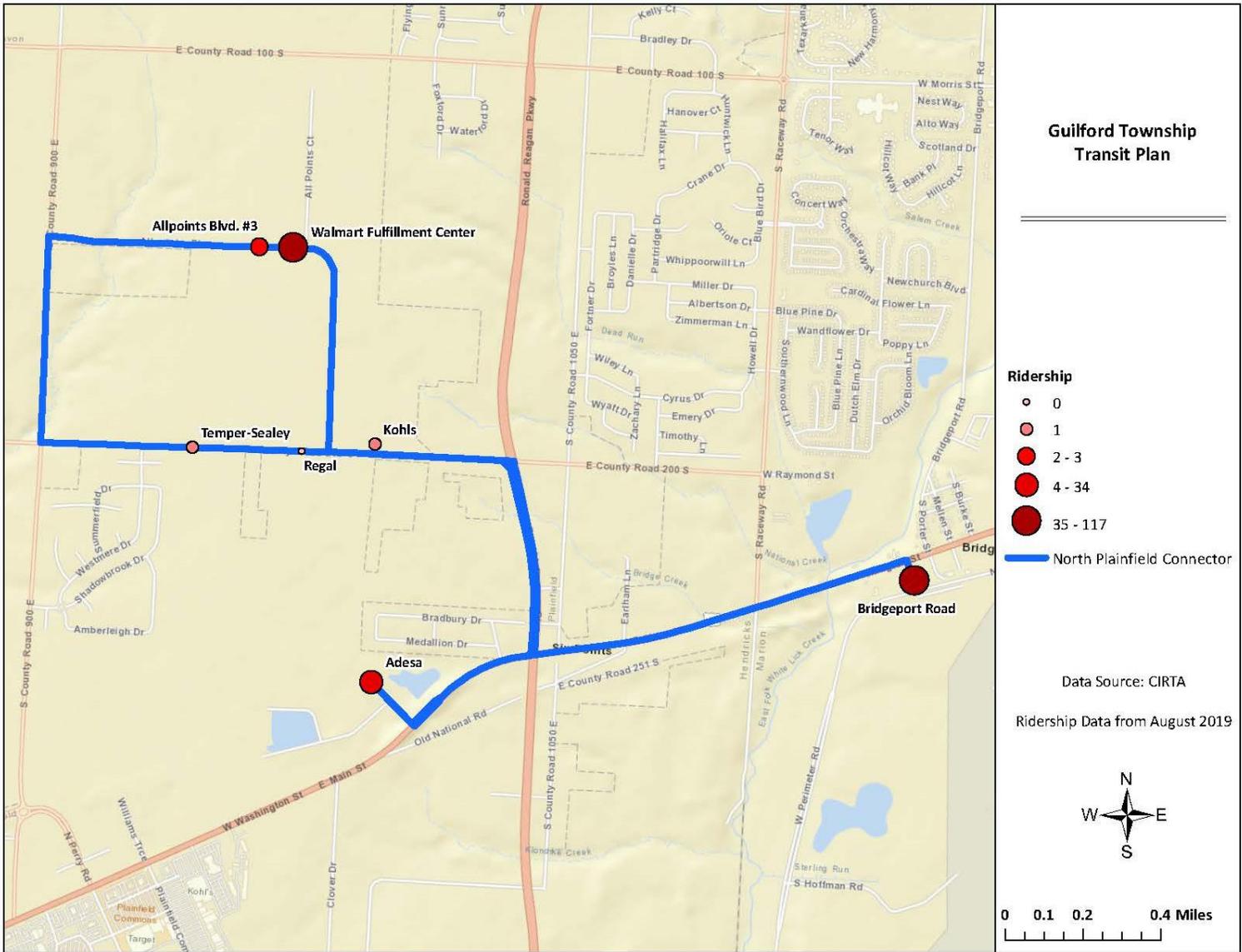
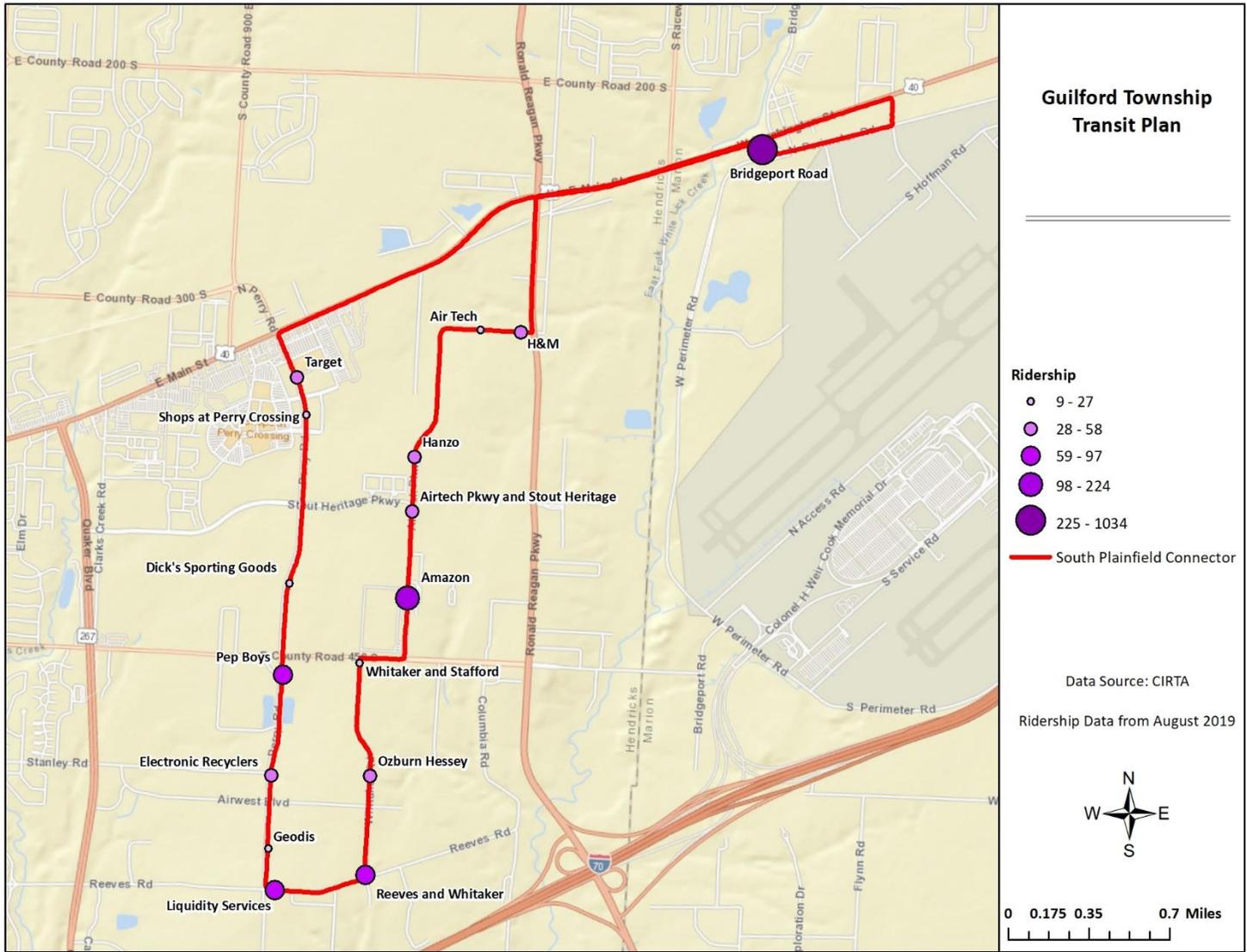


Figure 16. South Plainfield Connector Ridership by Stop



4.3. OTHER TRANSPORTATION SERVICES

Specialized transportation options that operate in Guilford Township include transportation provided by human service agencies to their clients, Medicaid non-emergency transportation, and My Freedom Vouchers. Additionally, the Commuter Connect program, a CIRTA service, provides ridesharing solutions to Central Indiana commuters, including carpooling support, vanpool service, and a guaranteed ride home benefit for commuters using alternatives to driving alone to work. The My Freedom and Commuter Connect programs utilize federal transportation funding. As a result, these programs are open to the general public or, in the case of My Freedom, open to a segment of the general public.

4.3.1. MY FREEDOM VOUCHERS

CIRTA, the Central Indiana Council on Aging (CICOA), and In-Home Solutions are partners in the My Freedom voucher program, which offers discounted transportation to people with disabilities in Central Indiana. CIRTA funds the program through FTA Section 5307 and PMTF funds. CICOA also provides funding for the program.

Individuals with disabilities, as well as seniors, qualify for the program after completing an eligibility determination process with CICOA. Participants receive a set number of vouchers for travel (up to 15 per month) using a network of private and non-profit transportation providers who accept the vouchers and bill the program for expenses. Participants pay \$6.00 per voucher. The vouchers can be used for travel across county lines, a service that is not available through the region's public transit operators, which typically offer services only within their counties. In Hendricks County, LINK and Indianapolis Yellow Cab accept the vouchers.

Twenty My Freedom vouchers were used for travel to or from Plainfield in 2018. Trips were provided within Plainfield or between Plainfield and an out-of-county location – Indianapolis, Speedway, and Mooresville.

4.3.2. COMMUTER CONNECT

Commuter Connect is a regional transportation demand management (TDM) program serving the nine-county Central Indiana region. The program offers carpool matching through a commuter database, vanpools, a guaranteed ride home benefit, and outreach services to assist employers in promoting alternative commute options to the workforce. There are 143 Plainfield-based employers participating in Commuter Connect. Participation in the program provides employers with outreach services and access to the guaranteed ride home benefit for their employees. The guaranteed ride home benefit offers free taxi service from the workplace to the employee's home in the event the employee must leave work due to a personal emergency.

A total of 524 employees working in Plainfield are registered with Commuter Connect. To receive the guaranteed ride home benefit, an employee must be an active participant in a carpool or

vanpool, or walk, bike, or use transit to get to work. Commuter Connect has 101 registered carpools that begin or end in Plainfield.

A vanpool (see **Figure 17**) consists of five to 15 people commuting from similar origins to similar destinations each workday. In the Commuter Connect program, CIRTA provides the van and passengers pay a monthly fare which secures their seat in the van. CIRTA provides subsidies to partially offset the monthly passenger fares. Currently, one vanpool serves a group of commuters who reside in the Plainfield area. This vanpool operates Monday through Friday from a park-and-ride location in Plainfield to the Defense Finance and Accounting Services center in northeast Indianapolis.

Figure 17. Commuter Connect Vanpool Vehicle



Any commuter can register with Commuter Connect to find carpool or vanpool opportunities, regardless of whether their employer participates in the program. **Table 7** summarizes the level of participation in Commuter Connect by Plainfield residents, employers, and workers. There are 73 active registrants with Plainfield home addresses in the program’s database, 49 of whom work in Indianapolis. Of the 524 registrants who work in Plainfield, 423 reside in Indianapolis and the rest reside in 24 different cities and towns.

Table 7. Commuter Connect Participation

Participation Type	Number
Database Registrants with Plainfield Home Addresses	73
Plainfield Employers Participating in Commuter Connect	50
Registered Carpools that Travel to or from Plainfield	101
Registered Commuters who Work in Plainfield	524

5. PUBLIC AND STAKEHOLDER INPUT

5.1. STAKEHOLDER INTERVIEWS

The project consultant conducted interviews with ten stakeholder organizations about transportation needs in Plainfield and Guilford Township. The stakeholders included:

- Hendricks Regional Health
- Family Promise of Hendricks County
- Allegiant Staffing
- Energeo Staffing
- Hendricks County Economic Development
- Kelley and Associates
- Hendricks County Senior Services
- Sycamore Services
- Indianapolis Airport Authority
- Central Indiana Regional Transportation Authority

The interviews provided a cross-section of feedback on the strengths and weaknesses associated with the two existing public transportation services, Hendricks County LINK and Plainfield Connector. LINK, a demand responsive transit service, does not have capacity to meet the needs of many in the community. Its current hours of operation are Monday through Friday, 6:00 AM to 6:00 PM. Additional hours in the early morning, evening, and on weekends would be beneficial.

LINK requires reservations at least one day in advance and accepts ride requests up to one month in advance. Schedules are often booked up well in advance, so people with short-notice trip needs are sometimes unable to get a ride with LINK. A service that could accommodate same-day requests would fill this need.

The Plainfield Connector provides a workforce transportation option for Indianapolis residents commuting to the warehouse district. Its hours are limited and would need to be expanded to accommodate second and third shift employment. Weekend service is also needed, as many warehouses have weekend shifts. While the Plainfield Connector is a valued service, it does not meet the needs of all warehouse employers. Some workplaces are not located within walking distance of the routes.

Because the Plainfield Connector routes pick up on the far west side of Indianapolis, the service is not as helpful to people without a convenient way to get to the bus stop. People who live far from downtown Indianapolis must first ride IndyGo downtown, transfer to IndyGo Route 8, then transfer to Plainfield Connector to get to work – making for a one-way commute of up to two hours. Many stakeholders feel there needs to be a workforce transportation solution that is more flexible and customizable than fixed route bus service.

Overall, the stakeholder organizations differed in how they provided, utilized, or relied on existing public transportation services. Supplemented by information gained in the 2019 Hendricks County Community Needs Survey, the following priorities emerged from the stakeholder interviews:

Health Care and Social Services Providers

- LINK is often at capacity
- Hours of operation are limited
- Need ability to reserve rides with shorter notice
- Need to get to places outside the county

Staffing Agencies and Economic Development

- Plainfield Connector needs longer hours (2nd/3rd shift) and weekends
- Employers off the routes need customized service, such as shuttle/van or “Uber for jobs”

2019 Hendricks County Community Needs Assessment

- The number 1 reported community concern of Plainfield/Guilford Township residents is inadequate public transportation and traffic congestion

5.2. PUBLIC SURVEY

The IMPO conducted a public survey to solicit feedback on transportation in Plainfield and Guilford Township. The survey was open from November 8, 2019 through December 6, 2019 (28 days total) and was shared with the public through:

- Plainfield and Guilford Township’s websites and social media pages
- The IMPO Facebook page
- Emails to key stakeholders in Plainfield and Guilford Township
- Public notice of the survey at Guilford Township Board Meetings
- Street teams at 100 different locations within Plainfield/Guilford Township on December 4 and 5, 2019

A survey team was in Plainfield on December 4-5 to encourage participation. They went to approximately 100 locations, including the parks, library and shopping along U.S. 40, including Perry Crossing Shopping Mall. They offered residents the chance to take the survey on an iPad or take a business card. Almost everyone chose to take a card which gave the survey website as well as the dates for the January public meetings. Two people distributed 670 cards and worked 12 hours each over the two days. The survey was completed by 606 people. Survey respondents were comprised of:

- 91% Guilford Township residents
- 34% in the range of 26-40 years old
- 43% in the range of 41-60 years old
- 20% who use transit to get to work or school
- 76% who own more than one car
- 81% who were either interested in better transit for themselves, or believed it would a benefit for others in Plainfield/Guilford Township

The public survey was structured to encourage respondents to consider the tradeoffs associated with providing transit services. Since transit budgets and revenues are limited, focusing on one element invariably means having less of another. Other priorities in the survey were to identify priorities for the most important origins and destinations to be served. Overall responses in the survey are summarized below:

Choices & Tradeoffs: Participants were split on their results. The results leaned in favor of transit picking up and dropping off in busier locations, and better travel time for riders, but also favored more local vs regional transit options that expanded upon the existing on-demand service in Plainfield/Guilford Township.

