TECHNICAL ADVISORY COMMITTEE

September 23, 2020

10:00 - 11:30 am

Virtual Location via Zoom https://bloomington.zoom.us/j/97011757550

Clicking on the link will take you to the meeting. You will automatically be given a dial-in number if you want to use your phone for audio and not your computer microphone.

I. Call to Order and Introductions

II. Approval of the Meeting Agenda*

III. Approval of Minutes*
   a. August 26, 2020

IV. Communications from the Chair and Vice-Chair

V. Reports from Officers and/or Committees
   a. LPA Project Updates

VI. Reports from the MPO Staff
   a. National Association of Regional Councils - 2020 Census Letter of Concern

VII. Old Business - None

VIII. New Business - None.
   a. Draft BMCMPO 2045 Metropolitan Transportation Plan
      https://bloomington.in.gov/sites/default/files/2020-09/BMCMPO%20Draft%202045%20Metropolitan%20Transportation%20Plan%20-09-04-20.pdf
      (1) Extended Discussion & Policy Committee Recommendations

IX. Communications from Committee Members *(non-agenda items)*
   a. Topic Suggestions for Future Agendas

X. Upcoming Meetings
   a. Policy Committee - October 9, 2020 at 1:30 p.m. (Virtual)
   b. Technical Advisory Committee - October 28, 2020 at 10:00 a.m. (Virtual)
   c. Citizens Advisory Committee - October 28, 2020 at 6:30 p.m. (Virtual)

Adjournment

**Action Requested / Public comment prior to vote (limited to five minutes per speaker).*

Auxiliary aids for people with disabilities are available upon request with adequate notice. Please call 812-349-3429 or e-mail human.rights@bloomington.in.gov.

TECHNICAL ADVISORY COMMITTEE

August 26, 2020

10:00 - 11:30 am

Virtual Location via Zoom https://bloomington.zoom.us/j/92568081678

Clicking on the link will take you to the meeting. You will automatically be given a dial-in number if you want to use your phone for audio and not your computer microphone.

Members Present: Lew May, Jane Fleig, Terri Porter, Paul Satterly, Lisa Salyers, Brian Noojin, Erica Tait, Jackie Nester Jelen (proxy), Steve Cotter, Matt Rhoads

Staff Present: Ryan Clemens, Pat Martin

Guests Present: Roy Aten (City of Bloomington Planning and Transportation Department)

I. Call to Order and Introductions

II. Approval of the Meeting Agenda*

a. Fleig moved approval of the agenda. Kopper seconded. Motion passes by unanimous voice vote.

III. Approval of Minutes*

a. June 24, 2020

(1) Fleig moved approval of the minutes. Porter seconded. Motion passes by unanimous voice vote.

IV. Communications from the Chair and Vice-Chair

a. May reported that Bloomington Transit is back to normal service levels and is still operating fare free. The Transit Center building is still closed and ridership levels have risen to 20-25% of normal.

V. Reports from Officers and/or Committees

a. LPA Project Updates

(1) Kopper gave the report for City of Bloomington projects. The school zone enhancement project is complete. Construction is ongoing for the Rogers/Winslow/Henderson multiuse pathways. The Sare Road project is ongoing. The 17th Street project is still ongoing with an estimated completion of September 2020.

(2) Satterly gave the report for Monroe County. The Fullerton Pike Phase 2 roundabout is complete with just a final walkthrough and final touches left. The Fullerton Pike Phase 3 preliminary field check including an environmental update and utility coordination.

VI. Reports from the MPO Staff

a. No report

VII. Old Business - None

VIII. New Business - None.

a. FY 2020 – 2024 Transportation Improvement Amendments
   (1) DES#2001708 & DES#2001709 – Statewide Safety Consulting
      (a) Clemens and Rhoads discussed the INDOT TIP Amendment.
   (2) DES#1700735 - B-Line Trail Extension
   (3) DES#1700976 - Crosswalk Improvements
   (4) DES#1900403 - Curb Ramp
   (5) DES#1900404 - Guardrail
   (6) DES#1500398 - Jackson Creek Trail
      (a) Kopper discussed the City of Bloomington TIP Amendments. Due to delays from the pandemic, right-of-way tasks have slowed for the B-Line Trail Extension project. This caused a need for a reallocation of federal funds throughout the five projects listed above. The important thing to note is that the total amount of federal funds remains the same and it is just merely a shifting of funds among the projects.

   Porter moved approval of all TIP Amendments. Fleig seconded. Motion passes unanimously by voice vote.

b. Draft BMCMPO 2045 Metropolitan Transportation Plan
   (1) Martin gave the report on the status of the Draft MTP. The Draft MTP is at 90% completion and will be at 95% completion by September 4 when it will appear in the Policy Committee packet as well as opening the draft document for the required 30-day public comment period before a vote on the Draft MTP at the October 9 Policy Committee meeting.
   (2) Based on the results and feedback from the MTP Public Survey, two new guiding principles will be featured throughout the MTP: transportation equity and climate change mitigation. The Safety guiding principle will also be enhanced to include the principles of Vision Zero, a safety program with the goal of eliminating fatalities and incapacitating injuries throughout our transportation network. Clemens noted that what these goals mean for projects in the short term is a revamping of the MPO's Complete Streets Policy to ensure our project prioritization criteria helps to select just, safe, and environmentally-friendly transportation projects.

IX. Communications from Committee Members *(non-agenda items)*

a. Topic Suggestions for Future Agendas

X. Upcoming Meetings

a. Policy Committee - September 11, 2020 at 1:30 p.m. (Virtual)
b. Technical Advisory Committee - September 23, 2020 at 10:00 a.m. (Virtual)
c. Citizens Advisory Committee - September 23, 2020 at 6:30 p.m. (Virtual)

Adjournment

Porter moved to adjourn the meeting.

**Action Requested / Public comment prior to vote (limited to five minutes per speaker*).

Auxiliary aids for people with disabilities are available upon request with adequate notice. Please call 812-349-3429 or e-mail human.rights@bloomington.in.gov.

August 31, 2020

The Honorable Mitch McConnell
Majority Leader
United States Senate
Washington, DC 20510

The Honorable Chuck Schumer
Minority Leader
United States Senate
Washington, DC 20510

The Honorable Nancy Pelosi
Speaker
United States House of Representatives
Washington, DC 20515

The Honorable Kevin McCarthy
Republican Leader
United States House of Representatives
Washington, DC 20515

Dear Leader McConnell, Speaker Pelosi, Leader Schumer, and Leader McCarthy,

The undersigned organizations, representing metropolitan, regional, and rural planning organizations from across the nation, are writing to express significant concerns about specific elements related to the 2020 United States census, namely: the reduction, by one month, in the amount of time available for data collection; the implementation of differential privacy; and the treatment of population counts for communities with colleges, universities, and other educational institutions impacted by the COVID-19 pandemic.

We are particularly troubled by changes announced by the U.S. Census Bureau to reduce the time allotted for in-person and virtual data collection by one month. Moving up the date on which the Complete Count effort will end, from October 31 to September 30, will sacrifice data comprehensiveness and accuracy in the interest of speed. As recently as April, Census Bureau Director Steven Dillingham sought statutory relief to allow for additional time to deliver its apportionment counts in response to challenges arising from the COVID-19 pandemic. This was to, in part, "ensure a complete and accurate count of all communities." Most states and cities trail their response rate from 2010, and an abrupt change in the end of data collection makes it more likely that these response rates will not catch up to previous levels.

The shortened data collection period will result in a more significant undercount of so-called "hard to count" populations, including minority populations, young children, and those with no or poor internet access. This last category is particularly notable for the 2020 census, which relied much more heavily than in the past on virtual data collection. Minority and lower-income households lack internet connectivity at much higher rates, further exacerbating the ongoing challenge of properly counting these communities. Additional time is required, therefore, for the Census Bureau to properly conduct in-person interviews and other outreach with these households to ensure they are properly represented in the final counts.

Regional, rural, and metropolitan planning organizations, and the communities in which we operate, rely upon and are impacted by census data in several important ways. Census data are used to calibrate and validate the transportation and land-use models that we use to evaluate our transportation systems and prioritize projects; census data determines which communities have sufficient population to designate a metropolitan planning organization (MPO) and which of those are designated as transportation management areas (TMAs); census data is necessary for our organizations to demonstrate compliance with Title VI, Environmental Justice, and Limited English Proficiency requirements of federal law; and

census data helps determine how trillions of dollars of federal funds will flow to states over the next 10 years and how funds will be distributed within states. As a result, an undercount caused by the reduction in time available for data collection can have significant impact on these communities and are particularly harmful for the "hard to count" populations. Communities with higher proportions of "hard to count" residents may not receive proper federal and state support due to an undercount.

Policymakers and practitioners utilize several tools and methods that rely on census data. For example, the Environmental Protection Agency (EPA) uses census data in its Environmental Justice Screening and Mapping Tool. Tools such as this allow for decisionmakers to identify communities that are negatively and disproportionately impacted by environmental hazards and ensure that environmental statutes and protections such as the Clean Air Act and the Safe Drinking Water Act are equitably enforced. It is also important to note that there are several federal funding programs that rely on census data or census-derived data, including the Federal Transit Administration (FTA) Capital Investment Grants. Without accurate census counts, critical tools, funding, and programs will be compromised and "hard to count" communities will suffer.

As organizations that rely on Census Bureau data to make informed policy and infrastructure investment decisions, the reduced census timeline raises troubling possibilities. Therefore, we strongly request that the administration reconsider this decision and provide additional time to ensure as comprehensive a survey as possible is performed.

In addition to the reduced census timeline, two other census-related issues raise concern for our organizations.

First, differential privacy (DP), the process by which the Census Bureau is attempting to ensure the confidentiality of individual respondents, may have similarly serious consequences on the allocation of federal funds, proportional representation, and the data that informs decision-making at every level of government and across the private sector. The use of DP will change important designations such as Opportunity Zones, Environmental Justice Areas, Qualified Census Tracts, and many others. DP appears to have particularly serious problems in very high population areas (where DP results in undercounts, undermining resource distribution) and very small population areas (where DP causes greater levels of data inaccuracy, undermining reliability). We encourage the Bureau to ensure that efforts to protect respondent confidentiality do not incorporate systematic biases that undermine the usability and reliability of census-derived data (including through the American Community Survey).

Second, the unprecedented situation regarding COVID-19 and its impact on university and college communities have altered response rates in those towns and cities. In the spring, millions of students were unable to remain at school when campuses were closed due to the coronavirus. Many of these students returned to the communities where their parents live and for those that remained, response rates in many cases remain far below historic levels. Given that the campus closures are a temporary measure, it would be grossly unfair to the many communities across the nation that house our colleges and universities to drastically undercount their population and deny them adequate funding and proportional representation as a result. While we appreciate the efforts the Census Bureau has taken to address this concern, student privacy requirements and other factors may yet prevent accurate counts in some communities. Reducing the Complete Count effort by 30 days will only serve to exacerbate this problem. We strongly request that the Census Bureau work to ensure an accurate count in each

community that houses a college, university, or other educational institution impacted by the COVID-19 pandemic.

Finally, given that the results of the decennial census will directly impact regional, rural, and metropolitan planning organizations, and the communities in which we operate, we recommend that the Census Bureau establish a working group with the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) as a way to mitigate the concerns outlined in this letter once the counts are completed.

The census process will impact every state, community, and region in the nation. It is in everybody's interest that the Census Bureau be given the time and resources necessary to complete its work in a comprehensive and accurate manner. We look forward to continuing our efforts, as partners with the Census Bureau, to help make this outcome a reality.

Sincerely,

Alabama

Southeast Alabama Regional Planning and Development Commission
Northwest Alabama Council of Local Governments

Arizona

Rural Transportation Advocacy Council
SouthEastern Arizona Governments Organization
City of Glendale
Maricopa Association of Governments

Arkansas

Central Arkansas Planning and Development District
Southwest Arkansas Planning and Development District, Inc.
Western Arkansas Planning and Development District

California

Association of Bay Area Governments
Metropolitan Transportation Commission
San Diego Association of Governments
San Joaquin Council of Governments
San Luis Obispo Council of Governments
Southern California Association of Governments
Tulare County Association of Governments

Colorado

Archuleta County Complete County Committee
City of Cortez
La Plata County Board of County Commissioners
Region 9 Economic Development District of Southwest Colorado

Southwest Colorado Council of Governments
Town of Bayfield

Connecticut

Capitol Region Council of Governments

Florida

Apalachee Regional Planning Council
Broward Metropolitan Organization
Central Florida Regional Planning Council
Emerald Coast Regional Council
MetroPlan Orlando
North Central Florida Regional Planning Council
Northeast Florida Regional Council
South Florida Regional Planning Council
Southwest Florida Regional Planning Council
Tampa Bay Regional Planning Council
Treasure Coast Regional Planning Council

Georgia

Atlanta Regional Commission
Heart of Georgia Altamaha Regional Commission
Northeast Georgia Regional Commission
River Valley Regional Commission
Southern Georgia Regional Commission
Southwest Georgia Regional Commission

Illinois

Champaign County Regional Planning Commission
Chicago Metropolitan Agency for Planning
Region 1 Planning Council
Southeastern Illinois Regional Planning & Development Commission

Indiana

Area Plan Commission of Tippecanoe County
Bloomington-Monroe County Metropolitan Planning Organization
East Central Indiana Regional Planning District
Evansville Metropolitan Planning Organization
Kankakee-Iroquois Regional Planning Commission
Michiana Area Council of Governments
North Central Indiana Regional Planning Council
Northwestern Indiana Regional Planning Commission
Southern Indiana Development Commission

Iowa

Des Moines Area Metropolitan Planning Organization
Region XII Council of Governments
East Central Iowa Council of Governments

Kansas

Mid-America Regional Council* (Missouri & Kansas)

Kentucky

Barren River Area Development District
Buffalo Trace Area Development District
Cumberland Valley Area Development District
Kentuckiana Regional Planning and Development Agency
Kentucky River Area Development District
Lake Cumberland Area Development District
Lincoln Trail Area Development District
Pennyrile Area Development District

Maine

Eastern Maine Development Corporation
Greater Portland Council of Governments
Northern Maine Development Commission

Massachusetts

Berkshire Regional Planning Commission
Cape Cod Commission
Central Massachusetts Regional Planning Commission
Franklin Regional Council of Governments
Metropolitan Area Planning Council
Northern Middlesex Council of Governments
Old Colony Planning Council

Michigan

Networks Northwest
Southeast Michigan Council of Governments
Western U.P. Planning and Development Region
Eastern U.P. Regional Planning and Development Commission

Minnesota

Mid-Minnesota Development Commission
Northspan
Region Five Development Commission
Region Nine Development Commission

Mississippi

North Central Planning & Development District

Missouri

Missouri Association of Councils of Government
Mo-Kan Regional Council
Pioneer Trails Regional Planning Commission
Southeast Missouri Regional Planning & Economic Development Commission
Mid-America Regional Council* (Missouri & Kansas)

Montana

Bear Paw Development Corporation

Nebraska

Southeast Nebraska Development District
South Central Economic Development District, Inc.

Nevada

Western Nevada Development District

New Jersey

Delaware Valley Regional Planning Commission* (Pennsylvania & New Jersey)

New Mexico

Southwest New Mexico Council of Governments

New York

Capital District Regional Planning Commission
Orange County Transportation Council

North Carolina

Land of Sky Regional Council
Lumber River Council of Governments
NC Capital Area Metropolitan Planning Organization
Southwestern Commission
Town of Cary
Triangle J Council of Governments

Ohio

Miami Valley Regional Planning Commission
Mid-Ohio Regional Planning Commission
Ohio Mid-Eastern Governments Association
Ohio Valley Regional Development Commission

Oklahoma

Association of South Central Oklahoma Governments
Southwest Oklahoma Regional Transportation Planning Organization

Oregon

NE Oregon Economic Development District
Oregon Cascades West Council of Governments
South Central Oregon Economic Development District

Pennsylvania

Southwestern Pennsylvania Commission
Delaware Valley Regional Planning Commission* (Pennsylvania & New Jersey)

South Carolina

Grand Strand Area Transportation Study
Lowcountry Council of Governments
Santee-Lynches Regional Council of Governments
Waccamaw Regional Council of Governments

Tennessee

East Tennessee Development District

Texas

Brazos Valley Council of Governments
East Texas Council of Governments
Houston-Galveston Area Council
North Central Texas Council of Governments
Texarkana Metropolitan Planning Organization

Utah

Southeastern Utah Association of Governments
Uintah Basin Association of Governments
Wasatch Front Regional Council

Vermont

Chittenden County Regional Planning Commission
Two Rivers-Ottauquechee Regional Commission
Windham Regional Commission

Virginia

New River Valley Regional Commission

Washington

Cowlitz-Wahkiakum Council of Governments
Puget Sound Regional Council

West Virginia

KYOVA Interstate Planning Commission
Mid Ohio Valley Regional Planning and Development Council

Washington, D.C.

Association of Metropolitan Planning Organizations
Community Transportation Association of America
National Association of Development Organizations
National Association of Regional Councils

* *Denotes a multi-state agency*

2045

Metropolitan Transportation Plan

Bloomington-Monroe County Metropolitan Planning Organization
Anticipated Final Policy Committee Adoption: October 9, 2020

Bloomington-Monroe County Metropolitan Planning Organization
401 N Morton Street, Suite 130
P.O. Box 100
Bloomington IN, 47401

September 4, 2020

Disclaimer

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Table of Contents

Acknowledgments

The *2045 Metropolitan Transportation Plan* achieved completion with the assistance and efforts numerous organizational groups and individual citizens. The staff acknowledges and greatly appreciates all Policy Committee, Technical Advisory Committee, and Citizens Advisory Committee representatives, alternate proxy representatives, and countless citizens who participated in public meetings, the 2045 Metropolitan Transportation Plan Survey, public workshops, and individual meetings thereby giving the community active participatory voices for policy decision makers, technical staff, and the Metropolitan Planning Organization's collective state and federal partners.

Policy Committee

Lisa Ridge, Chair	Monroe County Highway Department
Sarah Ryterband, Vice Chair	Citizens Advisory Committee
Kent McDaniel	Bloomington Transit
John Hamilton	City of Bloomington, Mayor
Matt Flaherty	City of Bloomington City Council
Jillian Kinzie	City of Bloomington Plan Commission
Adam Wason	City of Bloomington Public Works Department
Nate Nickel (Alternate)	City of Bloomington Public Works Department
Tony McClellan, PE	Indiana Department of Transportation, Seymour District
Becky Packer, PE (Alternate)	Indiana Department of Transportation, Seymour District
Chris Walman, PE (Alternate)	Indiana Department of Transportation, Seymour District
Jason Banach	Indiana University Capital Planning & Facilities
Penny Githens	Monroe County Commissioners
Kate Wiltz	Monroe County Council
Dave Warren	Monroe County Plan Commission
Pamela Samples	Town of Ellettsville
Erica Tate (non-voting)	Federal Highway Administration, Indiana Division
Susan Weber (non-voting)	Federal Transit Administration, Region V

Technical Advisory Committee

Lew May, Chair	Bloomington Transit
Paul Satterly, PE, Vice Chair	Monroe County Highway Department
David Walter	Citizens Advisory Committee
Jeff Underwood	City of Bloomington City Controller
Laura Haley	City of Bloomington Information Technology Services
Steve Cotter (Alternate)	City of Bloomington Parks and Recreation
Dave Williams	City of Bloomington Parks and Recreation
Neil Kopper, PE	City of Bloomington Planning and Transportation
Terri Porter, AICP	City of Bloomington Planning and Transportation
Jane Fleig, PE	City of Bloomington Utilities
Tonia Lucas (Alternate)	City of Bloomington Utilities
Emmanuel Nsonwu	Indiana Department of Transportation Planning & Programming
Brian Jones	Indiana Department of Transportation, Public Transit
Becky Packer, PE (Alternate)	Indiana Department of Transportation, Seymour District

Matt Rhoads, PE (Alternate)	Indiana Department of Transportation, Seymour District
Brian Noojin	Indiana University Campus Bus
Carlos Laverty	Monroe County Board of Aviation Commissioners
Chris Ciolli	Monroe County School Corporation
Tyler Caldwell	Monroe County Geographic Information Systems
Jacqueline Nester, AICP (Alternate)	Monroe County Planning Department
Larry Wilson	Monroe County Planning Department
Trohn Enright-Randolph, PLS	Monroe County Surveyor Department
Chris Myers	Rural Transit, Area 10 Agency on Aging
Lisa Salyers (Alternate)	Rural Transit, Area 10 Agency on Aging
Mike Farmer	Town of Ellettsville
Danny Stalcup	Town of Ellettsville
Kevin Tolloty	Town of Ellettsville
Erica Tate (non-voting)	Federal Highway Administration
Susan Weber (non-voting)	Federal Transit Administration

Citizens Advisory Committee

Sarah Ryterband, Chair	Prospect Hill Neighborhood
David Walter, Vice Chair	6th & Ritter Neighborhood
Paul Ash	McDoel Gardens Neighborhood
Mary Jane Hall	Bloomington Board of Realtors
Joan Keeler	Citizen
John Kennedy	Council of Neighborhood Associations
Geoff McKim	Eastern Heights Neighborhood
Maryann Williams	Citizen

Bloomington-Monroe County Metropolitan Planning Organization

Ryan Clemens	Staff
Pat Martin	Staff

Introduction

The BMCMPO *2045 Metropolitan Transportation Plan* was prepared in compliance with the Federal Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) and predecessor federal legislation applicable to metropolitan transportation planning. Metropolitan Planning Organizations are required to have a continuous, cooperative and comprehensive ("3C") planning processes that implement projects, strategies and services for maintaining federal funding eligibility.

The *2045 Bloomington-Monroe County Metropolitan Transportation Plan* (*2045 MTP*) establishes broad consensus-based, multi-modal transportation planning policy guidance for the urbanized area of Monroe County encompassing the Town of Ellettsville and the City of Bloomington. The 2045 MTP identifies transportation system policies, planning strategies, public opinions, and projects over the next twenty years and beyond updated on a four-year cycle. This continuing, cooperative, and comprehensive transportation planning process guides the development and the production of a Transportation Improvement Program (TIP) for the region.

The study area of this plan includes the urban area of Monroe County to ensure community representation and the creation of system-wide solutions to transportation issues within a cooperative and coordinated process. In addition, the Plan strives to achieve a multi-modal transportation perspective, including provisions to improve facilities for bicycling, walking, and public transit services that reduce the transportation dependency of automobiles, promote equitable community mobility access to jobs, education, health, recreation, and fosters an economic reduction of carbon emissions.

Chapter 1: Executive Summary

The *2045 Metropolitan Transportation Plan* (MTP) constitutes the long-range, multi-modal transportation plan for the Bloomington, Indiana Urbanized Area as required by Federal statutes (23 USC 134 and 23 CFR, Section 450.300) for the programming of Federal funds for transportation project planning and implementation of ground transportation modes (roadway, transit, bicycle, and pedestrian facilities). The Plan study area included all of Monroe County in order to make it coordinated and comprehensive in its scope. The City of Bloomington, Monroe County, the Town of Ellettsville, Bloomington Transit, IU Campus Bus, Rural Transit, and INDOT participated in a cooperative process through the BMCMPO to develop the Plan.

The *2045 Metropolitan Transportation Plan* supersedes the *2040 Long Range Transportation Plan* adopted by the Metropolitan Planning Organization's Policy Committee in the year 2017.

The *2045 Metropolitan Transportation Plan* is a "living" document, and complements the ongoing operational and capital improvement programs of the City of Bloomington, Monroe County, the Town of Ellettsville, Bloomington Transit, IU Campus Bus, Rural Transit, and INDOT in accordance with 23 CFR, Section 450.324

The Governor of the State of Indiana designated the City of Bloomington Plan Commission as the MPO responsible for transportation planning when Bloomington became an Urbanized Area in 1980. The BMCMPO completed the first long range transportation plan in 1984 and has since updated and adopted subsequent plans through a comprehensive, coordinated, and continuous process. The *2045 Metropolitan Transportation Plan* is a reflection of the community wants and needs. The Plan additionally demonstrates a long-term commitment to comprehensive, coordinated, and continuous transportation planning.

The *2045 Metropolitan Transportation Plan* incorporates all of Monroe County into its study area to improve project coordination on the edge of the expanding urban area. Upon adoption, the *2045 Metropolitan Transportation Plan* will:

- Serve as the basis from which to draw transportation projects involving Federal surface transportation funds for the Transportation Improvement Program for the Bloomington Urbanized Area;

- Be incorporated by reference into the Indiana Statewide Long-Range Multi-Modal Transportation Plan when it is updated; and

- Provide guidance of an advisory nature to Monroe County and the Indiana Department of Transportation on projects outside the Urbanized Area boundary.

The *2045 Metropolitan Transportation Plan* shall undergo an update at least every five years in order to maintain the minimum 20-year time horizon with more frequent amendments as needed and approved by the BMCMPO Policy Committee.

The *2045 Metropolitan Transportation Plan* document consists of four key chapters supported by an extensive set of technical appendices. Key chapters include:

- Chapter 2 outlining the BMCMPO's "Vision and Guiding Principles" that further establish transportation policies for preparing, evaluating and implementing multi-modal transportation improvements;

- Chapter 3 providing an overview and basis for multimodal "Future Transportation Needs", which identifies transportation needs through the year 2045 given current socioeconomic demand circumstances and the projected transportation system;

- Chapter 4 forecasts financial resources available for transportation investments and demonstrates a "Cost Feasible Plan" by illustrating BMCMPO fiscal constraints through the year 2045; and

- Chapter 5 details the analytical Travel Demand Model Scenarios initially developed in 2013-2017 for the *2040 Metropolitan Transportation Plan* that still remain valid as a guiding reference for the 2045 Metropolitan Transportation Plan using a range of local multimodal system performance measures. The recommended scenario policy, Urban Infill, meets or shall meet all FHWA national performance goals for safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and potentially reduced project delivery delays.

2045 Metropolitan Transportation Plan Development

The development of this plan satisfies federal and state planning requirements ensures the eligibility of the BMCMPO to receive multimodal federal transportation funding. ***Appendix A*** details the primary federal requirements. Additional Metropolitan Transportation Plan requirements include:

- Operational and management strategies maximizing system safety with a Vision Zero goal;

- Projected transportation demand of persons and goods;

- Existing and proposed transportation facilities for all modes;

- improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods;

- Assessment of capital investment to preserve the existing and projected future infrastructure and provide for multi-modal capacity increases based on regional priorities;

- A discussion of types of potential environmental mitigation;

- Pedestrian walkway and bicycle transportation facilities in accordance with 23 U.S.C. 217(g);

- Transportation and transit enhancement activities; and

- A financial plan that demonstrates implementation feasibility.

Public Outreach Process

Public and stakeholder outreach was continuous throughout development of the 2045 MTP despite unprecedented COVID-19 pandemic challenges that necessitated a shift to electronic platforms using Zoom video conferencing (https://zoom.us/), Facebook Live (https://www.facebook.com/facebookmedia/solutions/facebook-live), and the Monroe County Public Library Community Access Television Services (https://www.catstv.net/about.php). Through a variety of stakeholder interviews, initial public workshops, and interagency consultation and coordination meetings, the BMCMPO received ample input and direction regarding a community transportation vision, goals, and strategies.

Outreach opportunities additionally included public meeting notices, media press releases, electronic contact list mailings, telephone calls, several in-person meetings, and a highly successful community survey. All public meeting locations prior to the implementation of Centers for Disease Control and Prevention (CDC) CONVID-19 guidelines used fully accessible locations. ***Appendix C*** summarizes the methods for gathering public participation and public input for plan development. Public responses obtained from a survey of four hundred fifty-nine (459) respondents assisted with a refinement of MTP guiding principles. The BMCMPO employed the following opportunities throughout MTP development to inform the public and obtain their opinions.

- BMCMPO Committee Presentations for the 2045 Metropolitan Transportation Plan
    - January 2020
        - Policy Committee
        - Technical Advisory Committee
        - Citizens Advisory Committee
    - February 2020
        - Policy Committee
        - Technical Advisory Committee
        - Citizens Advisory Committee

- March 2020
  - Policy Committee
- April 2020
  - Technical Advisory Committee
  - Citizens Advisory Committee
- May 2020
  - Policy Committee
  - Technical Advisory Committee
  - Citizens Advisory Committee

- June 2020
  - Policy Committee
  - Technical Advisory Committee
  - Citizens Advisory Committee
  - 2045 Metropolitan Transportation Plan Public Survey Posting
- July 2020
  - 2045 Metropolitan Transportation Plan Public Survey Posting
- August 2020
  - Technical Advisory Committee
  - Citizens Advisory Committee
- September 2020
  - Policy Committee
  - Technical Advisory Committee
  - Citizens Advisory Committee
- October 2020
  - Policy Committee - Final Adoption

- Public Workshops
  - #1 – March 4, 2020 - Bloomington Transit Transfer Center; Noon – 2:00 P.M.
  - #2 – March 4, 2020 - Ellettsville Town Hall; 6:00 p.m. – 8:00 P.M.

Technical Assistance

The BMCMPO retained a transportation consulting firm in 2013 - 2016 for development of a county-wide travel demand forecast model. The successful development of this model completed for the 2040 MTP are carried over to the 2045 MPT in terms of travel demand model data, collection, methodologies, model development, and extensive future scenario evaluations. Further detail is found in Appendices B, C, and D. Professional consultant technical assistance focused on the following objectives in developing this MTP:

- Data Collection and Analysis;
- Socioeconomic Forecasts;
- Transportation Analysis Zones (TAZ);
- Land Use Forecasts;

- Travel Demand Model; and
- Performance Measures.

Future Transportation Needs

The determination of future transportation needs involved an extensive public involvement process previously noted with elected and appointed officials, transportation engineers and their representatives, managers, planners, and citizens through a very broad community-wide survey. Themes that emerged included:

- An explicit demand for a variety of multimodal transportation options founded on the traditional determinants of price, income, age, modal options, tastes, convenience, and (given COVID-19 concerns) safety.

- Modest elderly population growth as the individuals and families choose to remain in a diverse, active, dynamic, culturally rich, and responsive community environment after retirement.

- Deep environmental quality and scientifically documented climate change, plus health concerns associated with the use of fossil fuels, and

- Broad support of system-wide safety improvements, accessibility, operations, maintenance, and preservation of the current transportation infrastructure that includes roadways, public transit, bicycling, and walking.

The consensus finding was that current needs of the BMCMPO transportation network are virtually identical to the urbanized area's future needs, especially when examining safety, convenience, mode choice, and accessibility needs. The 2045 MTP therefore takes an aggregate systems approach by focusing toward performance measures and future scenarios instead of focusing on specific projects. This approach is consistent with guidance and requirements by the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Indiana Department of Transportation (INDOT).

Public transit needs include

- Maintaining COVID-19 safety protocols directed by the CDC into a currently undefined period

- A Calendar Year 2021 implementation of *Route Optimization Study* recommendations for Bloomington Transit and Rural Transit completed with the assistance of metropolitan transportation (PL) funds in FY 2019

- Passenger service and convenience improvements

- Facility modernization at the Grimes Lane facility used by Bloomington Transit and Indiana University Campus Bus,

- Continuing additions of passenger amenities (e.g., new shelters) at prioritized transit stops

- Cost-feasible fleet replacements with electric vehicles that are less dependent on fossil fuels

- Continuing pursuit of a Regional Transit Authority if so desired by local decision makers, and perhaps most critically

- The Calendar Year 2021 establishment of micro-transit service areas for the most vulnerable system users thereby enabling social equity access to jobs, services, recreation, and all other elements of the movement of people and goods. Social equity access is one of the most important ways government can enable residents to live safe, healthy, and productive lives.

Given the continued presence of COVID-19 in Calendar Year 2021 and future years, the key challenges for public transportation are ensuring operator and passenger safety, a continuation of federal, state and local operating assistance at pre-COVID-19 funding levels, the long-term availability of capital funding revenues for future fleet replacements including electric vehicles under flat to declining federal, state and local funding assistance ceilings encompassed within a very deep and potentially extensive national and state economic recessionary period brought about by the national COVID-19 pandemic.

State highway needs voiced by elected officials and the general public center on (1) the Southwest Corridor of Monroe County, an area of concentrated commercial activity and major employment; (2) multimodal safety, mobility, and connectivity for pedestrian and bicycles along and within selected city-county corridor areas. INDOT's July 2020 "road diet" conversion of the SR 46 corridor from Clarizz Boulevard to SR 446 from a four-lane corridor to a three-lane corridor with bicycle lanes and intersection ADA curb ramp replacements represents an Indiana best practice model in response to local needs.

Local road and street needs for Monroe County, the Town of Ellettsville and the City of Bloomington predominantly emphasize multimodal safety and connectivity, operations, maintenance and system preservation. In the face of a COVID-19 recessionary economy, local jurisdictional operations, maintenance and system preservation will face extremely challenging revenue streams in the near and intermediate terms.

Active transportation users identified a demand for separated and/or protected multi-use facilities for pedestrians and bicyclists along high volume corridors; facilities that address users of all ages and abilities.

Motor carrier freight movements and the identification of bottleneck corridors or locations is a new planning focus for the Bloomington-Monroe County urban area. The inclusion of freight planning comes from current federal transportation legislation and local business shipper-receiver expectations for safety, sound infrastructure condition, congestion reductions, consistent transportation system reliability, and sustained economic vitality.

Financial Forecasts

The Bloomington and Monroe County metropolitan planning area forecast suggests the receipt of approximately $83.3 million in Federal Surface Transportation Block Grant (STBG) program, $14.2 million in Highway Safety Improvement Program (HSIP), and $4.7 million in Transportation Alternatives (TA) funds through Fiscal Year 2045 for transportation infrastructure investments.

The sum total of revenue sources from Monroe County and the City of Bloomington Motor Vehicle Highway Account, Wheel Tax, Local Road and Street, Cumulative Bridge Funds, Cumulative Capital Development, and Alternative Transportation Funds suggest that, given forecast assumptions, the BMCMPO planning area will have over $706.2 million in local funds available for safety, maintenance, preservation, and added multi-modal transportation system capacity activities for Fiscal Years 2021 through 2045. However, some of these funds are for other priorities within each local public agency. This sum total assumes the investment of all available local funds to transportation projects – a "very best case" financial forecast that may not reflect actual local funding spent over time on transportation-related projects.

The sum total of revenue sources for Bloomington Transit under formula grants, capital investment grants, and locally derived income suggest that, given forecast assumptions, the BMCMPO metropolitan planning area will have over $211.2 million available for transit service activities for Fiscal Years 2021 through 2045.
A final note: The current economic fallout resulting from the COVID-19 pandemic is unprecedented since the Great Depression. It is therefore import to note that the full implications of the current health and economic crisis has yet to "play out". A reasonably accurate forecast of domestic, state, and regional economic recovery is currently impossible.

Fiscal Year 2045 MTP Scenarios

The BMCMPO 2040 Metropolitan Transportation Plan (MTP) travel demand model (TDM) examined macro-level transportation system network scenarios under an extensive assortment of policy considerations and associated socioeconomic/land use changes. Model validation (see ***Appendix D***) documented a high degree of correlation between observed network volumes and predicted volumes to the Year 2040. The 2045 MTP did not reexamine the TDM given that detailed 2020 Census socioeconomic data are not available until Calendar Years 2021-2022.

The future transportation system scenarios examined with the TDM relied upon guidance from a public Metropolitan Transportation Plan Task Force, general public input, and MPO staff experience as reasonable comparable examples. The travel demand model (TDM) used Federal

Highway Administration/Federal Transit Administration (FHWA/FTA) performance measures to further examine all scenarios.

The BMCMPO travel demand model examined a "Do Nothing" Scenario and twelve (12) Travel Demand Model alternative scenarios using Base Year 2013 forecast to the Year 2040.

The adopted policy, Scenario #12, using an established transportation policy orientation of projects programmed in the BMCMPO FY 2016-2019 Transportation Improvement Program plus a strong land use focus on urban infill (TIP + Urban Infill), clearly demonstrated the best multi-modal system performance in the Year 2040.
The BMCMO 2045 Metropolitan Transportation Plan recommends a continuation of Scenario #12 transportation policy focused on urban infill.

The benefits of urban infill for the core planning area include

- Adaptive reuse of land and infrastructure fostering a regeneration of sustainable urban vitality,
- Increased accessibility to public transit, cycling and walking alternatives leading to a reduction of car dependency,
- Air quality improvements through a reduction of vehicle greenhouse gas emissions,
- Reduced energy consumption,
- The preservation of green environmental space, and
- A higher quality of social and economic life for urban residents.

The recommended transportation policy of Scenario #12 meets FHWA national performance goals for safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and potentially reduced project delivery delays.

Chapter 2: Guiding Principles

Vision

We will plan, build, and maintain a transportation system that ensures the safe, efficient movement of people and goods through multiple modes of travel as directed by locally adopted land use and transportation plans; we will prioritize projects that improve public health outcomes, address systemic inequities in access, reduce greenhouse gas emissions associated with personal transportation, improve safety, and enhance community well-being. We understand that the transportation system functions within our largest public space and serves to link residents, the community, our region, our state, and our nation.

Goals

Safety

- ***Improve the safety of the transportation system for all users and all modes***
  - Reduce Vehicle Miles Traveled (VMT) as one tool to improve safety that also serves to reduce greenhouse gas emissions and improve public health through improved air-quality. A reduction in VMT can correspond with increased demand and increased travel if trips are served by and shift to other modes.
  - Target mode shift from Single Occupancy Vehicles to walking, bicycling, transit use, and carpooling as a tool to lower VMT and improve safety.
  - Promote projects that focus on improving safety for all transportation modes recognizing that distracted driving, illegal speeding, and alcohol impairment are the leading causes of fatal and serious injury crashes.
  - Analyze crash data to identify causes of crashes and safety hazards, using the most current federal and state transportation best management practices; pursue a "Vision Zero" Action Plan goal as a road map for safer streets for all modes and all users.
  - Annually evaluate the top ten (10) crash locations by crash rate and crash severity; implement quick, low-cost improvements while also seeking funding for more comprehensive changes if necessary.
  - Annually report on and evaluate crashes that involve vulnerable users examining crash location and crash severity; implement quick, low-cost improvements while also seeking funding for more comprehensive changes if necessary.

- Fund projects that encourage and educate the public about safe driving, walking, bicycling, and transit system use.

- Prioritize safety as part of design, for example projects should be designed for the target speed; favor compliance by design over selective compliance; depending on law enforcement for compliance is not considered a reliable strategy to consistently improve safety.

Transportation Equity

- ***Ensure that all transportation planning activities throughout the transportation system is equitable for all users***
  - Ensure an equitable and just distribution of benefits and burdens of transportation projects, plans, and policies among individuals and groups that differ by race, income, and ability.

  - Aim to protect and improve outcomes—with an emphasis on accessibility—for marginalized populations, especially low-income communities and communities of color.

  - Allocate resources based on communities' needs, with the aim of correcting existing differences and removing the effects of discrimination.

  - Provide efficient opportunities for marginalized populations to participate in the transportation decisions that will affect them.

Climate Change

- ***Strive to minimize, reduce the burdens of climate change equitably throughout all projects within our transportation system***
  - Ensure that projects throughout our transportation system are resilient by better preparing infrastructure to deal with the impacts of severe weather.

  - Use trees and other vegetation to reduce the impacts of the urban heat island effect while increasing walkability by creating lower shade temperatures.

  - Lower greenhouse gas emissions and improve air quality by reducing the number and impact of carbon-emitting vehicles, as well as reducing the demand for longer trips.

  - Incentivize using active and shared modes of transportation that use clean energy.

Mobility & Accessibility

- ***Improve accessibility and mobility movement of people by adding capacity through multimodal improvements and prioritizing networks for historically underfunded modes as a means to improve access within the community.***
    - Select transportation projects that are sensitive to community character, promote a sustainable compact urban form, and utilize "Complete Streets" criteria that include pedestrian, bicycle, and transit facilities; each of these are integral to an equitable transportation network.
    - Encourage LPAs to require that new developments and redevelopments incorporate grid street patterns that are more walkable, bikeable, connected, and readily served by both transit and public services including local government service operations and emergency response providers.
    - Identify, maintain, and enhance a dedicated freight and truck roadway network that facilitates the efficient movement of goods consistent with local, state, and interstate transportation needs.
    - Target intersections and corridors that experience high levels of congestion for investment to increase mode shift and decrease greenhouse gas carbon emissions. Alleviating congestion by adding vehicular capacity in order to reduce vehicle idling will not be considered an overarching strategy for reducing greenhouse gas emissions due to the tradeoffs in induced demand.
    - Encourage infill land use development to most effectively utilize existing infrastructure and promote shorter trips.
    - Enhance the safe, efficient, and effective movement of people and goods through an annual planning process that defines a five-year outlook for infrastructure maintenance, operational needs, and capital investment needs.
    - Annually target an average of 25% of STBG (or its equivalent in future transportation bills), to fund non-motorized projects that are not part of a larger motor vehicle capacity-expanding roadway project.
    - Use local Americans with Disabilities Act (ADA) Transition Plans to identify deficiencies and implement projects that ensure and promote integration of ADA components into the transportation system.