Destination Priorities: Nearly half of participants put places of work as the most important destination for transit in Plainfield/Guilford Township. Healthcare & Daily Needs was second by a large margin, with School and Shopping & Entertainments close behind. A third of participants put Regional Destinations as their lowest priority for using transit.

Map Markers: Participants were asked to first pin their home and place of work on the map. They were next asked to pin three destinations and label them using the same options from the Destination Priorities question. For all three destinations pins, Recreational/Entertainment locations were pinned the most. Geographically, the most pins overall were placed along U.S. 40 in Plainfield/Guilford Township, as well as in downtown Indianapolis.

The survey also provided the opportunity for open-ended comments. A total of 192 comments were recorded in the survey. Each comment was recorded as in favor of transit, not in favor of transit, or as “other comments.” “Other Comments” were related to the structure of the survey or other topics that did not show favor for or against transit in Plainfield and Guilford Township.

Among those choosing to offer an open-ended comment, 52% were in favor of transit.

- 24% of the comments in favor of transit believed it would help people who currently do not have easy access to a personal vehicle. Many of the comments mentioned low-income people, senior citizens, and persons with disabilities.
- 11% of the comments in favor of transit believed it would improve job access in Plainfield/Guilford Township.
- 8% of the comments in favor of transit believed it would help improve the environment.
- Other reasons mentioned include economic benefits, access to the airport, and access to Downtown Indianapolis.

Among those choosing to offer an open-ended comment, 36% were not in favor of transit.

- 40% of comments not in favor of transit did not provide reasons why transit would not benefit Plainfield/Guilford Township
- 24% of the comments not in favor of transit wanted no new Guilford Township tax.

- Other comments not in favor of transit suggested more focus on other infrastructure issues first and keep the existing transit system as it is.

Of the 192 comments recorded, 12% were general statements or they were related to the structure of the survey.

In summary, there was overall support for transit in the study area. Most respondents favored transit picking up and dropping off in busier locations with better travel time for riders and wanted transit to focus more on local service that would expand existing on-demand (LINK) offerings. Work was identified as the most important destination to access via transit, with most must-reach destinations identified along the US 40 corridor and in Indianapolis.

5.3. TRANSIT ADVISORY TEAM

A 20-member Transit Advisory Team was formed to provide input and support in the development of the Guilford Township Transit Plan. Transit Advisory Team members included elected officials from Guilford Township, the Town of Plainfield, and Hendricks County, as well as major stakeholders, transit providers, and citizens from throughout the study area and the region. A list of Transit Advisory Team members is provided in **Appendix B**.

The Transit Advisory Team met monthly between October 2019 and January 2020 to learn the results of data gathering related to community needs and opportunities, become informed regarding transit planning principles, and provide input to the project team about conditions specific to the Plainfield and Guilford Township area. Input from the Transit Advisory Team was essential in ensuring the final plan meets the goals of this study as set forth in **Section 1.2**.

The dates and locations, topics of discussion, and key take-aways of each Transit Advisory Team meeting are summarized below.

Transit Advisory Team Meeting 1 - Existing Conditions

October 24, 2019, Plainfield Fire Station Training Room

At this introductory meeting, the Transit Advisory Team was presented with a process overview, study schedule, and initial goals for the development of the Guilford Township Transit Plan. Demographic information on existing population, employment, and commuting patterns was presented, along with a description of existing transit service in the study area. Transit Advisory Team members participated in a brief exercise to identify key trip generators in the Plainfield and Guilford Township area.

Transit Advisory Team Meeting 2 – Suburban Transit Planning Workshop

November 22, 2019, Indianapolis Airport Authority Board Room

This all-day workshop focused on the application of transit planning principles to a constrained setting, first with a fictional community during the morning, then to actual conditions in Guilford Township and Plainfield during the afternoon. About 75 partners from the area were invited to participate, and 28 people attended. (See **Figure 18**)

Figure 18. Suburban Transit Planning Workshop



In the morning session, attendees were divided into five groups, with a large map of a fictional city (“Prairieville”) and a budget of 28 sticks, each representing a different unit of transit service (green for 60-minute, blue for 30-minute, and red for 15-minute headways). As headways became shorter, the length of the sticks was reduced since they covered a smaller distance in a given time period due to the more frequent service.¹

Each group developed a network for presentation in a full group discussion, and observations were shared. Some groups opted for more frequent service in dense areas and others chose to cover more area with less frequent service. The intent was to develop an understanding of overall planning concepts and constraints before applying the principles to Guilford Township.

In the afternoon session, the planning groups conducted the same exercise for the actual Plainfield and Guilford study area. At the printed scale, the transit route sticks provided to each group represented about \$300,000 of transit service. As with the morning Prairieville exercise, the resulting concept plans differed with respect to coverage area and frequency of service.

The workshop was beneficial to the attendees in coming to an understanding of the limitations and trade-offs faced by transit planning professionals as they develop system plans. The group discussion of strengths and weaknesses of each concept plan were useful to the professional staff in applying these principles to Plainfield and Guilford Township. Key take-aways and stakeholder feedback from the workshop are listed below:

- Create a network that will maximize ridership
- Serve U.S. 40, Perry Crossing, and downtown Plainfield
- Focus on seniors, disabled, and low-income populations
- Connect to Indianapolis

¹ Workshop materials used with permission of Jarrett Walker Associates, November 2019

Transit Advisory Team Meeting 3 – Preliminary Network Alternatives

December 11, 2019, Guilford Township Community Room

At this meeting, the IMPO transit planning team summarized all information to date, then presented eight transit system concepts for review by the Transit Advisory Team. A table showing estimated cost, revenue forecasts, and population demographics within a half-mile of each transit network was provided, but the location of transit lines was not shown. Advisory team members were asked to select their preferred network based solely on the information in the table.

The advisory team then reviewed maps of the eight networks and voted again on which networks should be presented to the public. Three of the eight networks were selected. The advisory team asked that no funding be allocated to the existing North and South Plainfield Connectors, that fixed route transit service be limited to Guilford Township, and that an alternative be added to provide funding only to LINK.

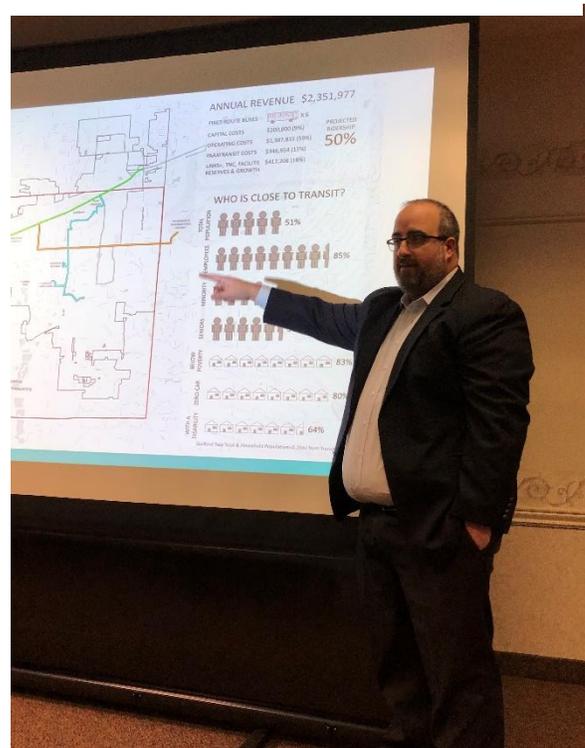
Following this meeting, the IMPO transit planning team modified the three selected transit networks per the requests of the advisory team, added a LINK-only alternative, and developed a final set of potential transit system concepts for presentation at the January public meetings.

5.4. PUBLIC MEETINGS

The team hosted public input sessions on January 14th from 9:00 am to 11:00 am and January 15th from 6:00 pm to 8:00 pm. Display posters showed the four potential transit system concepts developed from the December Transit Advisory Team meeting, along with a demographics board, transit ridership recipe board, and network summary board. The formal presentation began 30 minutes after the meeting start time to allow participants to examine the route options and ask questions of the planning team.

In the presentation, the IMPO transit planning team introduced the planning process and described existing conditions, interview and survey input, funding and revenue estimates, and general transit planning principles. The four transit plans and associated metrics were summarized and the multiple methods for providing feedback were described. See **Figure 19**.

Figure 19. Public Meeting Presentation



A brief question and answer session was held at the end of each meeting and attendees were asked to provide input by completing a questionnaire, adding notes to the concept maps, and allocating funding to one or more of the concepts through the use of coins representing a limited budget. Participants could also use their coins to indicate a preference for no change/no referendum. The four concepts presented at the public meetings are described in **Section 6** and the input received at the meetings regarding these concepts is summarized in **Section 7.3**. A full summary of the public meetings is provided in **Appendix C**.

6. PRELIMINARY ALTERNATIVES

6.1. GUILFORD TOWNSHIP TRANSIT SYSTEM BUDGET

For planning purposes, a financial model was developed and fiscally constrained by the annual revenue generated by Local Optional Income Tax (LOIT) revenue projections for Guilford Township. As shown in **Table 8**, the LOIT projected low, medium, and high revenue options ranging between \$2.1M - \$2.6M annually, which represents approximately \$100 per year for a household with \$40,000 income (State of Indiana-allowable rate). The medium revenue projection, \$2,351,977/year, was set as the transit system budget in the financial model.

Fixed-transit routes and their operating costs were designed and calculated using the transit network designing software, Remix. Operating costs generated in Remix were quality checked based on local experience and system data provided by IndyGo.

Table 8. Projected Transit Tax Revenue

Fiscal Year	Average Annual Income Growth		
	No Growth (0.00%)	Moderate (2.50%)	High (3.47%)
2019	\$ 2,184,044	\$ 2,184,044	\$ 2,184,044
2020	\$ 2,184,044	\$ 2,238,645	\$ 2,259,830
2021	\$ 2,184,044	\$ 2,294,611	\$ 2,338,246
2022	\$ 2,184,044	\$ 2,351,977	\$ 2,419,384
2023	\$ 2,184,044	\$ 2,410,776	\$ 2,503,337
2024	\$ 2,184,044	\$ 2,471,046	\$ 2,590,202
2025	\$ 2,184,044	\$ 2,532,822	\$ 2,680,082

6.2. GUILFORD TOWNSHIP TRANSIT PLAN OBJECTIVES

Based on the input from stakeholder interviews, public surveys, the Transit Advisory Team, and the public, summarized in **Section 5**, the following overall objectives have been identified for the Guilford Township Transit Plan:

- **Help older adults, people with disabilities, and low-income residents.** Prioritize older adults, people with disabilities, and low-income residents who have fewer transportation options and are often more transportation-cost burdened.

- **Connect people to work.** Improve service to the industrial parks, and help people get to work both in town and in Indy.
- **Maximize ridership.** Create a useful system that can maximize ridership.
- **Build on LINK.** Expand LINK’s existing on-demand service.
- **Connect to Indy.** Create at least one convenient way for township residents to access the Blue Line and/or downtown Indianapolis.

These objectives were considered in the development of the alternatives described below and served as a basis for evaluating the alternatives in **Section 7**.

6.3. PRELIMINARY ALTERNATIVES

Several potential transit system concepts were developed during the planning process. Some were developed by the IMPO transit planning team and others were developed by the Transit Advisory Team in group exercises. Ultimately, these preliminary concepts were consolidated into four alternatives consistent with the fiscal constraint described above. These four alternatives were presented at public meetings held in Plainfield in January 2020. The alternatives represent a range of trade-offs with respect to the transit planning concepts presented in **Section 2**.

Alternatives 1-3 include fixed transit routes, which means they must meet the requirements of the Americans with Disabilities Act (ADA). The law is intended to provide transportation to those who cannot access or independently utilize fixed route transit due to their disability. ADA requires the provision of complementary on-demand, door-to-door service for eligible individuals with disabilities within ¾ mile of either side of a fixed route. Individuals with disabilities must go through an eligibility certification before they are eligible to ride the service.

Complementary paratransit is a next-day, shared ride service that operates the same hours and days as the fixed route service. The response time of the service should be comparable and there cannot be any limitations on trip purpose. The service must operate without capacity constraints; there can be no trip caps or trip denials.

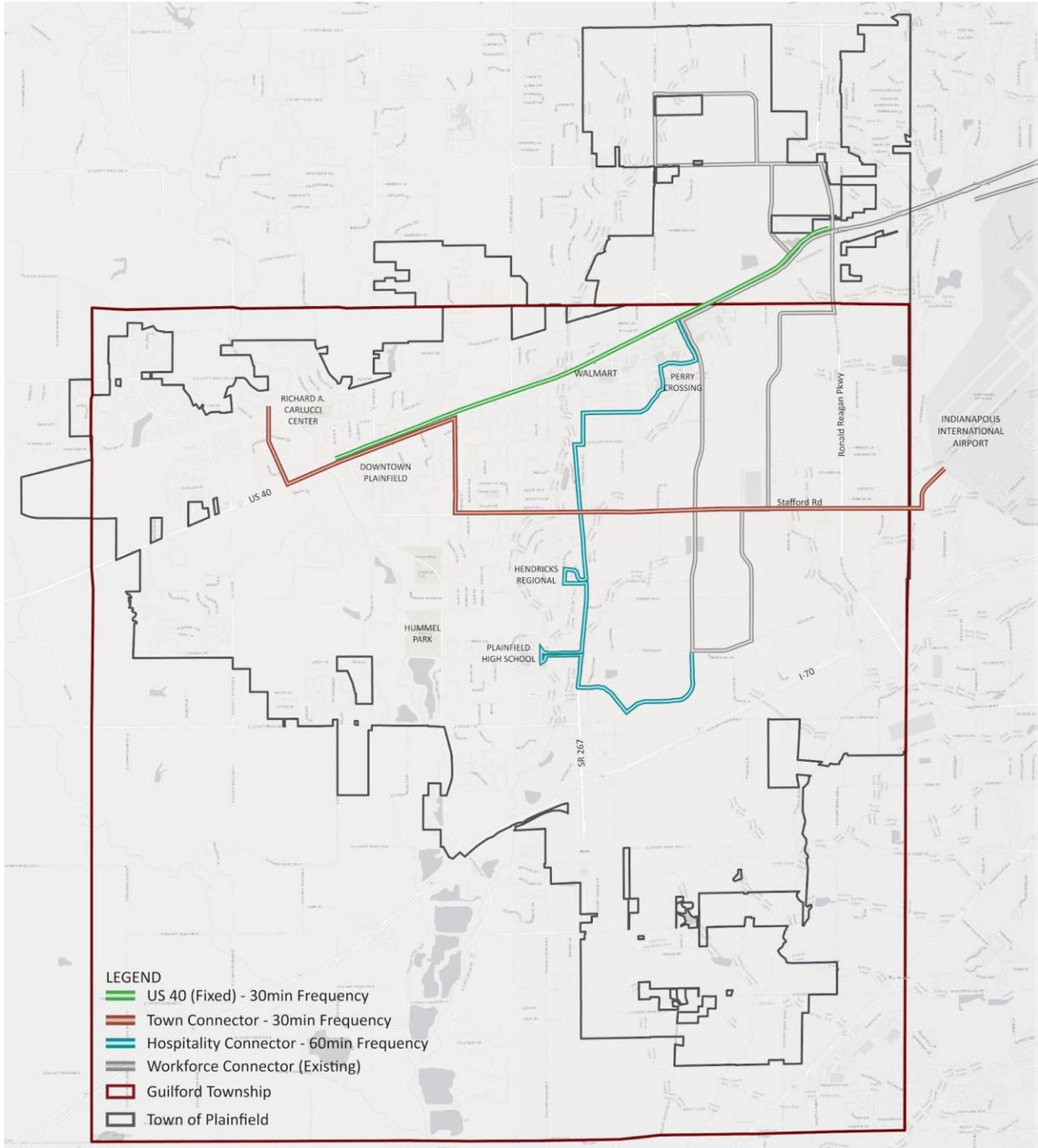
The three fixed route alternatives and a fourth alternative devoted entirely to expansion of demand-response service are described below.

Alternative 1

As shown in **Figure 20**, Alternative 1 includes three fixed routes in Guilford Township. One route is on US 40 from just west of South Center Street in Downtown Plainfield to Ronald Reagan Parkway. The route is about four miles long (8 miles round trip). The route is assumed to operate for 16 hours on weekdays and 10 hours on weekends. The frequency of the buses is assumed to be every 30 minutes on weekdays and every 60 minutes on weekends.

The second route in Alternative 1, labeled as “Town Connector” on the map, begins at the Richard A. Carlucci Community Center and connects to the Indianapolis International Airport via Vesta Road, US 40, South Center Street, and Stafford Road. This route is approximately 6.5 miles long

Figure 20. Transit Alternative Network 1



(13 miles round trip). The route is assumed to operate every 30 minutes over a span of 16 hours on weekdays and every 60 minutes over a 10-hour period on weekends.

The third transit route, labeled as “Hospitality Connector” on the map, begins at the Shoppes at Perry Crossing, operates along SR 267, and ends at the intersection of Perry Road and Reeves Road. This route would serve the SR 267/I-70 interchange area, Plainfield High School and Hendricks Regional Health. The length of the route is approximately 6.5 miles (13 miles round trip). This route is assumed to operate with a span of 16 hours on weekdays and 10 hours on weekends. The frequency of the buses is assumed to be every 60 minutes on weekdays and weekends.

In addition to the fixed routes described above, paratransit (on-demand) service would be provided to people with disabilities living within $\frac{3}{4}$ mile of fixed transit routes in accordance with ADA requirements.

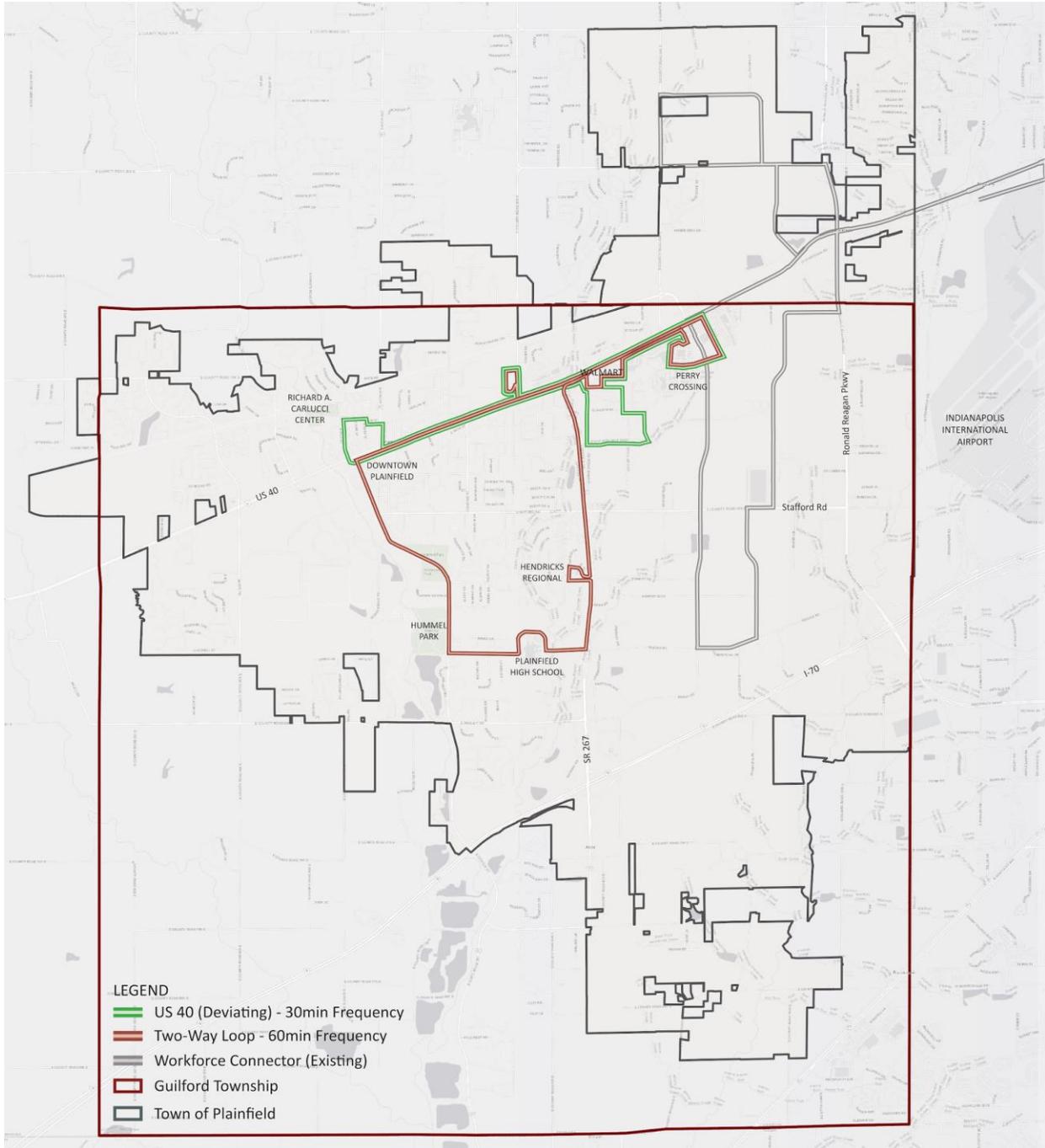
Alternative 2

As shown in **Figure 21**, Alternative 2 includes two fixed transit routes in Guilford Township. One route operates on US 40 from just west of South Center Street in Downtown Plainfield to Perry Road. Unlike the transit route along US 40 in Network 1, this option deviates off US 40 to provide door-to-door access to key destinations. The length of the route is approximately 7.5 miles (15 miles round trip). It is assumed to have an operating span of 16 hours on weekdays and 10 hours on weekends. The frequency of the buses is assumed to be every 30 minutes on weekdays and every 60 minutes on weekends.

The second transit route in Alternative 2, labeled “Two-Way Loop” on the map, is a circulator along US 40, SR 267, Reeves Road, and South Center Street. It would serve downtown Plainfield, Hummel Park, Plainfield High School, and Hendricks Regional Health. As with the route on US 40, the two-way loop deviates off the direct route to access key retail destinations, education institutions, and healthcare facilities directly. A complete cycle of the circulator is about 6 miles. It is assumed to have an operating span of 16 hours on weekdays and 10 hours on weekends. The frequency of the buses is assumed to be every 60 minutes on weekdays and weekends.

As with Alternative 1, paratransit (on-demand) service would be provided to people with disabilities living within $\frac{3}{4}$ mile of fixed transit routes to meet ADA requirements.

Figure 21. Transit Alternative Network 2



Alternative 3

Alternative 3 is illustrated in **Figure 22**. This alternative was designed as a blending of the fixed routes in Alternatives 1 and 2. Alternative 3 includes the transit route on US 40 as described for Alternative 2, and the Town Connector and Hospitality Connector as described for Alternative 1. The length of the routes and their operating spans and bus frequency are the same as those described for each route in Alternatives 1 and 2.

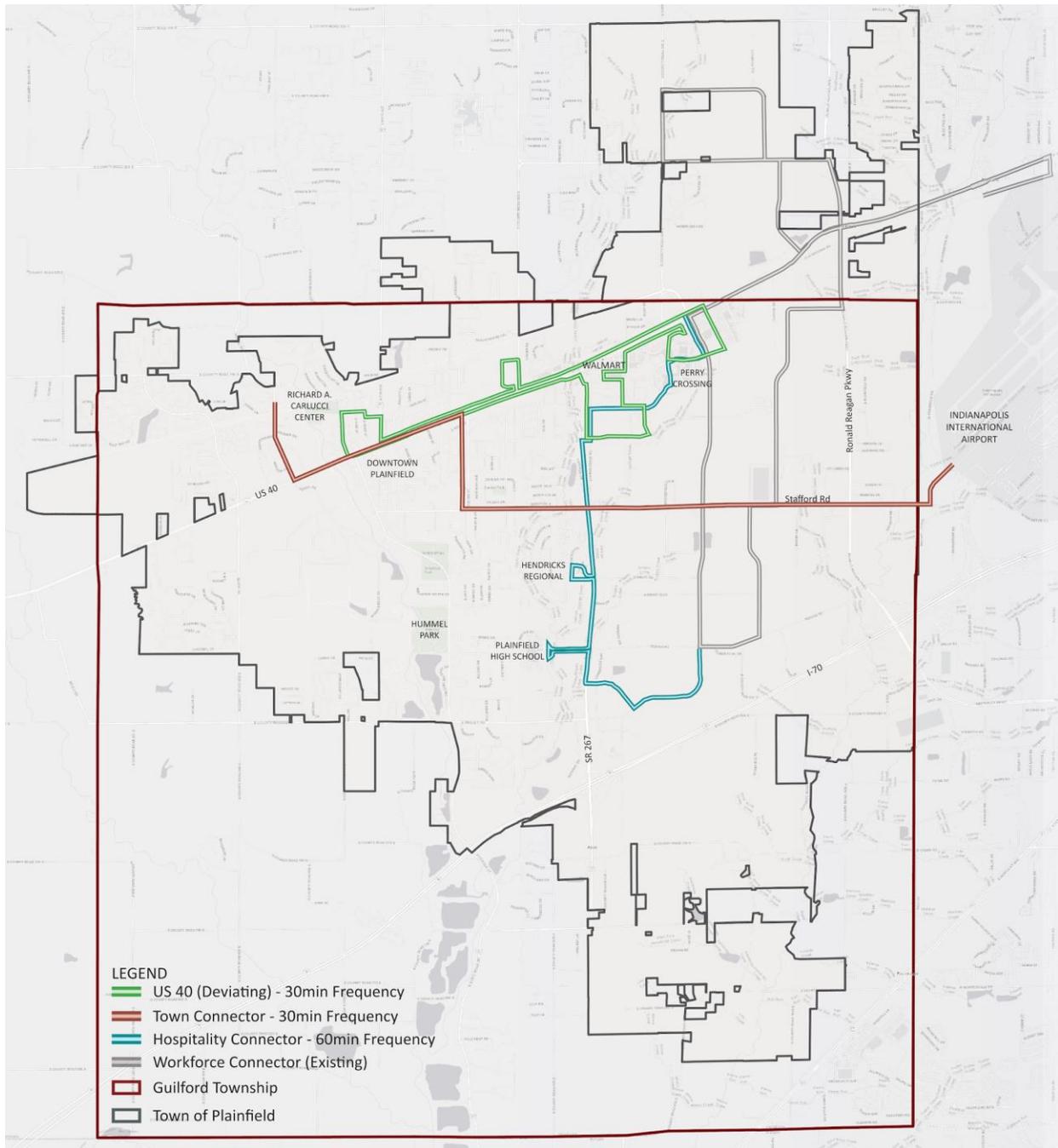
As described for Alternatives 1 and 2, paratransit (on-demand) service would be provided to people with disabilities living within $\frac{3}{4}$ mile of fixed transit routes in accordance with ADA requirements.

Alternative 4

In this alternative, new revenue would be used to support an expansion of demand-response service — also known as dial-a-ride — in Guilford Township. The expansion of demand-response service would be augmented by partnerships with Transportation Network Companies (TNCs— Uber and Lyft). There is no “system map” since the entire Guilford Township transit service area would be served with on-demand service with this alternative. This option allocates 100% of resources to coverage service (0% for ridership).

The cost of this service would be determined by budgets established for system availability (as it is today) and demonstrated demand for the service. Unlike Alternatives 1-3, this alternative is not “sized” based on a specific assumed funding level. An estimated budget for Alternative 4 based on service assumptions appropriate for a demand-response approach is presented in **Appendix D**.

Figure 22. Transit Alternative Network 3



7. ALTERNATIVES EVALUATION

The alternatives presented in **Section 6** are reviewed in this section with respect to three primary factors: financial factors, service factors, and public input. Financial factors relate to how the money is being spent based on the budget identified in **Section 6.1**. Service factors relate to the extent the alternative achieves the system objectives identified in **Section 6.2** and serves the populations most likely to need and use transit. Public input relates to the feedback received from the Transit Advisory Team and the public, as described in **Section 5**.

Information is also provided regarding ridership and coverage, as described in **Section 2**. For alternatives that include fixed route service (Alternatives 1-3), the number of buses is estimated and ridership versus coverage is estimated by comparing the annual operating cost for fixed route transit service (for ridership) versus on-demand service (for coverage). Alternative 4 is 100% coverage by definition.