- Measure street capacity using people throughput instead of conventional motor vehicle only capacity measurements (https://nacto.org/publication/transit-street-design-guide/introduction/why/designing-move-people/).

- Prioritize funding for projects that serve residents within the MPO boundary. (Complete Streets-reduce sprawl)

- Accept that all street, trail, and facility designs will induce demand. Prioritize projects that induce demand for walking, bicycling, and transit use, specifically, as opposed to projects that increase demand for driving private vehicles, which results in increased greenhouse gas emissions.

Transit

- ***Provide the community with safe, efficient, convenient, affordable, frequent, and reliable transit services***
  - Prioritize projects that will create or improve direct access to transit services throughout the identified planning area.

  - Pursue all prudent and feasible funding opportunities to increase public transit capital and operating investments.

  - Use the BMCMPO *Coordinated Human Services Transportation Plan* to identify and remove gaps in transit services to elderly, disabled and low-income, and socially disadvantaged residents within the identified planning area.

  - Encourage transit projects that increase ridership.

  - Encourage transit projects that reduce the transit travel time and make using transit more time-competitive and time-equitable to driving a private vehicle.

  - Continue to fund transit projects that maintain or upgrade current facilities.

  - Encourage the expansion of both geographic coverage and hourly services offered by transit.

  - Encourage investments in transit that reduce operations costs, improve efficiency, reduce time delay, or reduce greenhouse gas emissions, such as investing in electric buses.

Preservation & Fiscal Responsibility

- ***Directly focus on maintaining existing transportation facilities before building new ones***
  - Focus on adding capacity to existing streets by adding safe and comfortable facilities for walking, bicycling, and transit; these added facilities may be retrofitted into a redesigned street by efficiently using underutilized space or added to the street.
  - Prioritize projects that maximize the use of existing infrastructure by all users through the use of recognized national and state transportation agency best management practices and operational standards.
  - Adopt a "fix-it-first" mentality that directs funding and project selection to prioritize maintenance and renewal of existing transportation facilities.
  - Support projects that maximize the use of existing infrastructure through systematic, systemic, and operational best practices.
  - Maintain and improve existing infrastructure through projects such as surface treatment, bridge repairs, improved striping, and sign replacements.
  - Construct a Transportation Improvement Program that effectively directs spending in compliance with this Metropolitan Transportation Plan.

Community

- ***Ensure that transportation projects maximize the community's quality of life and are compatible with local land use plans and policies***
  - Pursue federal and state grant opportunities, or utilize local funding, to complete missing street grid connections and/or major links to increase mobility for all users, reduce carbon emissions, and increase accessibility while increasing sustainability and public services/emergency response access.
  - Involve the public in transportation project selection, scoping, and implementation.
  - Incorporate context sensitive solutions and best practices into all project designs as set forth in transportation plans, comprehensive plans, subdivision control ordinances and site design review processes.

- Pursue possible funding opportunities to increase trail/path use and investment.

- Plan, design, develop, construct and maintain transportation facilities to minimize adverse impacts on environmentally sensitive areas, public parks and recreation areas, historic structures and neighborhoods.

- Incorporate aesthetic elements such as streetscape features as deemed desirable by local public agencies into transportation projects such that they are compatible with the adjacent area.

Chapter 3: Future Transportation Needs

Introduction

Multimodal transportation plays a vital role in the social, economic, and environmental lives of the Bloomington-Monroe County area, the State of Indiana, and the nation. Future transportation needs for the Bloomington-Monroe County urban area encompass a wide array of multimodal options that directly reflect the unique characteristics of the community.

Elements of the 2045 Metropolitan Transportation Plan development process relied on evident themes from a voluntary July 2020 community-wide survey documented in ***Appendix C***. The key themes include:

- Personal vehicle ownership high and personal vehicle use is extensive given significant weekday employment-based commuter trip volumes along the I-69, SR 45 and SR 46 corridors.

- The urban area generates and draws major internal and external automobile trip volumes as a regional multi-county commercial shopping destination.

- Major recreational automobile trip generators include the extensive Indiana University sports calendar, Monroe County Parks, Bloomington parks, local school sports, clubs, and the sizable attractiveness of the Lake Monroe-Hoosier National Forest recreational areas.

- Bloomington is recognized as a major Midwest and Indiana cultural arts center known for attracting personal automobile trips for concerts, festivals, museums, musical performances, plays, and an extensive "home-grown" entertainment industry for the visual and performing arts. Major attractions include the Bloomington Entertainment and Arts District (BEAD), the Early Music Festival, Bloomington Boogies, the Lotus Festival of World Music, Indiana University's Jacobs School of Music performances, the Eskenazi Museum of Art, and multiple other venue opportunities.

- As a community somewhat geographically isolated from the balance of Indiana, the Bloomington-Monroe County urban area economy depends heavily on external and internal motor carrier and truck freight transportation for the delivery of food, residential and commercial goods, and for Monroe County manufacturing industrial products in both raw and finished product forms.

- The Bloomington-Monroe County urban area public transportation system moves more passengers per capita than any other Indiana community. Transit ridership is high given the presence of a large world-class university. School corporation bus transportation

ridership is additionally high with growing primary and secondary educational populations.

- The American League of Bicyclists recognizes the City of Bloomington as a "Gold" Bicycle Friendly Community. The American League of Bicyclists additionally recognizes Indiana University, home of the "Little 500", as the state's only Bicycle Friendly University. The Little 500 is the largest collegiate bike race in the United States. Community residents and students therefore expect a safe, efficient, and extensive city and county multi-use pathway system for pedestrians and bicycles.

- The urban area places a very high priority on environmental responsibility, sustainability, addressing the existential threat of climate change brought about by greenhouse gas emissions, climate resilience, Black Lives Matter, addressing systemic economic justice issues, racial justice, social equity, and community health equity far exceeding the balance of other Indiana communities. The nearly unanimous support of these issues reinforces a need for balanced urban transportation system investments that address full accessibility and mobility for all residents and visitors.

- The Bloomington-Monroe County urban area believes in evidentiary records of scientifically-based facts for meeting future challenges such as climate change, climate resilience, air pollution, and water quality.

- The community supports the conversion of the public transit vehicles from fossil fuel dependency to electric vehicles. The community further supports the installation of additional of electric vehicle charging stations within the urban area in preparation for a new generation of personal, commercial, and fleet vehicles.

- The Bloomington-Monroe County is highly educated or actively pursuing higher education degrees thus bringing together "world views" for the analysis and the promotion of alternative solutions to current and future challenges.

- Household income of the urban area is greater than that of most Indiana communities, but persistent areas of lesser income are clearly evident. The development of affordable housing with multi-modal transportation access is major policy priority.

- The community places a high and continuing investment emphasis directed toward safety, maintenance, operations and the preservation of current transportation infrastructure systems for maximizing economic resilience.

Socioeconomic Forecast and Regional Profile

The Metropolitan Transportation Plan must satisfy anticipated future transportation and mobility needs of residents within Monroe County since it shall serve as a comprehensive policy

"blueprint" by guiding future transportation projects and programs that have an expected implementation within the minimum twenty-year analysis period.

A majority of the population living within Monroe County is located within the urbanized area, which includes the Town of Ellettsville, the City of Bloomington, and portions of Monroe County adjacent to these incorporated areas. Stats Indiana has the current population estimate for Monroe County at approximately 143,000. Of this total, approximately 83,000 people live within Bloomington, and 6,400 people within Ellettsville. Coupled with Bloomington's density compared to the rest of Monroe County and the presence of Indiana University students (43,700 in September 2017), these two factors have a significant impact on the local transport system and modal choice with a specific clear emphasis on walking, cycling, and transit.

Several national and regional trends offer an important context to transportation and mobility needs for the BMCMPO. Just as "do nothing" or "no build" are often considerations for future investments, the following trends can offer local policy guidance on choices and future investment decisions:

- The lack of reliable and efficient transportation is a barrier to upward social mobility for many households especially within traditional areas of Bloomington and in rural areas of Monroe County, a fact that can hinder economic growth and stability.

Monroe County historically has avoided national and state economic cycles of boom and bust conditions. Historic trends demonstrate a relatively stable economy and modest population growth. The estimated population growth provided in the following Table shows a conservative 1% per year in population growth will likely continue given large stable employment within the public education, medical appliances and equipment, health services, and pharmaceutical sectors of the local economy. Monroe County additionally serves as a regional retail and service hub for the surrounding counties which facilitates sustainable stable economic conditions for consumer goods and services.

Monroe County's population growth rates establish daily trip demands based on employment, shopping, school, or pleasure. This in turn factors into the functionality of the whole transportation network, which is projected into anticipated future needs.

A simple growth projection of traffic volumes is not a sufficient means to account for future trip generation and network needs. Using more detailed demographic, household, land use, and employment data, projections can better incorporate these attributes which influence household trip generation. For example, the very young and elderly often are dependent upon others for their daily transportation needs and tend to generate fewer daily trips. Conversely, the employed and higher income households tend to generate more daily trips than other cohorts. Using a range of household and employment attributes is beneficial way to project future trip generation and network needs.

Land Use Scenario Development Forecasts 2040	Overall Growth Scenario ---> / Development Style --->	Low Growth			Mid-Range Growth			High Growth		
		Standard	Compact	Low Density	Standard	Compact	Low Density	Standard	Compact	Low Density
Control Totals - TAZ Global Assumptions										
	Number of households by scenario	64,431	64,431	64,431	72,952	72,952	72,952	82,552	82,552	82,552
	Total population by scenario	153,209	153,209	153,209	173,784	173,784	173,784	185,234	185,234	185,234
	Total employment by scenario	94,240	94,240	94,240	107,135	107,135	107,135	118,443	118,443	118,443
	School enrollment	15,762	15,762	15,762	17,879	17,879	17,879	19,057	19,057	19,057
	IU enrollment forecast	48,500	48,500	48,500	49,000	49,000	49,000	50,000	50,000	50,000
Employmnet Global Development Assumptions										
	Emp. Growth Existing	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
	Emp. Growth Undeveloped	70.0%	40.0%	80.0%	70.0%	40.0%	80.0%	70.0%	40.0%	80.0%
	Emp. Growth Redevelopment	20.0%	50.0%	10.0%	20.0%	50.0%	10.0%	20.0%	50.0%	10.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	New Housing - Low Density	50.0%	10.0%	80.0%	50.0%	10.0%	80.0%	50.0%	10.0%	80.0%
	New Housing - Medium Density	25.0%	50.0%	19.0%	25.0%	50.0%	19.0%	25.0%	50.0%	19.0%
	New Housing - High Density	25.0%	40.0%	1.0%	25.0%	40.0%	1.0%	25.0%	40.0%	1.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Residential Global Assumptions										
	Infill Medium Density	10.0%	50.0%	1.0%	10.0%	50.0%	1.0%	10.0%	50.0%	1.0%
	Redevelopment High Density	70.0%	90.0%	30.0%	70.0%	90.0%	30.0%	70.0%	90.0%	30.0%
	Rural SFR Units per acre	0.2	0.1	2	0.2	0.1	2	0.2	0.1	2
	Urban SFR Units per acre	8	12	5	8	12	5	8	12	5
	Max. Rural Growth	0.5%	0.1%	1.0%	0.5%	0.1%	1.0%	0.5%	0.1%	1.0%

Detailed Summary After Applying Assumptions:	Overall Growth Scenario ---> / Development Style --->	Low Growth			Mid-Range Growth			High Growth		
		Standard	Compact	Low Density	Standard	Compact	Low Density	Standard	Compact	Low Density
Total Employment 2040										
	RETAIL	2,443	2,443	2,443	2,777	2,777	2,777	3,070	3,070	3,070
	INDUST	7,228	7,228	7,228	8,217	8,217	8,217	9,084	9,084	9,084
	OFFICE	10,972	10,972	10,972	12,473	12,473	12,473	13,789	13,789	13,789
	SERVICE	73,597	73,597	73,597	83,668	83,668	83,668	92,499	92,499	92,499
	TOTAL_EMP	94,240	94,240	94,240	107,135	107,135	107,135	118,443	118,443	118,443
Net Employment Growth 2010-2040										
	RETAIL	(476)	(476)	(476)	(142)	(142)	(142)	151	151	151
	INDUST	(1,148)	(1,148)	(1,148)	(159)	(159)	(159)	709	709	709
	OFFICE	900	900	900	2,401	2,401	2,401	3,717	3,717	3,717
	SERVICE	15,353	15,353	15,353	25,423	25,423	25,423	34,254	34,254	34,254
	TOTAL_EMP	14,627	14,627	14,627	27,522	27,522	27,522	38,830	38,830	38,830
Employment Growth in Existing Establishments										
	RETAIL	(571)	(571)	(571)	(170)	(170)	(170)	15	15	15
	INDUST	(1,377)	(1,377)	(1,377)	(190)	(190)	(190)	71	71	71
	OFFICE	90	90	90	240	240	240	372	372	372
	SERVICE	1,535	1,535	1,535	2,542	2,542	2,542	3,425	3,425	3,425
	TOTAL_EMP	(323)	(323)	(323)	2,422	2,422	2,422	3,883	3,883	3,883
Employment Growth in Undeveloped Sites										
	RETAIL	74	74	74	22	22	22	106	61	121
	INDUST	179	179	179	25	25	25	496	284	567
	OFFICE	630	360	720	1,681	960	1,921	2,602	1,487	2,974
	SERVICE	10,747	6,141	12,283	17,796	10,169	20,339	23,978	13,702	27,404
	TOTAL_EMP	11,629	6,754	13,255	19,524	11,176	22,306	27,182	15,533	31,066
Employment Growth in Re-developed Sites										
	RETAIL	21	21	21	6	6	6	30	30	30
	INDUST	51	51	51	7	7	7	142	142	142
	OFFICE	180	180	180	480	480	480	743	743	743
	SERVICE	3,071	3,071	3,071	5,085	5,085	5,085	6,851	6,851	6,851
	TOTAL_EMP	3,323	3,323	3,323	5,578	5,578	5,578	7,766	7,766	7,766
Residential Growth - Rural	Total Rural Housing Units	11,273	9,804	13,411	11,273	9,804	13,411	11,273	9,804	13,411
	Net growth in rural	1,806	337	3,944	1,806	337	3,944	1,806	337	3,944
	Rural acres needed	9,028	3,370	1,972	9,028	3,370	1,972	9,028	3,370	1,972
Residential Growth - Urban	Total Urban Units	53,158	54,626	51,020	61,679	63,148	59,541	71,279	72,748	69,141
	Net growth in urban	8,141	9,609	6,003	16,662	18,131	14,524	26,262	27,731	24,124
Residential Growth Distribution	New vacant site low density	4,070	961	4,802	8,331	1,813	11,619	13,131	2,773	19,299
	New vacant site med. density	1,832	2,402	1,129	3,749	4,533	2,732	5,909	6,993	4,538
	New in-fill med. density	204	2,402	11	417	4,533	28	657	6,993	46
	New vacant site high density	611	384	42	1,250	725	102	1,970	1,109	169
	New redeveloped site high density	1,425	3,459	18	2,916	6,527	44	4,596	9,983	72
	Urban acres needed	509	80	960	1,041	151	2,324	1,641	231	3,860

Table 3-1: 2040 socioeconomic household and employment sector data by low, medium, high growth rates with data subsequently allocated into land use development of standard, compact, and low density development styles.

The BMCMPO took into account many important attributes in order to better reflect existing conditions and subsequently project relatively accurate future needs tailored more specifically to Monroe County. Another step to this future projection took into account how and how fast Monroe County would grow over time. The following table illustrates low density, standard, and high density growth patterns in combination with a slow, moderate, and fast growth rates. ***Chapter 5*** details a further accounting in scenario analysis.

The *2045 Metropolitan Transportation Plan* differs from prior plans with a focus directed toward public policy opinions, performance measures and scenarios rather than specific projects. ***Appendix C*** highlights the community's public involvement and public policy approach. ***Appendix D*** discusses the urban area travel demand model, base year conditions, and future year projections.

Actions that can accomplish addressing future transportation needs include:

- *For Safety Improvements & Localized Congestion Relief:* low-cost capital improvements for the preservation of safety and roadway capacity through intersection signalization, improved signage, pavement markings, and guardrail improvements based on safety, congestion, and access management programs.

- *For Commuting & Recreation:* the on-going day-to-day operation and maintenance of the existing roadway system and bicycle and pedestrian facilities, the public transportation fixed-route services, the demand-response transit services for the elderly and special needs;

- *For Capital Replacement:* the preservation of the built environment of roadways through resurfacing and reconstruction based on a pavement management program, the rehabilitation and reconstruction of bridges through a bridge management program, the on-going improvement of transit service facilities and replacement of diesel buses with electric vehicles through a public transportation capital assets management program; and

Future Transportation Needs

Capacity preservation projects are often identified in short-term system modernization needs planning based on responses to local development investments, land use, and travel pattern adjustments. The identification and funding of capacity preservation projects are defined, as appropriate, in the annual operating and capital improvement programs of the Town of Ellettsville, Monroe County, the City of Bloomington, and in the Transportation Improvement Program (TIP) of the Bloomington-Monroe County Planning Organization (BMCMPO).

Projecting capital investment needs between the BMCMPO, the INDOT Seymour District and INDOT's Central Office rely on the use of asset management systems for planning and

programming. The same systematic approach is true for Monroe County, the Town of Ellettsville, and the City of Bloomington.

Current needs of Bloomington-Monroe County urban area transportation network are in many ways similar to future needs, especially when examining the priorities of safety, accessibility, convenience, and mode choice. This is fairly easy to equate into future needs when developing specific projects. This could include safety improvements to a location with a high incidence of crashes, a new multi-use pathway project connecting a school to a neighborhood or recreational facility, extended transit service times to meet consumer demands, and updating an existing corridor for improving east-west connectivity.

In addition to safety, accessibility, convenience, and mode choice needs, "big picture" input from the general public, local agencies, and elected officials indicates overwhelmingly strong preferences towards a cleaner environment with lower carbon emissions, less dependence on automobiles, and increased mode shares for transit, bicycle trips and walking. Big picture ideas on the influence of land use conversions, employment and education centers, housing investment strategies, the growth of freight, and emerging technologies are additional considerations when anticipating future needs as these will have a significant impact upon the transportation network.

Indiana Department of Transportation State Highway Needs

The Indiana Department of Transportation's *2045 Long Range Transportation Plan* (https://www.in.gov/indot/3714.htm) guides INDOT's needs-based strategic planning approach. The management of INDOT's bridge and highway network system are directed by business models emphasizing a combination of federal and state economic and engineering performance goals to further derive bridge and highway needs.

INDOT facilities within Monroe County include I-69, SR 45, SR 46, the SR 45/46 Bypass, SR48, and SR 446. The functional use of these transportation network facilities fulfill urban, rural, Interstate, arterial, and collector distributive roles. The I-69 corridor will continue evolution after finishing corridor construction to Indianapolis in 2024. The remaining balance of INDOT roadway corridor facilities will additionally evolve to the Year 2045, but at lesser rates dependent upon local, regional, and state economic and population growth needs.

Through the 2020 *Monroe County Southwest Corridor Study* and an extensive set of public input and involvement opportunities, residents identified a set of state highway system needs within Monroe County. A majority of the citizen identified needs focus on safe facilities for pedestrians and bicyclists, motor carrier freight, and motorists along State Roads. These needs emphasize safety, mobility, and connectivity fully consistent with current FHWA and INDOT performance measures.

The following is a summary of future area needs for state highways identified in the 2020 *Monroe County Southwest Corridor Study* developed with BMCMPO planning funds.

- **SR 45 & Leonard Springs Road/Eller Road.** This is currently an unsignalized four-legged intersection, with dedicated left-turn lanes provided on each approach. Based on the capacity analysis results, the stop controlled approaches currently operates at LOS D or better during the PM peak hour in 2019, with existing intersection geometrics and two-way stop control. A capacity analysis for 2039 indicates that both the stop controlled approaches (eastbound and westbound) will likely experience increased delays resulting in LOS F conditions with future traffic volumes. With the following improvements and optimized signal timings, the intersection is anticipated to operate at an acceptable level of service during the PM peak hour in 2039. ***Recommendations:*** Installation of a traffic signal, provision of 100-foot storage for the eastbound left-turn lane (Eller Rd), and addition of a southbound right-turn lane (along SR 45)

- **I-69 SB Off-ramp & Fullerton Pike.** The intersection of Fullerton Pike & I-69 SB off-ramp is a newly constructed interchange (single-lane roundabout), with a dedicated right-turn lane (by-pass) on the southbound approach. Based on the capacity analysis results, the intersection overall is anticipated to operate at LOS A during the PM peak hour under with existing intersection geometrics. ***Recommendations:*** No improvements are needed for 2019 and 2039.

- **I-69 NB Off-ramp & Fullerton Pike.** The intersection of Fullerton Pike & I-69 NB off-ramp is a newly constructed interchange (single-lane roundabout), with a dedicated right-turn lane (by-pass) on the eastbound approach. Based on the capacity analysis results, the intersection overall is anticipated to operate at LOS A during the PM peak hour current and future traffic with existing intersection geometrics. ***Recommendations:*** No improvements are needed for 2019 and 2039.

- **SR 45 & Ison Road.** This intersection is currently programmed and in preliminary engineering and design.

- **SR 45 & Airport Road.** This intersection is currently a signalized tee-intersection, with dedicated turn lanes provided on each approach. Based on the capacity analysis results, the intersection operates at LOS B during the PM peak hour in 2019, with existing intersection geometrics and optimized signal timings. ***Recommendations:*** With the construction of Airport Road extension between SR 45 and Tapp Road, the following intersection improvements are required to accommodate future traffic volumes during the PM peak hour in 2039 with optimized signal timings: Construction of the westbound approach (Airport Rd extension), with one left-turn lane, one through lane and one right-turn lane, and at least one inbound lane, the Addition of an eastbound through lane (Airport Rd)n and the addition of a southbound left-turn lane (SR 45).

- **I-69 SB Off-ramp & Tapp Road.** The intersection of Tapp Road & I-69 SB off-ramp is a newly constructed interchange (single-lane roundabout). Based on the capacity analysis results, the intersection overall operates at LOS A during the PM peak hour in 2019, with

existing intersection geometrics. In 2039, the intersection overall is anticipated to operate at LOS B; however, excessive queueing on the eastbound approach is expected with future traffic volumes (with v/c of 0.98). ***Recommendations:*** The addition of an eastbound right-turn lane (by-pass) is recommended by 2039 to provide acceptable level of service and reduce queue spillback.

- **I-69 NB Off-ramp & Tapp Road.** The intersection of Tapp Road & I-69 NB off-ramp is a newly constructed interchange (single-lane roundabout). Based on the capacity analysis results, the intersection overall is anticipated to operate at LOS A during the PM peak hour in 2019 and 2039 with existing intersection geometrics. ***Recommendations:*** No improvements are needed for 2019 to 2039.

- **SR 45 & Curry Pike/Leonard Springs Road.** This intersection is currently a signalized four-legged intersection, with a dedicated left-turn lane provided on each approach, and a dedicated right-turn lane provided on the southbound and westbound approach. A review of capacity analysis with optimized signal timings has shown that, the intersection overall operates at LOS C under in 2019 during the PM peak hour, with existing intersection geometrics. Based on a field visit conducted at this location, it was observed that queue spill back at certain movements exceeds the available storage length. ***Recommendations:*** Improvements identified in 2019 to address existing congestion includes: The addition of a northbound right-turn lane (Leonard Springs Rd), and Increase storage length of left-turn bays on southbound approach (Curry Pike) and westbound approach (SR 45) to 200 feet. A capacity analysis for 2039 indicates that the intersection overall is anticipated to operate at LOS E (below acceptable) with LOS F at several movements during the PM peak hour, with the improvements identified above and optimized signal timings. With the following additional improvements and optimized signal timings, the intersection overall is anticipated to operate at an acceptable level of service during the PM peak hour in 2039: Conversion of northbound right-turn lane to a shared through/right-turn lane (Leonard Springs Rd); Conversion of westbound right-turn lane to a through lane (SR 45), and; Addition of a westbound right-turn lane (SR 45).

- **SR 45 & Curry Pike/Leonard Springs Road.** This intersection is currently a signalized four-legged intersection, with a dedicated left-turn lane provided on each approach, and a dedicated right-turn lane provided on the southbound and westbound approach. A review of capacity analysis with optimized signal timings has shown that, the intersection overall operates at LOS C in 2019 during the PM peak hour, with existing intersection geometrics. Based on a field visit conducted at this location, it was observed that queue spill back at certain movements exceeds the available storage length. ***Recommendations:*** Improvements in 2019 to address existing congestion, are as follows: Addition of a northbound right-turn lane (Leonard Springs Rd), and; Increase storage length of left-turn bays on southbound approach (Curry Pike) and westbound approach (SR 45) to 200 feet. A capacity analysis for 2039 indicates that the intersection

overall is anticipated to operate at LOS E (below acceptable) with LOS F at several movements during the PM peak hour, with the improvements identified above and optimized signal timings. With the following additional improvements and optimized signal timings, the intersection overall is anticipated to operate at an acceptable level of service during the PM peak hour in 2039: Conversion of northbound right-turn lane to a shared through/right-turn lane (Leonard Springs Rd); Conversion of westbound right-turn lane to a through lane (SR 45), and; Addition of a westbound right-turn lane (SR 45).

- **SR 45 & Liberty Drive/Hickory Leaf Drive:** SR 45 & Liberty Drive/Hickory Leaf Drive is currently a signalized four-legged intersection, with a dedicated left-turn lane provided on each approach, and a dedicated right-turn lane provided on the westbound and SE bound approach. A review of capacity analysis with optimized signal timings has shown that, the intersection overall operates at LOS B in 2019, and is anticipated to operate at LOS B until 2039 during the PM peak hour, with existing intersection geometrics and optimized signal timings. Based on a field visit conducted at this location, it was observed, however, that excessive queuing occurs on the SE bound approach (as a result of high left-turning volume) blocking the through lane. However, sufficient storage is available due to an existing four-lane cross-section along Liberty Drive between SR 45 and Aldi Grocery Store Drive. Besides, the utilization of optimized signal timings along the SR 45 corridor is anticipated to improve the traffic operations. ***Recommendations:*** No geometric improvements are recommended for the existing 2019 conditions. By 2039 the intersection overall is anticipated to operate at an acceptable level of service during the PM peak hour with the proposed geometric and signal modifications, as follows: Restriping of SE bound approach (Liberty Dr.) to provide dual left-turn lanes and one shared through/right-turn lane; Increase storage length of inner southbound left-turn lane to 200 feet, and; Split phasing for NW and SE bound approaches to accommodate the proposed atypical SE bound approach configuration (Liberty Dr.).

- **SR 45 & I-69 SB Off-ramp.** This is a SR 45 & I-69 SB off-ramp is a signalized four-legged intersection (partial cloverleaf), with dedicated left-turn and right-turn lanes provided on each approach. Based on the capacity analysis results, the intersection overall is anticipated to operate at LOS C during the PM peak hour in 2019 and 2039 with existing intersection geometrics and optimized signal timings. ***Recommendations:*** No improvements are identified for 2019. By 2039, increased storage for southbound left-turn lane (450 feet) is recommended to contain queues resulting from future traffic volumes.

- **SR 45 & I-69 NB Off-ramp.** This is a signalized tee-intersection, with turn lanes provided on each approach. Based on the capacity analysis results, the intersection overall is anticipated to operate at LOS C or better during the PM peak hour in 2019 and 2039 with existing intersection geometrics and optimized signal timings. ***Recommendations:*** No improvements are required for 2019 or 2039.

- **SR 48 & Park Square Drive/Profile Pkwy.** This intersection is currently a signalized four-legged intersection, with a dedicated left-turn lane provided on each approach. A review of capacity analysis has shown that the intersection overall operates at LOS B in 2019 during the PM peak hour and is anticipated to operate at LOS D by 2039 with existing geometrics and optimized signal timings. ***Recommendations:*** The following geometric improvements are identified for 2039 to improve traffic operations and contain PM peak hour queues: Addition of a northbound right-turn lane (Park Square Dr.), and; Increase storage length of southbound (Profile Pkwy) left-turn lane to at least 250 feet.

- **SR 48 & Curry Pike.** This is currently a signalized four-legged intersection, with a dedicated left-turn lane provided on each approach, and a dedicated right-turn lane provided on the northbound and westbound approach. Based on the capacity analysis results, the intersection overall operates at LOS C during the PM peak hour in 2019 with existing intersection geometrics and optimized signal timings. ***Recommendations:*** No improvements are identified for 2019. A review of capacity analysis for 2039 traffic volumes indicates that the intersection overall and two approaches are anticipated to operate at LOS F during the PM peak hour with existing intersection conditions and optimized signal timings. With the following recommended improvements, the intersection is anticipated to operate at an acceptable level of service during the PM peak hour in 2039: Addition of an eastbound through lane (150 feet), to supplement the proposed six-lane cross-section along SR 48, east of the intersection; Addition of a left-turn lane (dual) on the southbound approach (Curry Pike); Extension of westbound right-turn lane to operate as a travel lane (third through lane); Increase storage lengths of eastbound left-turn lane (200 feet), northbound right-turn lane (225 feet) and southbound left-turn lane (500 feet) to accommodate generated traffic volumes. **Special Notations:** A significant increase in southbound left-turning traffic is anticipated during the PM peak hour; thus, warranting dual left-turn lanes in conjunction with added capacity along SR 48. This is a worst case scenario based on the assumption that land-use parcels 21 (Cook Medical site) and 22 (employment node per Third Street Corridor Development Plan) will generate a substantial portion of PM peak traffic in the same 15-minute to 1-hour time period. It is likely that these employment centers will have employee shifts, which will deter the negative traffic impacts at this intersection. To reflect this, a 20% reduction was applied to the PM peak hour generated volumes from parcel 22.

- **SR 48 & Liberty Drive.** This is currently a signalized four-legged intersection, with a dedicated left-turn lane provided on each approach. A review of capacity analysis with optimized signal timings has shown that, the intersection overall operates at LOS D in 2019 during the PM peak hour with existing intersection geometrics. Based on a field visit conducted at this location, it was observed that queue spill back at certain movements exceeds the available storage length. ***Recommendations:*** Improvements identified to address existing congestion in 2939 include: Addition of a northbound right-turn lane (Liberty Dr.). A capacity analysis for 2039 indicates that the intersection is

anticipated to experience increased delays resulting in LOS F operations (v/c > 1.0 for several movements) during the PM peak hour, with the improvement identified above and optimized signal timings. With the following additional improvements, the intersection is anticipated to operate at an acceptable level of service during the PM peak hour in 2039; Addition of an eastbound through/right-turn lane (SR 48); Addition of a westbound left-turn lane (dual) along SR 48, and; Increase storage length of northbound (Liberty Dr.) left-turn lane to at least 250 feet.

- **SR 48 & I-69 SB Off-ramp.** This is currently a signalized intersection with turn lanes provided on each approach except northbound approach. A review of capacity analysis has shown that the intersection overall operates at LOS B in 2019 during the PM peak hour, and is anticipated to operate at LOS D in 2039 with existing geometrics and optimized signal timings. ***Recommendations:*** With the proposed widening of SR 48 between Curry Pike and I-69, the following intersection improvements are identified for 2039: Reconfigure eastbound approach (SR 48) to provide three through lanes (six-lane section) and two right-turn lanes (storage length of at least 350 feet) and; Widen south leg (I-69 SB on-ramp) to accommodate dual eastbound right-turn lanes.

- **SR 48 & I-69 NB Off-ramp.** This is currently a signalized intersection, with turn lanes provided on each approach except southbound approach. A review of capacity analysis has shown that the intersection overall is anticipated to operate at LOS C or better in 2019 and 2039 during the PM peak hour, with existing geometrics and optimized signal timings. ***Recommendations:*** By 2039, increased storage for northbound left-turn lane (at least 350 feet) is recommended to contain queueing resulting from future traffic volumes.

Public Transit Future Needs

Bloomington Public Transportation Corporation (BPTC), Indiana University Campus Bus, and Rural Transit are the three (3) public transportation service providers operating within Bloomington-Monroe County urban area. The Bloomington Public Transportation Corporation (BPTC), known as Bloomington Transit, provides public transportation services exclusively within the Bloomington corporate limits. Indiana University Campus Bus primarily serves student transportation needs on the Indiana University campus. Rural Transit, operated by the Area 10 Agency on Aging, serves demand response transportation needs within the 244,000 population service area covering Monroe, Lawrence, Owen, and Putnam Counties. Ridership demands within this service area are growing with an aging of the population.

The *2045 Metropolitan Transportation Plan* identifies a number of macro-level transit service and capital improvements necessary to ensure the safe, efficient and effective provision of transportation mobility management options that include the following transit provider future service and capital needs:

Public transit needs include

- Maintaining COVID-19 safety protocols directed by the CDC into a currently undefined period

- A Calendar Year 2021 implementation of *Route Optimization Study* recommendations for Bloomington Transit and Rural Transit completed with the assistance of metropolitan transportation (PL) funds in FY 2019

- Passenger service and convenience improvements

- Facility modernization at the Grimes Lane facility used by Bloomington Transit and Indiana University Campus Bus,

- Continuing additions of passenger amenities (e.g., new shelters) at prioritized transit stop

- Cost-feasible fleet replacements with electric vehicles that are less dependent on fossil fuels

- Continuing pursuit of a Regional Transit Authority if so desired by local decision makers, and perhaps most critically

- The Calendar Year 2021 establishment of micro-transit service areas for the most vulnerable system users thereby enabling social equity access to jobs, services, recreation, and all other elements of the movement of people and goods. Social equity access is one of the most important ways government can enable residents to live safe, healthy, and productive lives.

Given the continued national, state, and community-wide presence of COVID-19 in Calendar Year 2021 and future years, the key macro-level challenges for the Bloomington Transit and the Rural Transit public transportation systems are

- Ensuring critical operator and passenger safety;

- A continuation of federal, state and local operating assistance at full pre-COVID-19 funding levels once Coronavirus Aid, Relief, and Economic Security (CARES) Act funds expire or depleted by the respective systems, and;

- The long-term availability of capital funding revenues for future fleet replacements including electric vehicles under flat to declining federal, state and local funding assistance ceilings encompassed within a very deep and potentially extensive national and state economic recessionary period brought about by the national COVID-19 pandemic.

Local Road and Street Needs

Future local road and street needs for Monroe County, the Town of Ellettsville and the City of Bloomington predominantly focus on safety, maintenance and preservation, and multi-use pathway connectivity, and future capacity expansion to accommodate residential, industrial and commercial growth needs. Safety needs include pedestrian, bicycle and vehicular intersection improvements based on crash reports, corridor safety and mobility improvements (e.g., sidewalks, multi-use pathways) and from public concerns. ***Appendix G*** of the *2045 Metropolitan Transportation Plan* identifies local jurisdictional projects.

The following section is a summary of future area needs for people who walk and/or bicycle:

- The walking and bicycling network must include facilities on high-volume roads as most often these are near origin-destination locations;
- Higher-volume roads should include balanced high-comfort accommodations for all users;
- Facilities must address users of all ages and physical and/or mental abilities, especially the young, the old, people without personal vehicles, people with disabilities, and people accessing transit;
- Facilities near transit stops should undergo prioritization reviews to replace or improve sidewalks for transit patron connections; and
- The walking and bicycling network must not require the most vulnerable users to travel out of their way to access facilities for health care, employment, education, recreation or a full range of other needs.

Monroe County Local Road and Street Needs

The current and future transportation needs of Monroe County within the urban area are primarily focused on addressing the commercial and industrial growth on the west side of the County along with the estimated 30,000 people that commute into Monroe County from the surrounding counties every day.

As noted by Monroe County officials, the SR 46 corridor in the northwest part of Monroe County for example, handles a considerable daily commuter traffic volumes and freight traffic. The SR 46 corridor west of Ellettsville, however, has capacity problems given horizontal and vertical alignment issues to the Town of Spencer and a high number of crashes and a history of fatal crashes. From Monroe County, this segment of the SR 46 corridor serves commuter employment with Cook Medical LLC.

The SR 46 corridor within Ellettsville serves as a commercial and commuting corridor. Unfortunately the corridor does not comfortably accommodate pedestrians and bicyclists given

long distances between signalized intersections, a five-lane pavement section with no sidewalk buffer, plus the mandatory shared use of standard width sidewalks by pedestrians with cyclists. The lack of suitable access control also contributes to mobility problems for pedestrians and bicyclists. Safe "mid-block" crossings represent a clear pedestrian and bicyclist need.

Monroe County's Southwest Corridor Study completed in 2020 with MPO funds examined the southwest quadrant of Monroe County with a focused examination of intersections and roadways that need improvement to reduce congestion and improve level of service. Many of the improvement recommendations are relatively low cost but involve multiple agencies. The study set priorities for recommended improvements and estimated the associated development costs. The improvement strategy established a 20-year planning window to the Year 2039. The study recommendations fit within the time frame for the 2045 Metropolitan Transportation Plan.

The high priority projects presented in the Southwest Corridor Study include: West 3rd Street, Curry Pike north of SR 45, the West 3rd Street and Liberty Drive intersection, the West 3rd Street and Curry Pike intersection, SR 45 and Liberty Drive intersection, and the SR 45 and Curry Pike intersection noted under "State Highway Needs" of this Chapter.

Monroe County highway officials have additionally noted the following:

- When the capacity of a roadway is constrained, congestion increases and level of service drops for motorists as well as the transit vehicles that share the corridor. It is in the best interest of transit users to make sure that the corridors they use have sufficient capacity to minimize delays. Transit speeds are important to the transit users especially if they have a long commute or have to transfer between several busses for a trip.

- Restricted roadway capacity or lack of suitable corridors results in neighborhood cut through traffic. For example, the intersection of Leonard Springs/Curry Pike and SR 45 has capacity issues and traffic will often back up on the north and south approaches to the intersection. When traffic backs up on the south approach (northbound), motorists will divert through the adjacent Leonard Springs neighborhood. Monroe County receives frequent complaints about "cut-through" traffic in this neighborhood. Improvements to the SR 45 intersection would help to reduce the backups on Leonard Springs Road and contribute to the reduction in neighborhood cut-through traffic. Intersection improvements at this location were identified as part of the *Southwest Corridor Study*.

- A Fullerton Pike corridor "missing link" results in cut-through traffic especially in the Highlands neighborhood. Providing the final connection for this corridor will eliminate neighborhood cut-through traffic and will help reduce the amount of traffic on adjacent corridors such as Tapp Road. The new corridor will also improve connectivity for pedestrians and bicyclists by having the corridor's multi-use path connect with the Clear Creek trail and connect with the path west of Rockport Road.

- Expansion of the roadway network to provide added capacity and reduced congestion should have equal consideration along with system preservation.

- The *2040 Metropolitan Transportation Plan* appeared to focus primarily on the urban core instead of addressing countywide capacity and mobility issues. Different parts of Monroe County have varying challenges for the roadway network. Areas that continue to have commercial and industrial development have different needs compared to areas that are already well established.

- In many cases by increasing the capacity of a roadway, the level of service will improve resulting in reduced delays. Reducing delays contributes to a reduction in the amount of air pollution along higher volume corridors. Providing missing links in a corridor reduces vehicle miles traveled which also results in a reduction in air pollution.

Monroe County identified multiple pedestrian and bicycle future transportation needs through planning support from the 2020 *Southwest Corridor Study* funded with MPO assistance. The needs include:

- **Curry Pike (SR 48 to SR 45):** Rehabilitate existing sidewalk (if necessary) and add new sidewalk on either side of the roadway (where nonexistent) to facilitate continuous access through the roadway.

- **South Leonard Springs Road (SR 45 to Fullerton Pike):** Rehabilitate existing sidewalk (if necessary) and add new sidewalk on either side of the roadway (where nonexistent) to facilitate continuous access through the roadway.

- **Tapp Road (South Leonard Springs Road to I-69):** Add new sidewalk, curb, and curb ramps with the roadway widening project.

- **Kirby Road extension (Airport Road to SR 45):** Add new sidewalk, curb, and curb ramps as part of the roadway construction project.

- **Airport Road extension (SR 45 to South Leonard Springs Road):** Add new sidewalk, curb, and curb ramps as part of the roadway construction project.

- **Fullerton Pike extension (Rockport Road to Gordon Pike):** Add new sidewalk, curb and curb ramps as part of the roadway construction project.

The focus of the *2020 Southwest Corridor Study* was the identification and recommendation roadway improvement projects and roadway extension projects to accommodate vehicle traffic. This study built upon the high level recommendations of the *Monroe County Thoroughfare Plan* and provided more detailed recommendations to accommodate vehicle traffic within the southwest study area. However, pedestrian and bicycle needs are also an

important component of any transportation network. A pedestrian and bicycle master plan was adopted by the County on February 21, 2018 and is titled *Monroe County Transportation Alternatives*. Page 46 of this pedestrian and bicycle master plan provides a vision map which covers the southwest study area. This vision map recommends high level greenway corridors (pedestrian and bicycle corridors) for the southwest area, similar to the high level roadway recommendations of the *Thoroughfare Plan*. It is recommended that pedestrian and bicycle accommodations be incorporated into the cross-section design of the previously mentioned roadway extension projects. It is further recommended that a more detailed study to accommodate pedestrian and bicycle needs for the southwest study area be developed by qualified alternative transportation planners in order to provide connectivity from developing vacant land to the greenway corridors recommended by the Monroe County Transportation Alternatives report (pedestrian and bicycle master plan).