As described in **Section 6.3**, Alternative 4 is comprised entirely of demand-response service, which would not achieve the same level of service or productivity as the fixed route transit systems of Alternatives 1-3. Cost data is not comparable for Alternative 4 since the service would not be comparable to Alternatives 1-3. A breakdown of the estimated cost of demand-response service can be viewed in **Appendix D**.

7.1. FINANCIAL FACTORS

Investment in each alternative was fiscally constrained based on \$2.35 million in available annual revenue (the medium LOIT projection in **Table 8**). Using this budget, the financial model itemized the annual budget for the Guilford Transit System into four categories: Annual fixed route capital costs, annual fixed route operating costs, paratransit costs, and additional costs. The additional costs category includes future transit programs, future growth, and necessary transit facilities. These budget categories are described below.

Annual fixed route capital costs are funds set aside for financing fixed route transit vehicles, estimated by multiplying the number of required vehicles by the market rate of \$400,000 per vehicle, and dividing by 12 years (the standard operating lifespan of a fixed route transit vehicle). The cost and lifespan of a fixed route transit vehicle were provided by IndyGo. The number of buses needed for each transit alternative is estimated based on route length and bus frequency.

Annual fixed route operating costs are funds used for daily operations of a fixed transit route, calculated by multiplying annual revenue hours by projected cost per hour. Annual revenue hours are calculated by totaling the number of hours a bus would operate on a transit route in a year's

time multiplied by the number of buses. The cost per revenue hour (for a driver, fuel, and maintenance) was estimated based on data provided by IndyGo.²

Annual Paratransit costs are funds used to provide on-demand service to people with disabilities living within ¼ mile of a fixed transit route. This service is required by the Americans with Disabilities Act (ADA). The cost of operating paratransit is calculated by multiplying the annual operating cost of each fixed transit route in each alternative by 25%.

Additional costs are funds set aside for increased on-demand bus service, a rideshare voucher program via a Transportation Network Company (TNC), facilities costs, and reserves for unidentified cost and/or future system growth. The amount set aside for additional costs is the remaining balance when estimated capital, operating, and paratransit costs are subtracted from the available budget.

Values for the financial factors described above are presented in **Table 9** for the alternatives described in **Section 6**. Because of the way alternatives were defined, the overall cost is \$2.35 million per year for Alternatives 1-3 (the fixed route options). These alternatives differ with respect to operating cost and the amount of budget available for LINK+ and other additional costs. Alternative 3 would have the highest operating cost, with only about 10% available for LINK+ and other additional costs. Alternative 2 would have the lowest operating cost, as well as lower capital cost, and would have 26% available for LINK+ and other additional costs. Alternative 1 would fall in the middle with respect to the financial factors shown in **Table 9**

Table 9. Financial Factors Alternatives 1-4

Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
% Ridership / % Coverage	50% / 50%	10% / 90%	40% / 60%	0% / 100%
Buses	6	5	6	TBD
Annual Fixed Route Capital Cost	\$200,000	\$166,667	\$200,000	none
Annual Fixed Route Operating Cost	\$1,387,815	\$1,253,395	\$1,524,640	none
Paratransit Cost	\$346,954	\$313,349	\$381,160	none
Additional Costs (LINK+/ TNC/ Growth/ Reserve Fund/ Facilities)	\$417,208 (18%)	\$618,567 (26%)	\$246,177 (10%)	TBD

² IndyGo’s estimated operating costs for comparable vehicles and routes is \$54.00 per revenue hour. A 20% escalation factor was added to account for less favorable pricing in a smaller system, yielding an estimate of \$65.00 per revenue hour in Guilford Township.

7.2. SERVICE FACTORS

Service factors in this evaluation measure the degree of availability of transit service for those identified in the goals and objectives listed in **Section 6.2** and for those who are most likely to rely on transit for improved mobility. Service factors are measured by developing demographic information regarding those in proximity to the transit service provided.

Demographic information for each alternative was determined by generating a ½-mile buffer around the proposed transit network, and then inputting the buffered area into Esri’s online software, Community Analyst. Demographic information within ½ mile of the transit line was developed for the following measures:

- Population served
- Employees served
- Minority population served
- Older adults served (ages 65+)
- Number of households in poverty served
- Number of households with disability served
- Number of zero car households served

The demographic service factors listed above are presented for each of the four alternatives described in **Section 6** in **Table 10**.

Table 10. Service Factors Alternatives 1-4

Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
% Ridership / % Coverage	50% / 50%	10% / 90%	40% / 60%	0% / 100%
Buses	6	5	6	TBD
Population (% near fixed route transit)	16,862 (51%)	15,160 (46%)	15,895 (48%)	N/A
Employees (% near fixed route transit)	22,879 (85%)	18,804 (69%)	21,766 (80%)	N/A
Older Adults (ages 65+) (% near fixed route transit)	2,717 (56%)	2,531 (52%)	2,650 (55%)	N/A
Poverty Households (% near fixed route transit)	631 (83%)	570 (75%)	580 (76%)	N/A
Disability Households (% near fixed route transit)	1,927 (64%)	1,805 (60%)	1,845 (61%)	N/A
Zero-Car Households (% near fixed route transit)	64 (78%)	52 (63%)	65 (79%)	N/A

The demographic service factors in **Table 10** relate directly to the first two objectives identified in **Section 6.2** for the Guilford Township Transit Plan. The first objective is to prioritize older adults, people with disabilities, and low-income residents. As shown in **Table 10**, Alternative 1 reaches the largest numbers of potential riders in these target populations. Alternative 3 is the second most effective in most categories and is slightly better in service to zero-car households.

The second Guilford Township Transit Plan objective identified in **Section 6.2** is to connect people to work. In terms of total population and employees, **Table 10** shows Alternative 1 to be the most effective fixed route service, followed by Alternative 3, then Alternative 2.

7.3. INPUT FROM THE PUBLIC

Input from the public via public surveys is described in **Section 5.2** and from the Transit Advisory Committee is described in **Section 5.3**. This input was important in understanding community objectives for the system and in defining the alternatives to be evaluated. This section reviews the community response to the alternatives presented at public meetings on January 14, 2020, and January 15, 2020. A detailed summary of the public meetings is provided in **Appendix C**.

At each public meeting, attendees were provided a paper questionnaire and were asked to participate in a coin allocation activity. A total of 45 individuals attended the public meetings, with a total of 38 questionnaires returned (84% of attendees) and 39 individuals participating in the coin allocation activity (87% of attendees). Participants were also asked to place “sticky notes” on the maps and display boards for consideration during final plan refinement.

A majority of questionnaire respondents (76%) either strongly agreed or agreed that connecting a local transit system to Indianapolis was important. Alternatives 1 and 3 provide an opportunity to connect with the planned IndyGo Blue Line at the airport. Alternative 2 does not. A total of 70% of respondents either strongly agreed or agreed that connecting a local transit system to the Indianapolis International Airport was important.

When asked what percentage of potential referendum funding should be spent on transit improvements that stay within the township, 38% of respondents said either 0% or 25% of referendum dollars; 50% of respondents said either 50% or 75% of referendum funds; and 13% of respondents said 100% of referendum funds should be spent on transit only within the township borders. Of the fixed route options, only Alternative 2 operates solely within Guilford Township.

The coin allocation activity, also referred to as the “piggy bank” exercise, was structured to get input regarding which alternative was preferred, while also providing an opportunity to “split the vote” among options. Participants were given a Ziplock bag with one quarter, nickel, dime, and penny to distribute among five piggy banks, representing Alternatives 1-4 and a no-referendum option. The results of the coin allocation activity are shown in **Table 11**.

Table 11. Public Alternative Preference per Coin Allocation Exercise

Value Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Referendum
Quarters (37 Total)	12 (32%)	1 (3%)	5 (14%)	8 (22%)	11 (30%)
Dimes (34 Total)	6 (18%)	2 (6%)	12 (35%)	4 (12%)	10 (29%)
Nickels (39 Total)	9 (23%)	3 (8%)	4 (10%)	10 (26%)	13 (33%)
Pennies (35 Total)	7 (20%)	7 (20%)	6 (17%)	9 (26%)	6 (17%)
Total Count (145 Total)	34 (23%)	13 (9%)	27 (19%)	31 (21%)	40 (28%)
Total Value (\$14.95)	\$4.12 (28%)	\$0.67 (4%)	\$2.71 (18%)	\$2.99 (20%)	\$4.46 (30%)

As shown in **Table 11**, About 70% of the allocated coins were in support of one or more of the transit alternatives and about 30% supported no-referendum option. Of those that supported a transit alternative, almost half placed their most valuable coin (quarter) in support of Alternative 1, while a majority of the second most valuable coin (dime) were in support of Alternative 3, indicating that participants split and ranked their preferences among the alternatives.

Overall, the coin allocation activity showed a clear pattern. Of the 70% of participants that were in favor of a transit referendum, a majority preferred Alternative 1, which received \$4.12 (28%) of the total budget once the values of the coins were applied. The second most preferred network was Alternative 4 at \$2.99 (20%), followed by Alternative 3 at \$2.71 (18%).

7.4. EVALUATION RESULTS

This section reviewed the four alternatives presented in **Section 6** with respect to financial factors, service factors, and public input. Based on this review, Alternative 1 is the best fixed route transit option to carry forward for refinement. This recommendation is based on the following observations:

- With respect to financial factors, Alternative 1 provides a good balance of capital cost, operating cost, and paratransit cost for the proposed system. It also provides a reasonable allowance for additional costs, at 18% of budget, for LINK+, TNC, system growth, facilities, and reserves. Alternative 1 was at the midpoint of these factors among the alternatives, as described in **Section 7.1**.
- With respect to service factors, Alternative 1 was the most effective with respect to meeting the objectives of prioritizing older adults, people with disabilities, and low-

- income residents. It was also most effective in connecting people to work, as described in **Section 7.2**.
- With respect to public input, Alternative 1 was the clear preference among the fixed route transit options, as described in **Section 7.3**.

Based on these findings, Alternative 1 was carried forward and adjusted based on all input to date for potential presentation as a representative transit system for the proposed transit referendum. These refinements and the recommended transit system alternative are described in the next section.

8. RECOMMENDED TRANSIT NETWORK

8.1. FIXED ROUTE RECOMMENDATIONS

Final recommendations for a fixed route transit network are derived from Alternative 1, which was shared at the public meetings, and additional comments from the plan's Transit Advisory Team. Advisory Team members desired the fixed-transit routes to stay within Guilford Township (with the exception of connecting to the Indianapolis International Airport). The Team also believed a connection to Saratoga Crossing Apartments, located in the northeast corner of the township near US 40, would be beneficial.

The final recommendation is based on Alternative 1, as described in **Section 6.1**. It includes three fixed routes, as shown in **Figure 23**. Adjustments to Alternative 1 in the final recommended network are described below:

US 40 Fixed Route. In response to public and Advisory Team comments, the fixed-transit line on US 40 was shortened on its eastern terminus from Ronald Reagan Parkway to Perry Road. This ensures the transit line remains within Guilford Township. In addition, the terminus of the transit route on US 40 was changed from just west of downtown Plainfield to a split, with alternating buses going north to the Richard A. Carlucci Center and further west to Saratoga Crossing Apartments.

Town Connector Route. Changes to the US 40 transit route meant the segment of the Town Connector route originally proposed to terminate at the Richard A. Carlucci Center was no longer needed. The western terminus of the Town Connector was modified to end just west of South Center Street in downtown Plainfield. The proposed Town Connector route uses US 40, Simmons Street, and Stafford Road to connect the west side of downtown Plainfield to the Indianapolis International Airport.

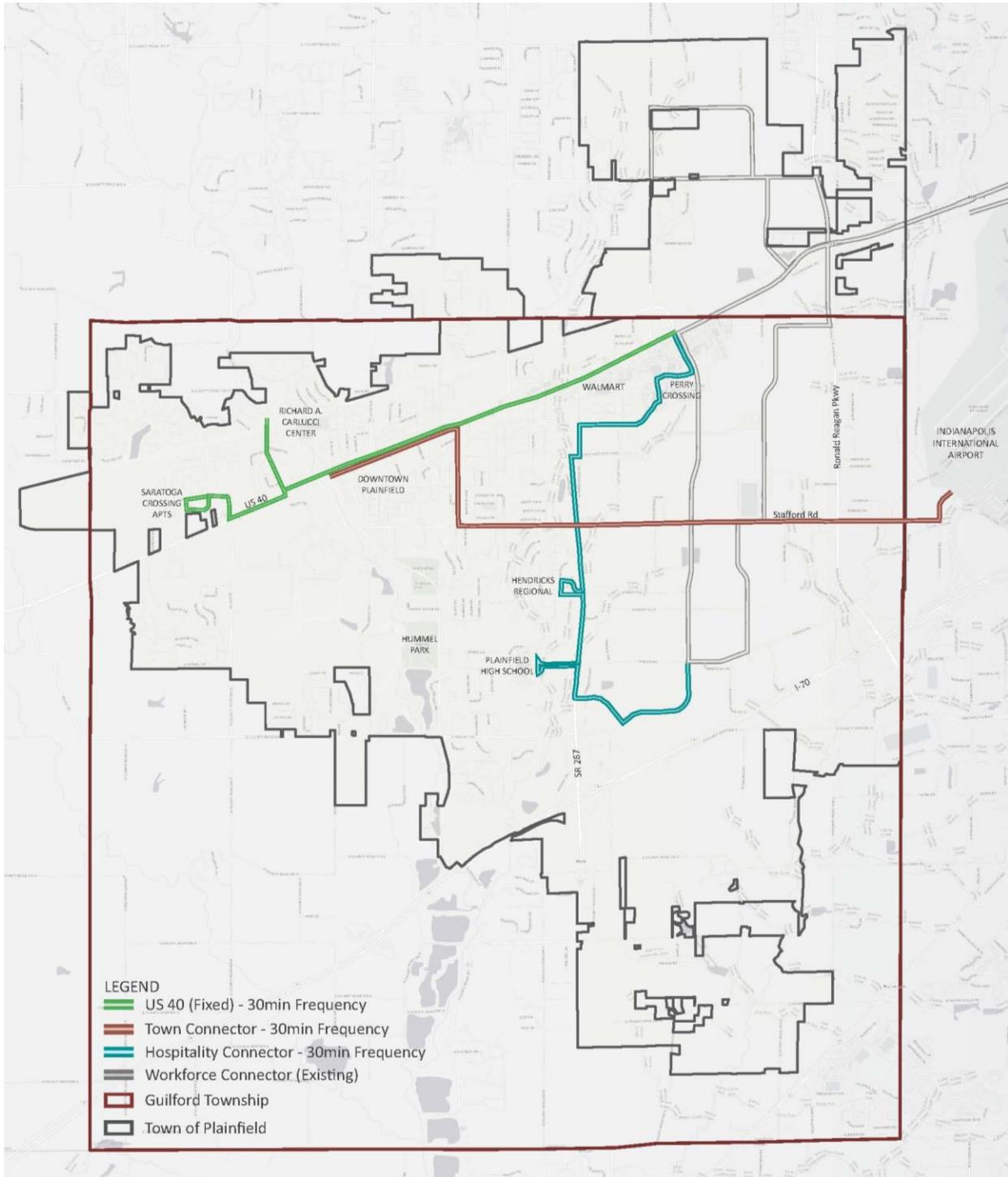
Hospitality Connector Route. The Hospitality Connector route, which connects the Perry Road and Reeves Road intersection to the Shoppes at Perry Crossing at US 40 using Perry Road and SR 267 is unchanged from the concept presented to the public. This route provides stops at Plainfield High School and Hendricks Regional Health.

All three proposed fixed-transit routes have an operating span of 16 hours on weekdays and 8 hours on weekends. The frequency of buses for each line is assumed to be every 30 minutes on weekdays and every 60 minutes on weekends.

8.2. OTHER RECOMMENDED SERVICES

As part of the recommended network, paratransit services would be provided for qualified residents within a $\frac{3}{4}$ mile radius of the three fixed transit routes. Additionally, funds are reserved for an expanded on-demand transit service within Guilford Township and a Transportation Network Company (TNC) voucher program.

Figure 23. Recommended Guilford Township Transit Network



8.3. ESTIMATED COSTS

All recommendations are fiscally constrained by the medium revenue projection for an annual Local Option Income Tax (LOIT) in Guilford Township (\$2,351,997/year). Like the alternative transit network options presented at the public meetings, the annual budget for this system is itemized by capital cost, operating cost, paratransit cost, and additional cost to fit within this overall budget. See **Table 8** for derivation of the anticipated annual transit budget.

8.4. ESTIMATED BENEFITS

The final recommended network meets the Guilford Township Transit Plan objectives shown in **Section 6.2**, including those to improve access for transit dependent populations, as described below:

- **Help older adults, people with disabilities, and low-income residents.**³ Prioritize older adults, people with disabilities, and low-income residents who have fewer transportation options and are often more transportation-cost burdened.
 - 59% of Guilford Township’s senior population live within ½ mile of one or more of the three recommended transit routes.
 - 67% of Guilford Township residents with one or more disabilities live within ½ mile of one or more of the three recommended transit routes.
 - 82% of Guilford Township residents living below the poverty level live within ½ mile of one or more of the three transit routes.
- **Connect people to work.** Improve service to the industrial parks, and help people get to work both in town and in Indy.
 - 80% of Guilford Township’s employable workforce live within ½ mile of one or more of the three recommended transit routes.
- **Maximize ridership.** Create a useful system that can maximize ridership.
 - 50% of the total budget is dedicated to generating ridership.
- **Build on LINK.** Expand LINK’s existing on-demand service.
 - Approximately \$358,000 is dedicated to the Additional Costs line item, which includes building LINK’s budget as well as contributing to some kind of TNC partnership or additional service.
- **Connect to Indy.** Create at least one convenient way for township residents to access the Blue Line and/or downtown Indianapolis.
 - The Town Connector terminates at the Indianapolis International Airport, which provides an opportunity to connect to the Blue Line and travel to Indianapolis as well as providing access to the airport.

³ Demographic data derives from Esri’s Community Analyst.

- Final recommendations from the public and the Advisory Team required all funds be spent within Guilford Township with the exception of this connection to the airport.

8.5. SUMMARY

The recommended network was designed in response to takeaways from stakeholder meetings, survey results, Advisory Team meetings, and public feedback as a modification of Alternative 1. The financial factors and service factors associated with the recommended network are shown in **Table 12**. Values for Alternative 1 are also shown in the table for reference.

This final recommendation is fiscally constrained, inclusive to Guilford township (with one outside connection to Indianapolis International Airport), and has been strategically designed to serve transit-dependent populations identified within the township. It allocates funding to new fixed route transit lines while still providing significant improvements to the existing on-demand transit service and has balanced resources dedicated to ridership and coverage.

Table 12. Recommended Transit Network Financial and Service Factors

Alternative	Alternative 1	Recommended Guilford Township Transit Network
% Ridership / % Coverage	50% / 50%	50% / 50%
Buses	6	6
Annual Fixed Route Capital Cost	\$200,000	\$200,000
Annual Fixed Route Operating Cost	\$1,387,815	\$1,434,550
Paratransit Cost	\$346,954	\$358,638
Additional Costs (LINK+/ TNC/ Growth/ Reserve Fund/ Facilities)	\$417,208 (18%)	\$358,790 (15%)
Population (% near fixed route transit)	16,862 (51%)	17,877 (54%)
Employees (% near fixed route transit)	22,879 (85%)	21,654 (80%)
Older Adults (% near fixed route transit)	2,717 (56%)	2,856 (59%)
Poverty Households (% near fixed route transit)	631 (83%)	623 (82%)
Disability Households (% near fixed route transit)	1,927 (64%)	1,998 (67%)
Zero-Car Households (% near fixed route transit)	64 (78%)	76 (93%)