Monroe County further identified multiple connectivity and accessibility future transportation needs through planning support from the 2020 *Southwest Corridor Study* funded with MPO assistance. The needs include:

- **Airport Road extension.** Airport Road is an east-west Major Collector in southwest Monroe County, which connects Kirby Road to SR 45 and provides a direct access to the airport from the south/east. The proposed extension from SR 45 to South Leonard Springs Road will improve mobility in the area and provide connectivity to the future MCUA Southwest Node land-uses (mixed-use development), and ease peak hour congestion along SR 45 and the SR 45 & I-69 interchange by providing an alternate E-W corridor for through/interstate traffic (via Tapp Road interchange) which is anticipated to carry over 6,400 vehicles per day. Furthermore, pedestrian/bike connectivity will be enhanced in the area as part of this extension with continuity provided along Tapp Road through a widening project. The speculative timeline for this project is 5 to 10 years (medium priority) based on the anticipated re-development of the adjoining land-uses as a Gateway District (Gateway West/G1).

- **Fullerton Pike Extension.** Fullerton Pike is an east-west Minor Arterial in southwest Monroe County that connects Leonard Springs Road and Rockport Road to I-69. The proposed extension from Rockport Road to Gordon Pike will improve mobility in the area by providing direct access to the interstate for the existing land-uses (residential subdivisions, apartments, Batchelor Middle School etc.) and future land-uses, reduce vehicle miles traveled (VMT) and alleviate traffic congestion on Tapp Road/W Country Club Road (east of I-69) by providing an alternate E-W corridor for through/interstate traffic. Additionally, the Fullerton Pike project encompasses sidewalk and trail enhancements (grade separated trail) along the corridor; thus, improving pedestrian/bike accessibility. **Special Note:** The design phase of this project is underway while the construction is anticipated to be completed in the next 5 years (high priority/planned).

- **Kirby Road Extension.** Kirby Road is a north-south Major Collector (SR 48 to Airport Road) in southwest Monroe County which directly serves as access to the Monroe County Airport, an aircraft supply store, a flight school and Van Buren Township Fire Station besides other residential and industrial land-uses. The proposed extension from Airport Road to SR 45 will improve mobility and connectivity in the area for existing and future land-uses (including a large office park employment node and institutional uses planned along Kirby Road), ease peak hour congestion along Curry Pike and South Leonard Springs Road by providing an alternate North-South corridor for through traffic, thereby improving traffic operations at intersections along these roadways. The speculative timeline for this project is 10 to 20 years (low priority) based on the projected land-use development in the area.

City of Bloomington Local Road and Street Needs

Bloomington's future transportation needs will center on motorist, pedestrian, and bicycle safety; maintenance, preservation and optimization of the existing system, and; the modernization of select corridors to current design standards with accommodations for drainage and extensions of multiuse pathways. The anticipated reauthorization or new iteration of the current FAST Act, urban area fund allocations based on 2020 Census data, and further Congressional COVID-19 recovery support will determine the direction of investment needs.

The City of Bloomington's recently initiated Recover Forward program will facilitate community recovery from the COVID-19 pandemic and the continuing economic downturn using 100% local funds. Rather than restoring a pre-pandemic normal, *Recover Forward* seeks to lean into a future consistent with community values, toward a Bloomington more thoroughly embodying our community's goals for racial equity, a sustainable and inclusive economy, and climate action. The city recognizes the need for important funding mechanisms provide the tools to recover quickly, and develop programming and infrastructure supporting racial, climate and economic justice in the next decade and beyond.

Recover Forward's initial phase entails passage of a 2020 $2.0 million special appropriation request from 2019 reversion funds, followed by the 2021 budget that will include a reallocation of funds among City departments and access to $4.0 million of reserves to protect basic services and accelerate equity projects. These appropriations will position Bloomington to make the infrastructure upgrades needed to meet current challenges and continue to provide basic City services.

- **Improve Mobility Options Sidewalk and Path Enhancements.** This City of Bloomington investment program initiative currently totaling $400,000 addresses ADA curb ramp improvements, pavement improvements to bike lanes and bike paths, and sidewalk damage caused by street trees, with investments focused in lower-moderate income areas. The Department of Public Works will use overall condition index data from its asset management system to identify specific locations for investment. The Department also intends to break up the work into several smaller contracts in order to attract local

small businesses to the projects, including a focused effort in promoting the work to minority and women-owned business enterprises.

- **Sidewalk and Multiuse Pathway Improvements for Bloomington Transit Stops.** The City of Bloomington will direct $250,000 in 2020 for sidewalk and multiuse pathways based on Bloomington Transit's (BT) 2019 Transit Stop Inventory Assessment. The assessment examined all transit stops with an evaluation and rating of each bus stop according to ADA and accessibility guidelines. City staff will work with a local engineering firm on preliminary designs to make accessibility improvements to BT bus stops. These improvement projects include creating paved landing zones, installing benches, and adding crosswalks and other pedestrian infrastructure where needed to make bus stops more easily accessible. To generate the greatest impact, the bus stops prioritized for improvement will include those rated lowest in accessibility that also serve large numbers of riders. Improvements to bus stop infrastructure will make public transit more accessible and convenient for the entire Bloomington community. The potential passage of economic stimulus funding for infrastructure investments by congress in 2021 could boost the availability of federal funds for meeting identified the sidewalk and multiuse pathway needs of service area transit stops.

Monroe County and City of Bloomington Freight Mobility Needs

The required scope of metropolitan transportation planning and FAST Act Performance Management rules includes the integration and connectivity of freight transportation system movements by:

- Defining elements of a metropolitan area's transportation system that are critical for the efficient movement of freight
- Identifying ways to measure system performance in terms of freight movement
- Developing freight-oriented data collection and modeling to identify problems and potential solutions, and
- Creating freight advisory committees to increase regional coordination on freight issues such as congestion, truck parking, identification of bottlenecks and other freight related issues.

Major elements of the Bloomington-Monroe County transportation system critical for the efficient movement of freight include I-69, SR 45, SR 46, SR 446, plus the arterial-collector classified routes of Monroe County and the City of Bloomington.

Freight movement corridors within the urban area of Monroe County outside of Bloomington have a large regional commercial and manufacturing employment-distribution center orientation geographically defined by I-69, SR 45, Curry Pike, and SR 46.

Freight movement corridors within the City of Bloomington were defined in recent decades by City Ordinance 91-67 which amended Chapter 15.28.020 of the Bloomington Municipal Code with established legal definitions for

- *Through Routes defined as* those truck routes intended for use by trucks which do not have destination points inside the perimeter of the community;

- *Destination Routes* as those truck routes intended for use by trucks which do have destination points inside the perimeter of the community, and

- *Emergency Routes* as those truck routes intended for use by trucks only when necessitated by closure of the associated through or associated destination route.

Bloomington's Through Routes include the I-69 corridor and the state highway system plus major arterials streets. Destination Routes encompass minor arterial and collector classified corridors. City authorities define Emergency Routes based on their locale in the street system and geometric-structural ability accommodate freight movements.

As directed by Municipal Code, trucks operating with the city must adhere to:

(1)

- One inside Destination Point. All trucks entering the city for a destination point in the city shall proceed only over truck routes and shall deviate only at the intersection with the street, upon which such traffic is permitted, nearest to the destination point. Upon leaving the destination point, such truck shall return to the truck route by the shortest permissible route.

- Multiple Inside Destination Points. All trucks entering the city for multiple destination points shall proceed only over truck routes and shall deviate only at the intersection with the street, upon which such traffic is permitted, nearest to the first destination point. Upon leaving the first destination point, a deviating truck shall proceed to other destination points by the shortest direction and only over streets upon which such traffic is permitted. Upon leaving the last destination point, a deviating truck shall return to the truck route by the shortest permissible route.

Trucks originating from inside the city shall be subject to the following:

- Outside Destination Point. All trucks on a trip originating in the city, and traveling in the city for a destination point outside the city, shall proceed by the shortest direction over streets on which such traffic is permitted, to a truck route.

- Inside Destination Points. All trucks on a trip originating in the city, and traveling in the city for destination points in the city, shall proceed only over streets upon which such traffic is permitted.

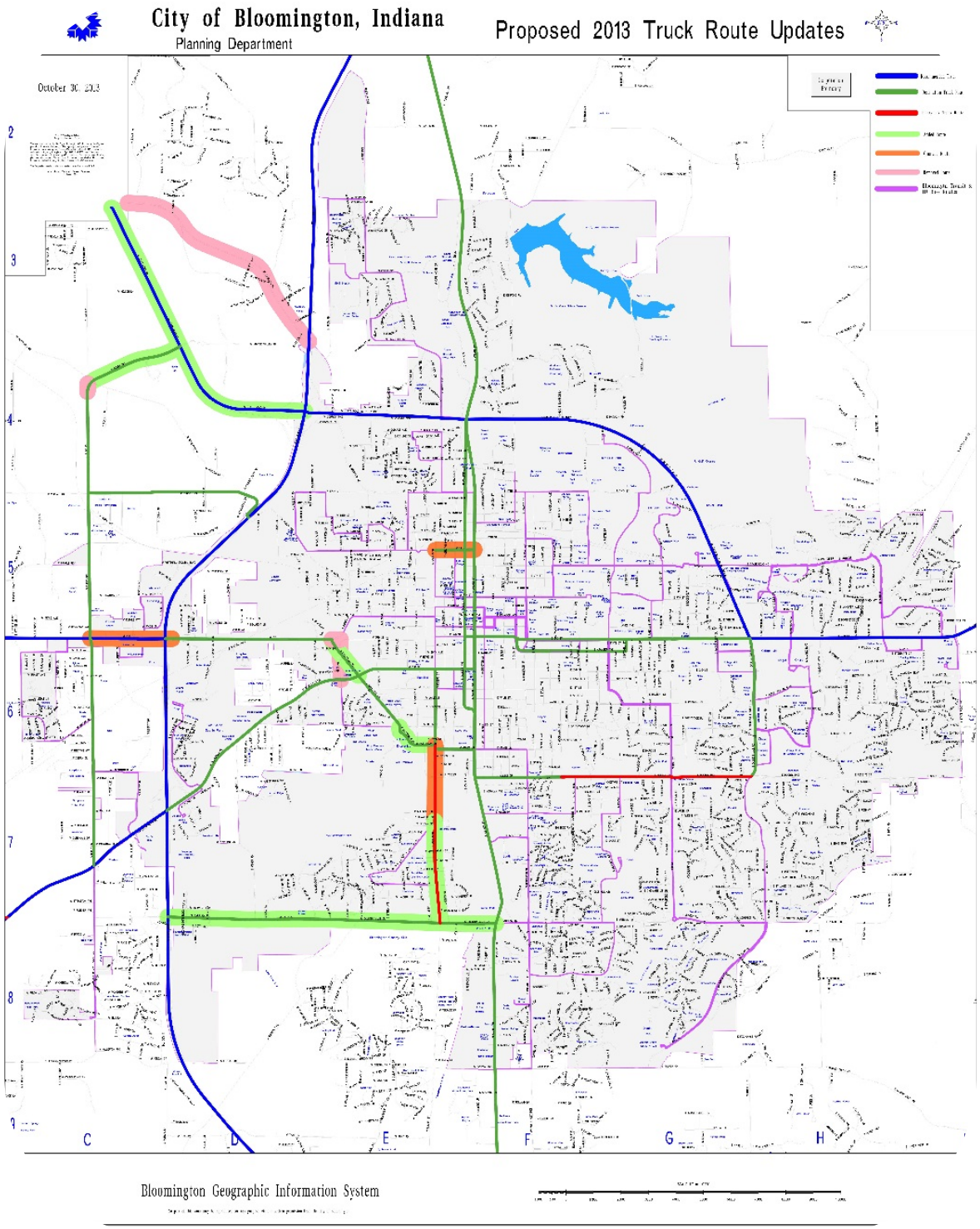
Current federal performance management regulations define a *truck freight bottleneck* as "a segment of roadway identified by the State DOT as having constraints that cause a significant impact on freight mobility and reliability.

Monroe County and the City of Bloomington currently measure freight system performance from interactions with commerce representatives.

Freight-oriented data collection occurs with HMPS traffic counts and traffic classification counts shared locally and with the Indiana Department of Transportation's traffic services engineers. The Bloomington-Monroe County travel demand forecast model incorporates commercial vehicle movements throughout the existing transportation system.

The Metropolitan Planning Organization Staff shall establish a technical freight advisory group in early calendar year 2021 for (1) the refinement of truck routes within Monroe County and the City of Bloomington; (2) increased regional coordination on freight issues such as congestion, truck parking, the identification of bottlenecks, and (3) other freight-related issues of importance to local shippers and receivers.

The following illustration shows the City of Bloomington's current Truck Routes proposed in Calendar Year 2013, but remain in abeyance.


City of Bloomington, Indiana
Planning Department
Proposed 2013 Truck Route Updates
October 30, 2013
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H
Bloomington Geographic Information System

Chapter 4: Financial Forecast

Introduction

Financial resources define the feasibility, timing, and scope of transportation project implementation. This chapter defines reasonable financial forecasts that support the recommended multi-modal transportation needs plan for the Bloomington and Monroe County urbanized area. The resulting fiscally constrained plan of projects is a requirement first set forth in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Successive Federal transportation legislation (TEA-21, SAFETEA-LU, MAP-21 and FAST) continued this requirement and permitted the inclusion of "illustrative" transportation projects for potential implementation if additional funding were to become available during the established Year 2045 planning period.

Financial resources for federal, state, and local highway transportation projects are typically set aside for three categorical areas:

- *eSafety and Security* - represent the highest multi-modal transportation system priority by protecting people, system users, and infrastructure investments

- *Facility maintenance and Preservation* – protects existing capital investments which include operation and maintenance and reconstruction (including pavement resurfacing, bridge rehabilitation transit operations, and bicycle/pedestrian facilities) of existing transportation facilities and services

- *Capacity Expansion* – adds to the functional capacity of the multi-modal transportation system through the addition of travel lanes, new transit facilities, sidewalks, and new bicycle/pedestrian multi-use pathways.

- *New Facilities* – represent major new capital investments including new roadways, bridges and interchanges where such facilities do not currently exist.

Federal Resource Programs

Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) governs current federal funding for highway, transit and railroad facilities. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 and maintains a focus on safety, keeps intact the established structure of the various highway-related programs, continues to streamline project delivery, and provides a dedicated source of federal dollars for freight projects.

The FAST Act apportions Federal program funds using a formula or a set of formulas, takedowns, and set-aside's. Legally established formulas determine initial lump sum amounts for each State's federal-aid apportionment. The lump sums may further subdivide among different programs (outlined below) based upon legally defined percentages. Federal legislation

further requires the distribution of some programs within the State to promote the fair and equitable use of funds and to meet certain priorities. Apportioned funds account for the overwhelming majority of Federal Highway Administration (FHWA) funds. Current congressional rules prohibit earmarking, which historically achieved accomplishment through allocations. Because of the limited funding for these programs, not every State will receive an allocation in a given fiscal year.

Major funding programs administered by the FHWA and the Federal Transit Administration (FTA) under current FAST Act legislation include the:

- **National Highway Performance Program (NHPP):** This program provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of federal-aid funds in highway construction directly support progress toward the achievement of performance targets established in a State of Indiana's asset management plan for the NHS.

- **Surface Transportation Block Grant Program (STBG):** This program provides flexible funding for use by states and localities to preserve and improve the conditions and performance on any federal-aid highway or bridge on any public road, pedestrian and bicycle infrastructure, and transit capital projects.

- **Highway Safety Improvement Program (HSIP):** Within the Surface Transportation Block Grant Program, the Highway Safety Improvement Program serves as a core federal-aid program with the purpose of achieving significant reductions in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance. The main elements of HSIP include the Strategic Highway Safety Plan (SHSP), the State HSIP or program of highway safety improvement projects, and the Railway-Highway Crossings Program (RHCP).

- **Congestion Mitigation and Air Quality Improvement Program (CMAQ):** This program directs flexible funding resources to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). The Bloomington-Monroe County metropolitan planning area is an air quality attainment area.

- **Metropolitan Planning Program (PL):** Under the FAST Act, the Metropolitan Planning Program directs a cooperative, continuous, and comprehensive multimodal planning framework for making transportation investment decisions in metropolitan areas. Program oversight is a joint Federal Highway Administration and Federal Transit

Administration responsibility. The FAST Act continues to require metropolitan transportation plans and transportation improvement programs (TIPs) to provide for facilities that enable an intermodal transportation system, including pedestrian and bicycle facilities.

- **National Highway Freight Program (NHFP):** This program provides States with highway-focused formula funding for use on freight-related projects, and a new program (FASTLANE) which provides discretionary grants for nationally-significant freight and highway projects.

Federal Funding Projections

Surface Transportation Block Grant (STBG)

The Surface Transportation Block Grant (STBG) program funds represent the primary source of federal support for improvements to Bloomington-Monroe County urbanized area roadways. The FAST Act converts the long-standing Surface Transportation Program (STP) into the Surface Transportation Block Grant (STBG) program. As statutorily cited [FAST Act § 1109(a)] by the Federal Highway Administration, "The STBG promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs."

Urbanized areas with a population of 200,000 or more persons (referred to as Group I areas) have a dedicated funding allocation stipulated by federal statute. Indiana urbanized areas, such as Bloomington, with a population of 50,000 to less than 200,000 persons (referred to as Group II areas) receive funding allocations based on a proportion of statewide population.

Under a sharing agreement for surface transportation programs, the Indiana Department of Transportation (INDOT) retains 75% of the federal funds received by the State of Indiana. INDOT distributes the remaining 25% federal fund balances to local jurisdictions, including Metropolitan Planning Organizations.

The federal-aid STBG fund allocation for the Bloomington Metropolitan Planning Area (MPA) in Fiscal Year 2021 was approximately $2.75 million. The forecast of STBG funds available between fiscal years 2021 and 2045 assumed a conservative, constant and real dollar growth rate of 2.0%.

As shown below, the Bloomington metropolitan planning area is likely to receive a total of approximately $86,076,367 in STBG funds between fiscal years 2021 and 2045 for locally initiated capital roadway system improvements.

Fiscal Years 2021 through 2030 = $28,695,667
Fiscal Years 2031 through 2045 = $54,630,567
Total = $83,326,234

Highway Safety Improvement Program (HSIP)

The Highway Safety Improvement Program (HSIP) provides federal funding for eligible safety improvement projects on local roadways. The Bloomington metropolitan planning area received an annual allocation of $470,684 for fiscal year 2020. The forecast of HSIP funds available between fiscal years 2021 and 2045 assumed a conservative, constant and real dollar growth rate of 2.0%.

Fiscal Years 2021 through 2030 = $4,911,250
Fiscal Years 2031 through 2045 = $9,349,997
Total = $14,261,247

Transportation Alternatives (TA)

Within the Surface Transportation Block Grant program, Transportation Alternatives (TA) provides federal funding for programs and projects defined as transportation alternatives, including on and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation, and enhanced mobility. The Bloomington urbanized area received an annual allocation of $155,801 for fiscal year 2020. The forecast of TA funds available between fiscal years 2021 and 2045 assumed a conservative, constant and real dollar growth rate of 2.0%.

Fiscal Years 2021 through 2030 = $1,625,672
Fiscal Years 2031 through 2045 = $3,094,940
Total = $4,720,612

State of Indiana Investments

The Indiana Department of Transportation does not have any committed major capital projects identified for construction in Bloomington and Monroe County between Fiscal Year 2021 and Fiscal Year 2045 given the recent completion of the I-69 corridor through the metropolitan planning area.

A majority of investment priorities shall focus on safety enhancements and system preservation to existing state roads. With the knowledge that these improvements rely upon an as-needed basis, no firm estimate of future investments in such projects is currently available.

Indiana's *Next Level Roads Plan* announced in 2017 resulting from House Enrolled Act 1002 (Effective July 1, 2017) focused funding in the BMCMPO area on preservation, maintenance, and safety investments with a 3-year investment total equaling $13,033,146 from 2018 through 2020. House Enrolled Act 1002 established an increase of ten-cents per gallon for gasoline, special fuels, and motor carrier surcharge taxes. The Act further established an indexation against inflation thereby maintaining constant dollar revenues in relation to overall indexed costs.

Local roads statewide received an estimated $264.0 million in additional dollars in FY 2019 and shall receive up to an estimated $340.0 million by FY 2024. The House Enrolled Act should raise $1.2 billion in new state and local revenues beginning in 2024.

INDOT's Community Crossing Local Road and Bridge Matching Grant Fund Program provides an additional source of revenue to the BMCMPO area through discretionary awards for systems preservation, maintenance, replacements, reconstruction, and similar activities. INDOT has awarded over $1.0 billion since 2013 to local public agencies to aid in modernizing local roads and bridges. No future funding availability is possible given the variable discretionary nature of this program, the size of requests in relation to available funds, and the year-to-year needs of Monroe County, the City of Bloomington, and the Town of Ellettsville. Therefore a reasonable financial forecast is not possible.

Federal Transit Program Formula Grants, Capital Investment Grants, and State Assistance

Federal transit program formula grants and capital investment grants and state assistance are critical to the success of Bloomington Transit and its provision of service over 1,178,700 vehicle miles traveled for 3.14 million annual customers in 2018. This equates to 2.66 miles per customer trip.

Federal transit formula operating and capital investment grants for Bloomington Transit totaled $2,770,000 in calendar year 2020. The forecast of Federal Transit Administration (FTA) funds available between fiscal years 2021 and 2045 assumed a conservative, constant and real dollar growth rate of 2.0%. As shown below, Bloomington Transit is likely to receive a total of $86,076,367 in formula grants and capital investment grants for Fiscal Year 2021 through Fiscal Year 2045.

Fiscal Years 2021 through 2030 = $30,937,342
Fiscal Years 2031 through 2045 = $59,561,067
***Total* = $90,498,409**

State transit program assistance to Bloomington Transit totaled $2.6 million in 2020. A conservative, constant dollar growth rate of 2.0% used to forecast these funds available between 2021 and 2045 projects Bloomington Transit will likely receive a total of $88,937,271 in formula grants and capital investment grants for Fiscal Year 2021 through Fiscal Year 2045.

Fiscal Years 2021 through 2030 = $29,500,694
Fiscal Years 2031 through 2045 = $56,795,209
Total = $86,295,903

Federal transit formula operating and capital investment grants for Rural Transit totaled $748,544 in 2020. The forecast of Federal Transit Administration (FTA) funds available between fiscal years 2021 and 2045 assumed a conservative, constant and real dollar growth rate of 2.0%. As shown below, Rural Transit is likely to receive a total of $24,455,610 in federal formula grants and capital investment grants for Fiscal Year 2021 through Fiscal Year 2045.

Fiscal Years 2021 through 2030 = $8,360,275
Fiscal Years 2031 through 2045 = $16,095,336
Total = $24,455,610

State transit program assistance to Rural Transit totaled approximately $306,875 in 2020. A conservative, constant dollar growth rate of 2.0% used to forecast these funds available between 2021 and 2045 projects Rural Transit will likely receive a total of $10,025,884 in formula grants and capital investment grants for Fiscal Year 2021 through Fiscal Year 2045.

Fiscal Years 2021 through 2030 =$3,427,400
Fiscal Years 2031 through 2045 = $6,598,485
Total = $10,025,884

Local Resources

Primary resources for locally initiated transportation projects include Motor Vehicle Highway Account (MVHA) fund receipts, Local Road and Street Funds (LRS), the Wheel Tax, the Cumulative Bridge Fund, Cumulative Capital Development Funds, alternative transportation funds and, in certain instances, Tax Increment Financing (TIF) District funds.

Motor Vehicle Highway Account (MVHA) & Wheel Tax

The Motor Vehicle Highway Account (MVHA) receipts for Monroe County and the City of Bloomington typically exhibit an annual variability. The construction or reconstruction and maintenance of streets and alleys rely upon MVHA funds. These funds represent the primary operating and maintenance expenditures for Monroe County and the City of Bloomington between 2021 and 2045. The forecast assumption for the 2045 MTP is that MVHA receipts will remain at a constant real dollar growth rate of 2.0% until the Year 2045 and that these funds will continue use for basic operations and maintenance.

Monroe County and Bloomington use Wheel Tax funds for resurfacing and minor roadway rehabilitation projects. The forecast assumption for the 2045 MTP is that Wheel Tax receipts will remain at a constant real dollar growth rate of 2.0% until the Year 2045 and that these funds will continue for the purposes prescribed by the Indiana General Assembly.

Given MVHA and Wheel Tax receipts and under the assumptions outlined above, the following fiscal period forecasts can be reached:

Fiscal Years 2021 through 2030 = $112,497,308
Fiscal Years 2031 through 2045 = $207,949,604
Total = $320,446,912

Local Road and Street (LRS) Funds

Local Road and Street account (LRS) funds, including accelerated allocations, are available for capital investment; however, a portion of the funds must be set aside for preservation projects such as resurfacing, intersection/signalization projects, and safety improvements.

Based on past and present budgets, Monroe County and the City of Bloomington allocate variable portions of these funds for capital investments. These funds represent the primary expenditures that Monroe County and the City of Bloomington use for engineering, land acquisition, construction, resurfacing, restoration, and rehabilitation of roadway facilities. The forecast assumption for the 2045 MTP is that LRS receipts will remain at a constant real dollar growth rates of 2.0% until the Year 2045 and that these funds will continue use for the purposes prescribed by the Indiana General Assembly.

Given LRS receipts and under the assumptions outlined above, the following fiscal period forecasts can be reached:

Fiscal Years 2021 through 2030 = $21,718,454
Fiscal Years 2031 through 2045 = $41,812,716
Total = $63,531,169

Cumulative Bridge Funds

The Monroe County Cumulative Bridge Fund will continue dedication to bridge preservation for the cost of construction, maintenance, and repair of bridges, approaches, grade separations and county-wide bridge inspections. The forecast assumption for the 2045 MTP is that the Cumulative Bridge Fund will remain at a constant real dollar growth rate of 2.0% until the Year 2045 and that these funds will continue use for the purposes prescribed by the Indiana General Assembly.

Given Cumulative Bridge receipts and under the assumptions outlined above, the following fiscal period forecasts can be reached:

Fiscal Years 2021 through 2030 = $18,491,741
Fiscal Years 2031 through 2045 = $35,600,597
Total = $54,092,338

Major Bridge Fund

The Major Bridge Fund established under (IC § 8-16-3.1) is a special fund to address major obstructions between commercial or population centers which are capable of causing an economic hardship because of excess travel time to conduct a normal level of commerce between the two (2) centers. A major bridge is defined as a structure of 200-feet or longer or 100-feet in a qualified city. The tax levy shall not exceed $0.0333 per $100 assessed valuation within the eligible county. The Major Bridge Fund has no forecast for the 2045 MTP.

Cumulative Capital Development Funds

The forecast assumption for the 2045 Metropolitan Transportation Plan is that the Cumulative Capital Development Fund will remain at a constant real dollar growth rate of 2.0% until the Year 2045 and that these funds will continue use for the purposes prescribed by the Indiana General Assembly.

Given Cumulative Capital Development Fund receipts for Monroe County and the City of Bloomington under the assumptions outlined above, the following fiscal period forecasts can be reached:

Fiscal Years 2021 through 2030 = $49,018,809
Fiscal Years 2031 through 2045 = $76,084,055
Total = $125,102,864

Tax Increment Financing (TIF) Funds

Tax Increment Financing (TIF) District revenue receipts are occasionally used by Monroe County and the City of Bloomington for capital infrastructure investments including roadway and drainage improvements. Forecasts for these districts are inexact given their direct link to project development, property values, and sunset provisions. The Monroe County TIF District Funds have no forecast for the 2045 MTP.

Alternative Transportation Funds

The City of Bloomington established Alternative Transportation funding exclusively for pedestrian and bicycle infrastructure maintenance, preservation, and facility expansions more than a decade ago. The Common Council allocates funds through annual municipal budget approvals. The forecast assumption for the 2045 Metropolitan Transportation Plan is that the Alternative Transportation fund allocations will remain at a constant real dollar growth rate of 2.0% until the Year 2045 and that these funds will continue use for the purposes prescribed by the City of Bloomington.

Given Alternative Transportation Fund allocations from 2012 through 2019 for the City of Bloomington under the assumptions outlined above, the following fiscal period forecasts can be reached:

Fiscal Years 2021 through 2030 = $8,378,638
Fiscal Years 2031 through 2045 = $16,130,689
***Total = $*24,509,328**

Public Transportation Locally Derived Income

Federal transit program formula grants and capital investment grants help to support Bloomington Transit's service. Bloomington Transit is additionally supported by locally derived income (LDI) consisting of fare revenue, contract/other revenue, and local assistance. Bloomington Transit's locally derived income have no forecast for the 2045 MTP.

General Obligation Bonds

Monroe County and the City of Bloomington may use General Obligation (GO) bonds for transportation infrastructure investments. The use of this funding mechanism, however, is subject to a variety of unique circumstances. General Obligation Bonds have no forecast for the 2045 MTP given a measurable level of uncertainty over their use.

Conclusion

The Bloomington and Monroe County metropolitan planning area forecast suggests the receipt of approximately $83.3 million in Federal Surface Transportation Block Grant (STBG) program, $14.2 million in Highway Safety Improvement Program (HSIP), and $4.7 million in Transportation Alternatives (TA) funds through Fiscal Year 2045 for transportation infrastructure investments.

The sum total of revenue sources from Monroe County and the City of Bloomington Motor Vehicle Highway Account, Wheel Tax, Local Road and Street, Cumulative Bridge Funds, Cumulative Capital Development, and Alternative Transportation Funds suggest that, given forecast assumptions, the BMCMPO planning area will have over $706.2 million in local funds available for safety, maintenance, preservation, and added multi-modal transportation system capacity activities for Fiscal Years 2021 through 2045. However, some of these funds are for other priorities within each local public agency. This sum total assumes the investment of all available local funds to transportation projects – a "very best case" financial forecast that may not reflect actual local funding spent over time on transportation-related projects.

The sum total of revenue sources for Bloomington Transit under formula grants, capital investment grants, and locally derived income suggest that, given forecast assumptions, the BMCMPO metropolitan planning area will have over $211.2 million available for transit service activities for Fiscal Years 2021 through 2045.

A final note: The current national and state economic fallout resulting from the COVID-19 pandemic is unprecedented since the Great Depression. It is therefore import to note that the full implications of the current economic crisis brought about by the health crisis has yet to "play out". A reasonably accurate forecast of domestic, state, and regional economic recovery is currently impossible until the adoption of a national pandemic strategy in 2021 or beyond. Current (August 2020) national economic forecasts strongly indicate that an economic recovery to pre-pandemic levels shall take at minimum six years or a greater time horizon.

Chapter 5: Travel Demand Model Scenarios

Introduction

This chapter highlights the fundamental aspects to the *2045 Metropolitan Transportation Plan* (MTP) used as a policy level decision-making guide for future transportation investment by the BMCMPO. The Guiding Principles, the financial forecast, and the future needs discussed in the previous chapters reflect the course of future decisions by the BMCMPO.

The travel demand modeling process establishes a quantifiable framework through which the BMCMPO Committees and the general public can

- Examine the existing transportation system under current performance assumptions
- Examine alternative future investment policy scenarios, and
- Achieve a broad policy-level investment consensus of solutions that meet the established Guiding Principles vision, goals, and objectives and satisfy fiscally constrained transportation needs and wants of the urban area.

The MTP provides direction for these considerations from the beginning project concept through implementation. The MTP provides general policy direction during the project concept phase by using the Guiding Principles; during the financial feasibility by considering the financial forecast or available resources and; during the technical design by addressing future needs.

The Bloomington-Monroe County Travel Demand Model (TDM) is another powerful tool of the MTP to assist in the 3C process. Again, this should inform and establish a framework for all BMCMPO members to work towards the best solution. ***Appendix D*** (Travel Demand Model) provides TDM technical information not detailed in this chapter. The TDM was developed to project future growth and travel demands and to apply these to the 2013 base year conditions (existing and committed projects) and then to the year 2040. The TDM also uses multiple growth and development scenarios. This is a unique aspect of this TDM and a new analysis for the BMCMPO. What is important to this analysis is it allows the TDM to consider different rates of growth and allocate the growth into several different development styles as land uses and people are the most significant influences on transportation needs. Finally, another unique aspect and new tool for the BMCMPO is a TDM performance measure analysis. Together these components of the TDM provide results to further guide decision.

Travel Demand Model

The BMCMPO Travel Demand Model (TDM) established 2013 baseline conditions for Monroe County. This “Base Year” snapshot used travel demand forecast model methodology for measuring transportation network changes over time given alternative policy scenarios. The BMCMPO TDM quantified travel demand growth through land use, county-specific socioeconomic characteristics, and modal choices. This standard approach identified basic future transportation network needs in the absence of network considerations such as political,

topographical, and technical feasibility for system improvements. Needs derived from public comments, feedback from various agencies, and even land development activities can further assist planners formulate a TDM to reasonably reflect transportation needs. This list could include bigger buses to aid in serving busy bus routes, a roundabout for a dangerous intersection, and new road to serve business park growth.

Factors related to financial aspects, political support, technology, environmental constraints, societal trends, and public policy can introduce complexity into a TDM. Projections twenty-five years into the future make this exercise much more complicated. While the TDM does aid in this process by assessing socioeconomic trends, anticipated land use changes, and some transportation improvements highly anticipated, the future is nevertheless uncertain. What the TDM can achieve is aid with understanding the magnitude of future needs by considering a range of scenarios. The TDM can further assist planners and public officials to understand possible consequences of scenarios and near-term decisions by using performance measures. Together the TDM can guide decisions based on preferred courses of action or trajectories to meet our future expectations.

Network Scenarios

The BMCMPO travel demand model examined transportation system network scenarios to determine the macro-level performance impacts under an assortment of policy considerations. Scenario identifications evolved through general public input and BMCMPO committees. Staff evaluations through the MTP steering committee resulted in the identification of thirteen (13) network scenarios. These scenarios provided an understanding of the implications that may result from public policy investments strategies within the transportation network and associated socioeconomic changes, land use changes and other defined parameter conditions.

All scenarios examined with the BMCMPO TDM relied upon guidance from the public Metropolitan Transportation Plan Task Force, general public input, and the MPO staff. The overall assumption for most scenarios is that general operations and maintenance shall continue at existing necessary baseline levels. Scenarios 2, 3, 4, 6, and 11 did examine aspects of changing operations, maintenance, or potential external factors impacting travel demand. The financial forecast (**Chapter 4**) accounted for general operations and maintenance as an element of all scenarios.

The BMCMPO TDM examined a no build or “Do Nothing” scenario and twelve (12) additional scenarios using the modeled Base Year 2013. The E+C network (Existing plus Committed) is included as part of all other scenarios with the single exception of Scenario 3 which did not include I-69 corridor development through the BMCMPO, and is intended only to compare it with the E+C network to better understand local impacts associated with I-69. Each scenario is detailed on the following pages below:

Scenario Statistics		Scen #-->	0	1	2	4	5	6	9	10	11	12
		Land Use-->	Base	Mid-Stnd	Mid-Stnd	Mid-Stnd	Mid-Stnd	Mid-Stnd	IURP	Bed Comm.	Mid-Stnd	Infill
Category	Measure	Net-->	Base	E+C	E+C+BRT	E+C	TIP	TIP+	TIP	TIP	2-Ways	TIP
Demand	Vehicle Miles (VMT)		2,955,625	3,584,415	3,564,909	3,297,662	3,694,826	3,731,774	3,700,595	4,107,402	3,570,078	3,469,918
Demand	Vehicle Hours (VHT)		108,575	132,246	134,597	135,499	132,050	134,939	132,203	166,833	133,584	148,175
Demand	Work Trip - Vehicle Occupancy		1.08	1.08	1.07	1.09	1.08	1.08	1.07	1.07	1.08	1.08
Demand	Person Trips		589,162	690,749	690,748	690,748	690,738	690,738	692,285	702,061	690,744	685,964
Demand	Transit Share		4.49%	5.50%	6.39%	8.14%	5.50%	5.45%	5.51%	5.30%	5.50%	5.67%
Demand	Daily Ridership		27,792	39,892	46,555	59,038	39,895	39,496	40,458	39,056	39,897	40,808
Demand	Transit Trips		26,468	37,992	44,128	56,227	37,995	37,615	38,168	37,196	37,997	38,864
Demand	Transit Person Miles		51,875	60,819	72,535	91,984	60,818	60,210	60,955	61,815	60,819	60,398
Demand	Transit Person Hours		3,435	4,028	4,591	6,092	4,028	3,987	4,023	4,094	4,028	4,000
Demand	Non-Motorized Share		38.3%	37.2%	36.7%	40.9%	37.2%	36.8%	37.2%	34.7%	37.2%	39.0%
Demand	Non-Motorized Trips		225,589	256,619	253,542	282,280	256,617	254,051	257,262	243,832	256,619	267,385
Demand	Non-Motorized Person Miles		278,934	327,028	320,831	359,731	327,024	323,754	327,756	310,732.84	327,026	306,894
Demand	Non-Motorized Person Hours		42,974	50,384	49,435	55,421.94	50,383	49,879	50,496	48,176	50,383	47,287
Efficiency	Vehicle Hours Under Delayed Conditions		5,976	28,416	28,826	25,006	28,379	28,168	28,294	28,002	29,717	28,568
Efficiency	Avg. PM Peak Speed		27.22	23.54	23.06	24.34	24.30	24.09	24.31	24.62	23.25	23.42
Efficiency	Avg. Auto Trip Length		6.78	6.50	6.55	9.36	6.50	6.57	6.51	6.43	6.50	6.24
Efficiency	Lane Miles at LOS E or worse		9.93	65.88	65.91	58.00	65.79	64.48	65.59	64.92	68.89	65.52
Environ	Vehicle Emissions (Daily Tons CO2)		1,418	1,845	1,835	1,697	1,902	1,921	1,905	2,114	1,838	1,786
Safety	Fatal Accidents		12	15	15	14	16	16	16	17	15	15
Safety	Injury Accidents		1,111	1,453	1,461	1,313	1,472	1,494	1,474	1,626	1,457	1,410
Safety	Property Damage Accidents		3,068	4,011	4,034	3,626	4,066	4,126	4,071	4,489	4,023	3,894
Econ	Avg. Daily Roadway User Costs in 2040 ($2013 millions)		$ 2.697	$ 4.830	$ 4.412	$ 5.362	$ 4.405	$ 4.339	$ 4.409	$ 4.739	$ 4.398	$ 4.290
Econ	Daily User Cost per Vehicle Trip (Autos and Trucks)		$ 8.00	$ 12.19	$ 11.22	$ 13.64	$ 11.12	$ 10.95	$ 11.11	$ 11.26	$ 11.10	$ 11.30
Econ	Present Value ($2013 millions) 2013-2040 lifecycle user and safety benefits		n/a	n/a	$ 1,106.67	$ (430.04)	$ 1,019.04	$ 1,042.39	$ 993.90	$ (1,064.14)	$ 1,176.28	$ 1,820.47
Econ	Capacity Added to Meet Standards (Road Lane Miles)		9.93	65.88	65.91	58.00	65.79	64.48	65.59	64.92	68.89	65.52
Econ	Est. Cost to Achieve LOS D ($Million)		$ 7.45	$ 49.41	$ 49.43	$ 43.50	$ 49.34	$ 48.36	$ 49.20	$ 48.69	$ 51.67	$ 49.14

Scenario Statistics		Scen #-->	0	1	2	4	5	6	9	10	11	12
		Land Use-->	Base	Mid-Stnd	Mid-Stnd	Mid-Stnd	Mid-Stnd	Mid-Stnd	IURP	Bed Comm.	Mid-Stnd	Infill
Measure		Net-->	Base	E+C	E+C+BRT	E+C	TIP	TIP+	TIP	TIP	2-Ways	TIP
Acres with a 5D Score > 0.8			1,208	1,623	1,623	1,623	1,623	1,620	1,682	1,548	1,623	1,794
Population with a 5D Score > 0.8			27,367	32,734	32,734	32,734	32,734	32,555	35,144	29,386	32,734	39,468
Households with a 5D Score > 0.8			6,575	9,516	9,516	9,516	9,516	9,461	10,013	7,397	9,516	10,956
Employment with a 5D Score > 0.8			35,293	52,307	52,307	52,307	52,307	52,183	47,637	47,311	52,307	57,080
Aggregate 5D Score (sum of 600 zones)			318.58	329.46	329.47	329.47	329.53	327.06	329.61	326.83	329.58	333.58
Average 5D Score			0.53	0.55	0.55	0.55	0.55	0.55	0.55	0.54	0.55	0.56
Aggregate Number of HH Autos			93,780	122,578	122,577	122,577	122,561	123,176	122,769	128,522	122,555	116,672
Population			152,952	188,760	188,760	188,760	188,760	188,760	189,464	188,229	188,760	188,759
Households			57,191	75,011	75,011	75,011	75,011	75,011	75,389	75,011	75,011	75,011
Jobs			79,611	107,138	107,138	107,138	107,138	107,138	107,138	107,136	107,138	107,138
Autos per Household			1.64	1.63	1.63	1.63	1.63	1.64	1.63	1.71	1.63	1.56
Pct. Of Acres with a 5D Score > 0.8			0.48%	0.64%	0.64%	0.64%	0.64%	0.64%	0.66%	0.61%	0.64%	0.71%
Pct. Of Population with a 5D Score > 0.8			17.9%	17.3%	17.3%	17.3%	17.3%	17.2%	18.5%	15.6%	17.3%	20.9%
Pct. Of Households with a 5D Score > 0.8			11.50%	12.69%	12.69%	12.69%	12.69%	12.61%	13.28%	10.01%	12.69%	15.11%
Pct. Of Employment with a 5D Score > 0.8			44.33%	48.82%	48.82%	48.82%	48.82%	48.71%	44.46%	44.16%	48.82%	53.28%

Color Coding

Best Performer
Better than Avg.
Average
Worse than Avg.
Worst Performer
n/a

5D/Urban Design Score

Category	*Range*	*Characteristics*
Auto oriented	0.0 to 0.2	Low density, low diversity, no destinations within walking distance, road design favors autos, little or no transit
More auto oriented than avg.	0.2 to 0.4	^
Average for area	0.4 to 0.6	|
More walk oriented than avg.	0.6 to 0.8	v
Walk/Bike/Transit oriented	0.8 to 1.0	High density, mixed land uses, many destinations within walking distance, road design favors walking, good access to transit

Table 5-1: TDM Scenario Results

Scenario 0 - "Do Nothing"

This scenario, also known as the Existing plus Committed Network (E+C), operates under the Base Year 2013 transportation network conditions (roadway configurations, operations of traffic control devices, transit services, and bicycle and pedestrian facilities, population, employment, households, and land use) and only with the committed transportation projects scheduled for then near-term construction (i.e., bid awards by FY 2014). All the other scenarios represent Year 2040 projections.