APPENDIX A – DEMOGRAPHIC, EMPLOYMENT, AND COMMUTING MAPS

Figure 24: Percent of Population below Poverty Level, Guilford Township

Figure 25: Percent of Zero Vehicle Households (ZVH), Guilford Township

Figure 26: Older Adult (65+) Population Density, Guilford Township

Figure 27: Where Employees Live who Work in Census Tract 2109

Figure 28: Where Employees Live who Work in Census Tract 2108.02

Figure 29: Where Employees Live who Work in Census Tract 2106.07

Figure 30: Where Employees Work who Live in Guilford Township

Figure 24. Percent of Population below Poverty Level, Guilford Township

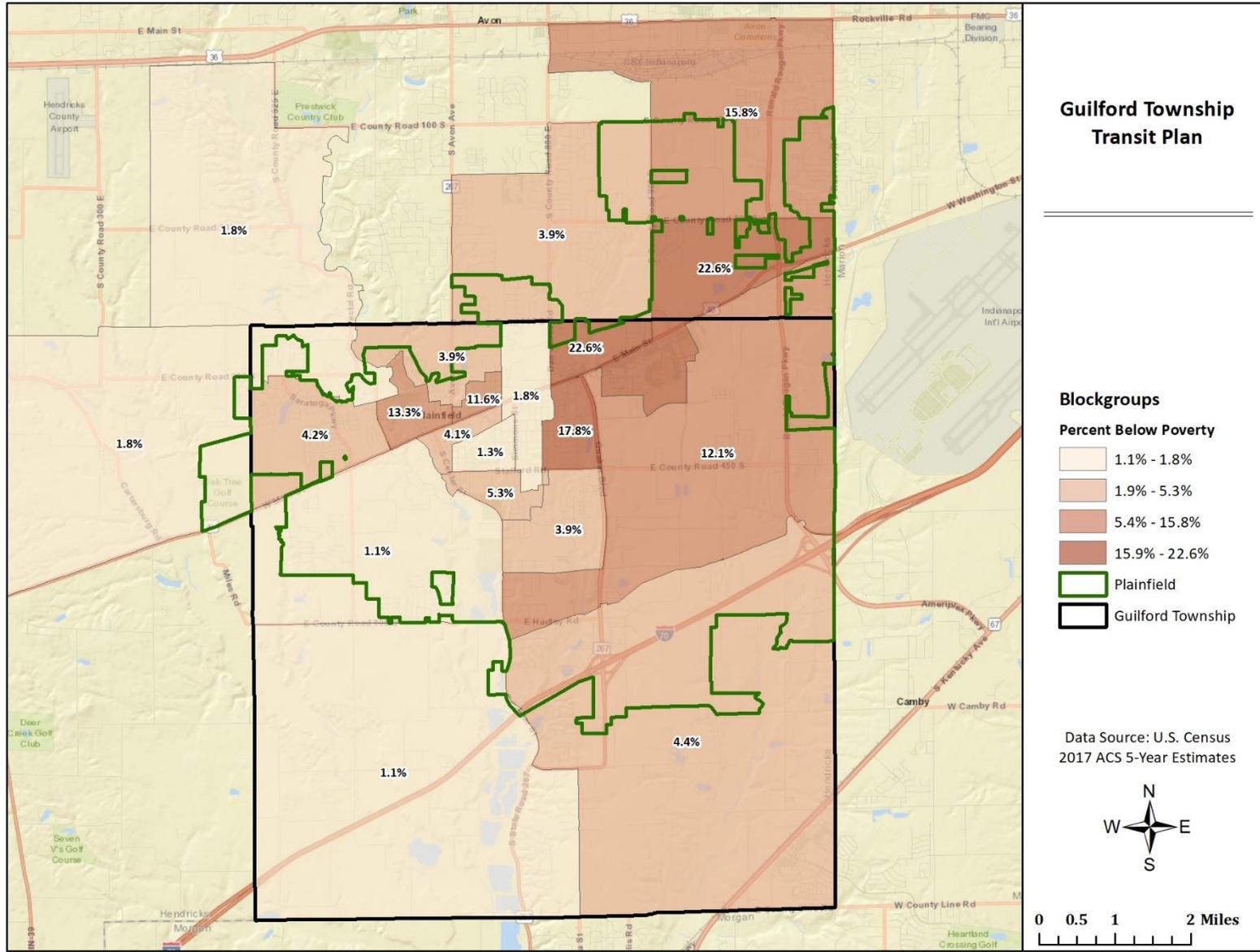


Figure 25. Percent of Zero Vehicle Households (ZVH), Guilford Township

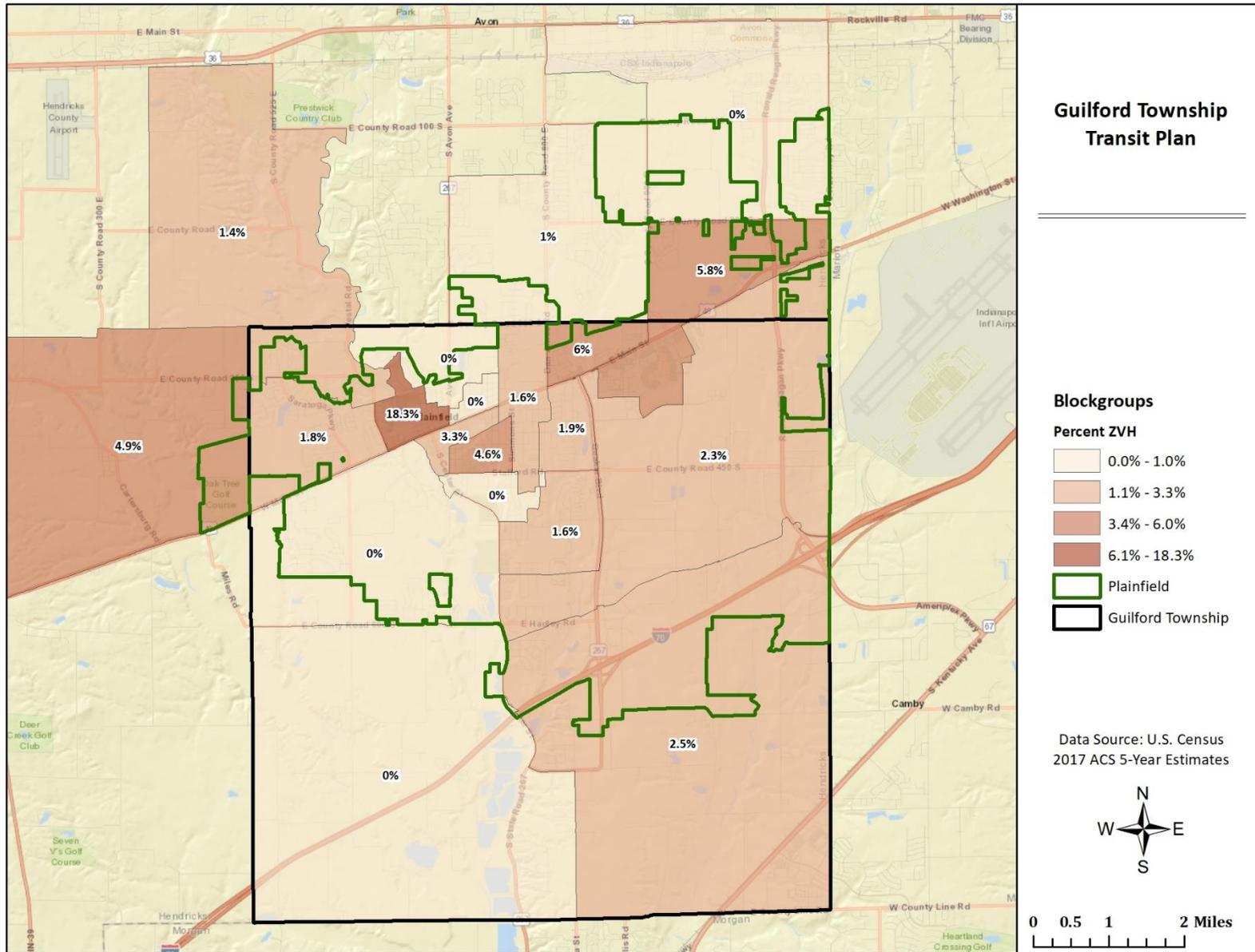


Figure 26. Older Adult (65+) Population Density, Guilford Township

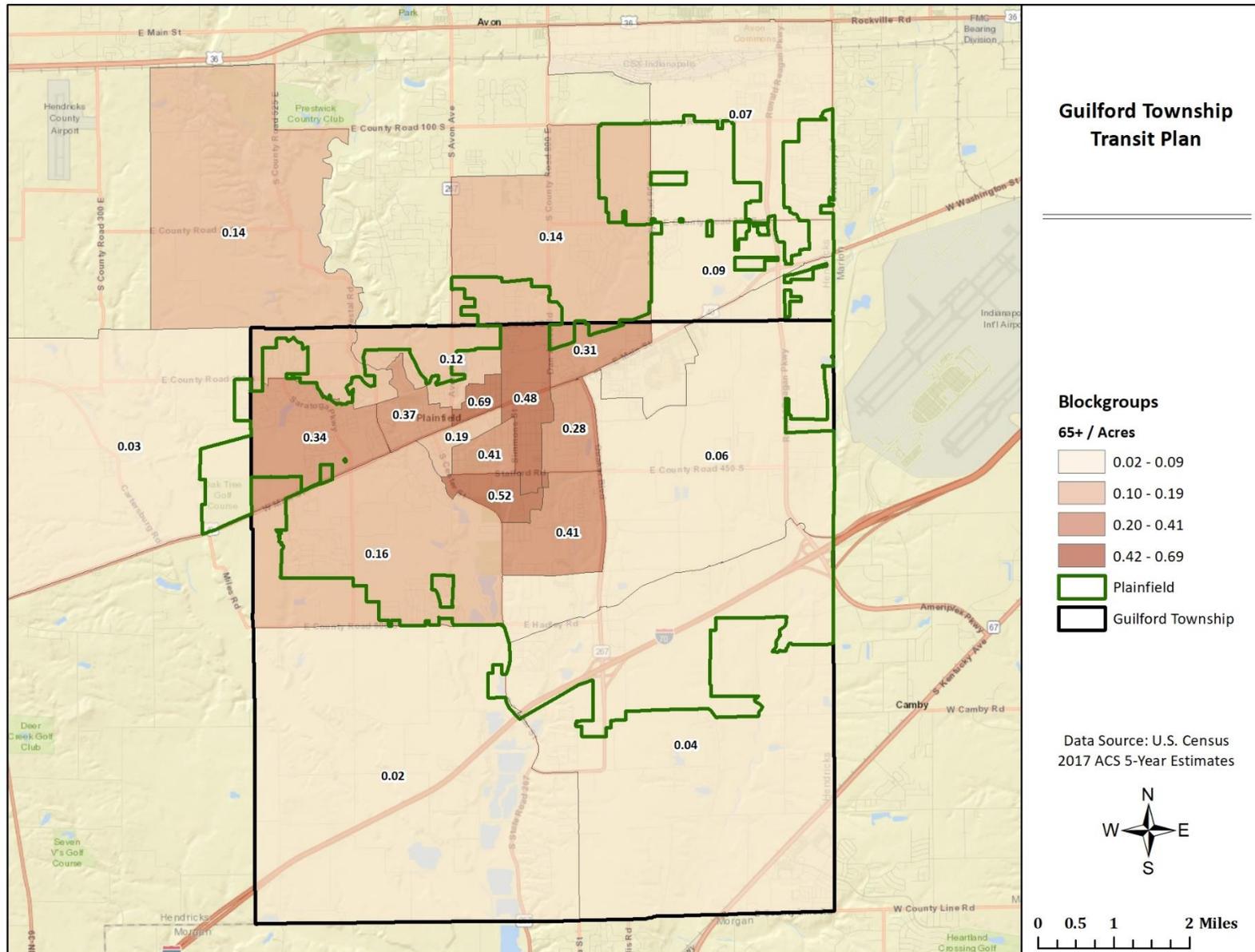


Figure 27. Where Employees Live who Work in Census Tract 2109

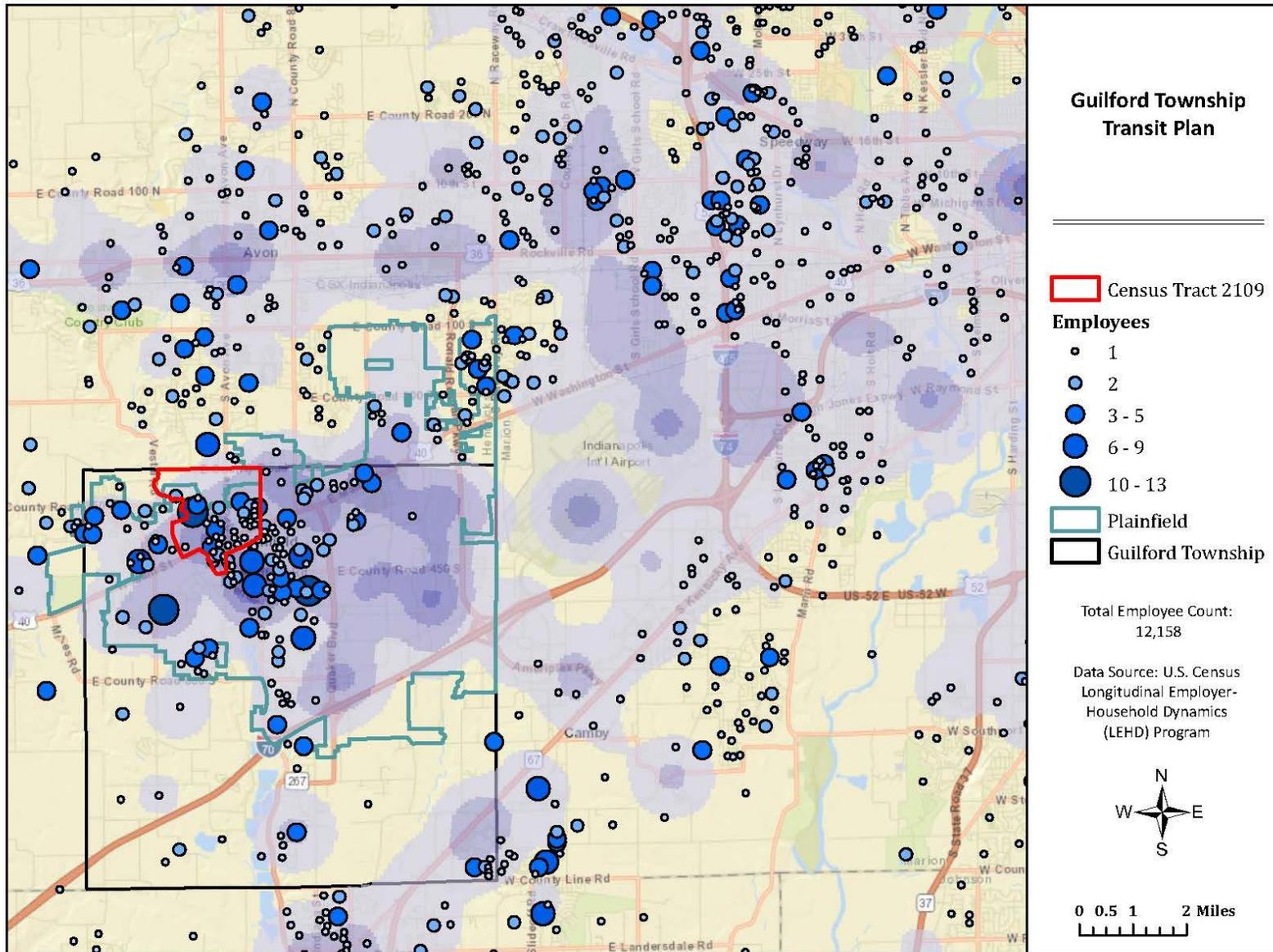


Figure 28. Where Employees Live who Work in Census Tract 2108.02

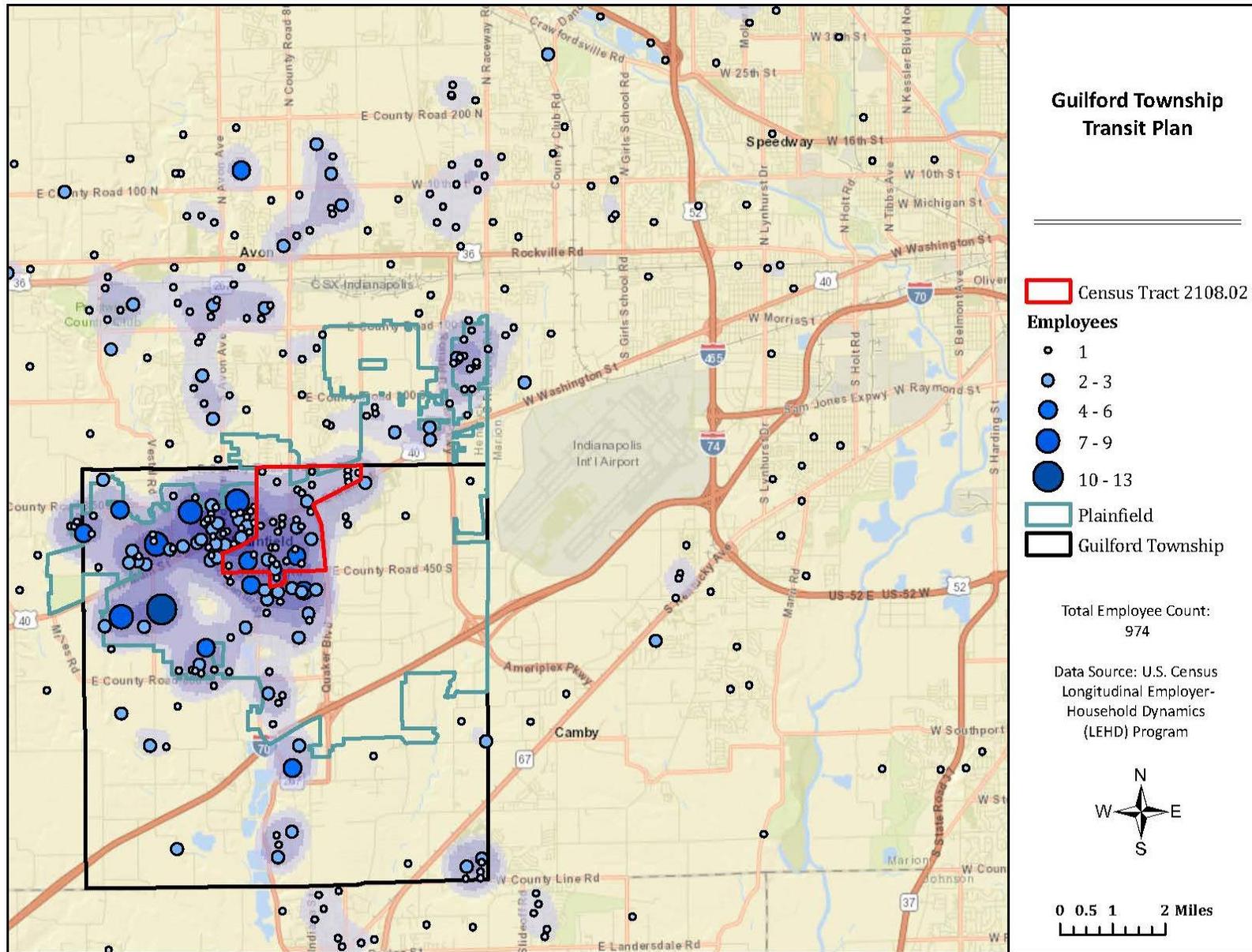


Figure 29. Where Employees Live who Work in Census Tract 2106.07

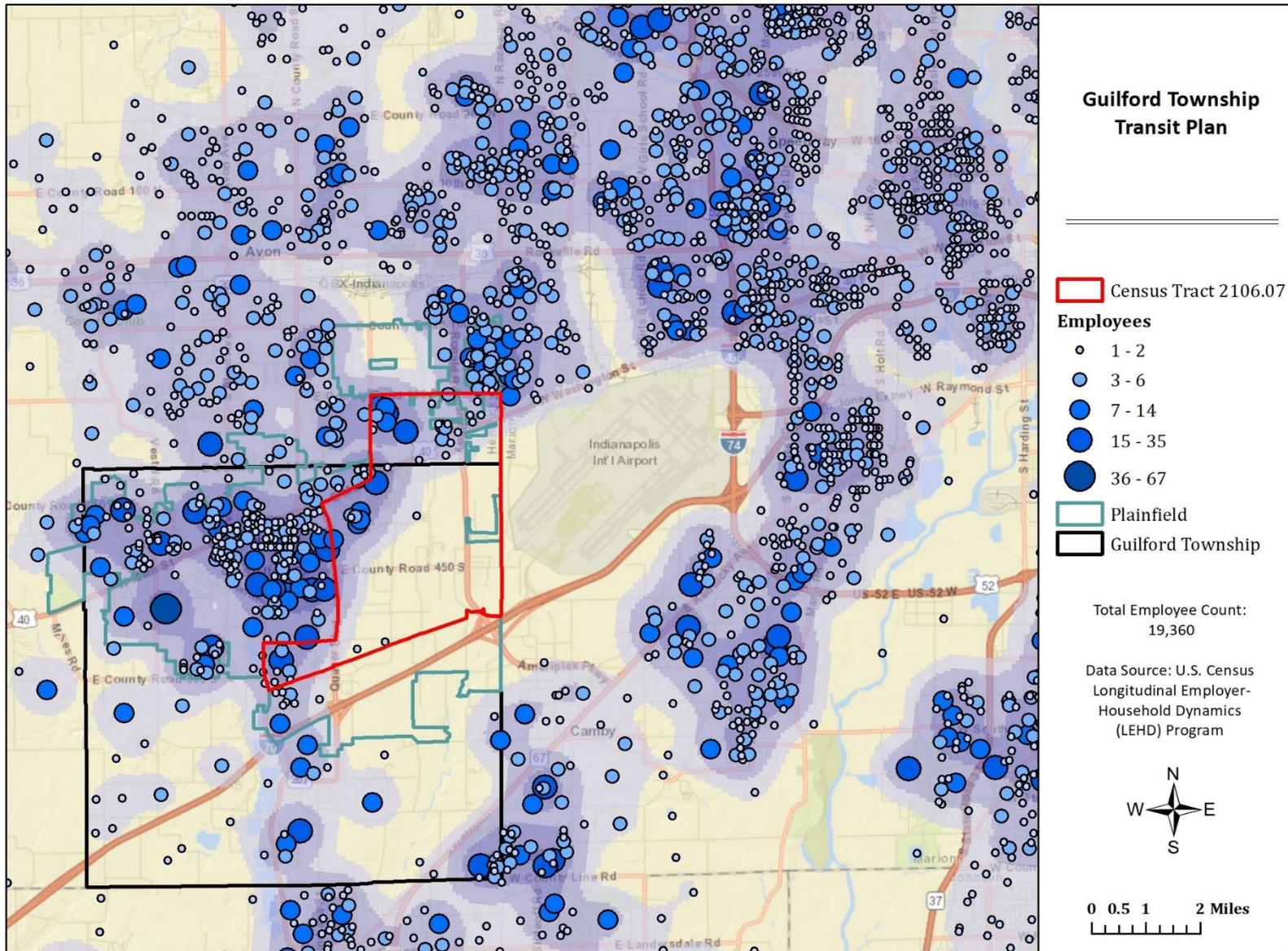
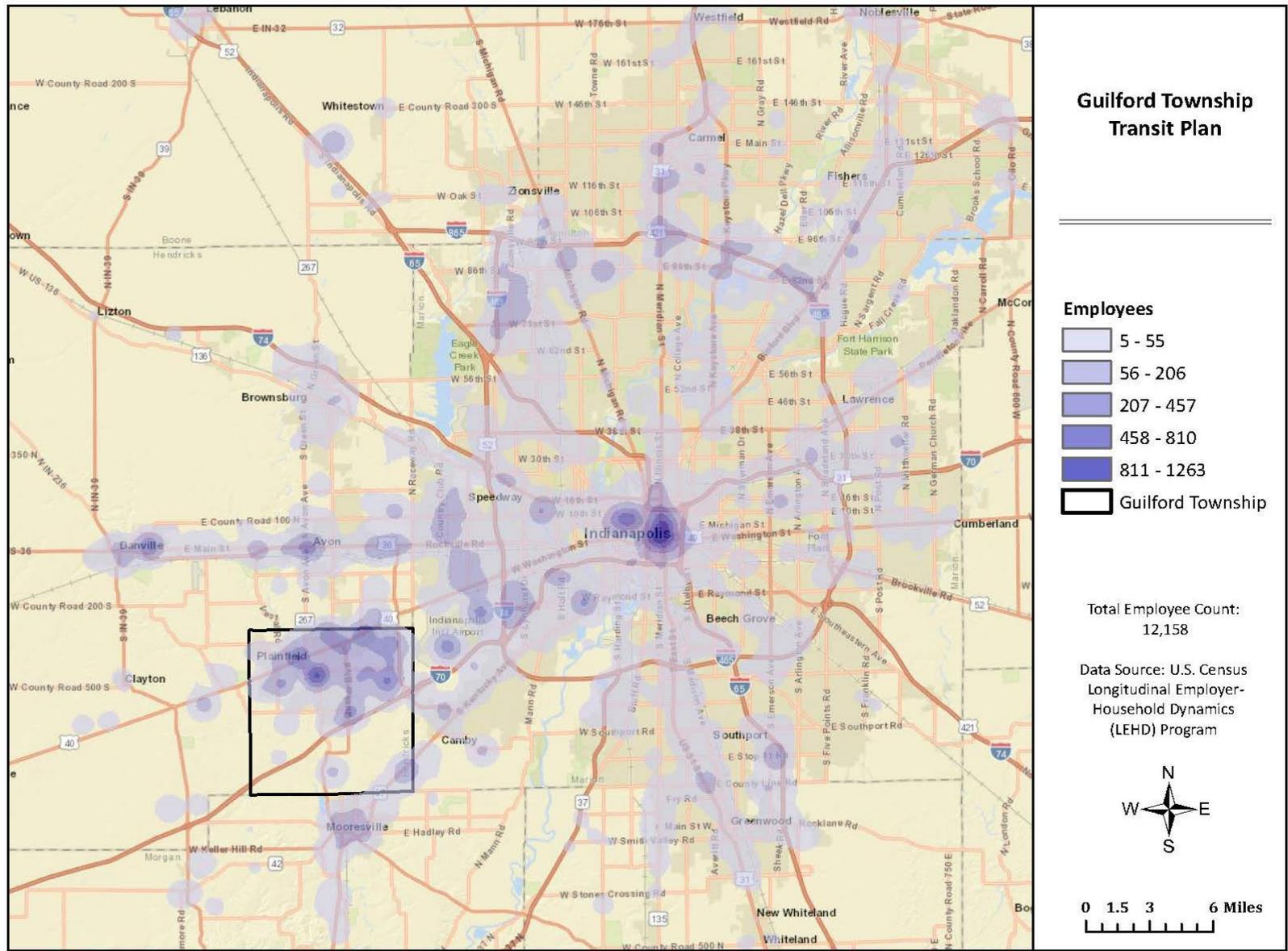


Figure 30. Where Employees Work who Live in Guilford Township



APPENDIX B - GUILFORD TOWNSHIP-PLAINFIELD TRANSIT ADVISORY TEAM

List of Advisory Team Members

Name	Title	Organization
Members		
Lisa Bentley	Executive Director	Indy Gateway, Inc.
Robin Brandguard	Town Council President	Town of Plainfield
Pat Cockrum	CEO	Sycamore Services
Brad Coffing	Research Analyst	MIBOR
Todd Cook	Economic Development Director	Town of Plainfield
Chase Cotton	Public Health Specialist	Hendrick County Health Department
Brad DuBois	President/CEO	Plainfield Chamber of Commerce
Chuck Ellis	Trustee	Guilford Township Trustee
Ed Gaddie	Member	Guilford Township Board
Larry Hesson	Councilor/ Treasurer	Hendricks County Council/ CIRT
Jaime Johnson	Associate	Kelley and Associates
Marina Keers	Executive Director	Hendricks County Senior Services
Cinda Kelley	Owner	Kelley and Associates
Dave Kelly	Resident	Resident
Daniel Kinnamon	Member	Guilford Township Board
Bill Kirchoff	Town Council Vice President	Town of Plainfield
Andrew Klinger	Town Manager	Town of Plainfield
Charles Morris	Member	Guilford Township Board
Tony Perona	Resident	Resident
Chris Pryor	Government Affairs Director	MIBOR
Staff & Consultants		
Cindy Benedict	Convener & Project Manager	Stones3 Resources, LLC
Ray Boylston	Senior Associate	RLS & Associates

GUILFORD TOWNSHIP TRANSIT PLAN

Christy Campoll	Associate	RLS & Associates
Annie Dixon	Mobility Manager	CIRTA & Indianapolis MPO
Anna Gremling	Executive Director	Indianapolis MPO
John Myers	Senior Transportation Planner	HNTB
Sean Northup	Assistant Executive Director	Indianapolis MPO
Jennifer Pyrz	Planning Group Leader/Project Manager	HNTB
James Rinehart	Special Projects Planner	Indianapolis MPO
Ryan Wilhite	Strategic Planner	IndyGo

APPENDIX C - PUBLIC MEETING SUMMARY

Introduction

The team hosted two two-hour long public input sessions on January 14th from 9am-11am and January 15th from 6pm-8pm. At each public meeting, there were display posters for four different transportation networks as well as one demographic board, one transit ridership recipe board, and one network summary board. To collect feedback from the public, each session included a paper survey as well as a coin allocation activity. Participants were given a Ziploc bag with one quarter, nickel, dime, and penny to distribute between five different piggy banks. One piggy bank was provided for each transportation network and the fifth bank was for no change/no referendum. A brief presentation included the following information:

- Jennifer Pyrz of HNTB (the lead consulting firm on the project) started a presentation with explaining referenda and the process of public engagement.
- Pyrz explained the state-established referendum rate of .25% and that a household with an income of \$40,000/year would contribute \$100 over the same period.
- Christy Campoll of RLS (a subconsultant on the project) then gave an overview of the current transportation services available to Guilford Township residents and how the different services are funded.
- Campoll gave an overview of LINK Hendricks County as well as the Plainfield Connector services. Campoll explained LINK receives federal transportation dollars for rural areas, and the Plainfield Connector services were funded via an Economic Improvement District.
- Campoll also noted some gaps in transportation including LINK operating at capacity and the desire for a service to travel beyond county lines.
- Campoll noted where the highest concentration of transit-dependent populations were located within the township.
- Sean Northup of the IMPO followed the existing conditions with an explanation of the main themes the team heard during the stakeholder engagements which included a focus on seniors, individuals with disabilities, and low-income populations.
- Northup also described multiple tradeoffs in transportation planning including ridership versus coverage and linear versus curving routes.
- Northup highlighted different details of each transportation network proposal, which included route locations and how to read additional information presented on each map.
- Cindy Benedict of Stones3Resources (a contractor for the IMPO) closed the presentation with an explanation of the two types of feedback mechanisms. Benedict explained participants could use the coins provided to indicate which transportation network they

preferred and reminded participants a quarter in any one piggy bank would be considered as a stronger preference than a penny.

Questions from the audience were answered and participants were then released to view boards, complete questionnaires, complete the piggy bank exercise, and have one-on-one conversations with staff.

Networks for Evaluation

*All alternatives showed the existing North and South Plainfield connectors.

Alternative #1:

Network 1 included a fixed route with along US 40, a Town Connector that connected the Carlucci Center to the Indianapolis Airport using US 40 and Stafford Road, and a Hospitality Connector serving the 267/70 interchange with the Plainfield High School, Hendricks Regional Health, and the Shops at Perry Crossing.

Alternative #2

Network 2 included a deviating-fixed route service along US 40 with stops at storefronts set back from the main road as well as a two-way loop connecting the Shops at Perry Crossing to downtown Plainfield, Hummel Park, Plainfield High School, and Hendricks Regional Health.

Alternative #3

Network 3 included similar Town and Hospitality Connectors as in Network 1, and the US 40 route in Network 3 was the same as in Network 2.

Alternative #4

Network 4 did not include any fixed routes or maps. Network 4 devoted all resources to improving the existing LINK Hendricks County service within Guilford Township. The revenue would be used to increase the level of service within Guilford Township for Guilford Township residents.

No Referendum (No Tax)

Following input on the piggy bank options from a member of the public, a fifth option was added at the beginning of the January 14th session and represented no additional transportation services for Guilford Township.

Summary of Quantitative Results

A total of 45 individuals attended a public meeting with a total of 38 surveys returned (84.4% of attendees) and 39 contributing to the piggy bank activity (86.6% of attendees). Of survey respondents that answered why they were interested in local transit (35 responders), 80% stated they either wanted a transportation option for themselves or for the community. The remaining 20% did not think the community needed transit. The results of the piggy bank exercise were

similar to the survey responses with about 70% allocating coins to some kind of transportation service and about 30% allocating coins to the “No Referendum” option.

A total of 76% of survey respondents either strongly agreed or agreed that connecting local transit system to Indianapolis was important. A total of 70% of survey respondents either strongly agreed or agreed that connecting a local transit system to the Indianapolis International Airport was important.

Investment by Network

	Quarters		Dimes		Nickels		Pennies		Total Count (coins)		Investment Value Total (coin value* number of coins)	%
Network 1	12	32%	6	18%	9	23%	7	20%	34	23%	\$ 4.12	28%
Network 2	1	3%	2	6%	3	8%	7	20%	13	9%	\$ 0.67	4%
Network 3	5	14%	12	35%	4	10%	6	17%	27	19%	\$ 2.71	18%
Network 4	8	22%	4	12%	10	26%	9	26%	31	21%	\$ 2.99	20%
No Referendum	11	30%	10	29%	13	33%	6	17%	40	28%	\$ 4.46	30%
TOTAL	37	100%	34	100%	39	100%	35	100%	145	100%	\$ 14.95	100%

Though the No Referendum option and Network 1 were closest in the number of coins (“Total Count” column), when the values of the coins were applied (Investment Value column), Network 1 increased 5% in the percentage of overall investment value compared to 2% for the No Referendum option.

Of the 37 individuals that used their most valuable coin (the quarter), 70% of participants put their highest weighted coin in one of the four transit network options (indicating a preference for transit) while 30% used this coin to support the No Referendum option (indicating a preference for no additional transit). A similar pattern emerged for the dimes (71% a transit network vs 29% no referendum), nickels (67% a transit network vs 33% no referendum), and pennies (83% a transit network vs 17% no referendum).

Of the 70% of participants that were in favor of transportation, a majority preferred Network 1.

Public Comments

Attendees had the option to write on post-it notes and place them on each corresponding board. Additionally, some participants wrote comments on their paper surveys. All comments are below exactly how they were written.

Public Comments included the following:

- No preference on network. No benefit to me
- Where do 2,000 who live and work in Guilford Township live? Would they be served? Where will low income live after tearing down houses? What percent of new apartments are subsidized?
- I think a high percentage (of funding) should go towards connecting to people and ridership option outside the county
- Is the ridership there (referring to the percentage of funds spent within the township)
- Only employees would use the airport connection
- IN high school is so important especially with made at Plainfield coming
- Post-it notes left on maps:
 - Stafford Road
 - Library
 - Post office
 - Churches PCC
 - Advertise meetings more
 - 300 Township Line Road
 - Stop at the library to get jobs

Next Steps

The team will be meeting again to finalize the recommendations to the Township, which will include incorporating feedback from the public meeting engagements. The team will present the finalized plan at the March 4th Township Board Meeting.

Attachment A: Date-Specific Data

January 14th, 2020 (9-11am)

Piggy Bank Results from most to least preferred:

- Network 1 (\$3.10)
- No Referendum (\$2.84)
- Network 3 (\$1.79)
- Network 4 (\$1.67)
- Network 2 (\$0.13)

Though no referendum was overall the second preferred option, this option represented only 29.9% of the total coins deposited (see below). The preference for the addition of some form of transportation (Network 1-4) represented 70.1% of total coins and 70.8% of coins with the heaviest weight (the quarter).

	Quarters	# Coins	Dimes	# Coins	Nickels	# Coins	Pennies	# Coins	Total
Network 1	\$2.25	9	\$0.40	4	\$0.40	8	\$0.05	5	\$3.10
Network 2	-	0	\$0.10	1	-	0	\$0.03	3	\$0.13
Network 3	\$1.00	4	\$0.60	6	\$0.15	3	\$0.04	4	\$1.79
Network 4	\$1.00	4	\$0.30	3	\$0.30	6	\$0.07	7	\$1.67
No Referendum	\$1.75	7	\$0.70	7	\$0.35	7	\$0.04	4	\$2.84
Total	\$6.00	24	\$2.10	21	\$1.20	24	\$0.23	23	\$9.53

Answers to the paper survey questions are below in the order they appear on the survey.

1. It is important to connect a local transit system to Indianapolis.

	Number of responses	% of total responses
Strongly Agree	10	45%
Agree	6	27%
No Opinion	1	5%
Disagree	0	0%
Strongly Disagree	5	23%
Total	22	100%

2. It is important to connect a local transit system to the Indianapolis International Airport.

	Number of responses	% of total responses
Strongly Agree	10	45%
Agree	6	27%
No Opinion	1	5%
Disagree	2	9%
Strongly Disagree	3	14%
Total	22	100%

3. Why are you interested in local transit?

	Number of responses	% of total responses
I do not think my community needs transit	3	15%
I don't need transit, but it's good for others and the community	14	70%
I would like to have a transit option for me	3	15%
Total	20	100%

4. What percentage of funding should be used for transit improvements that stay strictly within the township (no connections outside of the township)?

Percent of funding that should stay in the township	Number of responses	% of total responses
0%	3	16%
25%	4	21%
50%	7	37%
75%	2	11%
100%	3	16%
Total	19	100%

5. Rank your most preferred network.

	Most preferred	Second preference	Third preference	Fourth preference
Network 1	8	1	3	0
Network 2	2	2	7	1
Network 3	1	6	2	3
Network 4	1	3	0	6

January 15th, 2020 (6-8pm)

Following the conclusion of the presentation, the audience had the opportunity to ask questions. There were none following the conclusion of the presentation on the 15th.