The "Do Nothing" Scenario in not comparable to other scenarios. The committed projects included within this scenario included the following Existing + Committed (E+C) projects:

- ***I-69 Section 4*** – New Major roadway/interchange construction from U.S. 231 near Crane NSWC/NSA to State Road 37 south of Bloomington.

- ***I-69 Section 5*** – Major roadway/interchange construction and the roadway conversion of SR 37 to a fully access controlled interstate from Kinser Pike to Victor Pike.

- ***Fullerton Pike/Gordon Pike/Rhorer Road*** - Road reconstruction and safety improvements including bituminous pavement, curb, gutter, sidewalk, multi-use side path, bridges and drainage appurtenances. This project included turn lanes and the installation of a new traffic signal at the Walnut Street Pike intersection from 475 feet west of the intersection of Old SR 37 and proceeding east to the end point, 200 feet east of Walnut Street Pike.

- ***Karst Farm Greenway (Phase I)*** – Preliminary engineering, Right-of-Way and construction of a multi-use pathway for non-motorized use, including site amenities (~4.00 miles long) from South of Vernal Pike to Karst Farm Park.

- ***Karst Farm Greenway (Phase IIa)*** – Preliminary engineering, Right-of-Way and construction of a multi-use pathway for non-motorized use, including site amenities (approximately 1.1 mile length) from Vernal Pike to Woodyard Road.

- ***Karst Farm Greenway (Phase 3)*** – Multi-use pathway construction with amenities from railbanked area to Hartstrait Road.

- ***17th St. & Arlington Rd. Roundabout*** – Construction to replacement of "K" intersection with a modern roundabout to serve this intersection of three streets to improve safety and facilitate better traffic flow from the Intersection of Arlington Road, West 17th Street and North Monroe Street.

- ***17th St. & Jordan Avenue*** – Construction to improve vertical geometry and sight distance at the intersection and on approaches from the Intersection of East 17th Street and North Jordan Avenue.

- ***17th St. & Jordan Avenue Pathway*** – Construction of a new non-motorized side path on 17th Street at Jordan Avenue.

- ***Old SR 37 & Dunn St. Intersection Improvements*** – Construction to Improve horizontal and vertical geometry and sight distance at the intersection and on approaches.

- ***Tapp Rd & Rockport Rd Intersection Improvements*** - Intersection improvements to correct a skew, improve sight distance & geometry and add bicycle and pedestrian facilities at the intersection of Tapp Rd/Country Club Drive and Rockport Road.

- ***Black Lumber Trail Spur*** - Construction of a multi-use trail for non-motorized use from Henderson Street to B-Line Switchyard property (approximately 0.3 mile length).

- ***Ellettsville Heritage Trail (Phase 1)*** – Construction of a multi-use pathway for non-motorized use, including site amenities along the former rail line from Main Street to Depot Road.

- ***Ellettsville Heritage Trail (Phase II)*** – Construction of a multi-use trail bridge for non-motorized use over Jack's Defeat creek

Scenario #1 - I-69 Section 5

This scenario assumes the full construction of I-69 Section 5 as committed and the following associated, committed projects benefiting the Bloomington-Monroe County local area including:

- ***Fullerton Pike Phase I*** - Construction for the installation of a new traffic signal and turn lanes at the Walnut Street Pike intersection from approximately 500 feet west of South Walnut Street to just east of Walnut Street Pike.

- ***Karst Farm Trail Phase 2a*** – Construction from of a multi-use path on publicly owned land connecting Ellettsville, Bloomington, three educational institutions, several large residential areas, several major, employment centers, the Monroe County Airport, and Karst Farm Park.

- ***Mt. Tabor Road*** – Roadway reconstruction as an element of I-69 Section 5.

- ***17th Street/Arlington Road/Monroe Street roundabout*** – Construction to resolve significant grade and sight distance problems.

- ***17th Street and Jordan Avenue*** – Pathway construction and reconstruction.

- ***Old SR 37 and Dunn Street*** – Improve horizontal and vertical geometry and sight distance at the intersection and approaches. Construction and reconstruction of a multiuse trail.

- ***The Black Lumber Trail*** - Construction of a multi-use trail for non-motorized use from Henderson Street to B-Line Switchyard property (approximately 0.3 mile length).

Scenario #2 - Bus Rapid Transit Route #3

This scenario converts and slightly modifies Bloomington Transit's existing Route #3 by converting it into a bus rapid transit route. This route would have 10-minute headways and signal preemption for added time-efficiency. This scenario demonstrates the system impacts associated with a major east-west bus rapid transit route.

Scenario #3 - State Road 37

In this scenario, the only modification to the E+C network is to exclude the I-69 Section 5 project and all associated local projects previously noted. This scenario analysis provided further understanding of the transportation system impacts associated with the construction of I-69 Section 5 beyond the proposed construction/operational corridor as well as a means to identify other local needs outside the I-69 Section 5 corridor. Table 5-1 does not show final results.

Scenario #4 - Peak Oil/COVID-19 Pandemic Proxy

This scenario considered the impacts of rising gasoline and diesel fuels an element affecting aggregate vehicle miles of travel (VMT) and mode choice decisions. This scenario did not modify the E+C network, but did illustrate the reduction of trips as fuel prices increased leading to economic and behavioral influences with fuel prices at $5.00 per gallon. Fuel efficiencies as well as alternative fuels and new technologies will play a long-term mitigating factor, but scenario serves as a reasonable economic constraint factor, i.e., cost, into the mode-choice process for the BMCMPO planning area.

This transportation demand behavioral scenario for Monroe County did not foresee the 2020 COVID-19 pandemic. This scenarios does, however, serve as a useful proxy measure for a broad aggregate decline of passenger and commercial vehicle VMT. The key difference is the absence of a distinct modal shift to public transportation. Indiana Governor Eric Holcomb's March "stay-at-home or place-of-residence" order (E.O. 20-08 effective March 24, 2020, expiring on May 18, 2020) restricted population movements except for closely-defined essential businesses and operations. As a consequence of this action, Monroe County VMT declined by as much as 39% according to available metadata. Bloomington Transit ridership declines by 95% during the stay-at-home period.

The FHWA Office of Highway Policy Information reported travel on all roads and streets declined by -18.6% for March 2020 as compared with March 2019; travel on all roads and streets declined by -39.8% for April 2020 as compared with April 2019, and; travel on all roads

and streets declined by -25.5% for May 2020 as compared with May 2019. Prior to a COVID-19 stay-at-home order, FHWA data for January and February 2020 showed VMT growth at approximately increased by 2.1% and 2.2%, respectively over the same months in 2019. Aggregate VMT and public transit ridership for Monroe County and the balance of Indiana are likely to remain suppressed for the length of the economic recession generated by the COVID-19 pandemic which began in March 2020. A potential economic recovery is dependent upon control of the pandemic and health crisis. Economic insecurity will very likely remain elevated for a considerable period of time pending the effective adoption of widespread scientifically documented COVID-19 control measures advocated by the Centers for Disease Control and Prevention (CDC).

Scenario #5 - Transportation Improvement Program (TIP)

This scenario modified the E+C network with programmed projects of the adopted BMCMPO FY 2016-2019 TIP scheduled for completion well before 2040. The new transportation projects for this scenario included the following:

- Rogers Road Multi-Use Pathway construction.
- Winslow Road Multi-Use Pathway construction.
- 10th Street and Law Lane new road connection construction.
- 17th Street reconstruction.
- Fullerton Pike Phases 1 & 2 construction and modernization.
- South Henderson Multi-Use Pathway construction, and
- Jackson Creek Trail Extensions construction.

Scenario #6 - TIP + Public Workshop Allocation

This scenario uses the TIP network with the addition of priorities identified by two (2) public workshops. The additional new transportation projects included:

- The construction of a B-Line Trail extension westward to the Karst Farm Trail
- The construction of a Fullerton Pike connection from I-69 to Rogers Road (3-lane with sidewalks and pathway that connects to Clear Creek Trail)
- The construction of a competed Jackson Creek Trail, and

- The implementation of a new Bloomington Transit service route along Tapp/Winslow/Rogers/Country Club from Curry Pike and SR 45 to Sare Road and Rogers Road with 30 minute headways

Results demonstrated by this scenario provided system performance information on the community-based transportation projects previously noted.

Scenario #7 - TIP + MTP 2035 Carryover Projects

This scenario evaluated older local project priorities that had yet to achieve fruition. Several of these projects did not move forward for a variety of reasons because of changes in local investment and private sector funding priorities. Generally speaking, these improvements included completing South Adams Street, connecting East 14th Street to Law Lane, completing Sudbury Drive, connecting Fullerton Pike from I-69 to Walnut Street, the modernization of Curry Pike from Constitution Avenue to Tapp Road, the realignment of Weimer Road, and the total completion of the Jackson Creek Trail. System performance information derived from this scenario aided in a reassessment of challenging local project needs previously identified in the 2030 Long Range Transportation Plan.

Scenario #8 - TIP + MTP 2030 Limited Carryover

This scenario is identical to Scenario #7 except it omits the construction of improvements to Weimer Road, 14th Street, Curry Pike, Sudbury Drive, and sections of the Jackson Creek Trail that are not part of the TIP. This analysis primarily illustrates information for a new 3-lane connection of Fullerton Pike from I-69 to Rogers Road, and projects included within the FY 2014-2017 TIP. Table 5-1 does not show these final results.

Scenario #9 - TIP + IU Research Park

This scenario examined the transportation system impact of Bloomington Hospital's relocation to the Indiana University Research Park neighborhood at East 10th Street and SR 45/46 Bypass. Land at the vacated current Bloomington Hospital site located at 2nd Street and Roger Street would then convert to a traditional single family housing neighborhood. This scenario provided a system understanding of the associated changes that would potentially occur with a Bloomington Hospital relocation to the east side of the city.

Scenario #10 - TIP + Sample Road Bedroom Community

This scenario examined the construction of a new I-69 Section 5 interchange at Sample Road and demonstrated transportation system impacts associated with a conceptual new bedroom community having new access to either Bloomington or to Indianapolis. In this scenario, the BMCMPO TDM model allocated a majority of new population growth around this interchange to demonstrate the maximum impacts for an urban sprawl type of land use development.

Scenario #11 - TIP + 2-Way Streets

This scenario converts many of the existing local one-way streets back into two-way street corridors for College Avenue, Walnut Street, 3rd Street, and Atwater Avenue. This scenario demonstrated the impacts of one-way streets in Scenario #5 when compared with the results of this scenario (i.e., Rogers Road Pathway, Winslow Road Pathway, 10th Street and Law Lane new road connection, 17th Street reconstruction, Fullerton Pike Phases 1 & 2 modernization, the South Henderson Multi-use Pathway, and the Jackson Creek Trail Extensions).

Scenario #12 - TIP + Urban Infill (Recommended)

This scenario allocated to growth to existing housing by minor increases in neighborhood densities through the inclusion of accessory dwelling units, or so-called "granny flats". This scenario eliminated the potential for allocating new population growth with new bedroom communities. This scenario offered an additional examination of impacts on land use policy similar to a relocation of the Bloomington Hospital and a subsequent adaptive reuse/conversion of that land into a traditional single family housing neighborhood.

Performance Measures

The Bloomington-Monroe County Travel Demand Model (TDM) examined a range of performance measures to further shed insight on outcomes of the thirteen scenarios considered to the year 2040. These performance measures used MAP-21 and current FAST Act federal performance guidance with the expectation that performance measures shall remain a requirement for all future transportation projects using federal resources.

The TDM additionally considered local performance measures to further assess the conditions of the built environment and influences on travel. The first tier of performance measures use attributes based on safety, travel demand, travel efficiency, environmental considerations, and economic factors. Respectively they include multiple measureable values such as the crash frequency and severity, person trips, delay and accessibility, greenhouse gas emissions, and multiple economic factors.

A second tier of local performance measures used various urban design variables (a land use density score called "5D") that included density, diversity, design, destinations, and distance to transit elements. This scoring process further assessed the relationship between land uses and transportation.

Conclusion - 2040 MTP Scenarios Summary

The BMCMPO examined a "Do Nothing" Scenario and twelve additional travel demand model (TDM) scenarios using Base Year 2013 conditions and forecasting to the Year 2040. The TDM additionally used a range of local performance measures (travel demand, efficiency, environmental, safety, economic, and a "5D" land use score) to further examine the overall performance of the thirteen (13) scenarios. The information in Table **5-XX** illustrates the summary results of each scenario by their respective performance. The scenarios summary

analysis shows that Scenario #4 (Peak Oil), and Scenario #12 (Urban Infill), respectively out-performed other scenarios using the local performance measures.

Coupled with the 5D land use scores, Scenario #12 stands out from all other scenarios. Using an adopted transportation policy orientation of projects programmed in the BMCMPO FY 2016-2019 TIP plus a strong focus on urban infill (TIP + Urban Infill), clearly demonstrated the best multi-modal system performance in the Year 2040. Furthermore, Scenario #12 meets or shall meet all FHWA national performance goals for safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and potentially reduced project delivery delays.

Appendix A:
Transportation Planning Requirements

Introduction

The BMCMPO *2045 Metropolitan Transportation Plan* was prepared in compliance with the Federal Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) and predecessor federal legislation applicable to metropolitan transportation planning. Metropolitan Planning Organizations are required to have a continuous, cooperative and comprehensive ("3C") planning processes that implement projects, strategies and services that will address the ten (10) core planning factors. This Appendix addresses the core Federal planning factors (23 CFR 450.306(d)(4)(vi)) and further notes how the 2045 Metropolitan Transportation Plan incorporates each core planning factor.

Federal Transportation Planning Factors

Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.

The BMCMPO 2045 Metropolitan Transportation Plan supports and builds upon the locally adopted 2012 Monroe County Comprehensive Plan, the 2018 City of Bloomington Comprehensive Plan, the 2018 Monroe County Transportation Alternatives Plan, and the 2019 City of Bloomington Transportation Plan in supporting the local economic development goals of partner communities. *Transform2045* promotes an efficient compact urban form transportation network with high levels of travel time reliability and on-time delivery/service maintenance by strengthened network circulation. One objective this Plan incorporates is connectivity and ease of movement by persons and goods in and through the area by making multi-modal investments thereby ensuring the availability of multiple sustainable travel options and bringing balance to the transportation system.

Increase the safety of the transportation system for motorized and non-motorized users. Safety investments are a high priority for the 2045 Metropolitan Transportation Plan.

The *2045 Metropolitan Transportation Plan* focuses on increased safety of the transportation system for motorized and non-motorized users in the following ways:

- The Plan advocates system preservation over capacity expansion, thereby limiting the addition of lane-miles where potential multi-modal user conflicts could occur.

- The Plan supports increased investment in bicycle, pedestrian, and transit modes, providing opportunities for safer and more efficient travel by users of those modes.

- The projects contained in the Plan reduce congestion by providing alternative routes for user needs thereby decreasing system conflicts and enhancing safety.

- The BMCMPO Complete Streets Policy requires local planning agencies (LPAs) to consider the needs of all users within a corridor when designing a project.

- As a new safety polity, the Plan urges the adoption of a "Vision Zero" goal with the premise that traffic deaths and severe injuries are largely preventable. This commitment shall define a timeline and bring stakeholders together to ensure a basic right of safety for all transportation system users through clear, measurable strategies.

Increase the security of the transportation system for motorized, non-motorized and transit users.

Transform2045 enhances the security of all transportation users in several ways. Increasing roadway connectivity provides redundancy in the system, allowing for multiple routes of ingress and egress and flexibility in planning evacuation routes in emergency situations. Monroe County Emergency Management Administration (EMA) is the lead county agency for security issues and BMCMPO will play a supporting role providing assistance as needed.

Bloomington Transit has several security strategies in operation including access control, surveillance and monitoring on system vehicles as well as office and maintenance facilities. Operations include Computer-Aided Dispatching and Automatic Vehicle Locater technology.

Increase the accessibility and mobility options available to people and freight.

Transform2045 strengthens and creates accessibility on two distinct levels. One focuses on improving the continuity of the road network. The other provides additional connections and improvements between modes of travel. All citizens, travelers and businesses benefit from this dual approach. This Plan reduces travel and delivery time by increasing accessibility through the completion of key new connections and the enhancement of existing corridors. Access to the I-69 highway corridor through Monroe County increases statewide and national connectivity for local and regional interstate system users, including the movement pf freight origin-destination operations within the BMCMPO.

Transform2045 increases bicycle and pedestrian mobility, as well as the safety of transit riders since all proposed road improvements are required to include provisions for these modes through an adopted Complete Streets Policy. Transit user's, bicyclists, and

pedestrians achieve greater safety with the availability of well-maintained sidewalks, curb ramps meeting current ADA standards, side-paths, multi-use pathways, and trails.

Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

Transform2045 clearly supports these goals by recommending the implementation of transportation projects that are consistent with adopted local land use plans. It is clear from analysis of the MPO region that local land use decisions have the greatest impact on transportation system performance. It is thus paramount that transportation investments made by the MPO are supportive of best practices in land use planning, including focusing development density in existing urban centers rather than encouraging sprawl development.

Transform2045s focus on system preservation over expansion as well as emphasis on investment in non-motorized transportation facilities shall support environmental protection and enhancement.

Finally, *Transform2045* strongly supports additional public transit systems services that will reduce single-occupant vehicle usage on the roadway network.

Enhance the integration and connectivity of the transportation system, across and between modes.

Transform2045 sets forth a program of goals and projects that support the integration and connectivity of the transportation system. Roadway network improvements focus on enhancing the existing system while providing key new connections, particularly with the completion of the I-69 corridor through Monroe County. Investments across surface transportation modes will expand travel options for community residents.

Transform 2045 additionally builds upon the multi-modal plans and programs of previous adopted metropolitan transportation plans where freight movements, transit system use, bicycling, and walking play an increased regional role. *Transform2045* makes specific recommendations for public transit, bicycling, and walking because multi-modal travel promotes reduced congestion, energy conservation and quality of life improvements.

Promote efficient system management and operation

The BMCMPO's local partners have refined pavement, bridge, traffic, and transit asset management systems. These systems allow responsible jurisdictions to monitor system performance, identify deficiencies, specify needs, and then define target projects to address needs.

Pavement, bridge, traffic, transit and other asset management systems jurisdictional authorities the ability to use existing transportation facilities more efficiently and effectively in response to every changing system needs. All jurisdictions within the BMCMPO are continuously updating individual asset management systems to address Americans with Disabilities Act needs and to establish investment priorities.

Bloomington Transit, IU Campus Bus and Rural Transit have mature asset and system management practices that promote safety, mobility and more efficient use of their existing transportation infrastructure as evidenced by the employment of information management, fleet maintenance and acquisition, marketing, schedule adherence and strategic planning, all contributing to public transit systems that successfully provides an alternative to automobiles.

Emphasize the preservation of the existing transportation system.

System preservation is a key tenet of the *Transform2045* Vision and Goals. *Transform2045* advocates a "fix it first" mentality to ensure that maintenance and system preservation represent a higher priority over investments that would expand the capacity of existing roads or the creation of new corridors.

Virtually all *Transform2045* proposed roadway and roadway reconstruction improvements are on existing transportation corridors. Projects identified within *Transform2045* follow changes in land use thereby necessitating modernization investments for roadway safety, and the accommodation of multi-modal transit, bicycle and pedestrian users.

Improve the resiliency and reliability of the transportation system and reduce or mitigate storm water impacts of surface transportation.

The Monroe County Emergency Management Agency (EMA) is the local community's lead for crisis and disaster response. The MPOs local partners have representation on the Local Emergency Planning Committee. The EMA additionally works in close cooperation with Community Organizations Active in Disaster (COAD) for Monroe County as well as District 8 Indiana EMA, a multi-county regional EMA. Established local asset management systems allow for the timely assessment, speedy repair and recovery from unexpected infrastructure damage. Bloomington and Monroe County have long operated storm water utilities that manage such infrastructure and provide for its maintenance and enhancement over time. All new or upgraded roadway corridors include storm water runoff control as a mandatory design component.

Enhance travel and tourism.

Monroe County and the City of Bloomington are historically recognized throughout the Midwest United States and Indiana as major travel and tourism destinations for:

- *Arts and Cultural Opportunities* within and outside of the Indiana Arts Commission's recognized Bloomington Entertainment and Arts District (BEAD). BEAD includes the "what to do" element of art galleries, museums, cultural centers, historic landmarks, and regional trails. The "what to eat" element of BEAD incorporates American and International cuisine restaurants, food trucks and carts, coffee & sweet shops, bars & pubs, breweries, and wineries and distilleries. BEAD's "where to say" element includes hotels and motels, inns and Bed & Breakfasts, cabins and guesthouses, and apartments and suites.

- *Outdoor Recreation Opportunities* given the presence of the Hoosier National Forest, the Deem Wilderness, the Paynetown State Recreational Area, Lake Monroe, Lake Lemon, Griffy Lake Reservoir, nature preserves, hiking/biking trails, extensive county and community parks, recreational facilities, and alternative transportation multimodal pathway systems offering a full range of alternative active or passive recreational choices for all citizens and visitors.

- *Major "Big Ten Conference" Sporting Events and Cycling Events* through Indiana University and the Bloomington Bicycle Club including the women's and men's Little 500 Bike Races on the Indiana University Campus and the Hilly Hundred Bike Ride.

- Regional and local retail shopping locations, and

- Access to high quality regional health care providers, diverse health care services, and regional health care facilities.

Given this context of travel and tourism, Monroe County and the City of Bloomington will maintain and continually modernize existing multimodal transportation system corridors while continually expanding pedestrian and bicycle infrastructure investments with new investments directed toward safety, convenience and seamless connectivity.

Appendix B: Performance Measures

Introduction

The Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) and the Moving Ahead for Progress in the 21st Century (MAP-21) Act (P.L. 112-141) established new requirements for transportation planning performance management. The following National performance goals meet established in seven (7) key areas in accordance with 23 USC 150: *National Performance Measure Goals*. States and MPO must establish performance targets in support of the national goals. The national performance goals for Federal Highway Administration (FHWA) programs are:

- **Safety** – To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure Condition -** To maintain the highway infrastructure asset system in a state of good repair.
- **Congestion Reduction** – To achieve a significant reduction in congestion on the National Highway System (NHS).
- **System Reliability** – To improve the efficiency of the surface transportation system.
- **Freight Movement and Economic Vitality** – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental Sustainability -** To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced Project Delivery Delays** – To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through the elimination of delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The following discussion notes each of these key areas.

Performance Measures

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) issued new transportation planning rules on the statewide and metropolitan transportation planning processes to reflect the use of a performance based approach to decision-making in support of the national goals. These processes must document in writing how the Metropolitan Planning Organizations (MPOs), the Indiana Department of Transportation (INDOT) and providers of

public transportation shall jointly agree to cooperatively develop and share information related to transportation performance data, the selection of performance targets, the reporting of performance to be used in tracking progress toward attainment of critical outcomes for the region of the MPO (see 23 CFR 450.306(d)), and the collection of data for the INDOT asset management plan for the National Highway System as specified in 23 CFR 450.314(h).

The FTA's performance measures for Transit Asset Management are published and currently in effect. FHWA currently has performance measures and final regulations published for Safety, Bridge and Pavement Conditions, Congestion Reduction and System Reliability; however, only the Safety Performance Measure regulation is in effect at the present time.

INDOT along with the MPOs and FHWA will continue collaborating to identify Performance Targets for each Performance Measure. Once Performance Targets are established, the Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) shall require modification reflecting this information.

For FHWA and FTA to approve any TIP amendments after May 27, 2018, INDOT, MPOs and Public Transit Operators must reflect this information and describe how projects in the TIP/STIP, shall (to the maximum extent practicable) achieve the Federally required performance targets identified in the Statewide and Metropolitan Transportation Plans, linking investment priorities to these performance targets.

Safety

INDOT, the MPOs, FHWA, and the Indiana Criminal Justice Institute (ICJI) actively discuss and collaborate on the Indiana's Safety Performance Measures and Safety Performance Targets. INDOT initially submitted Safety Performance Target Measures in 2018 followed by an updated 2020 target submission.

Indiana's MPOs collectively support INDOT's Safety Targets. The Highway Safety Improvement Program (HSIP) is a primary source of federal funds for qualifying safety improvement projects. INDOT and the Indiana's MPOs use HSIP along with other funding sources for the implementation of safety improvements with the purpose to reduce roadway crashes, and a corresponding reduction in fatalities and serious injuries on all public roads. The five specific safety performance measures are:

- Number of fatalities;
- Rate of fatalities;
- Number of serious injuries;
- Rate of serious injuries; and
- Number of non-motorized fatalities and non-motorized serious injuries

The Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO) agreed in January 2020 to support the 2020 safety targets established by the Indiana Department of

Transportation as reported to the National Highway Traffic Safety Administration and Federal Highway Administration.

The Indiana Department of Transportation's 2020 safety maximum targets based on five-year rolling averages are:

- Number of Fatalities = 965
- Number of Serious Injuries= 3,628
- Fatality Rate (fatalities per 100 million miles traveled)= 1.154
- Serious Injury Rate (serious injuries per 100 million miles traveled = 4.342
- Total Number of Non-Motorist Fatalities and Serious Injuries= 420

The Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO) will support INDOT's maximum safety targets by incorporating planning activities, programs, and projects in the 2045 Metropolitan Transportation Plan and the FY 2020 - 2024 Transportation Improvement Program. The BMCMPO Policy Committee approved this action at their regularly scheduled meeting on January 10, 2020.

Pavement Condition Target Performance Measures

The Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO) agreed in October 2018 to support the 2019 and 2021 Pavement Condition targets established by the Indiana Department of Transportation (INDOT) as reported to the Federal Highway Administration (FHWA). The 2019 and 2021pavement targets based on a certified Transportation Asset Management Plan are:

- Percent of Interstate pavements in Good condition
- Percent of Interstate pavements in Poor condition
- Percent of non-Interstate NHS pavements in Good condition
- Percent of non-Interstate NHS pavements in Poor condition

The BMCMPO agreed to support the Indiana Department of Transportation's 2019 and 2021 Pavement Condition targets established by the Indiana Department of Transportation for reporting to the Federal Highway Administration. The 2019 and 2021 pavement targets based on a certified Transportation Asset Management Plan are:

- 2019 Percent of Interstate pavements in Good condition - 84.24%
- 2019 Percent of Interstate pavements in Poor condition - 0.80%
- 2019 Percent of non-Interstate NHS pavements in Good condition - 78.71%
- 2019 Percent of non-Interstate NHS pavements in Poor condition - 3.10%
- 2021 Percent of Interstate pavements in Good condition - 84.24%
- 2021 Percent of Interstate pavements in Poor condition - 0.80%
- 2021 Percent of non-Interstate NHS pavements in Good condition - 78.71%
- 2021 Percent of non-Interstate NHS pavements in Poor condition - 3.10%

The BMCMPO will support the Pavement Condition targets by incorporating planning activities, programs, and projects in the Adopted Metropolitan Transportation Plan and the current Transportation Improvement Program. The BMCMPO Policy Committee approved this action at their regularly scheduled meeting on October 12, 2018.

Bridge Performance Measures

The Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO) agreed in October 2018 to support the Indiana Department of Transportation's 2019 and 2021 statewide National Highway System (NHS) Bridge Condition targets for the following performance measures:

- Percent of NHS bridges by deck area classified as in Good condition
- Percent of NHS bridges by deck area classified as in Poor condition

The BMCMPO will support the 2019 and 2021 NHS Bridge Condition targets established by the Indiana Department of Transportation for reporting to the Federal Highway Administration. The 2019 and 2021 NHS Bridge Condition targets based on a certified Transportation Asset Management Plan are:

- 2019 Percent of NHS bridges by deck area classified in Good condition - 48.32%
- 2019 Percent of NHS bridges by deck area classified in Poor condition -2.63%
- 2021 Percent of NHS bridges by deck area classified in Good condition -48.32%
- 2021 Percent of NHS bridges by deck area classified in Poor condition -2.63%

The BMCMPO will support the NHS Bridge Condition targets by incorporating planning activities, programs, and projects in the Adopted Metropolitan Transportation Plan and the current Transportation Improvement Program. The BMCMPO Policy Committee approved this action at their regularly scheduled meeting on October 12, 2018.

System Performance

The system performance measures are also applicable to the Interstate and non-Interstate NHS. These performance measures assess National Highway System (NHS) truck travel time reliability and interstate freight reliability targets, and performance measures for on-road mobile source emissions consistent with the national Congestion Mitigation and Air Quality (CMAQ) Program.

NHS Truck Travel Time Reliability Targets

The Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO) has elected to plan and program projects so that they contribute towards the accomplishment of the Indiana Department of Transportation's 2019 and 2021 NHS Truck Travel Time Reliability targets for the performance measures are as follows:

- Level of Travel Time Reliability on Interstate
- Level of Travel Time Reliability on non-Interstate NHS

The BMCMPO agrees to support the 2019 and 2021 NHS Truck Travel Time Reliability targets established by the Indiana Department of Transportation for reporting to the Federal Highway Administration. The 2019 and 2021 statewide travel time reliability targets based on percent of person miles that are certified as reliable:

- 2019 Percent of person miles reliable on Interstate - 90.5%
- 2021 Percent of person miles reliable on Interstate - 92.8%
- 2021 Percent of person miles reliable on non-Interstate - 89.8%

The BMCMPO will support the NHS Truck Travel Time Reliability targets by incorporating planning activities, programs, and projects in the Adopted Metropolitan Transportation Plan and the current Transportation Improvement Program. The BMCMPO Policy Committee approved this action at their regularly scheduled meeting on October 12, 2018.

Interstate Freight Reliability Targets

The Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO} elected to plan and program projects so that they contribute towards the accomplishment of the Indiana Department of Transportation's 2019 and 2021 Interstate Freight Reliability targets for the following performance measure:

- Interstate Freight Reliability

The BMCMPO agrees to support the 2019 and 2021 Interstate Freight Reliability targets established by the Indiana Department of Transportation for reporting to the Federal Highway Administration. The 2019 and 2021 Interstate Freight Reliability targets based on the truck travel time reliability index are:

- 2019 Interstate freight reliability index -1.27
- 2021 Interstate freight reliability index -1.24

The BMCMPO will support the Interstate Freight Reliability targets by incorporating planning activities, programs, and projects in the Metropolitan Transportation Plan and the current Transportation Improvement Program. The BMCMPO Policy Committee approved this action at their regularly scheduled meeting on October 12, 2018.

On-Road Mobile Source Emission Target Performance Measures

The Bloomington-Monroe County Metropolitan Planning Organization (BMMPO) has elected to plan and program projects so that they contribute towards the accomplishment of the Indiana Department of Transportation's 2019 and 2021 On-Road Mobile Source Emission targets for the performance measures listed below.

- CMAQ project reduction volatile organic compounds (VOC)

- CMAQ project reduction carbon monoxide (CO)
- CMAQ project reduction oxides of nitrogen (NOx)
- CMAQ project reduction particulate matter less than 10 microns (PM10)
- CMAQ project reduction particulate matter less than 2.5 microns (PM2.5)

The BMCMPO agrees to support the 2019 and 2021 On-Road Mobile Source Emission reduction targets established by the Indiana Department of Transportation for reporting to the Federal Highway Administration. The 2019 and 2021 On-Road Mobile Source Emission reduction targets based on kilograms per day are:

- 2019 Volatile Organic Compounds (VOCs) reduction of 1,600 kilograms per day
- 2019 Carbon Monoxide (CO) reduction of 200 kilograms per day
- 2019 Oxides of Nitrogen (NOx) reduction of 1,600 kilograms per day
- 2019 Particulate Matter (PMl0) less than 10 microns reduction of 0.30 kilograms per day
- 2019 Particulate Matter (PM2.5) less than 2.5 microns reduction of 20 kilograms per day
- 2021 Volatile Organic Compounds (VOCs) reduction of 2,600 kilograms per day
- 2021 Carbon Monoxide (CO) reduction of 400 kilograms per day
- 2021 Oxides of Nitrogen (NOx) reduction of 2,200 kilograms per day
- 2021 Particulate Matter (PM10) less than 10 microns reduction of 0.50 kilograms per day
- 2021 Particulate Matter (PM2.5) less than 2.5 microns reduction of 30 kilograms per day.

The BMCMPO will support the On-Road Mobile Source Emission reduction targets by incorporating planning activities, programs, and projects in the Metropolitan Transportation Plan and the current Transportation Improvement Program. The BMCMPO Policy Committee approved this action at their regularly scheduled meeting on October 12, 2018.

Transit Performance Measures

The Transit Asset Management Final Rule requires transit providers to set performance targets for state of good repair by January 1, 2017. The Federal Transit Administration extended that deadline to January 1, 2018. The Planning Rule requires each MPO to establish targets not later than 180 days after the date on which the relevant provider of public transportation establishes its performance targets. The BMCMPO will adopt the targets established by Bloomington Transit. Targets will be established in the following categories:

- Rolling Stock - Percent of revenue vehicles that have met or exceeded their useful life benchmark.

- Equipment - Percent of service vehicles that have met or exceeded their useful life benchmark.

- Facility - Percent of facilities rated below 3 on the condition scale

BMCMPO Performance Measures

The BMCMPO independently developed urban area Performance Measures for alignment with *Transform 2045* vision and goals. These Performance Measures additionally reflect the community's character and goals for the transportation network. The Performance Measures grouped into five (5) larger categories include Travel Demand, Travel Efficiency, Economic, Safety, and Environmental issues. Each of these Performance Measures underwent analysis through the BMCMPO Travel Demand Model. A second tier of Performance Measures used a 5D score shown in the table above.

Vision and Performance Measures

Travel Demand

- Person trips per day
- Daily vehicle trips
- Daily vehicle miles
- Daily vehicle hours
- Daily transit boarding's
- Mode shares

Travel Efficiency

- Vehicle hours of delay
- Accessibility by mode
  - Number of jobs within X minutes
  - Shopping within X minutes
- Transit person hours
- Weighted average transit walk distance
- Weighted average transit headway
- 5D Variables

Economic

- Infrastructure costs
- Monetized System User benefits (time, cost, etc.)
- Potential jobs impacts
- Prosperity index

Safety

- Predicted number of accidents
  - Fatal, Injury, Property Damage

Environmental

- Greenhouse gas emission tonnage
- GHG per trip
- GHG per capita

Aggregate Statistics

Urban Design Variables

Elements	Variables	Data Source		Units
Density				
DENS1	Households Densiity	*No. Households from TAZ data*	*TAZ land area in sq.mi*	*Households per sq. mi. jobs per sq.mi.*
DENS2	Employment Density	*No. of Jobs from TAZ data*	*TAZ land area in sq.mi*	
Diversity				
DIVERS	Jobs/Housing Ratio	*No. of Jobs within 1 mile radius/No. Households within 1 mile radius*		*Jobs per household ratio*
Design				
DESGN1	Walkability	*Pct. Of TAZ streets that are walkable*		*Miles walkable per total centerline miles*
DESGN2	Average Blockface (miles)	*Centerline miles of road (non-freeway)*	*Number of links (non-freeway)*	*Miles per link*
DESGN3	Street Density	*Centerline miles of road (non-freeway)*	*Land area of TAZ*	*Road miles/square mile*
Destinations				
DEST1	Commercial establishments within 10 min walk	*Selection set of commercial parcels*	*Count parcels within 0.1667 mi*	*Number of establishments*
DEST2	Retail jobs within 10 min walk	*No. of Retail jobs from TAZ data*	*Count jobs within 0.1677 mi*	*Number of retail jobs*
Distance to Transit				
DTT1	Street Coverage within 10min. Walk to Transit Stop	*Street miles within a 10 min walk of transit stops*		*Pct. Of Centerline Miles*
DTT2	Access to destinations via transit	*Number of stops within 5 miles via transit*		*Number of stops*

Appendix C: Plan Development & Public Involvement Methodology

Introduction

The 2045 MTP prepared by the BMCMPO staff relied on consultation guidance from the Federal Highway Administration-Indiana Division, the Indiana Department of Transportation Indianapolis central office and Seymour District staff, Monroe County, the Town of Ellettsville, Rural Transit, Bloomington Transit, IU Campus Bus, and the City of Bloomington.

As a non-technical MTP update, the staff focused on an extensive public involvement/public input process through open meetings of the Citizen Advisory Committee (CAC), Technical Advisory Committee (TAC), and Policy Committee. The adoption of Centers for Disease Control and Prevention (CDC) COVID-19 guidelines as a preventative safety measure beginning in April 2020 necessitated a shift to virtual digital platforms for all meetings using Zoom and Facebook Live. All meetings of the Policy Committee routinely recorded for community viewing by the Citizens Access Television System (CATS https://www.catstv.net/) continued uninterrupted throughout the calendar year as the staff presented Draft MTP chapters. Draft MTP chapters had additional postings on the BMCMPO website (https://bloomington.in.gov/mpo/metropolitan-transportation-plan) along with a discussion/adoption schedule.

Staff presentations and public meeting discussions adhered to the following schedule throughout calendar year 2020:

- January 10, 2020 - Policy Committee Meeting
  - Proposed development timetable
  - Purpose and need
  - Anticipated plan content

- January 13, 2020 – FHWA/INDOT/BMCMPO 2045 MTP Plan Scope Meeting
  - Proposed development timetable
  - Purpose and need
  - Anticipated plan content
  - Plan requirements and considerations

- January 22, 2020 - Technical Advisory Committee Meeting
  - Proposed development timetable
  - Purpose and need & anticipated plan content
  - MTP Kick-off Coordination Meeting with INDOT/FHWA

- January 22, 2020 - Citizens Advisory Committee Meeting
  - Proposed development timetable
  - Purpose and need & anticipated plan content

- MTP Kick-off Coordination Meeting with INDOT/FHWA

- February 14, 2020 - Policy Committee Meeting
  - 2045 Metropolitan Transportation Plan - Introduction, Background, Requirements
  - Financial Forecast
  - Environmental Justice
  - Air Quality
  - Draft 2045 MTP Discussion - Glossary

- February 26, 2020 - Technical Advisory Committee Meeting
  - Guiding Principles
  - Transportation Planning Requirements
  - Performance Measures

- February 26, 2020 - Citizens Advisory Committee Meeting
  - Guiding Principles
  - Transportation Planning Requirements
  - Performance Measures

- March 13, 2020 - Policy Committee Meeting
  - Guiding Principles
  - Transportation Planning Requirements
  - Performance Measures
  - Financial Forecast

- April 13, 2020 - Policy Committee Meeting
  - Guiding Principles
  - Transportation Planning Requirements
  - Performance Measures

- April 22, 2020 - Technical Advisory Committee Meeting
  - Public Workshops, Comments, Schedules, Next Steps
  - 2045 Metropolitan Transportation Plan Public Survey

- April 22, 2020 - Citizens Advisory Committee Meeting
  - Public Workshops, Comments, Schedules, Next Steps
  - 2045 Metropolitan Transportation Plan Public Survey

- May 8, 2020 - Policy Committee Meeting
  - Public Workshops, Comments, Schedules, Next Steps
  - 2045 Metropolitan Transportation Plan Public Survey
  - BMCMPO Comprehensive Website Postings

- May 27, 2020 - Technical Advisory Committee Meeting
    - 2045 Metropolitan Transportation Plan Public Survey
    - BMCMPO Comprehensive Website Postings

- May 27, 2020 - Citizens Advisory Committee Meeting
    - 2045 Metropolitan Transportation Plan Public Survey
    - BMCMPO Comprehensive Website Postings

- June 12, 2020 - Policy Committee Meeting
    - Guiding Principles
    - Financial Forecast
    - Transportation Planning Requirements
    - Environmental Justice
    - Air Quality
    - Performance Measures
    - Travel Demand Model
    - Travel Demand Model Scenarios
    - Glossary
    - 2045 Metropolitan Transportation Plan Public Survey

- June 24, 2020 - Technical Advisory Committee Meeting
    - Guiding Principles
    - Financial Forecast
    - Transportation Planning Requirements
    - Environmental Justice
    - Air Quality
    - Performance Measures
    - Travel Demand Model
    - Travel Demand Model Scenarios
    - Glossary
    - 2045 Metropolitan Transportation Plan Public Survey

- June 24, 2020 - Citizens Advisory Committee Meeting
    - Guiding Principles
    - Financial Forecast
    - Transportation Planning Requirements
    - Environmental Justice
    - Air Quality
    - Performance Measures
    - Travel Demand Model
    - Travel Demand Model Scenarios

    - Glossary
    - 2045 Metropolitan Transportation Plan Public Survey

- August 28, 2020 - Technical Advisory Committee Meeting
    - 2045 Metropolitan Transportation Plan: 90% Complete Draft including public survey results

- August 28, 2020 - Citizens Advisory Committee Meeting
    - 2045 Metropolitan Transportation Plan: 90% Complete Draft including public survey results
- September 11, 2020 - Policy Committee Meeting
    - 2045 Metropolitan Transportation Plan: 90% Complete Draft including public survey results

- September 23, 2020 - Technical Advisory Committee Meeting
    - 2045 Metropolitan Transportation Plan: 95% Complete Final Draft including public survey results

- September 23, 2020 - Citizens Advisory Committee Meeting
    - 2045 Metropolitan Transportation Plan: 95% Complete Draft including public survey results

- October 9, 2020 - Policy Committee Meeting
    - 2045 Metropolitan Transportation Plan Adoption

Public Outreach Process

The public outreach process began with the following advertised workshop meetings prior to the COVID-19 crisis:

- *MTP Public Workshop #1 - Bloomington Transit Downtown Transfer Center, March 4th from 12:00 p.m. to 2:00 p.m.* Presentation materials included an overview of the MTP purpose and need, an urban area boundary map, project types, guiding principles plus two open-ended workshop participant questions: (1) How would you describe transportation conditions in the community today, and (2) What should the community transportation system look like in 2045?

- MTP Public Workshop #2 - Ellettsville Town Hall, March 4th from 6:00 p.m. to 8:00 p.m. Presentation materials included an overview of the MTP purpose and need, an urban area boundary map, project types, guiding principles plus two open-ended workshop participant questions: (1) How would you describe transportation conditions in the community today, and (2) What should the community transportation system look like in 2045?

Interagency Consultation & Coordination - 2020

The BMCMPO staff continuously consulted and coordinated with federal, state and local transportation partner agencies throughout the 2045 MTP development process from mid-2019 through October 2020 to ensure the attainment of federal and state requirements. A joint scope meeting on January 13, 2020 with representatives from the Federal Highway Administration and the Indiana Department of Transportation, Planning & Program staff defined expectations, roles, responsibilities, and the MPO's development timetable leading to a formal Policy Committee adoption in October 2020.

The consultation/coordination process further ensured the receipt of corresponding comments. This interagency consultation and coordination ensured the completion of appropriate technical level reviews prior final 2045 MTP adoption by the BMCMPO Policy Committee in October 2020.

2045 Metropolitan Transportation Plan Survey

The issuance Indiana Executive Order 20-02 Declaration of a Public Health Emergency for COVID-19 on March 6, 2020 by Governor Eric Holcomb necessitated the cancellation of all scheduled in-person MPO committee meetings and public workshops. As an active engagement initiative, the staff developed the *Bloomington-Monroe County Metropolitan Planning Organization's Draft 2045 Metropolitan Transportation Plan - Public Comment Form* (https://docs.google.com/forms/d/1HUKR6sq9MMO5CnB32BHCyFy_3TNh8maJSP_z85tRKoM/viewform?edit_requested=true) with the following message:

> *Welcome to the Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO) Draft 2045 Metropolitan Transportation Plan (MTP) Public Comment Form. The purpose of this form is to gather comments about this Draft 2045 MTP, which can be found online or obtained in person at the City of Bloomington Planning and Transportation Department. Written comments on the Draft 2045 MTP are accepted beginning on March 4, 2020 and ending on October 2, 2020. Comments may be submitted through this form. Comments may also be submitted in person or by mail to the City of Bloomington Planning and Transportation Department located at 401 N Morton Street, Suite 130, Bloomington, IN 47404. The BMCMPO Policy Committee will vote on the BMCMPO Draft 2045 MTP at their meeting held on October 9, 2020. Thank you for participating.*

The 2045 MTP Survey collected during the month of July 2020 focused on mode choice, transportation policy priorities, and the impact of COVID-19 on personal transportation use. The BMCMPO staff received a total of four hundred fifty-nine (N = 459) individualized voluntary survey responses. All questions required completion for submittal. The following graphical images documents the *2045 Metropolitan Transportation Plan* survey question responses.

2045 Metropolitan Transportation Plan Survey: Key Summary Findings

Survey Respondent Demographic Profiles

- The 2045 Metropolitan Transportation Plan survey received a total of four hundred fifty-nine (459) voluntary citizen responses, thereby a broad cross section representation of Monroe County the Town of Ellettsville, and the City of Bloomington.

- The age of survey respondents extended from 16 years to 85 years with nearly equal distribution between ages 25 through 75.

- Nearly 57% of the survey respondents were women.

- Over 85% of the survey respondents identified themselves as white.

- Approximately 60.5% of the survey respondents had an annual household income exceeding $50,000.

- Approximately 88.5% of the survey respondents had a highest level of formal education beyond high school.

- Over 79% of the survey respondents owned the home that they lived in.

- Approximately 87.3% of survey respondents live within the Bloomington-Monroe county urban area.

- A vast majority of the survey respondents live within identifiable City of Bloomington neighborhood.

Survey Respondent Transportation Mode Choice

- Personal vehicles (75.8%), bicycling (11.1%), walking (9.6%), and transit (3.1%) are the primary mode choices

- Secondary mode choices include walking (33.3%), does not apply (19.2%), bicycling (16.8%), personal vehicles (13.1% or transit (11.5%).

- Approximately 84.3% of personal vehicle users feel safe driving.

- Approximately 54.7% of the survey respondents expressed an interest in purchasing an electric vehicle.

- Survey respondents favored (67.8%) public transit vehicle lanes.

- Survey respondents favored increased transit frequency (48.6%), additional transit stop locations (50.3%), increased transit stop comfort (28.8%), and a need for eliminating route transfers (45.3%).

- Only 27.0% of bicycle users feel safe, but 41.8% enjoy cycling convenience, strongly favor roadway accommodations (80.6%) and nearly 31.8% have an interest in purchasing an electric bicycles.

- A majority (75.8%) of pedestrians felt safe walking; approximately 57.0% believed walking was convenient.

- Only 7.4% of survey respondents felt using a scooter was safe or convenient (10.5%), but 38.5% believed in scooter parking.

- Ride hailing was viewed as safe by 42.5% of survey respondents while convenience rated at only 30.2%.

- Shared vehicle safety (56.0%), expense (37.4%), locations (37.7%), availability (37.4%) raked uniformly low under "I don't know/doesn't apply to me."

- Taxi service received high for "agree" and "strongly agree" for safety (40.3%), but only 10.7% in the same categories for taxi service convenience.

Survey Respondent Transportation System Policy Priorities:

Safety

- Survey respondents overwhelmingly (79.1%) feel that the transportation system should prioritize safety over speed.

Vision Zero

- Survey respondents overwhelmingly (89.1%) feel that it is important that we prioritize eliminating crashes, serious injuries, and fatalities on our roadways and across our entire transportation system.

Maintaining Existing Facilities

- Survey respondents overwhelmingly (81.9%) feel that it is important that we prioritize maintaining the roads we have over building new roads.

Climate Change and Climate Resilience

- Survey respondents overwhelmingly (75.8%) feel that transportation projects should actively address climate change and climate resilience.

Healthy Outcomes

- Survey respondents overwhelmingly (81.5%) feel that transportation projects should ensure and/or increase healthy outcomes for everyone.

Transportation System Negative Impacts – Air Pollution

- Survey respondents overwhelmingly (82.8%) feel that it is important as a community we work to address and reduce the negative impacts of our transportation system, such as air pollution.

Electric Vehicle Charging Stations

- Survey respondents overwhelmingly (79.1%) we should prioritize the installation of more electric vehicle charging stations in the community.

Public Transportation for Environmental Quality

- Survey respondents overwhelmingly (49.7%) feel that they would use or consider using public transportation because it is better for the environment.

Public Transportation Electric Fleet Conversion

- Survey respondents overwhelmingly (58.4%) feel that it important that our public transportation system moves to an entirely electric bus fleet.

Carpooling for Environmental Quality

- Only 31.6% of the survey respondents favored choosing to carpool with others because it is better for the environment.

Bicycle Use for Environmental Quality

- Survey respondents agreed or strongly agreed (56.2%) that they would use or consider using a bicycle because it is better for the environment.

Scooter Use for Environmental Quality

- Only 15.5% of survey respondents agreed or strongly agreed that they would use or consider using a scooter because it is better for the environment.

Shared Vehicles for Environmental Quality

- Only 21.8% of survey respondents agreed or strongly agreed that they would use or consider using a share vehicles because it is better for the environment.

Survey Respondent COVID-19 Pandemic: Alterations to Transportation System Use

- The COVID-19 (coronavirus) Pandemic has altered transportation system use for 64.7% of the survey respondents.

- Survey respondents overwhelmingly (71.5%) noted that the COVID-19 Pandemic has impacted normal transportation activities.

- Survey respondents overwhelmingly strongly disagreed or disagreed (71.2%) that they were using their personal vehicle more than normal due to the COVID-19 Pandemic.

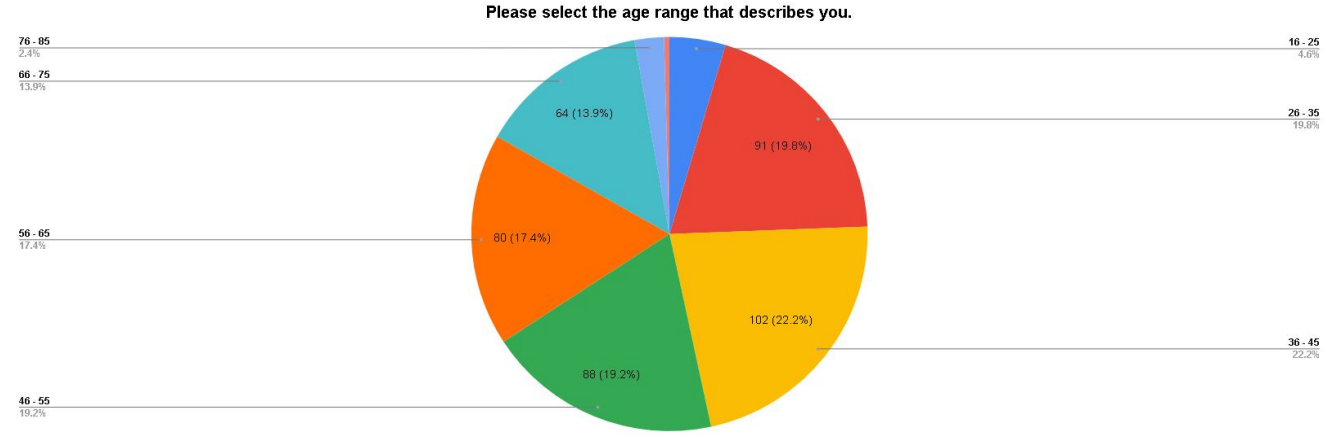
- Only 21.6% of survey respondents agreed or strongly agreed that the COVID-19 Pandemic has limited normal use of taking public transportation.

- Only 22.4% of survey respondents agreed or strongly agreed that they found themselves bicycling more due to the COVID-19 Pandemic.

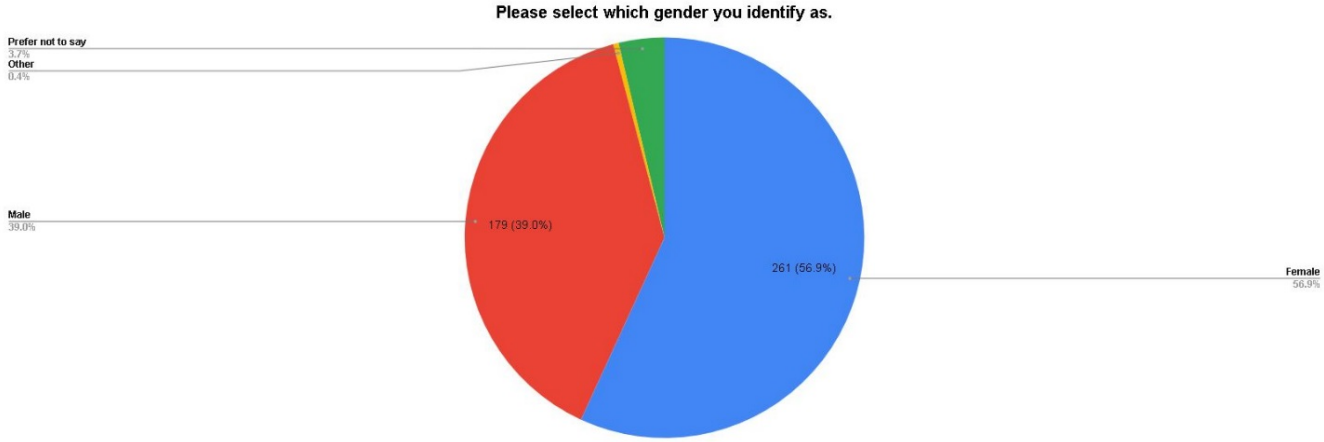
- Survey respondents agreed or strongly agreed (47.9%) that they found themselves walking more due to the COVID-19 Pandemic.

- Only 35.9% or the survey respondents agreed or strongly agreed that the COVID-19 Pandemic has made them consider changes to normal transportation activities throughout the community for the future.

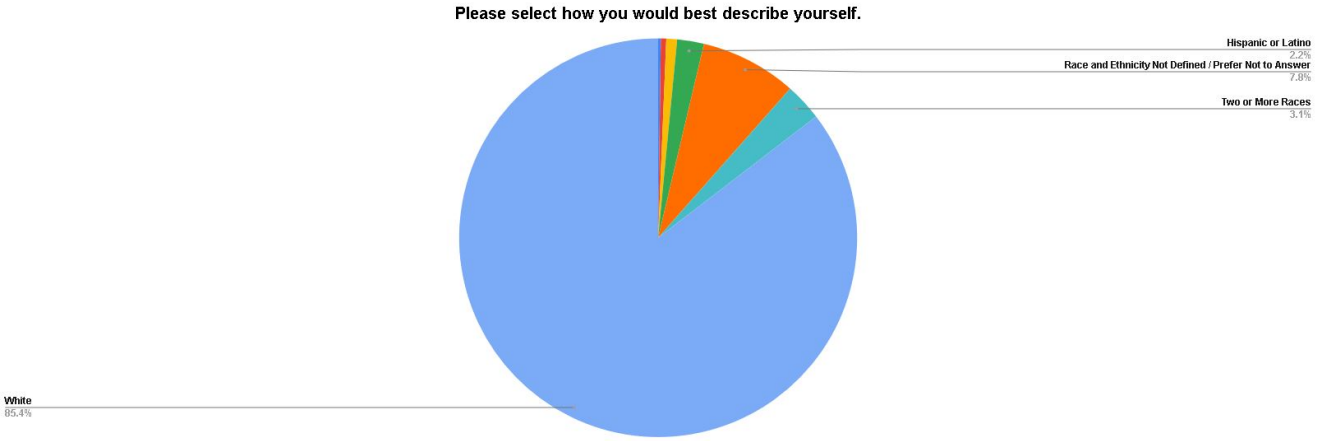
Age of Survey Respondents



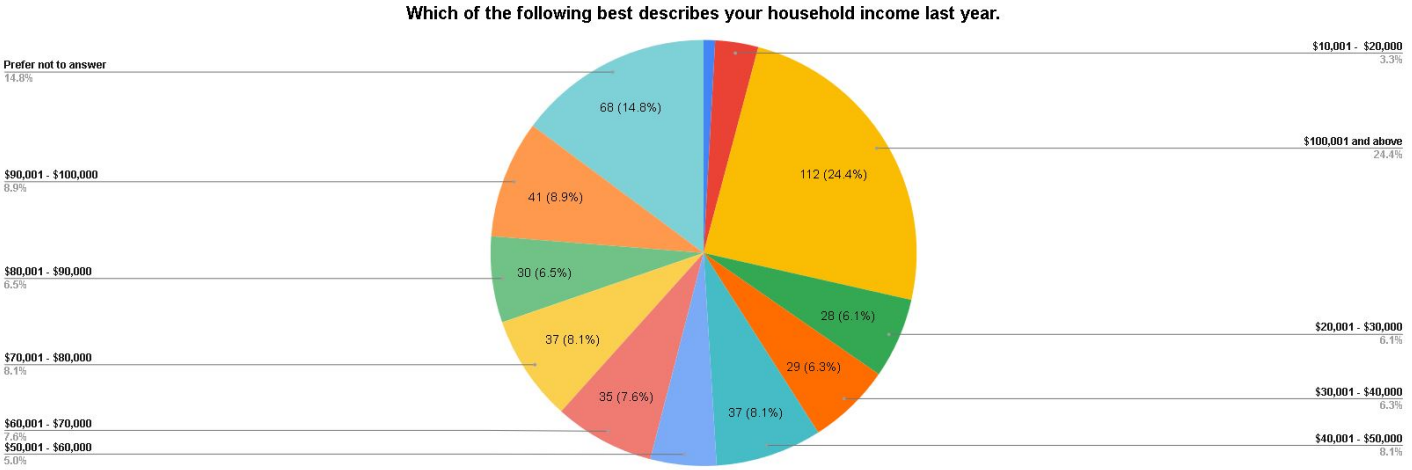
Gender of Survey Respondents



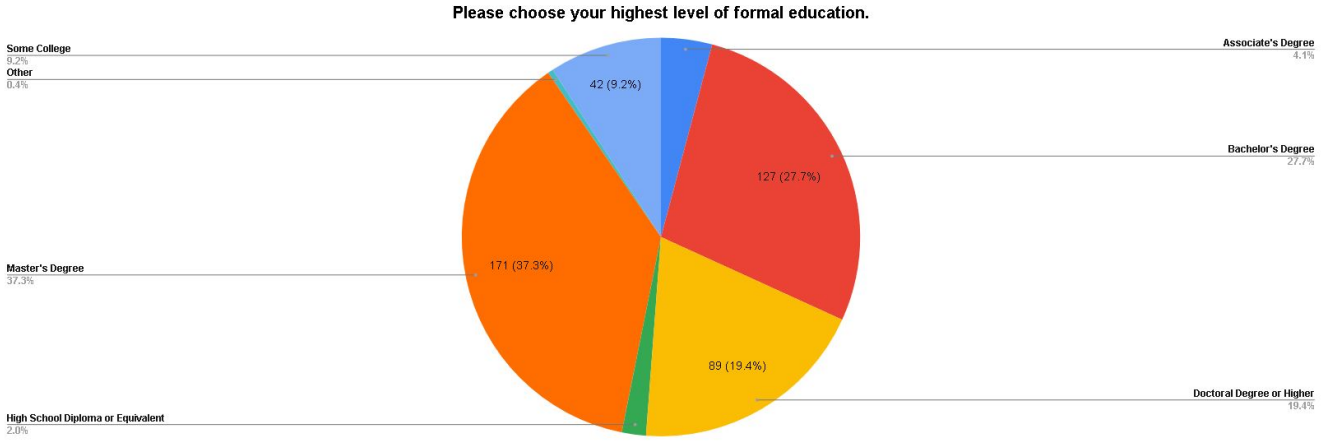
Race of Survey Respondents



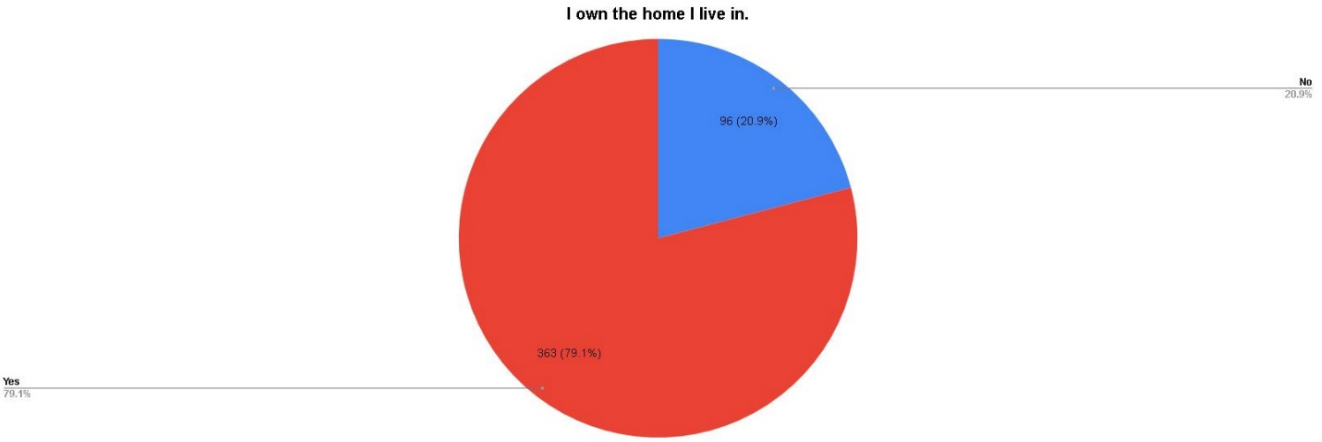
Household Income last year of Survey Respondents



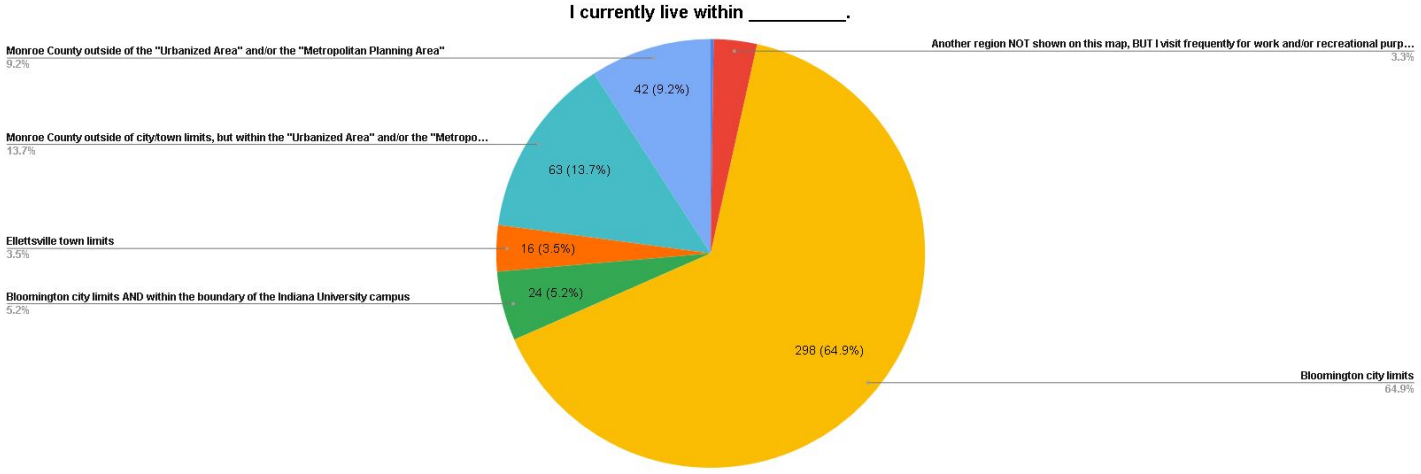
Highest level of formal education of Survey Respondents



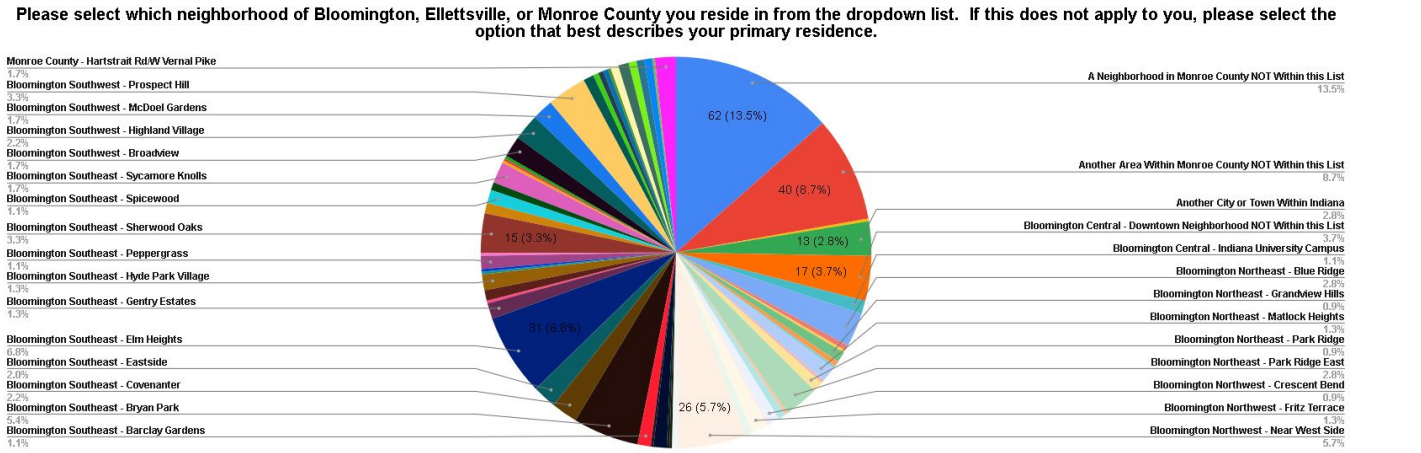
Residence Ownership of Survey Respondents



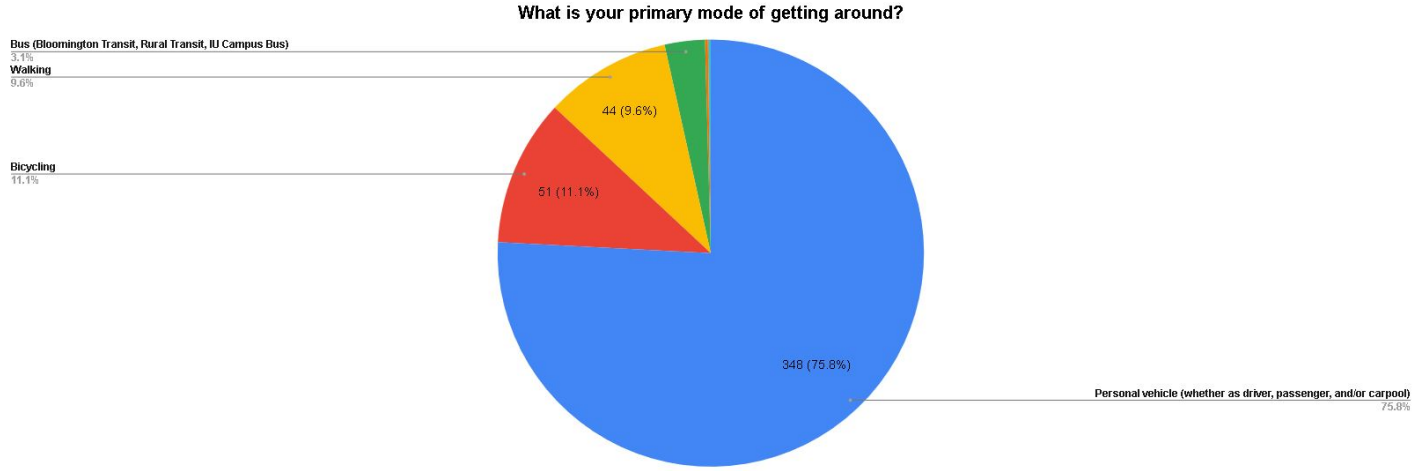
Monroe County Community Residence of Survey Respondents



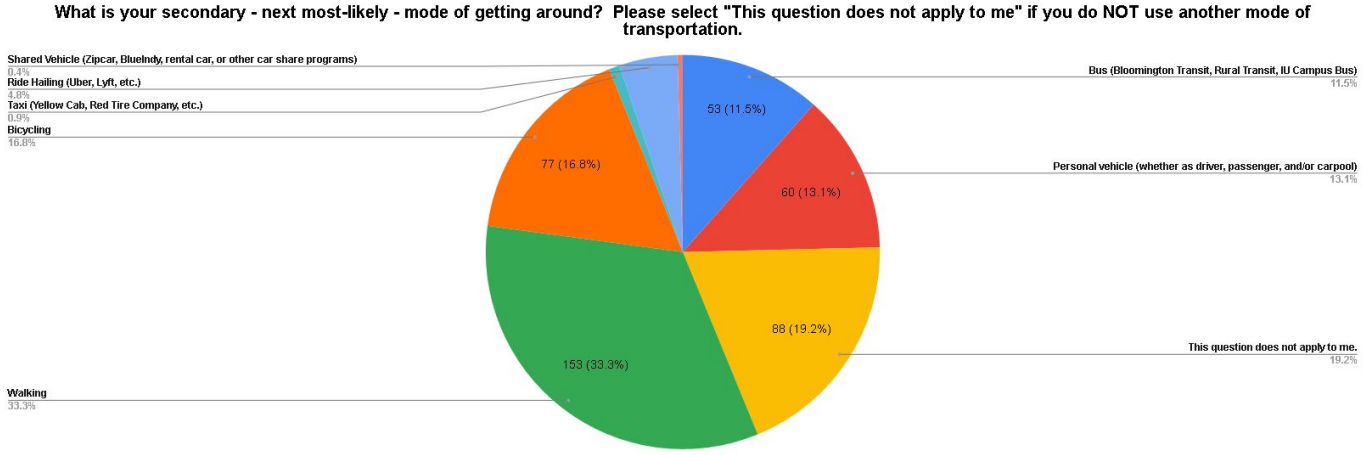
Neighborhood Residence of Survey Respondents



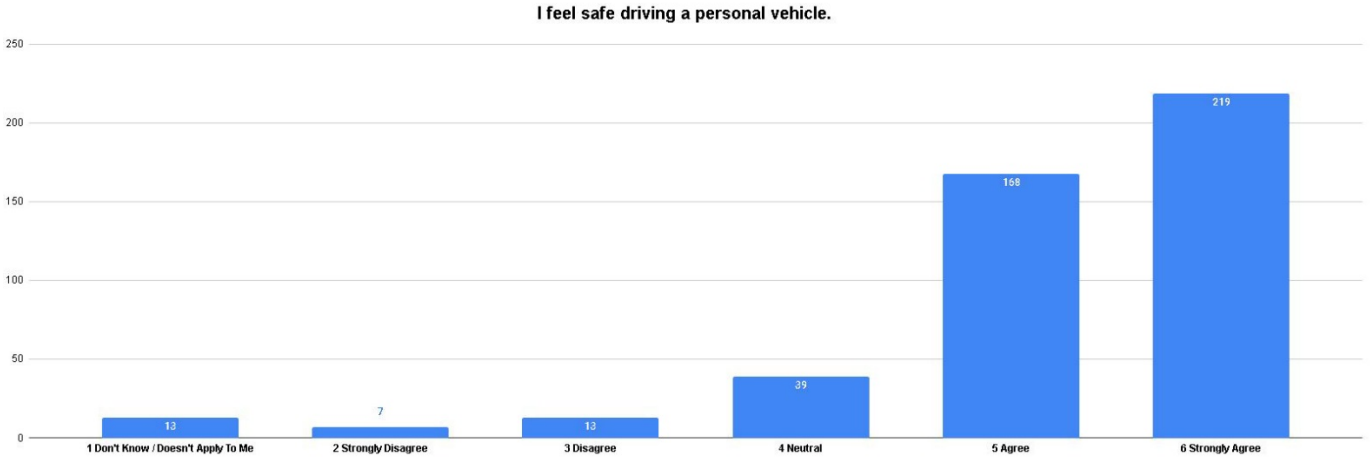
Transportation Mode Choice: Primary



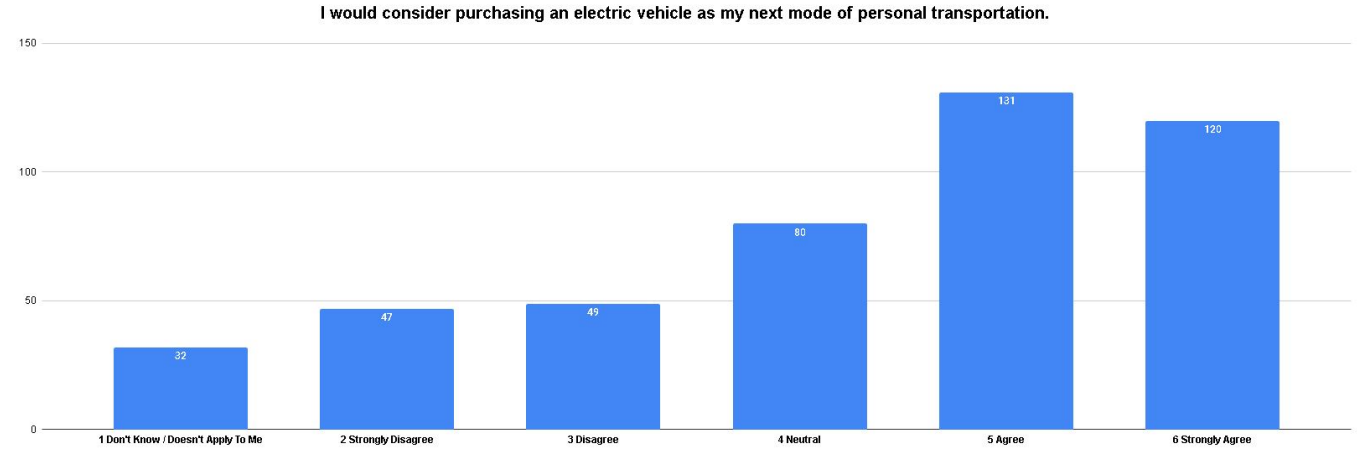
Transportation Mode Choice: Secondary



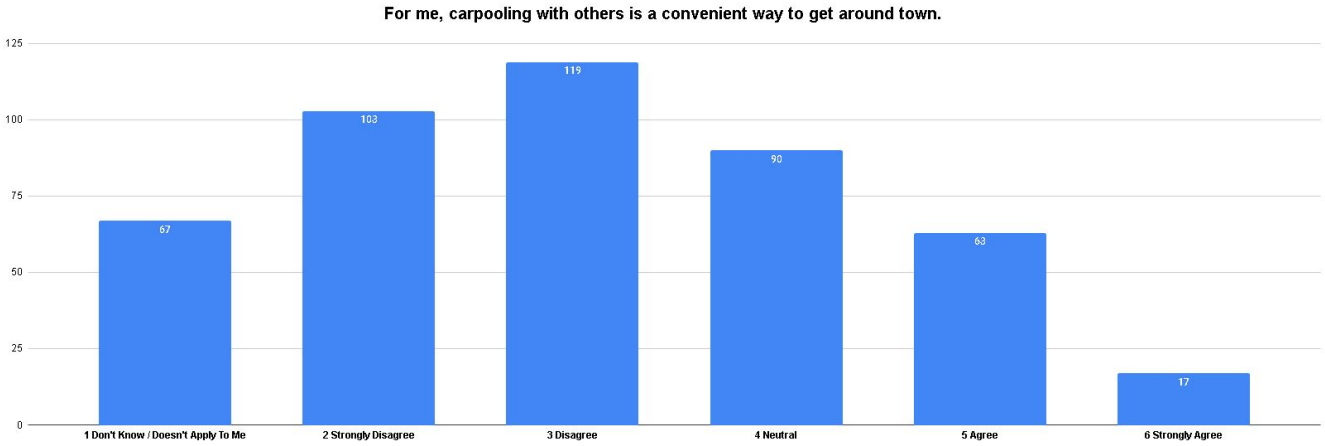
Transportation Mode Choice: Personal Vehicle Safety



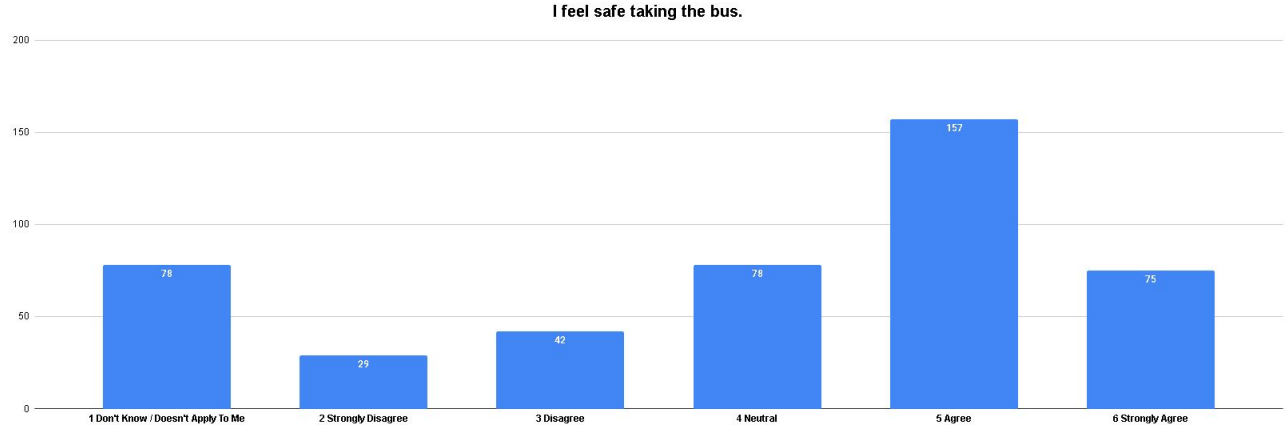
Transportation Mode Choice: Individual Electric Vehicle Purchase



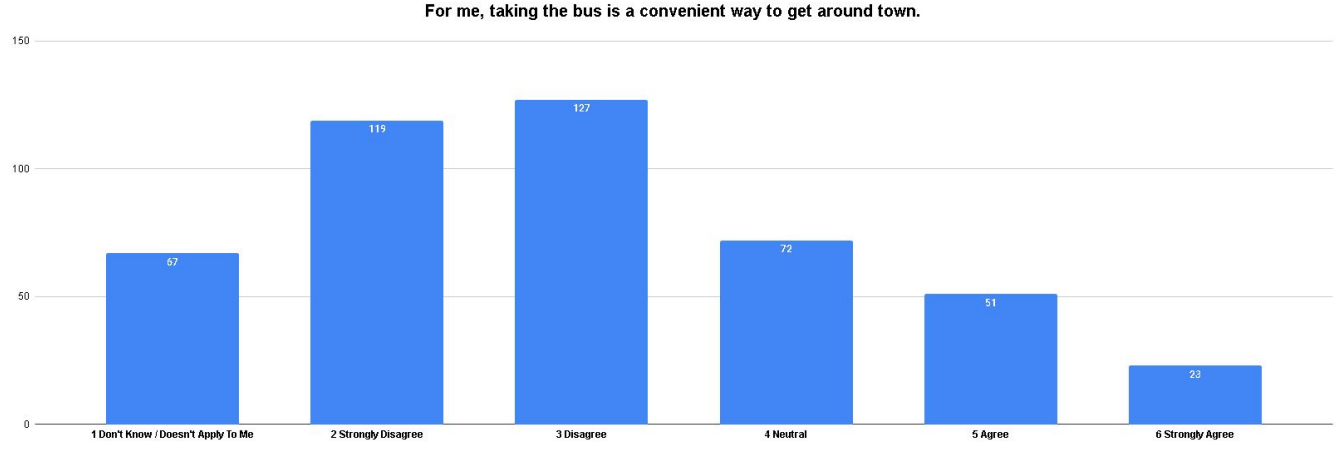
Transportation Mode Choice: Carpooling Convenience