Piggy Bank results from most to least preferred

1. No Referendum (\$1.62)
2. Network 4 (\$1.32)
3. Network 1 (\$1.02)
4. Network 3 (\$0.92)
5. Network 2 (\$0.54)

Though No Referendum option was the most preferred network, this option represented only 29.8% of total coins. The preference for some kind of transportation improvement (Network 1-4) represented about 70.2% of total coins and 69.2% of coins with the heaviest weight (the quarter).

	Quarters	# Coins	Dimes	# Coins	Nickels	# Coins	Pennies	# Coins	Total
Network 1	\$0.75	3	\$0.20	2	\$0.05	1	\$0.02	2	\$1.02
Network 2	\$0.25	1	\$0.10	1	\$0.15	3	\$0.04	4	\$0.54
Network 3	\$0.25	1	\$0.60	6	\$0.05	1	\$0.02	2	\$0.92
Network 4	\$1.00	4	\$0.10	1	\$0.20	4	\$0.02	2	\$1.32
No Referendum	\$1.00	4	\$0.30	3	\$0.30	6	\$0.02	2	\$1.62
Total	\$3.25	13	\$1.30	13	\$0.75	15	\$0.12	12	\$5.42

Answers to the paper survey questions are below in the order they appear on the survey.

1. It is important to connect a local transit system to Indianapolis.

	Number of responses	% of total responses
Strongly Agree	6	27%
Agree	6	27%
No Opinion	0	0%
Disagree	0	0%
Strongly Disagree	3	14%
Total	15	100%

2. It is important to a connect a local transit system to the Indianapolis International Airport.

	Number of responses	% of total responses
Strongly Agree	5	33%
Agree	5	33%
No Opinion	1	7%
Disagree	2	13%
Strongly Disagree	2	13%
Total	15	100%

3. Why are you interested in local transit?

	Number of responses	% of total responses
I do not think my community needs transit	4	27%
I don't need transit, but it's good for others and the community	6	40%
I would like to have a transit option for me	5	33%
Total	15	100%

4. What percentage of funding should be used for transit improvements that stay strictly within the township (no connections outside of the township)?

Percent of funding that should stay in the township	Number of responses	% of total responses
0%	3	23%
25%	2	15%
50%	1	8%
75%	6	46%
100%	1	8%
Sum	19	100%

5. Rank your most preferred network

	Most preferred	Second preference	Third preference	Fourth preference	Fifth preference
Network 1	14	2	4	2	1
Network 2	3	5	13	2	0
Network 3	1	10	6	6	0
Network 4	5	5	0	10	0
No Referendum	0	1	0	0	5

*Participants in the January 14th session did not have the No Referendum option available for ranking.

Attachment B: Participant Geographic Information

A total of 45 individuals attended at least one of the two public meetings. Of these attendees, 42 provided complete street addresses (address, town, zip code). Of the 42 completed addresses, 31 individuals listed Plainfield addresses. All Plainfield addresses are located within Guilford Township as well as two individuals with addresses in Mooresville and Clayton (within the Guilford Township bounds). A total of 78% of meeting attendees live in Guilford Township. Two individuals listed either a zip code or a town but not a complete street address. A list of attendee addresses is below:

Date of Attendance	Street Address	Town	Zip
1/15/2020	4958 Beechwood Circle	Avon	46123
1/15/2020	7663 Monterey Circle	Avon	46123
1/14/2020	10636 E. County Road 800 S	Camby	46113
1/14/2020	5984 S State Road 39	Clayton	46118
1/15/2020	1201 Sycamore Ln	Danville	46122
1/14/2020	5232 N Kenwood	Indianapolis	46208
1/14/2020	616 E New York St	Indianapolis	46202
1/14/2020	8970 Sunningdale Blvd	Indianapolis	46234
1/15/2020	5231 Oakridge Dr	Mooresville	46158
1/15/2020	920 Moonlight Ct	Mooresville	46158
1/14/2020	1218 Stafford Road	Plainfield	46168
1/15/2020	1405 Reeves Rd	Plainfield	46168
1/14/2020	206 W Main St	Plainfield	46168
1/14/2020	247 Vestal Rd	Plainfield	46168
1/15/2020	247 Vestal Rd	Plainfield	46168
1/14/2020	310 Raines St	Plainfield	46168
1/14/2020	334 Country Ln	Plainfield	46168
1/15/2020	419 Dunn St	Plainfield	46168
1/14/2020	419 E Main St	Plainfield	46168
1/14/2020	419 E. Main St	Plainfield	46168
1/14/2020	427 Avon Ave	Plainfield	46168
1/14/2020	427 Avon Ave	Plainfield	46168
1/15/2020	5063 Clay Creek Ln	Plainfield	46168
1/14/2020	5398 Marigold Dr	Plainfield	46168

GUILFORD TOWNSHIP TRANSIT PLAN

Date of Attendance	Street Address	Town	Zip
1/15/2020	5726 Saratoga Place	Plainfield	46168
1/14/2020	5727 Augusta Woods Dr	Plainfield	46168
1/14/2020	5816 Kenwood Way	Plainfield	46168
1/15/2020	6244 Quail Ridge E Dr.	Plainfield	46168
1/15/2020	6357 S County Road 521 E	Plainfield	46168
1/14/2020	6727 S County Road 175 E	Plainfield	46168
1/14/2020	6923 Mockernut Ct	Plainfield	46168
1/14/2020	6962 Forest Ridge	Plainfield	46168
1/14/2020	7095 Hickory Hollow Ct	Plainfield	46168
1/15/2020	7158 E County Road 675 S	Plainfield	46168
1/15/2020	748 Central Park Dr W	Plainfield	46168
1/14/2020	748 Central Park Dr W	Plainfield	46168
1/14/2020	7616 Willsey Ln	Plainfield	46168
1/14/2020	7616 Willsey Ln	Plainfield	46168
1/15/2020	8136 Timberwood Dr	Plainfield	46168
1/14/2020	8737 S County Road 825 E	Plainfield	46168
1/14/2020		Plainfield	
1/14/2020			46234

APPENDIX D - EXPANDED DEMAND-RESPONSE SERVICE

With Alternative 4 (described in **Section 6.3**), Guilford Township could form a contract with Sycamore Services/Hendricks County Senior Services dba LINK to supplement LINK service through a partnership with a Transportation Network Company (TNC). Under a contract with the township, LINK could operate a dedicated fleet of vehicles to provide demand-response transportation to Guilford Township residents. Currently, it is not allowable for LINK to dedicate a portion of its existing FTA-funded public transit fleet to any specific geographic area. This funding is provided for countywide service. The subrecipient agreement between INDOT and Hendricks County states that the service will be operated throughout the county.

The annual operating cost to provide a separate Guilford Township demand-response service depends on the amount of service provided. For example, a service that runs eight vehicles for ten hours per day costs more than a service with three vehicles running for six hours a day. The largest cost in running transportation is operator wages and benefits.

A ridership modeling technique⁴ and transit system peer analysis were used to make assumptions about the level of demand for demand-response transportation service in Guilford Township. This analysis indicated that demand would be approximately 16,500 one-way passenger trips per year. The modeling technique assumed that the service would allow next-day reservations and charge a one-way trip fare of \$3.00.

It is assumed that it would take approximately three years for the service to reach its ridership potential. The model assumes a cost per revenue hour of \$45.00 with 3% annual growth. **Table 13** provides the estimate annual operating costs for the service expansion.

Table 13. Demand-Response Operating Costs/Outputs by Year

	Year 1	Year 2	Year 3	Year 4	Year 5
Vehicles	4	6	7	7	7
Annual Revenue Hours	4,000	6,125	8,250	8,250	8,250
Ridership	8,000	12,250	16,500	16,500	16,500
Productivity (Boardings/ Revenue Hour)	2.0	2.0	2.0	2.0	2.0
Cost per Revenue Hour	\$45.00	\$45.90	\$46.82	\$47.75	\$48.71
Total Operating Expenses	\$180,000	\$281,138	\$386,249	\$393,973	\$401,853
Fare Revenue	\$24,000	\$36,750	\$49,500	\$49,500	\$49,500
Net Operating Expenses	\$156,000	\$244,388	\$336,749	\$344,473	\$352,353

⁴ U.S. DOT. Estimating Ridership of Rural Demand-Response Transit Services for the General Public. 2016. Downloaded at <https://www.nctr.usf.edu/wp-content/uploads/2016/09/21177060-NCTR-NDSU08.pdf>

Under this example, the service would run from 6:00 AM to 6:00 PM, Monday through Friday. Customers would be allowed to call the day before for their rides. In Year 1 there would be three part-time drivers and one full-time dispatcher/supervisor. In Year 2, the drivers would transition to full-time and one driving position would be added. In Year 3 the staff would grow to five full-time drivers and one part-time driver. **Table 14** provides capital costs for the service expansion.

Table 14. Demand-Response Capital Costs by Year

		Year 1		Year 2		Year 3	
	Price Each	Qty	Total Cost	Qty	Total Cost	Qty	Total Cost
Low-floor minivan	\$39,260	2	\$78,520	1	\$40,438	1	\$41,651
8 seat/2 wheelchair cutaway van	\$56,473	2	\$112,946	1	\$58,167		
4-camera system	\$1,500	4	\$3,000	2	\$3,090	1	\$1,591
Tablet/mount	\$300	4	\$600	2	\$618	1	\$318
Total Capital Costs			\$195,066		\$102,313		\$43,561

Total system cost is estimated by adding operating and capital costs. **Table 15** provides the combined operating and capital costs by year for the first 5 years. Following Year 5, the system would incur vehicle replacement costs due to an aging fleet.

Table 15. Total Demand-Response System Cost by Year

	Year 1	Year 2	Year 3	Year 4	Year 5
Net Operating Expenses	\$156,000	\$244,388	\$336,749	\$344,473	\$352,353
Capital Costs	\$195,066	\$102,313	\$43,561	N/A	N/A
Total Annual Expenses	\$351,066	\$346,701	\$380,310	\$344,473	\$352,353

Service Area Recommendation

One-way passenger trips would be required to have the origin and/or destination within Guilford Township limits. It is recommended that the service allow township residents to travel outside of the township within a 6-mile radius. Current LINK riders who reside in Guilford Township often travel to Avon and Danville, especially for medical appointments. A six-mile radius (within Hendricks County only if desired) would allow riders to travel to health care providers with locations outside of the township, but within Hendricks County.

TNC Partnership

In recent years, some transit agencies have developed partnerships with TNCs (such as Uber or Lyft) as pilot projects to provide an affordable mobility option when transit service is unavailable

or inadequate, such as late at night when it is not cost-effective to operate a fixed route. A few transit agencies have begun to provide discounted TNC rides to eligible customers of ADA complementary paratransit services, which offers to these customers an option for an on-demand ride instead of using traditional paratransit service, which typically requires reservations one day in advance. At present, there are no known examples of transit-TNC partnerships in Indiana, and further study is required to ensure that TNC partnerships meet state insurance requirements.

TNC subsidies should be targeted for shared-ride service (e.g. UberPOOL or LyftLine). Otherwise, the program will incentivize single-occupant trips and increased vehicle miles travelled, increasing congestion and vehicle emissions. It is recommended that Guilford Township offer \$5.00 TNC ride subsidies to residents who are qualified for the program based on their income. The TNCs would use geofencing so that the subsidies would not be available outside of the designated zone.

When TNCs are used to provide public transportation, the transit agency must offer an equivalent wheelchair-accessible alternative that provides the same level of service as the TNC service provided to those without disabilities as measured by the following criteria:

1. Response time
2. Fares (people need to be able to pay even if they don't have a credit card; some agencies allow passengers to purchase pre-paid cards as a way around this)
3. Geographic area of service
4. Hours and days of service
5. Restrictions or priorities based on trip purpose
6. Availability of information and reservations capability (people need to be able to call to request their on-demand trip, not just hail through a smartphone)
7. Any constraints or capacity or service availability

The estimated TNC budget, provided in **Table 16**, includes costs to ensure that an equivalent wheelchair-accessible alternative will be available.

Additional costs, estimated at 25% of the cost of TNC ride subsidies, would include a contract with LINK (or a different call center, such as the company used by IndyGo for Open Door paratransit) to provide a telephone-based ride scheduling option and to arrange wheelchair-accessible rides that would be guaranteed by a taxi operator.

Table 16. Estimated TNC Partnership Costs

	Year 1	Year 2	Year 3	Year 4	Year 5
Start-Up Costs*	\$30,000				
Call center and administrative costs		\$25,000	\$30,000	\$36,000	\$43,200
Potential Ridership		10,000	12,000	14,400	17,280
\$5 subsidy/ride		\$5.00	\$5.00	\$5.00	\$5.00
Subsidy cost		\$50,000	\$60,000	\$72,000	\$86,400
On-demand WAV taxi cost/trip - assumes 5% of trips are WAV taxi trips)		\$100	\$100	\$100	\$100
WAV taxi cost		\$50,000	\$60,000	\$72,000	\$86,400
Total Annual Expenses	\$30,000	\$125,000	\$150,000	\$180,000	\$216,000

**Year 1 would be dedicated to program start-up; costs include staff time and/or consultant fees dedicated to developing contracts with TNC and WAV taxi providers and creating policies and procedures.*

The total estimated cost for the first five years of a demand-responsive service, described as Alternative 4 in **Section 6.3**, is shown in **Table 17**.

Table 17. Total Estimated Cost for Demand-Response Alternative

	Year 1	Year 2	Year 3	Year 4	Year 5
Demand-Response Operating Costs	\$156,000	\$244,388	\$336,749	\$344,473	\$352,353
Demand-Response Capital Costs	\$195,066	\$102,313	\$43,561	N/A	N/A
TNC Partnership Costs	\$30,000	\$125,000	\$150,000	\$180,000	\$216,000
Total Costs	\$381,066	\$471,701	\$530,310	\$524,473	\$568,353

APPENDIX E - GLOSSARY OF ACRONYMS

ADA – Americans with Disabilities Act

CASMC – Coordinated Aging Services of Morgan County

CICOA – Central Indiana Council on Aging

CIRTA – Central Indiana Regional Transportation Authority

CMAQ – Congestion Mitigation Air Quality

EID – Economic Improvement District

FHWA – Federal Highway Administration

FTA – Federal Transit Administration

HCSS – Hendricks County Senior Services

IMPO – Indianapolis Metropolitan Planning Organization

INDOT – Indiana Department of Transportation

LEHD Program – U.S. Census Longitudinal Employer-Household Dynamics Program

LOIT – Local Optional Income Tax

MOU – Memorandum of Understanding

PMTF – Public Mass Transportation Fund

STBG – Surface Transportation Block Grant

TDM – Transportation Demand Management

TNC – Transportation Network Company (Uber, Lyft, etc.)

ZVH – Zero-Vehicle Households

TNC – Transportation Network Company (Uber, Lyft, etc.)