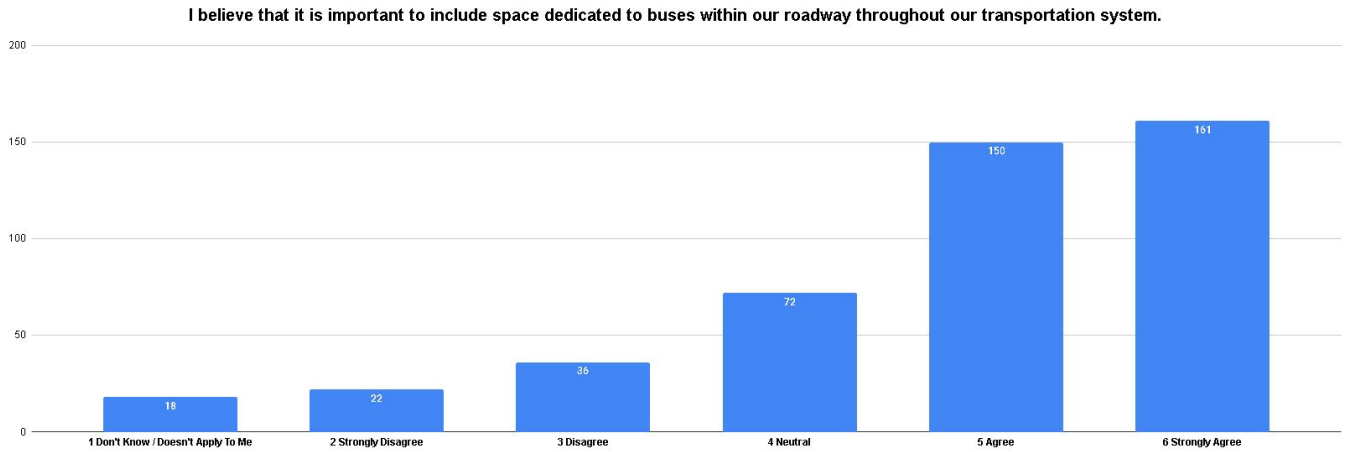
Transportation Mode Choice: Public Transit Service Safety



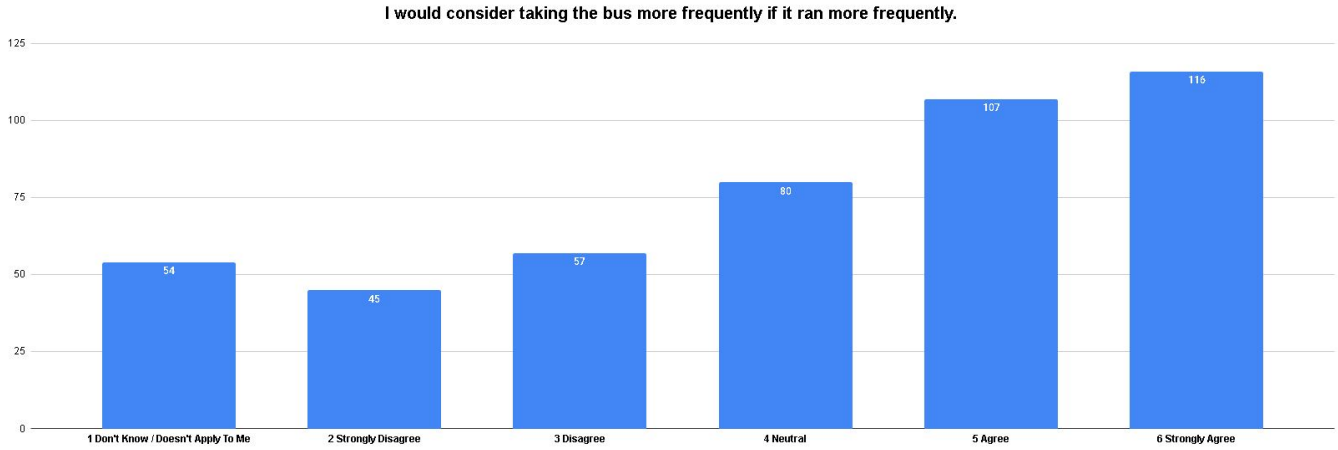
Transportation Mode Choice: Public Transit Service Convenience



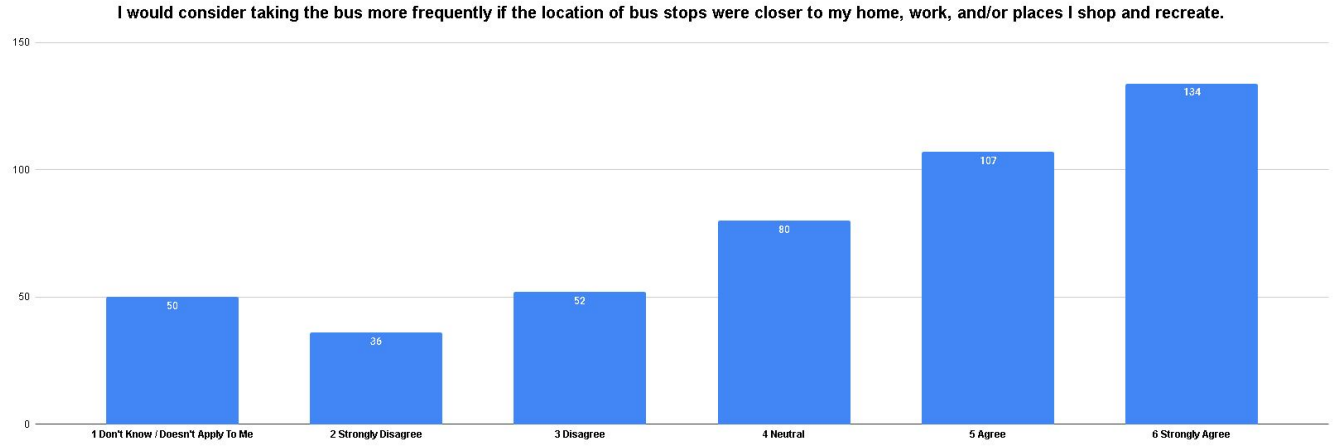
Transportation Mode Choice: Public Transit Vehicle Travel Lanes



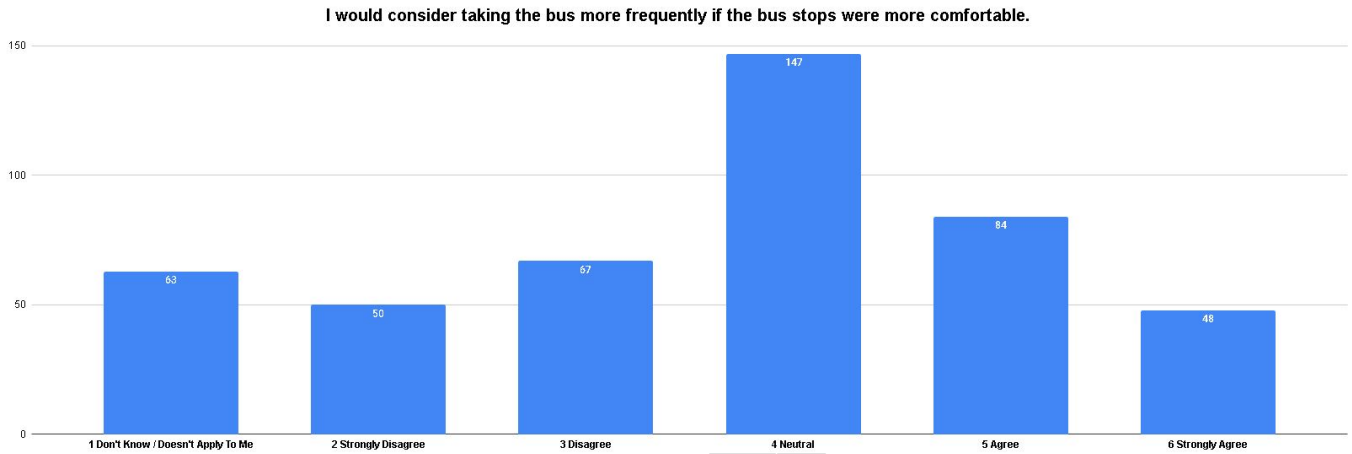
Transportation Mode Choice: Public Transit Service Frequency



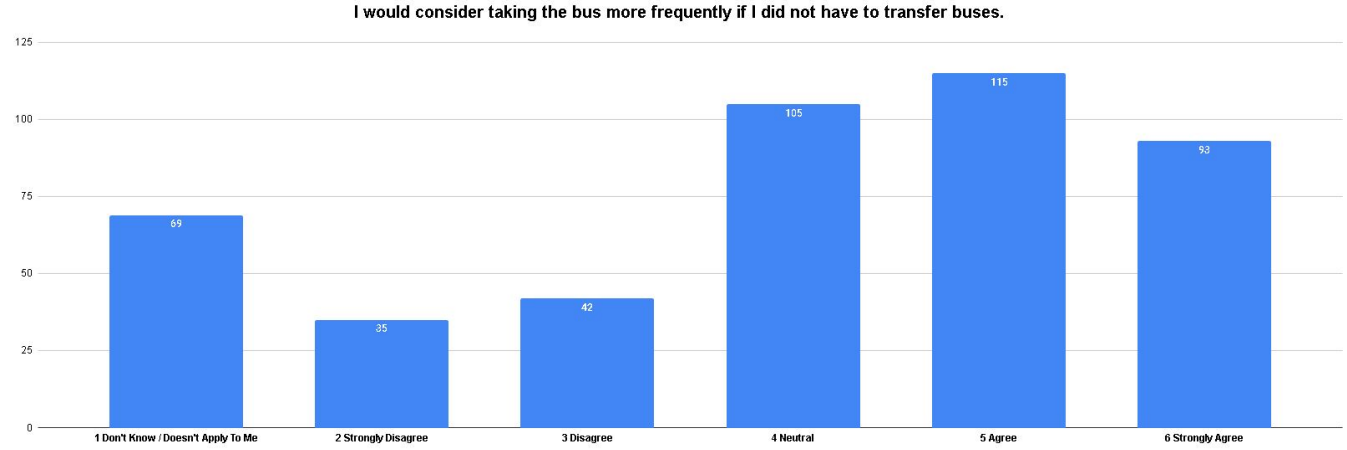
Transportation Mode Choice: Public Transit Stop Locations



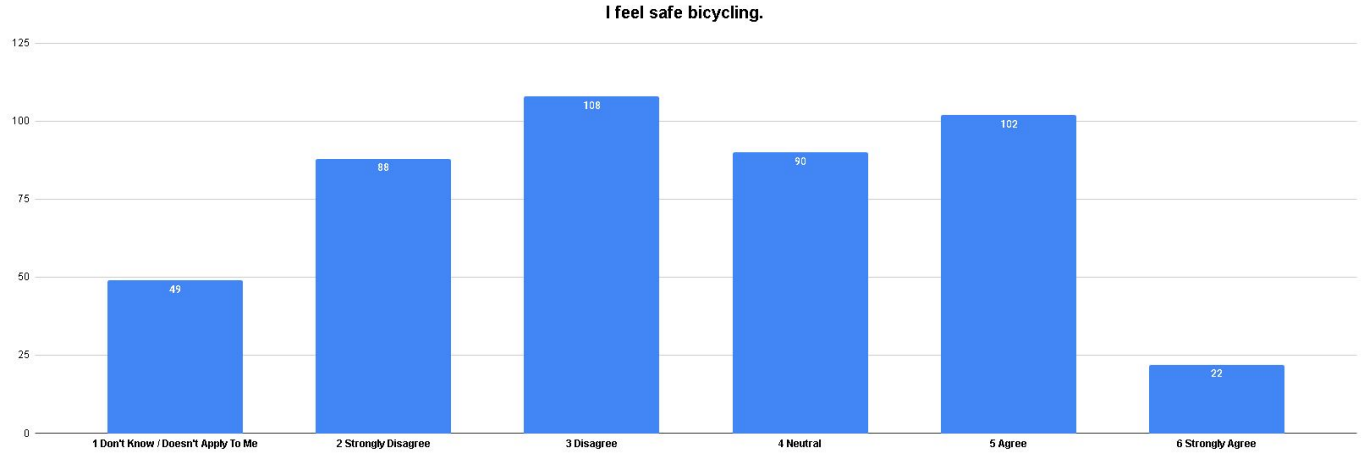
Transportation Mode Choice: Public Transit Stop Comfort



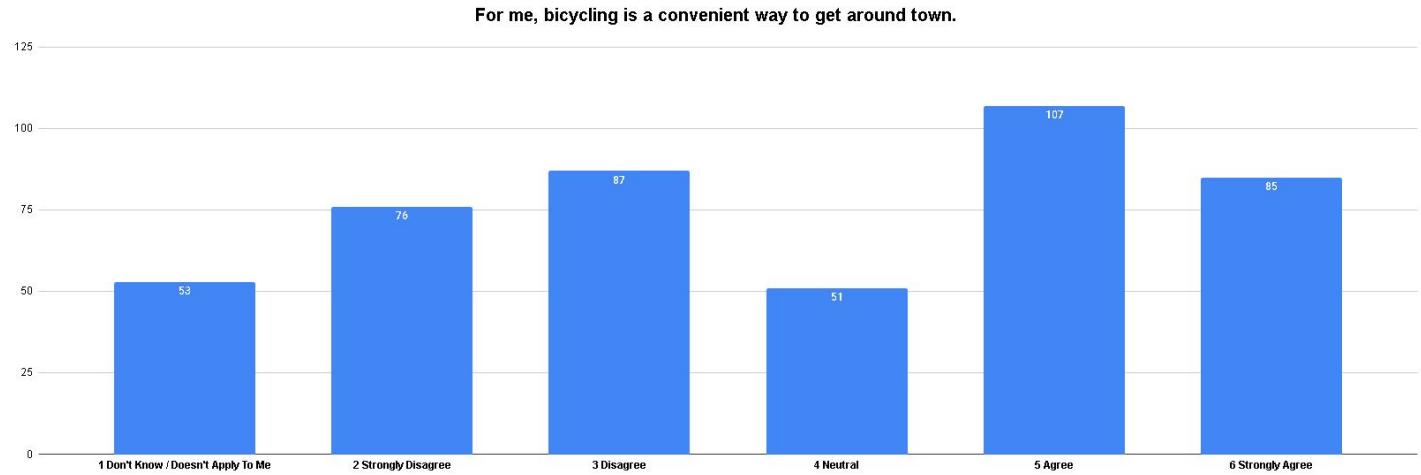
Transportation Mode Choice: Public Transit Route Transfers



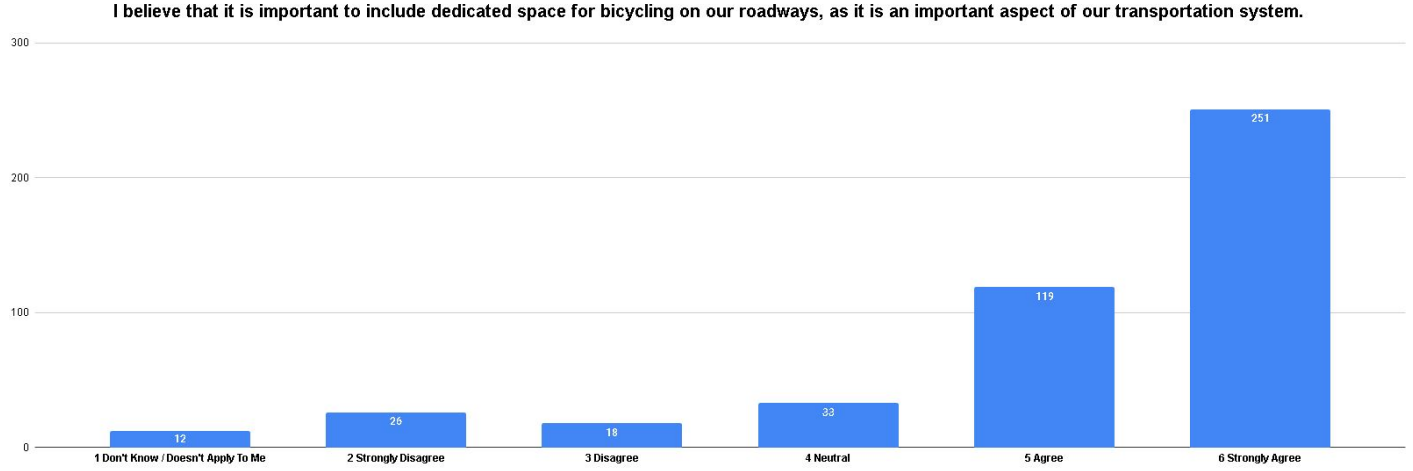
Transportation Mode Choice: Bicycle Safety



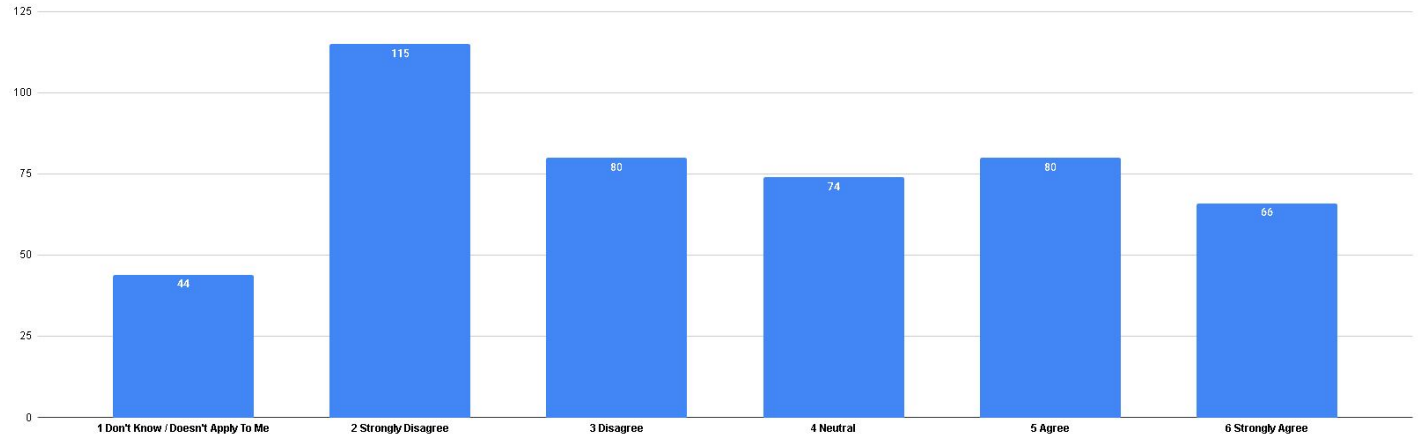
Transportation Mode Choice: Bicycle Convenience



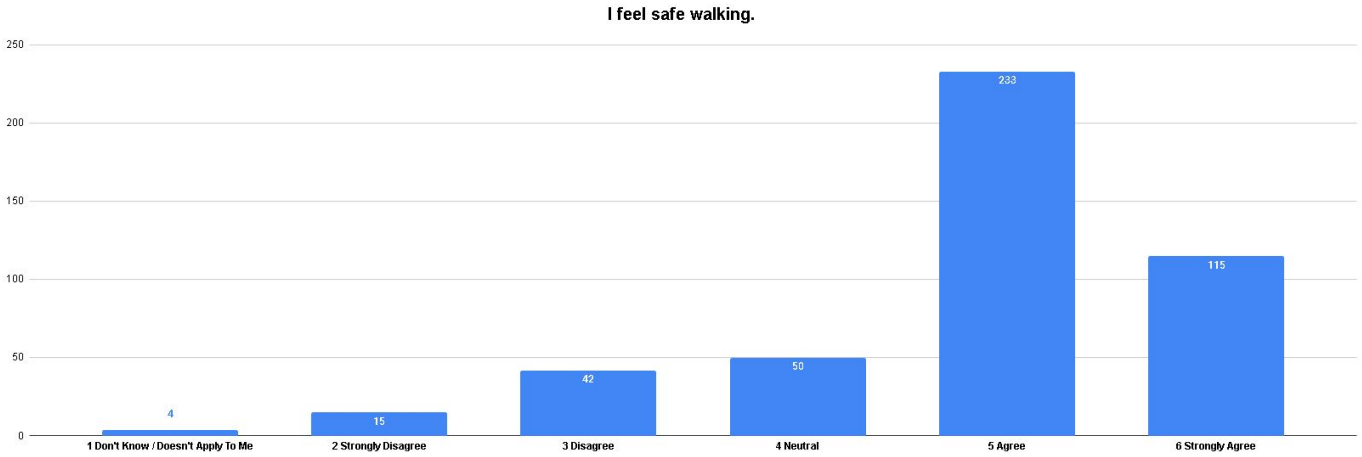
Transportation Mode Choice: Bicycle Roadway Accommodations



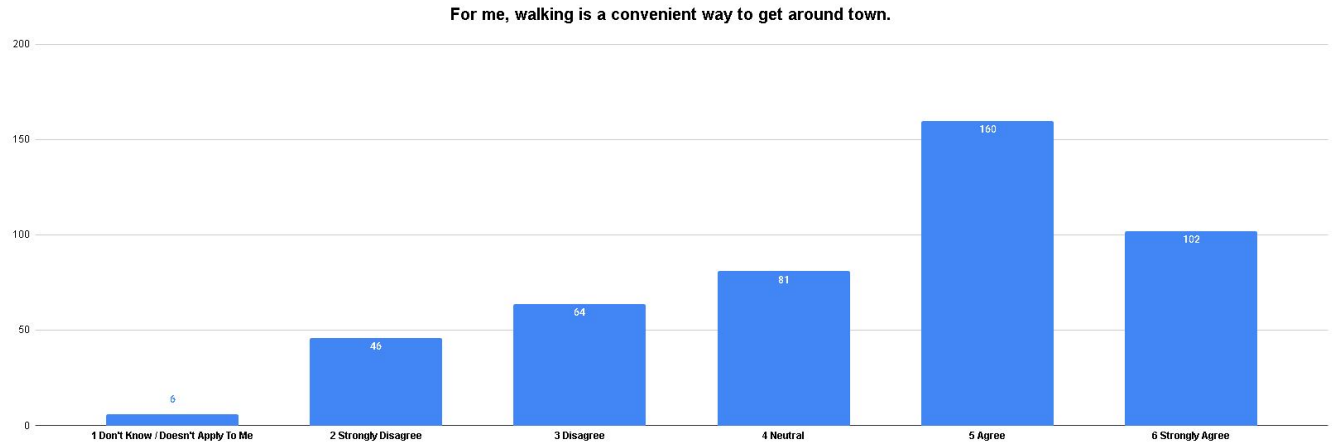
Transportation Mode Choice: Electric Bicycle Purchase and Use



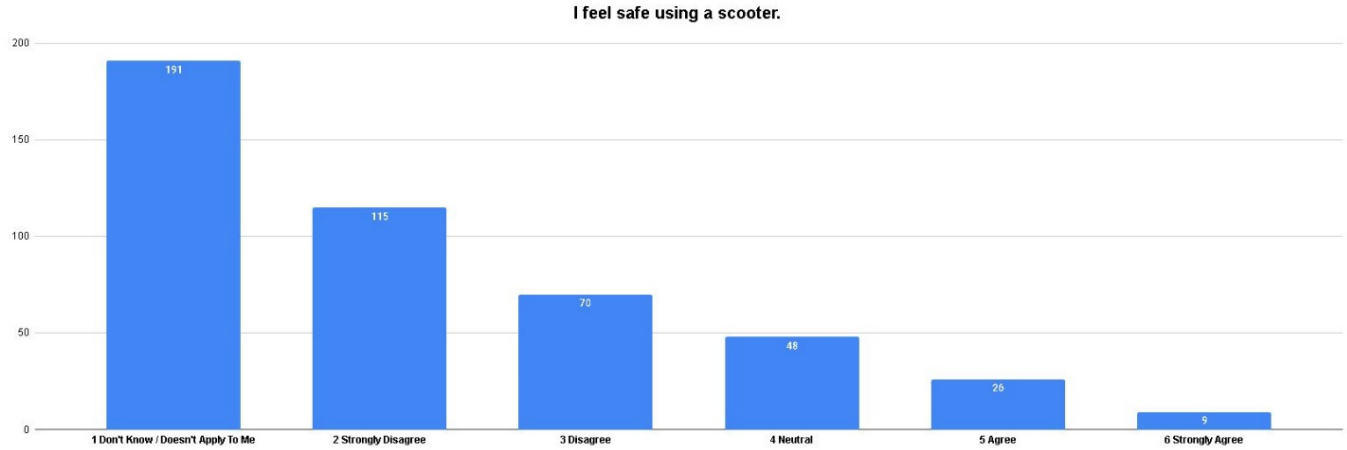
Transportation Mode Choice: Pedestrian Safety



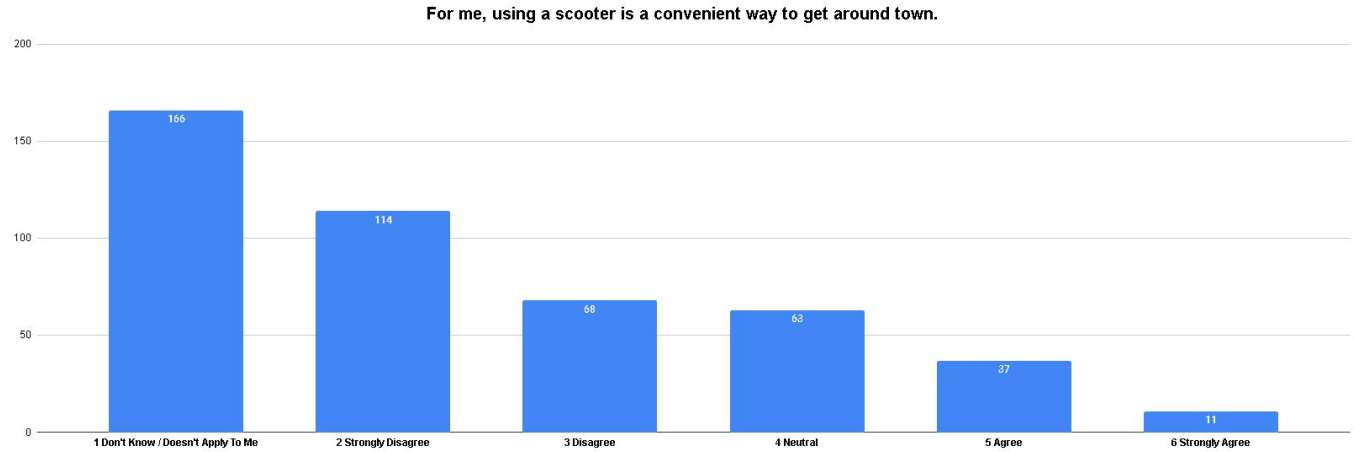
Transportation Mode Choice: Pedestrian Convenience



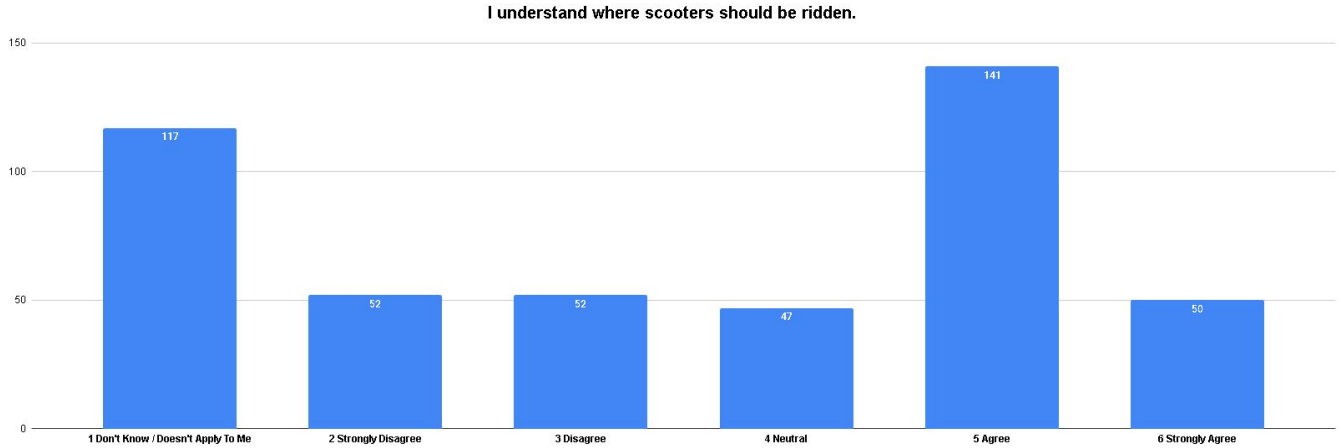
Transportation Mode Choice: Scooter Safety



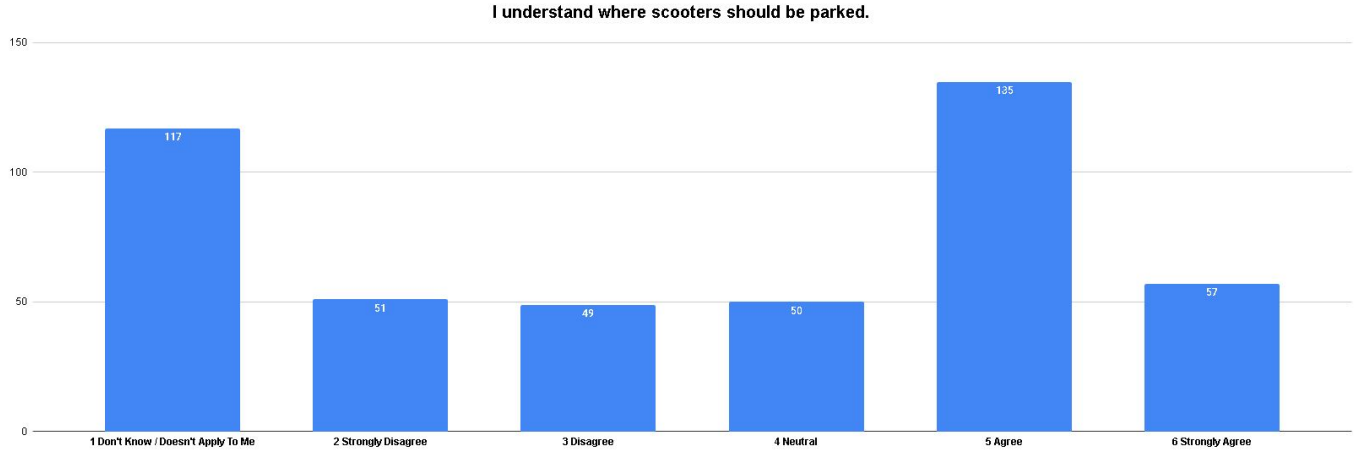
Transportation Mode Choice: Scooter Convenience



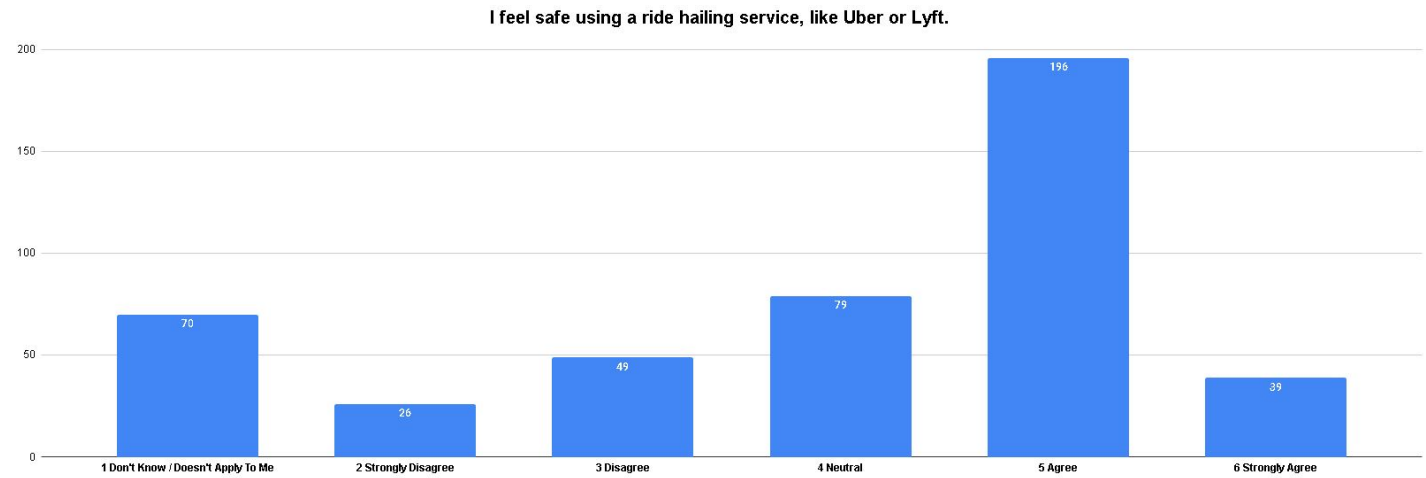
Transportation Mode Choice: Scooter Operational Use



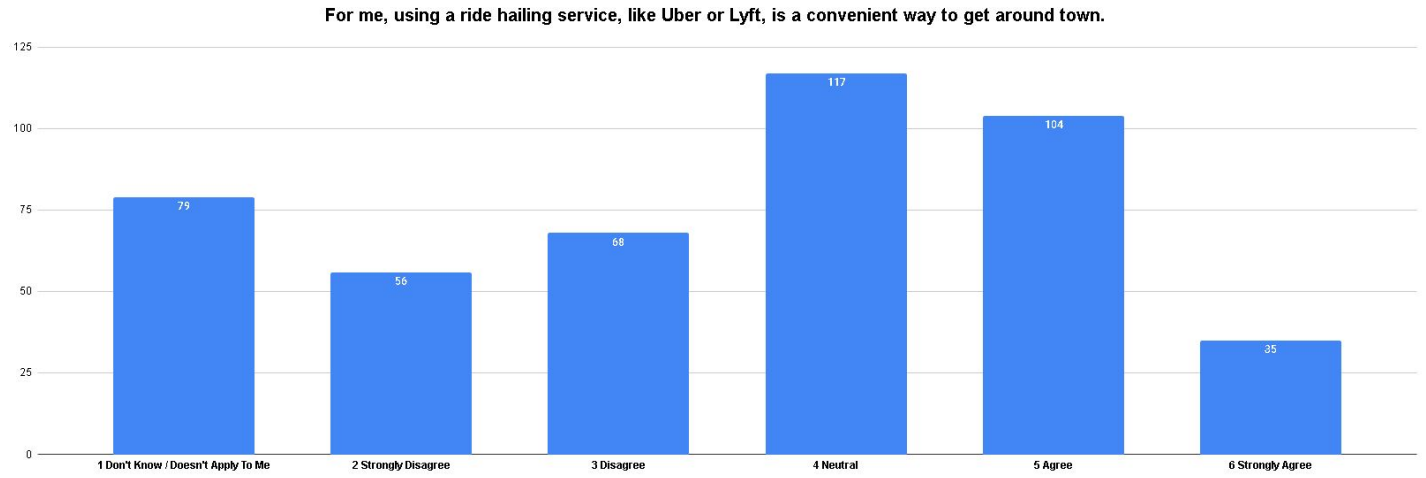
Transportation Mode Choice: Scooter Operational Parking



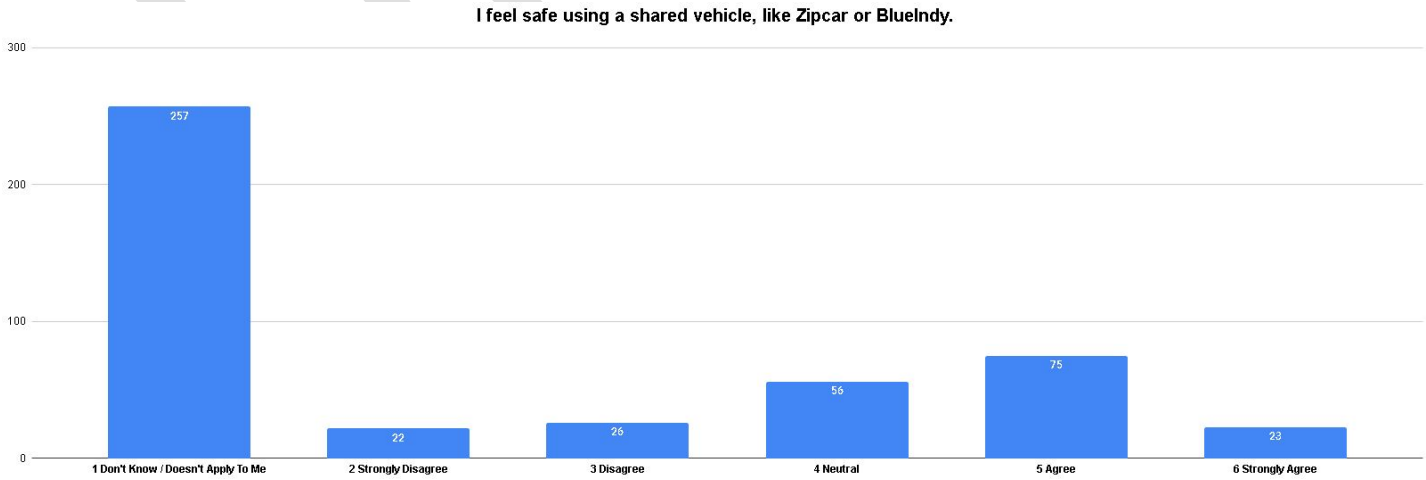
Transportation Mode Choice: Ride Hailing Service Safety



Transportation Mode Choice: Ride Hailing Service Convenience

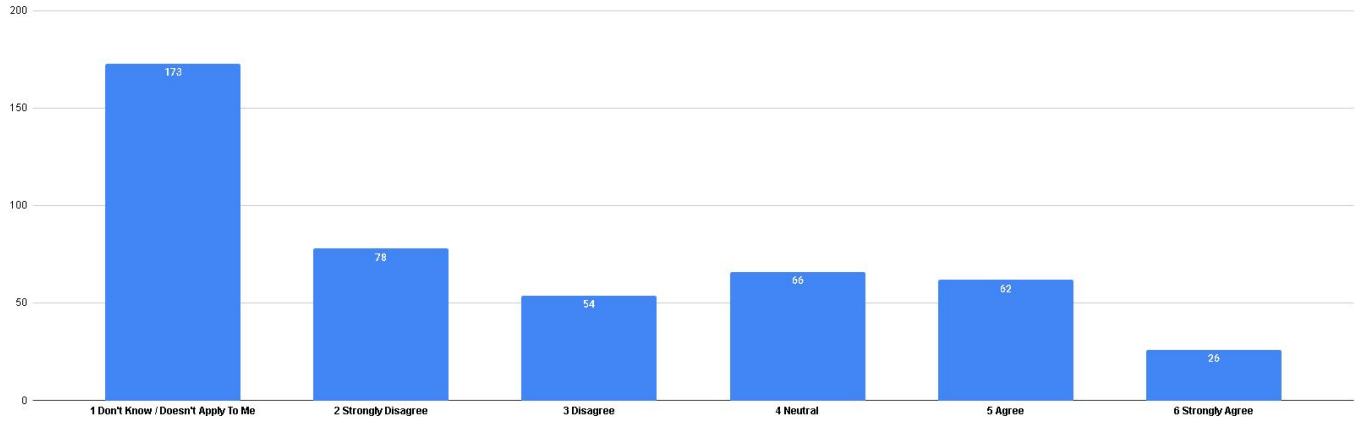


Transportation Mode Choice: Shared Vehicle Safety



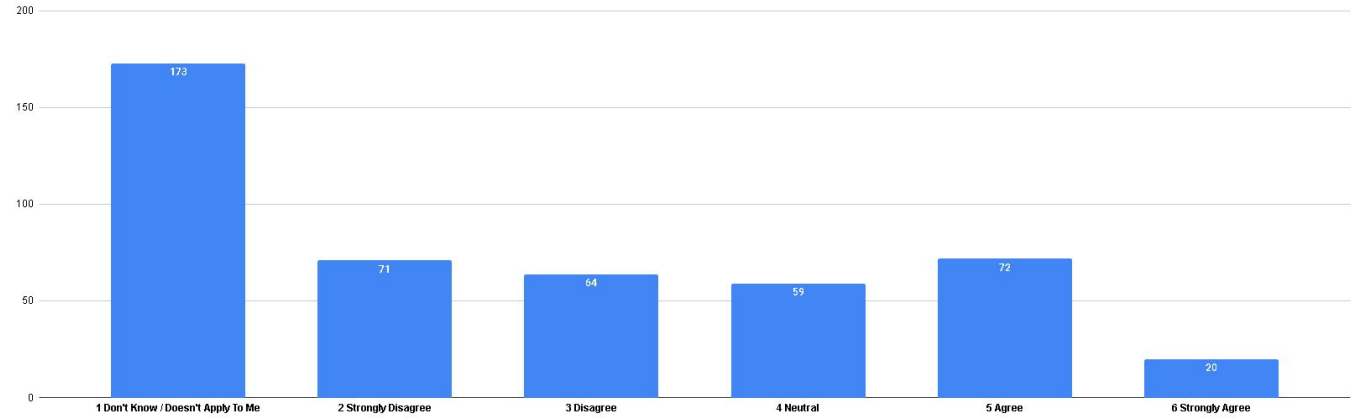
Transportation Mode Choice: Shared Vehicle Expense

I would consider using a shared vehicle, like Zipcar or BlueIndy, because it is less expensive than owning a personal vehicle.



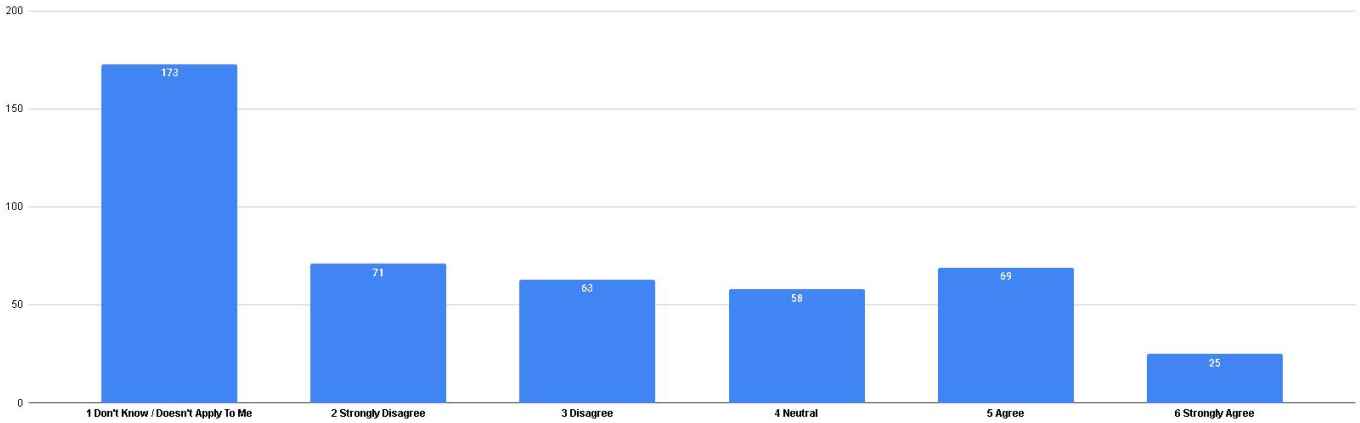
Transportation Mode Choice: Shared Vehicle Locations

I would consider using a shared vehicle, like Zipcar or BlueIndy, more frequently if one were available closer to my home, work, and/or places I shop and recreate.

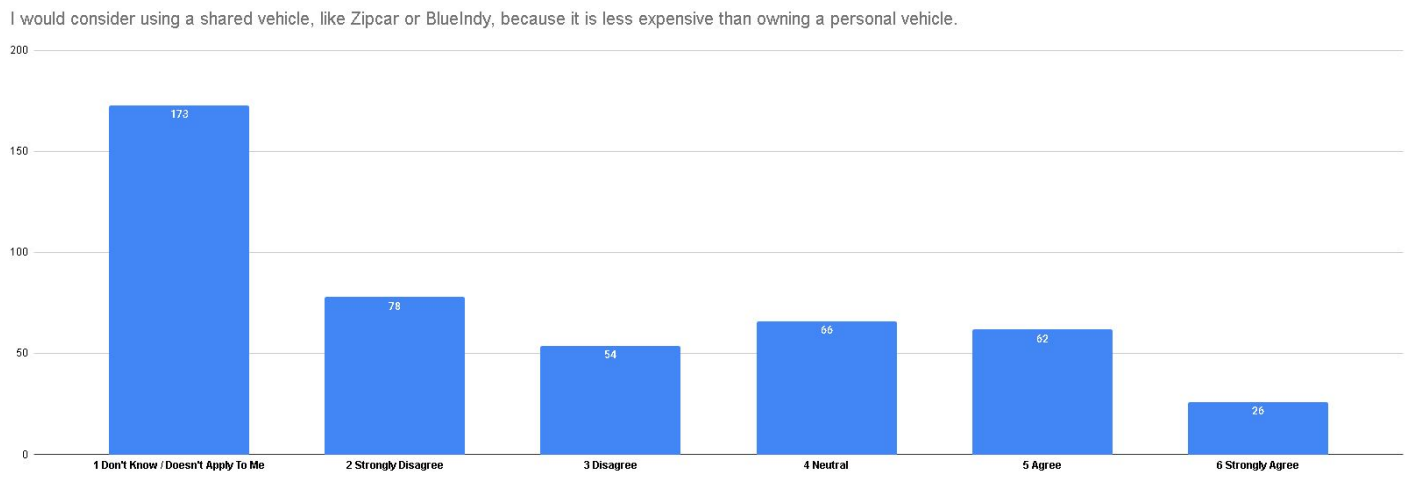


Transportation Mode Choice: Shared Vehicle Availability

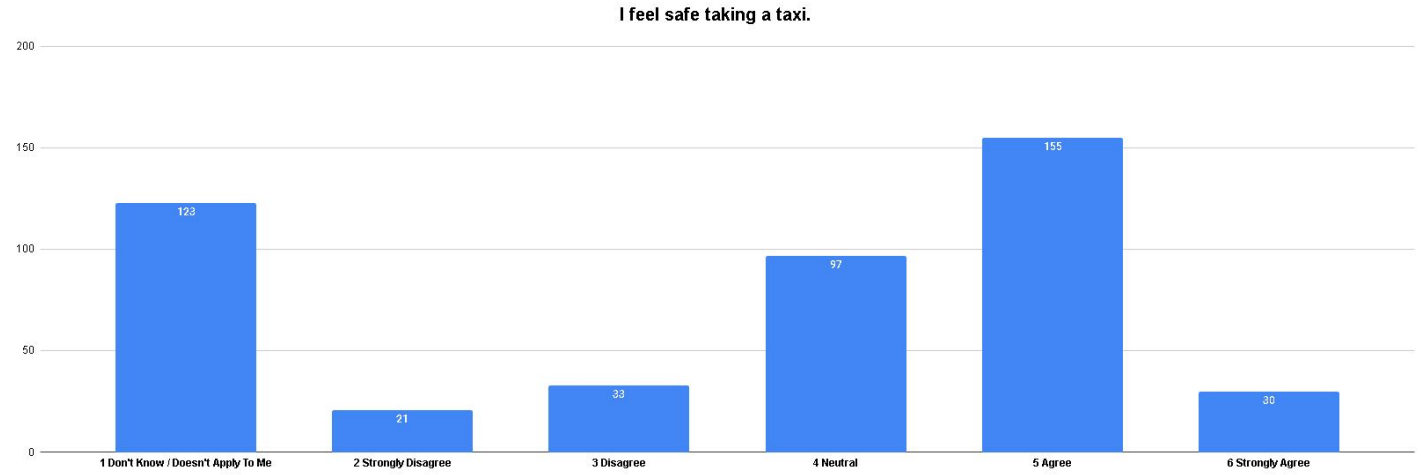
I would consider using a shared vehicle, like Zipcar or BlueIndy, more frequently if more of these vehicles were available at any given time.



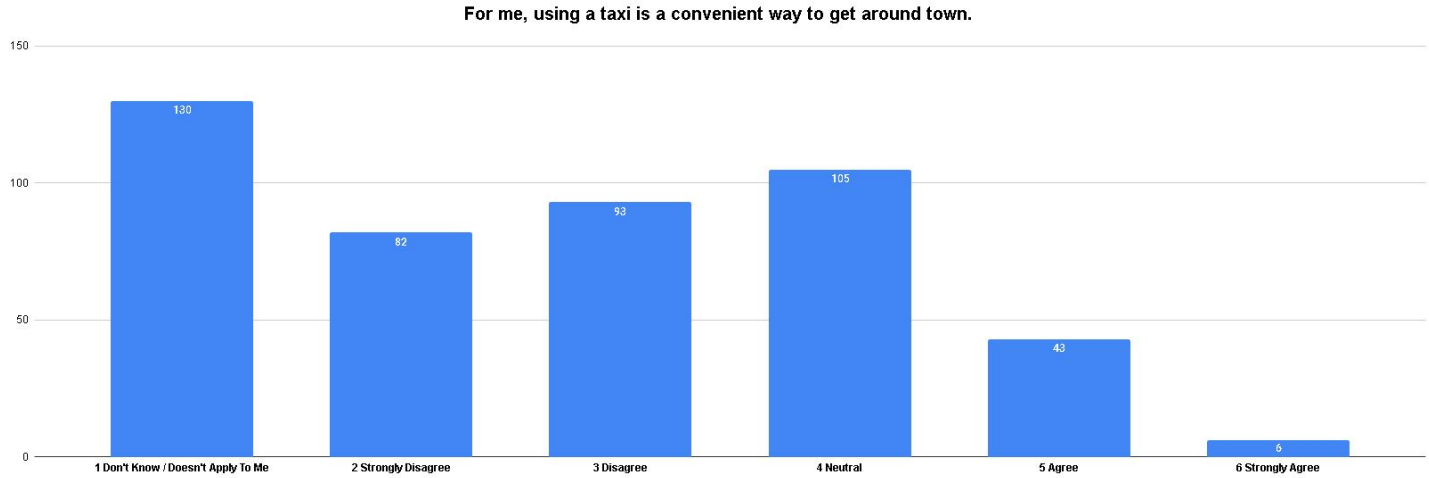
Transportation Mode Choice: Shared Vehicle Expense



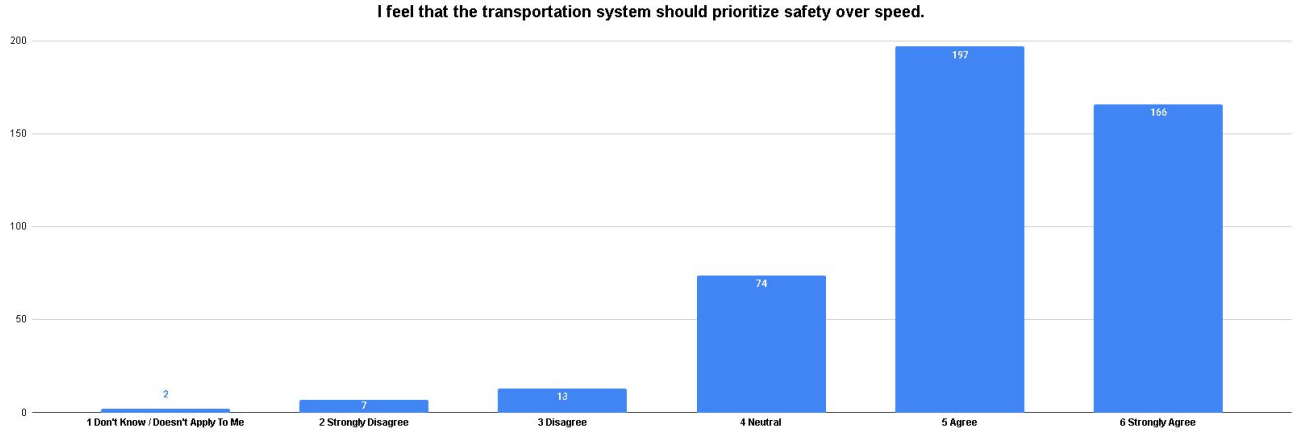
Transportation Mode Choice: Taxi Service Safety



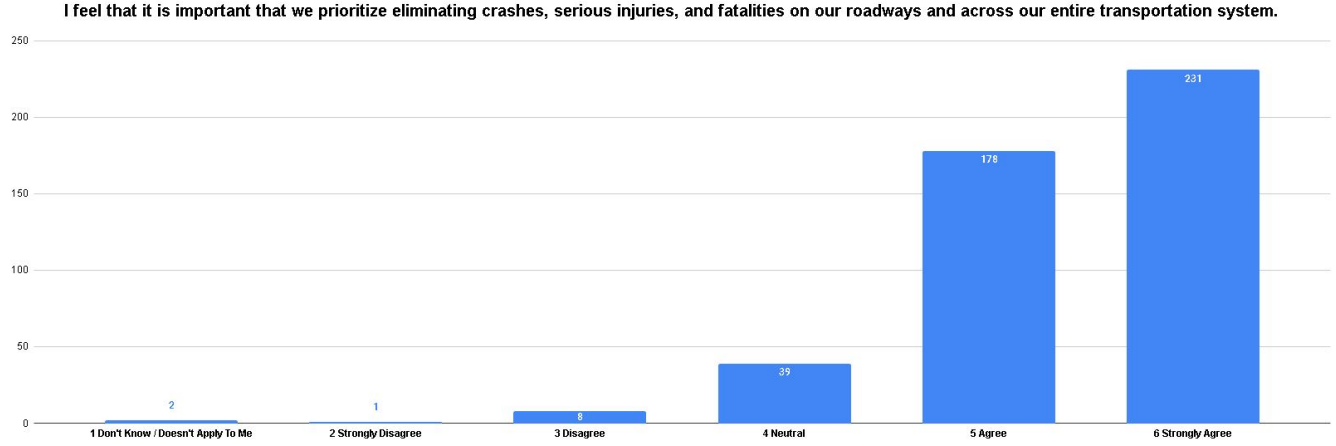
Transportation Mode Choice: Taxi Service Convenience



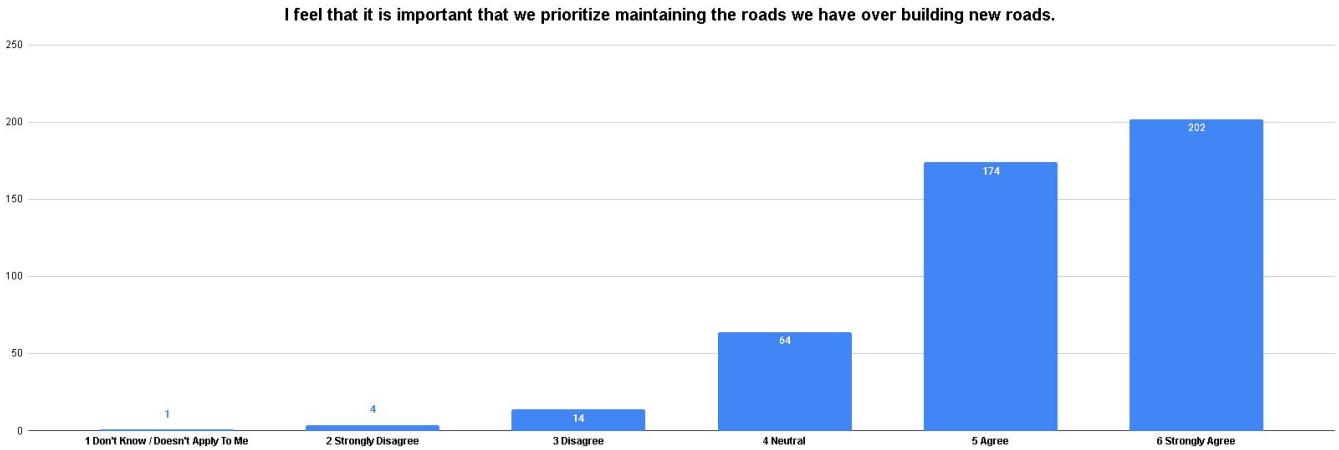
Transportation System Policy Priority: Safety and Speed



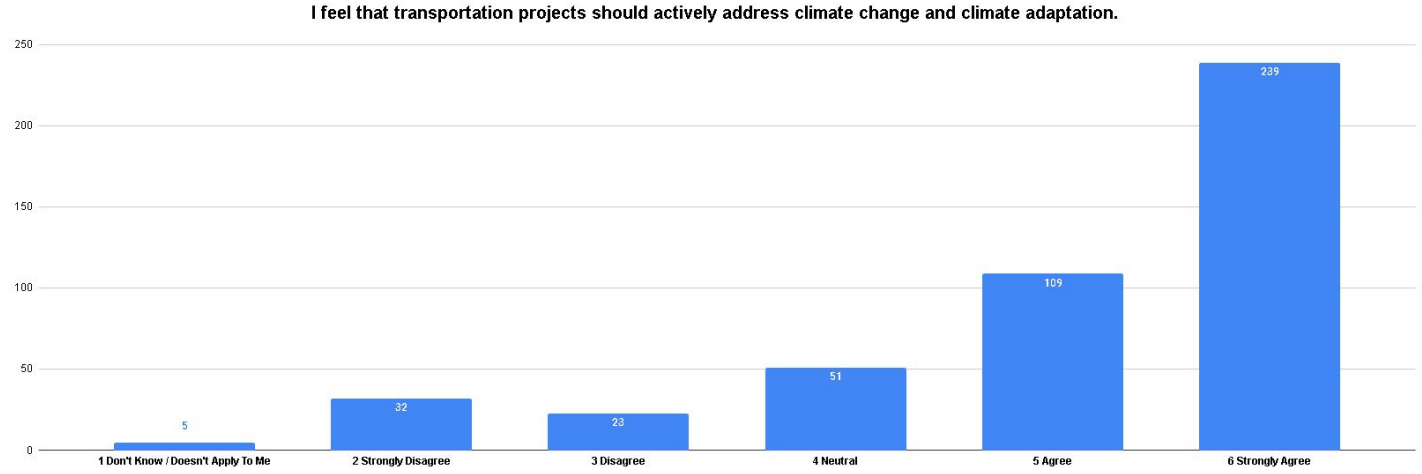
Transportation System Policy Priority: Vision Zero



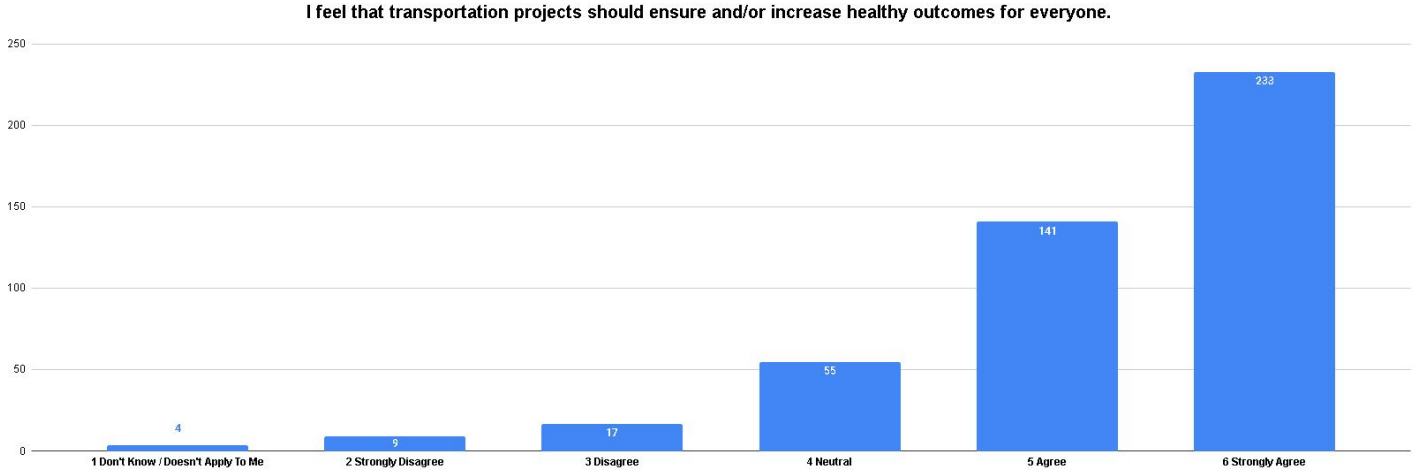
Transportation System Policy Priority: Maintenance of Existing Roadway System



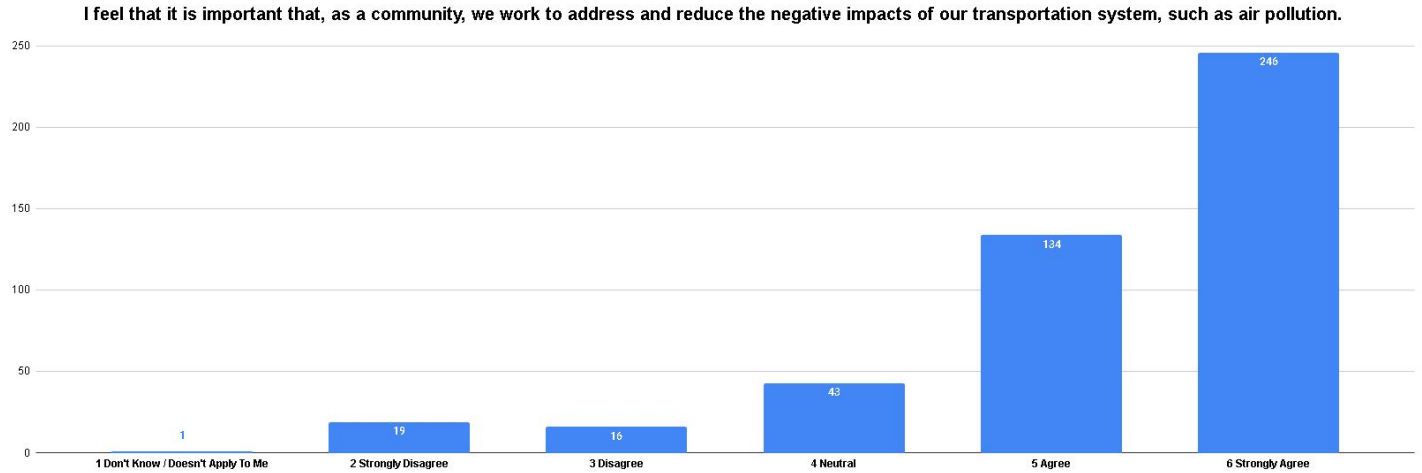
Transportation System Policy Priority: Addressing Climate Change



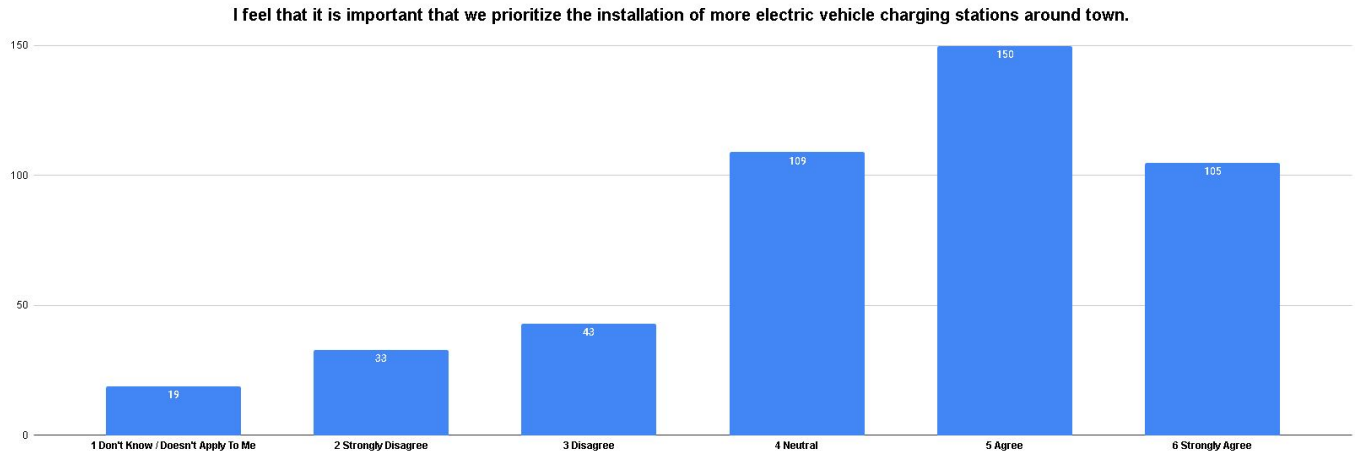
Transportation System Policy Priority: Ensure Public Health Outcomes



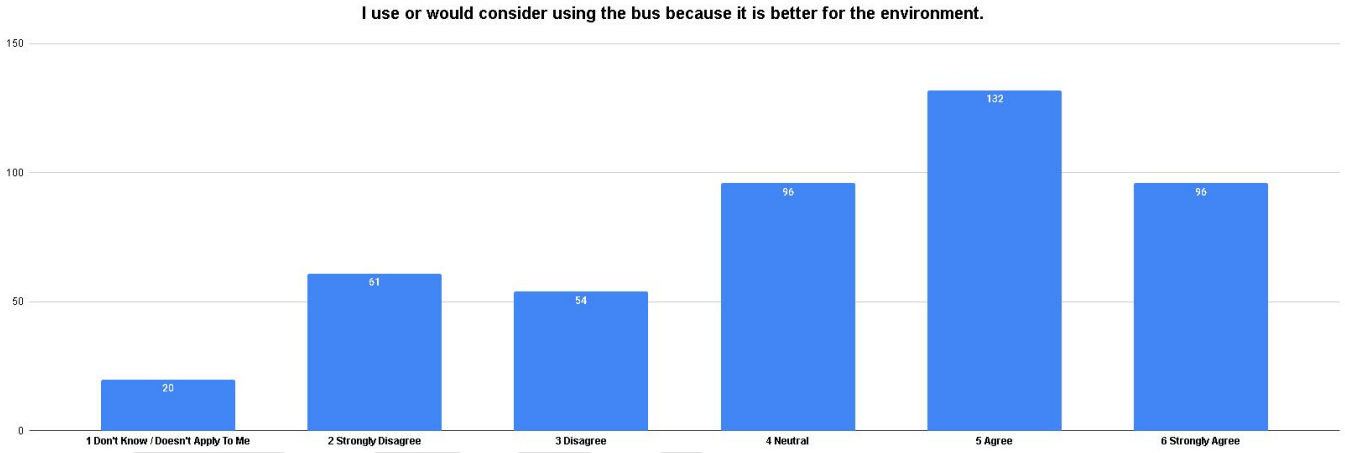
Transportation System Policy Priority: Transportation System Air Pollution



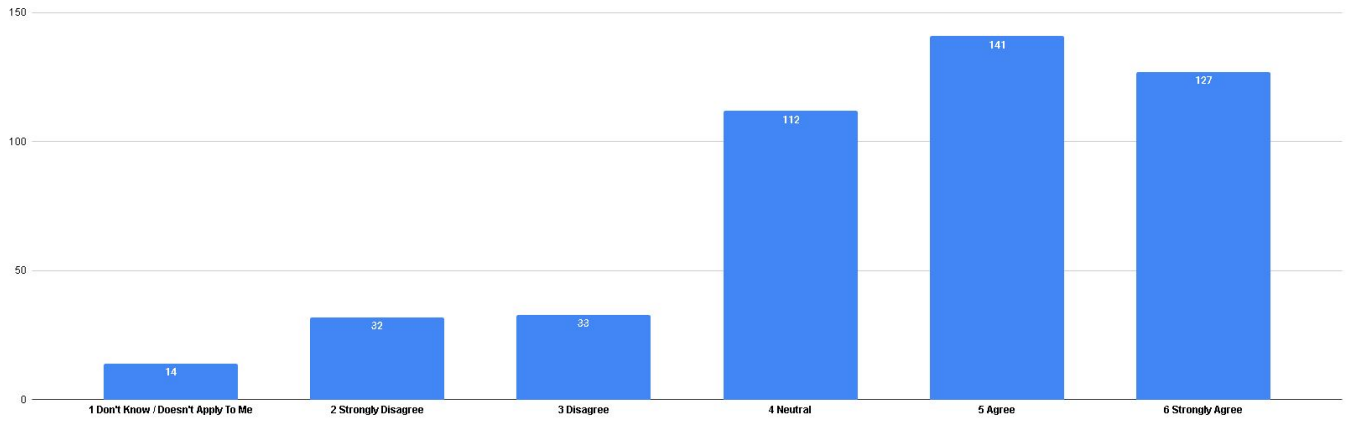
Transportation System Policy Priority: Electric Vehicle Charging Stations



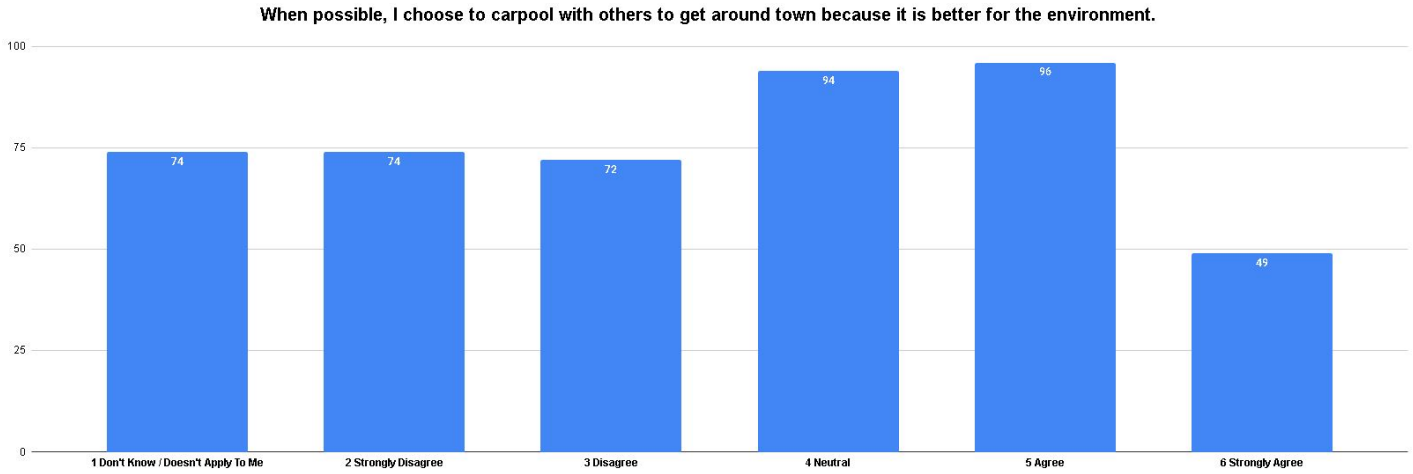
Transportation System Policy Priority: Public Transportation and Environmental Quality



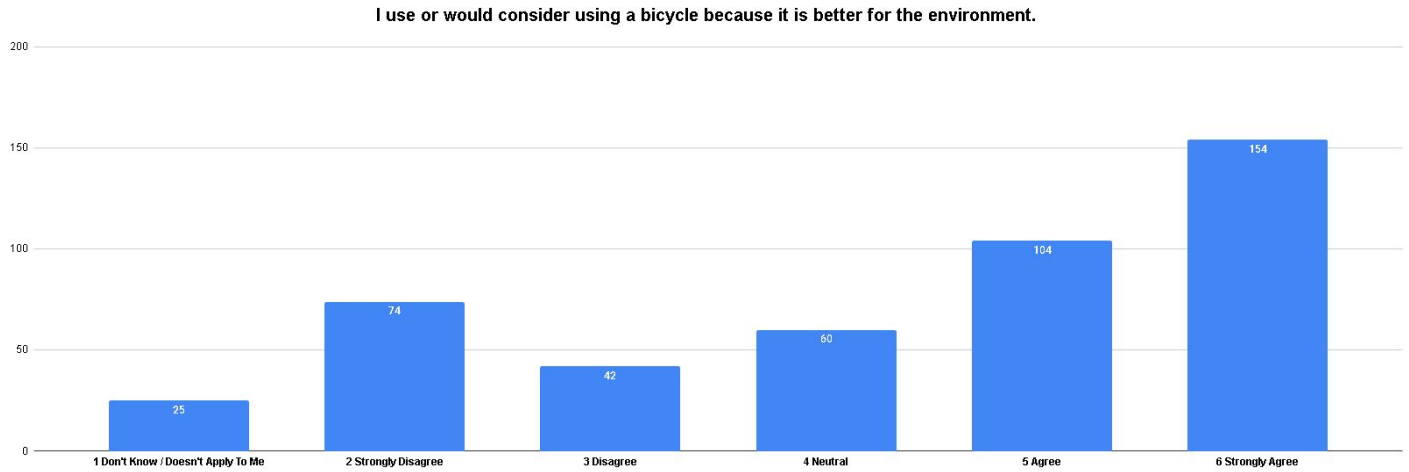
Transportation System Policy Priority: Public Transportation and Electric Vehicle Conversion



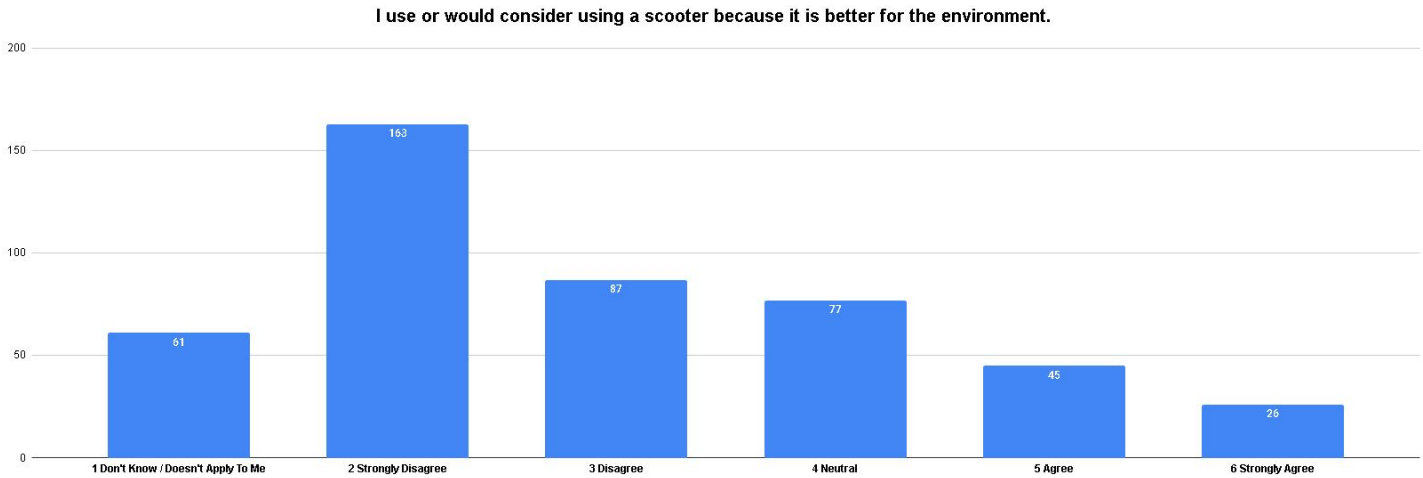
Transportation System Policy Priority: Carpools and Environmental Quality



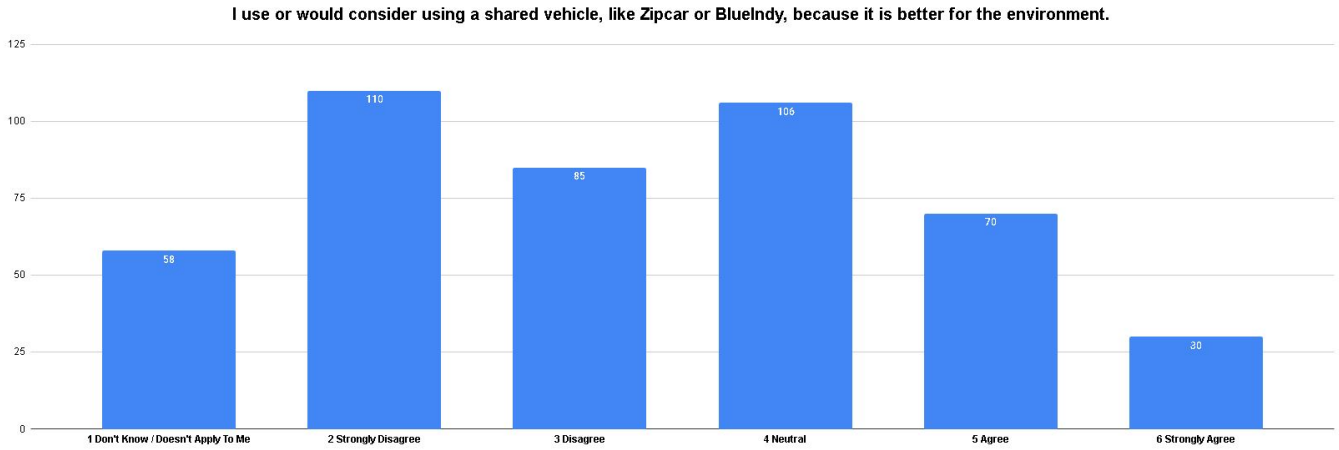
Transportation System Policy Priority: Bicycles and Environmental Quality



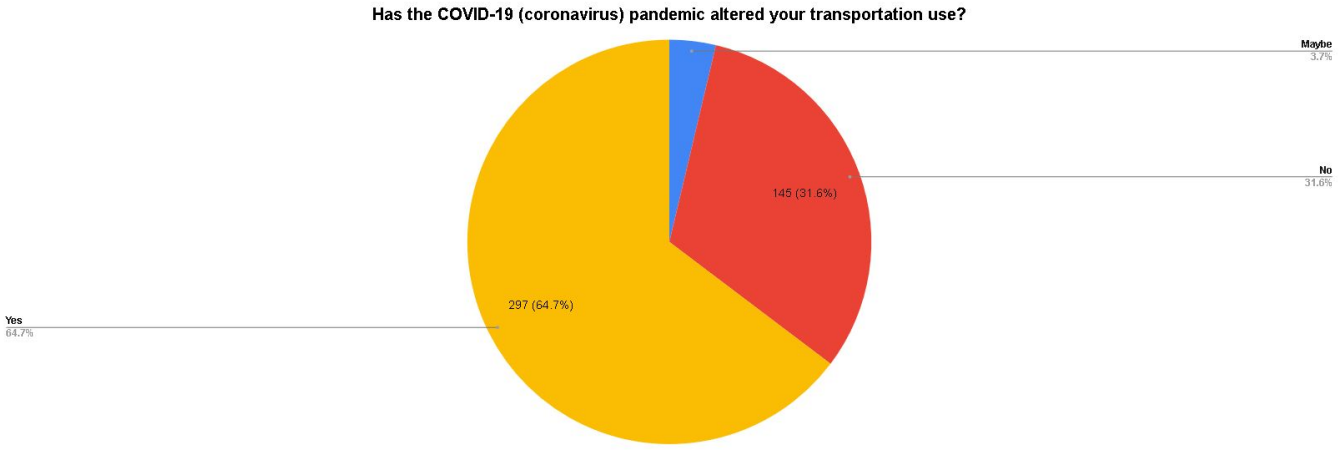
Transportation System Policy Priority: Scooters and Environmental Quality



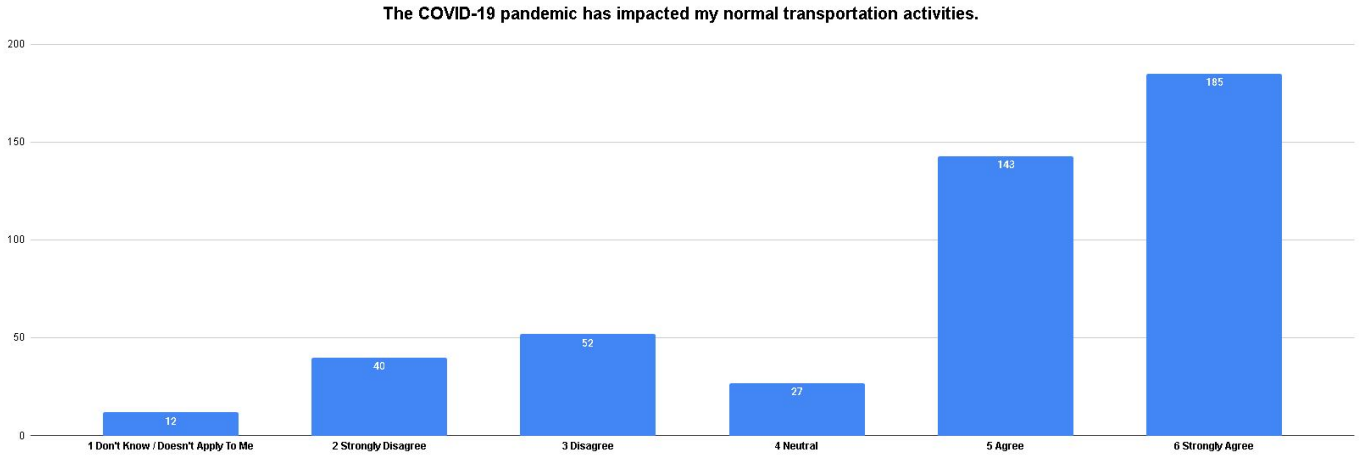
Transportation System Policy Priority: Shared Vehicles and Environmental Quality



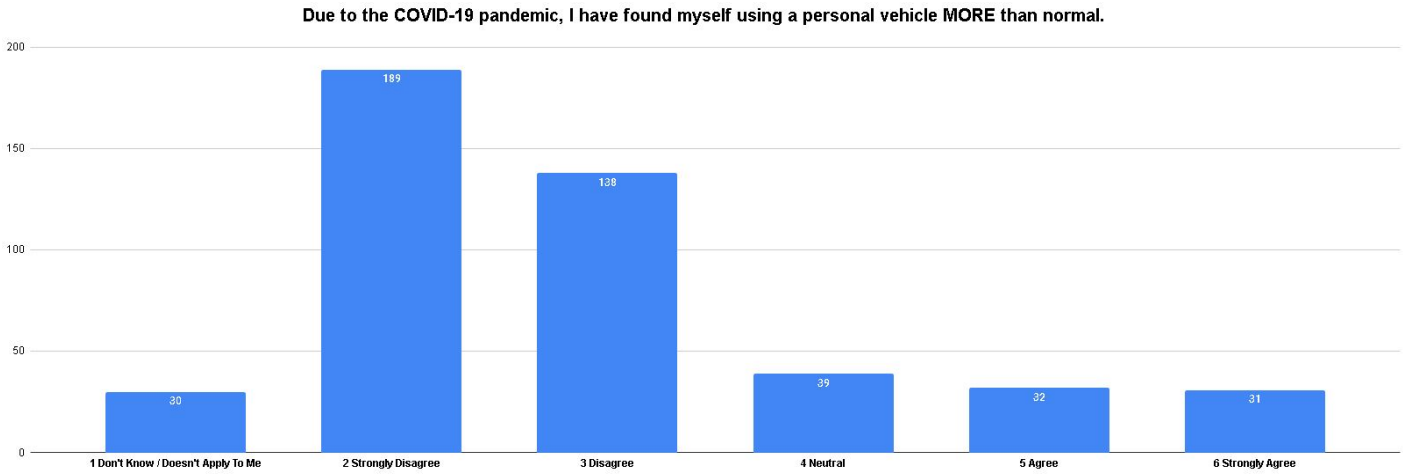
COVID-19 Pandemic: Alterations to Transportation System Use



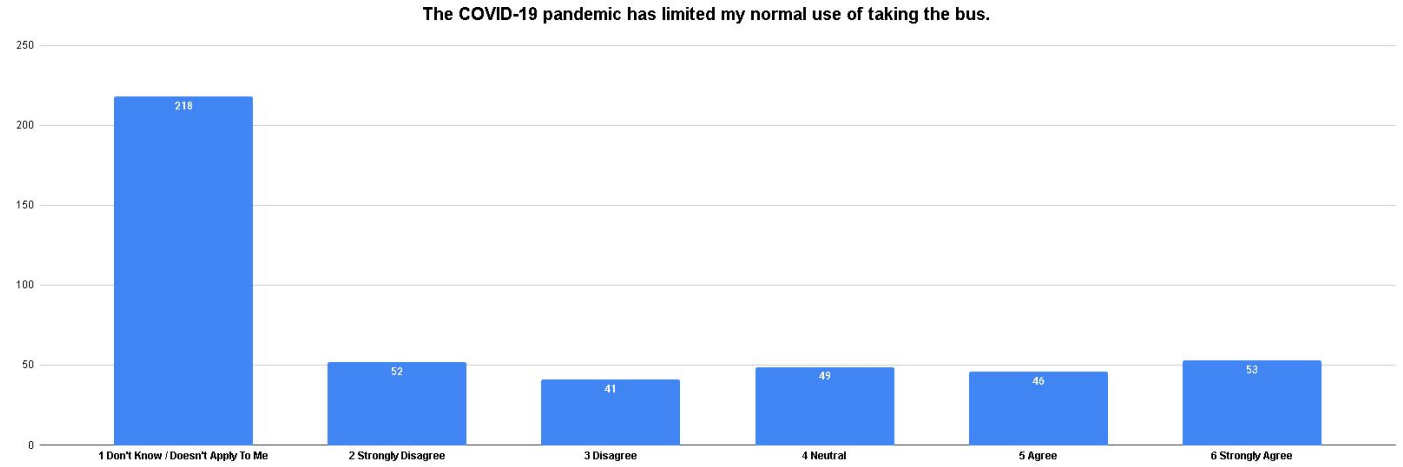
COVID-19 Pandemic: Impact on Normal Transportation Activities



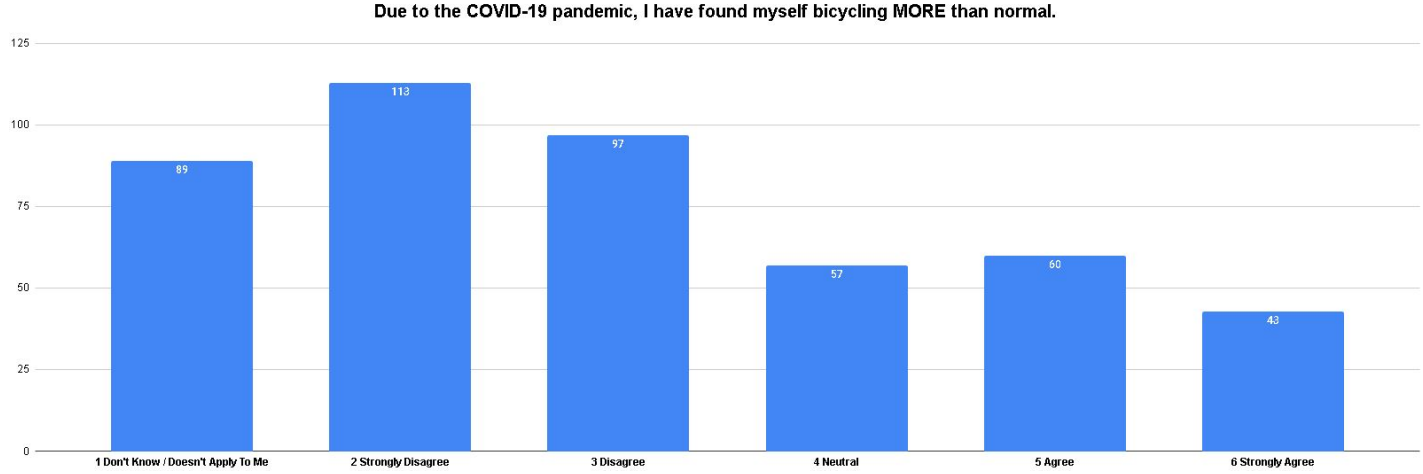
COVID-19 Pandemic: Personal Vehicle Use as a Mode Choice



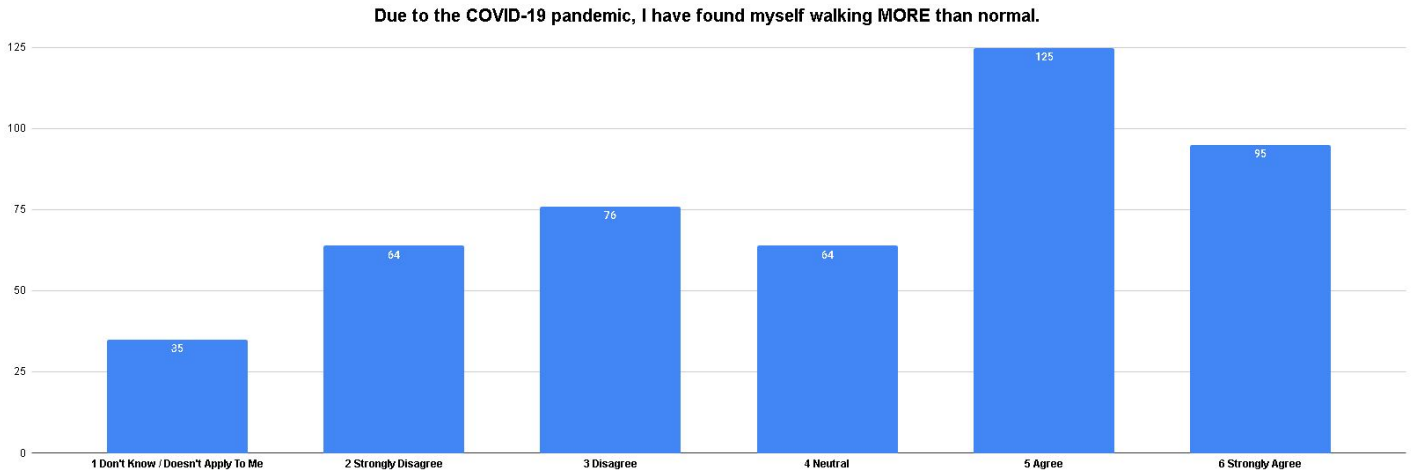
COVID-19 Pandemic: Public Transportation as a Mode Choice



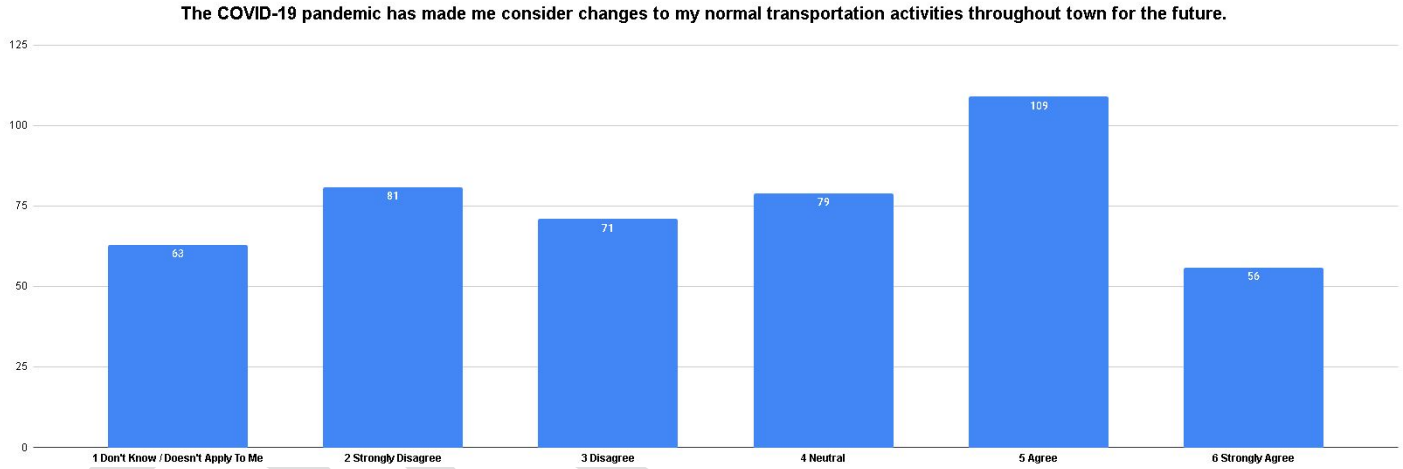
COVID-19 Pandemic: Bicycle Use as a Mode Choice



COVID-19 Pandemic: Walking Bicycle Use as a Mode Choice



COVID-19 Pandemic: Transportation System Activity



Appendix D: Travel Demand Model

Introduction

This appendix is a general overview summary of technical aspects related directly to the BMCMPO travel demand model (TDM) developed in 2013-2017 embodied within the BMCMPO 2040 Metropolitan Transportation Plan and the 2045 Metropolitan Transportation Plan. The following narrative provides an overview of the model, the network attributes, traffic analysis zones, trip generation, destination and mode choice, traffic assignments, and statistical model validation. More detailed technical documentation is available upon request.

Model Overview

The BMCMPO maintains a Travel Demand Model covering Monroe County developed with TransCAD Transportation Planning software (https://www.caliper.com/tctraveldemand.htm) for travel demand modeling serving as a macro-level analytical tool for the Bloomington-Monroe County area. Travel demand forecasting commonly uses complex statistical models for predictive changes in transportation system travel patterns resulting from alternative exogenous and endogenous policy assumptions including land use policies and use, demographic characteristics, employment, and multimodal transportation supply networks.

The BMCMPO model design focuses on transportation planning efforts at a regional scale and as a useful tool the 2040 Metropolitan Transportation Plan. The travel demand model further retains vital importance with respect to the 2045 Metropolitan Transportation Plan as an overarching guide for policy-level investment decisions until 2020 Census block geography data becomes available for reassessments and/or recalibration.

Conventional Travel Demand Models use a four-step process. Each step of the TDM simulates the traveler's decision-making on one aspect of trip making. For example, trip generation predicts whether to make a trip while trip distribution finds where to go. Mode split determines which transportation mode to use for specific trip purposes, and traffic assignment estimates which route to take for the trip. This conventional approach follows four sequential steps:

- *Trip Generation* - this initial step translates household and employment data into person trips using trip generation rates established during model calibration.

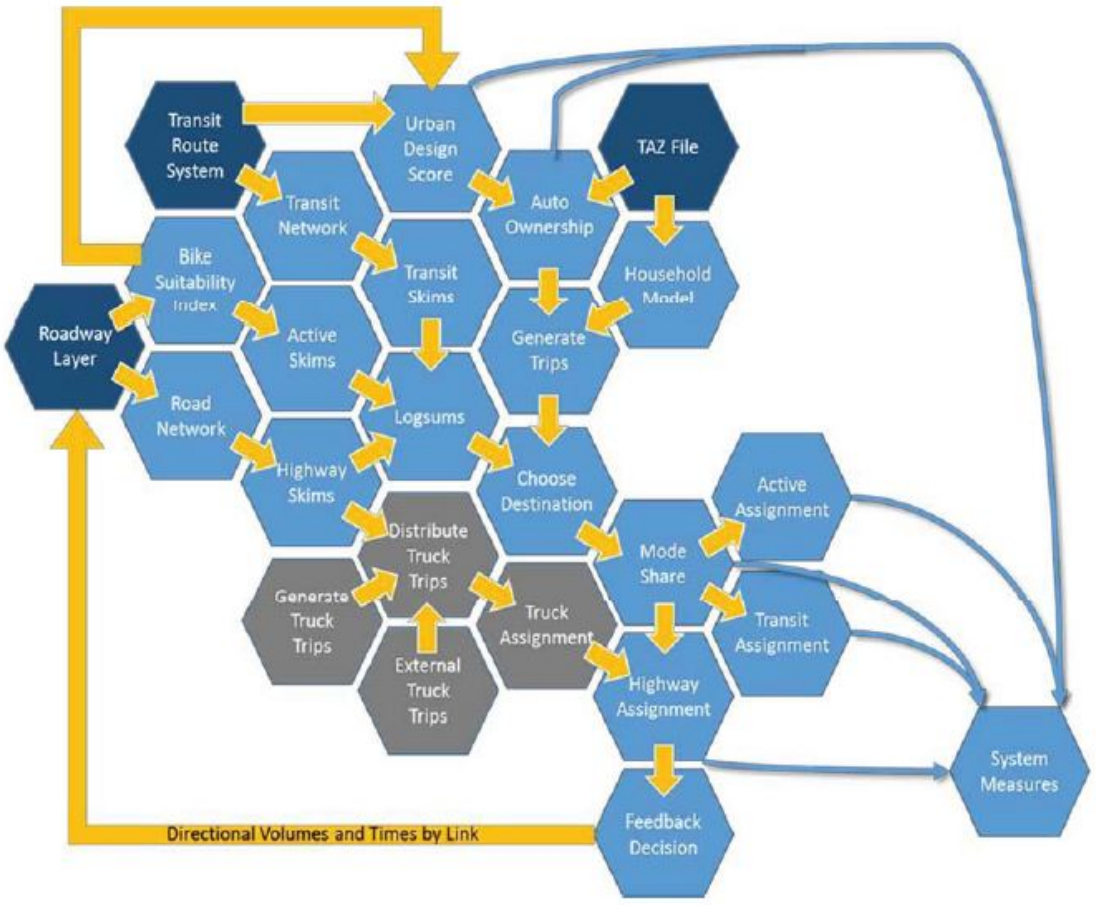
- *Destination Choice* - this second step estimates how many trips travel from one transportation analysis zones (TAZ) to any other zone with the distribution based on the number of trips generated in each of the two zones, and on factors that relate the likelihood of travel between any two zones to the travel time between the two zones.

- *Mode Choice* – this third step estimates the proportions of the total person trips which use transit and ride-sharing modes as opposed to single occupant vehicles for travel between each pair of zones.

- *Trip Assignment* - this final step assigns trips from one zone to another to specific travel routes between the zones. The assignments to routes do consider effects, such as traffic congestion.

The BMCMPO Travel Demand Model uses a feedback loop referenced by the following illustration to pass congested speeds back through the modeling steps so that trip distribution and mode choice components produce results that are consistent with modeled congestion for a given scenario. The following illustration depicts the generalized modeling process.

Development of the BMCMPO Travel Demand Model required various data and information to run each of the four steps of the TDM. Much of these data and information were attributes assigned to each TAZ. Statistical analysis, network attributes, and other parameters used to establish a Base Year (2013) condition for comparisons of future conditions or scenarios employed the same four-step process, but with projected data values. The general aspects of Transportation Analysis Zones, Trip Generation, Destination and Mode Choice, and Traffic Assignment and Validation provided below illustrate the relationships of data, attributes, and model parameters used for the Travel Demand Model.



Transportation Analysis Zones (TAZ)

A total of 591 Transportation Analysis Zones (TAZs), including 34 external stations, were developed for the BMCMPO Travel Demand Model based on 2010 U.S. Census Block geography. Each TAZ identifies total population, households, household characteristics, employment, school enrollment and other socioeconomic data for key attributes. The Travel Demand Model developed in 2013 contains significantly more TAZs than the previous BMCMPO travel demand models (e.g., 1993, 2003) thereby allowed for a more refined level of detail analysis for key spatial attributes. For example, the Base Year 2013 refinement includes group quarters associated with Indiana University which were not been accounted for within TAZ development of models prior to 2013.

The aggregation of population and household data from the 2010 Census into each BMCMPO Travel Demand Model TAZ resulted in a total Monroe County population of 137,976 located within 68,624 households. TAZ attribute development additionally used household and economic data from the 2010 Census. This approach represented key household characteristics, which typically affect the number of trips made by household members (e.g. average household size, median household income, average number of workers per household, average number of vehicles per household).

School enrollment and employment are additional key attributes aggregated into each TAZ. School enrollments identified a total population of 14,660 K-12 students, and a 50,948 higher education enrollment population (41,997 for Indiana University and 8,951 for Ivy Tech) for Monroe County trip assignments. Travel demand model assignments for employment included a total of 79,738 employees for Monroe County by North American Industry Classification System (NAICS-based) employment types. This resulted in a total population of 8,376 retail jobs, 10,066 industry jobs, 3,140 office jobs, and 58,156 service employment jobs.

Another attribute of TAZs used was their classification by area types (rural, suburban and urban). This information is required for speed and capacity estimation of network links. The area types were determined by combined criteria of population and employment density for each TAZ and followed the following tabular guidelines:

TAZ Classification

Area Type	Population Density (Persons/mile2)		Employment Density (Jobs/mile2)
Rural	Less than 1,500	AND	Less than 400
Suburban	400 to 1,000	OR	1,500 to 2,000
Urban	1,000 or greater	OR	2,000 or greater

Trip Generation

Trip generation represents the initial step of the travel demand model development. Attributes assigned to each TAZ translate this information into person trips using trip generation rates, household worker stratification curves, and household market segmentation (automobile ownership). Approximately 75% of the Bloomington-Monroe County households have two people and two or less workers. Household stratification is used because the number of employed workers and size of the household strongly influence the trip generation (e.g. home-based work, home-based other, home-based shop, home-based school).

Likewise, the market segmentation strongly influences trip generation when factoring in the number of autos available to adult household members. The auto ownership variable is key to the trip generation process. The inclusion of the auto ownership model allows the regional travel model sensitivity to different types of urban development and/or non-auto infrastructure (transit and non-motorized). The market segmentation element of the trip generation process categorized household automobile ownership into Zero Auto, Autos Less than Workers, Autos Greater than Workers.

Commercial vehicle (truck) trips represent another aspect that the Travel Demand Model incorporates into the trip generation step. Generally, commercial trips correlate with local employment aspects generated by aggregate commerce (retail, wholesale, manufacturing, mining, etc.) economic activities.

Destination and Mode Choice

The next step of the BMCMPO Travel Demand Model TDM first estimated how many trips travel from one TAZ to another TAZ. The number of trips generated in each of the two zones and use factors such as the likelihood of travel between any two zones to the travel time between the respective two zones determines trip distribution. This step included time of day factors, peak travel, and other attributes to estimate trips. Another aspect that the TDM is the use of a congested travel time feedback loop for assessing consistency with air quality and travel speeds as they are interrelated.

The Travel Demand Model next estimated the proportions of the total person trips by mode type between each pair of zones. This Mode Choice step uses a regression or logit model to assign the probability of using a particular travel mode based upon the utility of that mode in relation to the sum of the utility for all modes. The utility measure is specific to each travel mode, while the coefficients for travel time and cost are generally held constant for all modes for a given trip purpose and population. This regression assumes an improvement in one mode will divert trips proportionately from all other modes. For example, a transit improvement that attracts an additional five percent of all trips would reduce trips on all other modes by five percent. It also has the ability to recognize the potential for something other than equal competition among modes. In this instance, a reasonable assumption for a premium express transit service would attract more diversion from the parallel local bus service than from the

auto modes. Finally, it also relates the mode choice to the type of trip generation (e.g. home-based work, home-based other, home-based shop, and home-based school).

Another unique aspect of the BMCMPO Travel Demand Model is the inclusion of urban design attributes. There are strong correlations in the Bloomington-Monroe County area between land uses and transportation needs. The development and use of a "5D Score" relates land development types and their respective impact on travel behavior (e.g. low density tends to favor high VMT and high density tends to favor low VMT on a per capita basis). The 5D Scores used Density, Destination, Design, Diversity, and Distance to Transit as part of the Mode-Choice step.

Traffic Assignment and Validation

Accurately representing the transportation network of Monroe County is a fundamental part for the successful validation of the BMCMPO TDM. The City of Bloomington and Monroe County provided roadway traffic counts and transit ridership data, and a variety of GIS files of roadways, transit routes, bike routes, trails/paths, traffic signals and parcels data. All these data incorporated for model network development established an accurate representation of transportation infrastructure conditions in Base Year 2013. Technical analysis considered aspects of future networks, highway speeds, capacity estimation, delays, external stations, growth rates, truck traffic, transit network, and other network attributes.

Trip assignment step is the last step of the conventional four-step model process. The standard approach to this process takes trips from the various trip generation tables and assigns trips to the network according to a mathematical algorithm ensuring that all zone to zone trips use paths that minimize the total travel time of all trips on the network. This step is also the last step in the feedback loop that returns updated highway travel times to the trip distribution step which generates revised trip tables based on these updated travel times. This loop ensures the establishment of consistent, stable highway travel times before the final set of highway and transit trips prior to network assignment. Trip assignment uses the following steps: Highway Assignment (equilibrium assignment for peak periods, off peak period, by single occupancy vehicle, high occupancy vehicle, trucks, bikes, and pedestrians), Congested Travel Speeds (standard design curves), and Count Data (local, INDOT).

Validation of the BMCMPO Base Year (2013) Travel Demand Model included comparative measurements against recorded historical data for the Bloomington-Monroe County region. Calibration of a Travel Demand Model takes place at each step in the modelling process involving initial estimations followed by an iterative refinement of the various parameters and coefficients of the model components by comparing model results to observed conditions. This iterative process continues until calibration refinements have resulted in satisfactory results. Once validated, the model becomes a tool for the prediction of future travel patterns with a high degree of confidence.

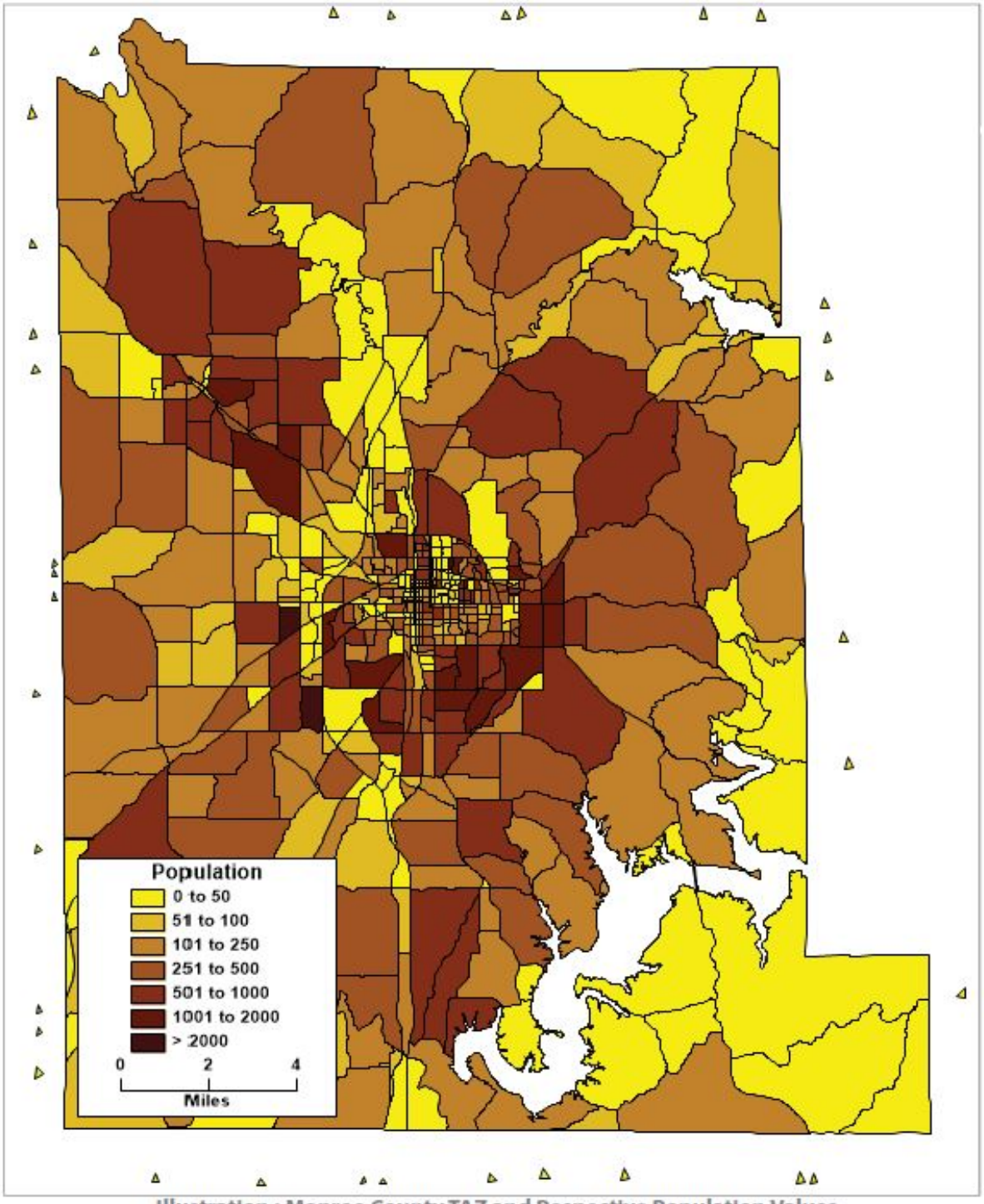
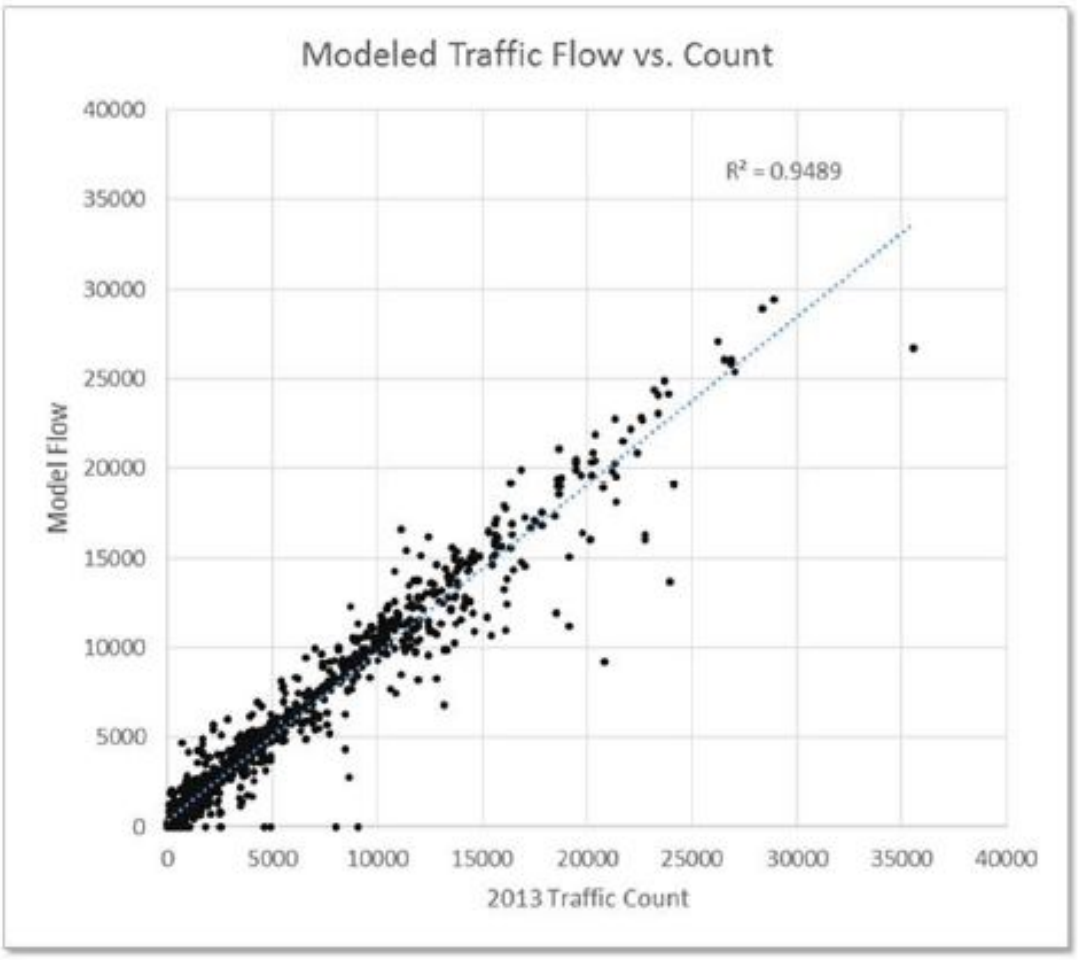


Illustration : Monroe County TAZ and Respective Population Values

A Root Mean Squared Error (RMSE) statistical methodology validated for different volumes, facility and area types. In regard to RMSE, The model is generally within the desirable range of error for high-volume roads and overall, but above desirable targets for low-volume roads, which are more difficult to replicate, given the inherently smaller margins of error afforded.

The BMCMPO travel demand model 2013 Base Year model exhibited a high degree of statistical validation in comparison to documented traffic volume counts showing an overall 26.2% RMSE and a 1.5% count Vehicle Miles of Travel (VMT) error. The system-wide modeled 2013 Base Year VMT estimate is consistent with the 2005 Highway Performance Monitoring System (HPMS) estimate (within -5%). The figure below illustrates in graphical form estimated traffic flows of the BMCMPO Travel Demand Model in relation to actual traffic counts as an element of the validation process.



Appendix E: Environmental Justice

Introduction

Environmental justice is defined by the U.S. Environmental Protection Agency as "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies."

Federal Statutes

Title VI of the Civil Rights Act of 1964 requires that no person in the United States shall on the grounds of race, color, national origin, gender, age, or disability be excluded from participation in, or be denied the benefits of, or be subjected to discrimination under any provision or activity of federal aid recipients, sub-recipients or contractors. Title VI established a standard of conduct for all Federal activities that prohibits discrimination.

Executive Order 12898, issued on February 11, 1994 titled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and the President's Memorandum on Environmental Justice, directed every federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies and activities on "minority populations and low-income populations".

The institution of environmental justice (EJ) ensures equal protection under federal laws, including the following:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq*., 78 stat. 252),
- The National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. § 4321;
- The Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, as amended, 42 U.S.C. § 4601
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq*.) as amended, (prohibits discrimination on the basis of disability);
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq*.), (prohibits discrimination on the basis of age);
- The Americans with Disabilities Act of 1990, as amended, (42 U.S.C. § 12101 *et seq.),* (prohibits discrimination on the basis of disability)

All policies, programs, and other activities undertaken, funded, or approved by the FHWA, FTA, or other US DOT components must comply with EJ requirements from initial concept

development through post-construction operations and maintenance (policy decisions, systems planning, project development and NEPA review, preliminary design, final design, right of way, construction, operations, and maintenance).

The underlying principle of Title VI for the *2045 Metropolitan Transportation Plan* is that minority and low-income residents should:

- Participate in the planning process;
- Benefit from planned transportation improvements; and
- Not bear an unfair burden of the environmental impacts.

The *2045 Metropolitan Transportation Plan* estimates growth patterns using 2010 Census data and future transportation needs which aid in assessing the benefits and burdens that future transportation projects might have on traditionally disadvantaged populations. Plan development provides growth projections to evaluate opportunities for all populations to provide input (Public Participation Plan), assess the effects of future decisions on neighborhoods, the environment, and the economy, and help ensure that the benefits and impacts of future transportation systems are equally distributed.

Methodology & Results

The BMCMPO 2040 MTP environmental justice methodology relied upon demographic and socioeconomic data from the U.S. Bureau of the Census, *American Community Survey (ACS) 2013-2017 Five-Year Estimate, Poverty Status* for each of Monroe County's sixteen (16) Census Tracts. Examinations of each census tract incorporated estimates of total population in relation to minority populations and percentage of population below poverty status. ***Table 1*** summarizes the percentage of non-white and below poverty populations per Census Tract for Monroe County given currently available data. Individual Census Tract identifications relied on two environmental justice characteristics:

- *High minority population tracts where 50 percent or more of the residents in the tract consists of "minority" populations;* and
- *Low income tracts where 50 percent or more of the individuals within the tract are classified as living below poverty level*.

Monroe County census tracts with 50 percent or more of either of the two environmental justice characteristics are locations of importance for transportation planning and project development needs. The identified areas with high proportions of minority population and poverty levels within Monroe County are:

- **Census Tract 1** covering the Bloomington Central Business District and immediate surrounding areas;

- **Census Tract 2.01** covering the northern portion of the Indiana University campus;

- **Census Tract 2.02** covering the southern portion of the Indiana University campus;

- **Census Tract 6.01** covering the west portion of the City of Bloomington

- **Census Tract 6.02** covering the northwestern portion of the City of Bloomington; and

- **Census Tract 16** covering the area north of downtown Bloomington and immediately northwest of the Indiana University campus.

Figure 1 illustrates the Monroe County census tracts with 50 percent or more of the two environmental justice characteristics subject to compliance for current or future transportation system projects. The *2045 Metropolitan Transportation Plan* does not foresee any residential project displacements, commercial project displacements or adverse environmental impact for any project within Monroe County's identified Environmental Justice census tracts.

The Environmental Justice census tracts identified for this plan encompass most of the Indiana University campus and/or have high concentrations of off-campus housing desired by the university's student populations. The high percentage below poverty classification for these tracts is very likely a reflection of the large number of students residing within geographically established boundaries. Furthermore, Tract 2.02 has a high minority proportion possibly reflecting international student residents. By comparison, the Bloomington Housing Authority manages a large low-income housing complex within Tract 6.01 as do several other agencies within this tract. Tract 6.01 is close to meeting the EJ characteristics, but offers some context when comparing it to the balance of environmental justice census tracts that have high student populations. Projects that are within environmental justice census tracts shall require higher levels of analysis during Red Flag Investigations prior to Transportation Improvement Program (TIP) programming. This in turn may require the need to address specific EJ concerns as a project moves forward with implementation.

Public transit service is an additional Environmental Justice consideration. ***Figure 1*** provides a useful reference for assessing the spatial relationship between Transit services and Environmental Justice compliance. Bloomington Transit, Indiana University (IU) Campus Bus, and Rural Transit provide transit services within and in close proximity to Indiana University and the downtown area (Tracts 1, 2.01, 2.02, 6.01, 6.02, and 16). Taken together, Bloomington Transit, IU Campus Bus, and Rural Transit provide a thorough range of transit services to all Environmental Justice Tracts within Monroe County. Future transit investments supported by the *2045 Metropolitan Transportation Plan* shall continue to enhance mobility and service for all Environmental Justice tract populations.

The multi-modal transportation improvements contained in the *2045 Metropolitan Transportation Plan* will benefit areas with a concentration of low-income households through improved mobility and accessibility without having a "disproportionately high" or "adverse" impacts. No households will undergo displacement in implementing transportation improvements within these low-income or high minority areas. Finally, the 2045 MTP makes multi-modal transportation investments within, and to, low-income areas ensuring that low-income groups receive a proportionate share of benefits, without enduring adverse social, economic or environmental impacts. Given these consideration factors, the *2045 Metropolitan Transportation Plan* is in compliance with Title VI relative to Environmental Justice.

Environmental Justice Conclusions

Table 1 and ***Figure 1*** define current Monroe County Environmental Justice census tracts with respective minority populations and poverty thresholds meeting Title VI requirements as they relate to transportation planning. Census tracts 1, 2.01, 2.02, and 16 illustrate a high minority population and poverty level concentrations within and surrounding the Indiana University campus. Conversely, environmental justice census tracts 6.01 and 6.02 reflect the City of Bloomington's poverty levels along the west and northwest corporate boundaries. No other environmental justice areas reside within balance of the metropolitan planning area or more rural areas of Monroe County.

Environmental Justice – Future Reassessments

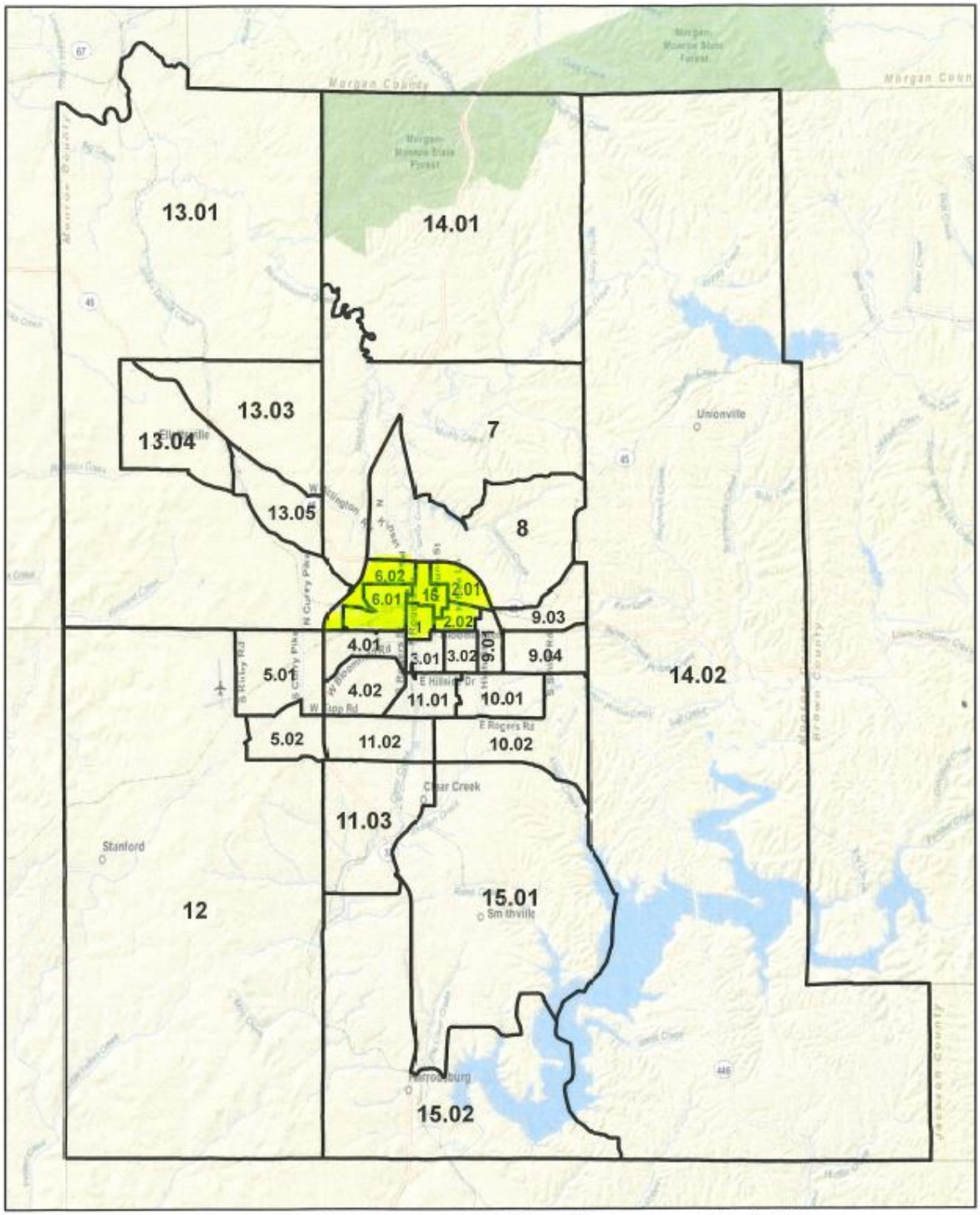
Future reassessments of identifiable Monroe County environmental justice census tracts will coincide with the release of the 2020 Census data in calendar years 2021-2022. At present (08-17-2020), Indiana's self-response rate stands at only 67.2% in comparison to a national self-response rate of 63.0%. These low rates are a reflection of the once-in-a-century global/national COVID-19 pandemic and current domestic economic, social, and political crises exacerbated by the pandemic. The U.S. Census Bureau requested from the U.S. Congress in April 2020 a four-month extension of the 2020 Census allowing for an October 31, 2020, targeted completion given the COVID-19 pandemic plus significant population undercounts in national urban areas with traditionally underrepresented environmental and social justice communities. The Census Bureau announced in August 2020 a prematurely shortened deadline supported by the national administration of September 30, 2020. This action will effectively limit non-response follow-up (NRFU) within the Bloomington urban area, Monroe County, the State of Indiana, and national communities leading to potentially significant undercounts of total populations plus disproportionate undercounts within vulnerable environmental justice and social justice populations who reside in urban political jurisdictions. The long-term consequential impacts of prematurely shortened statutory reporting deadlines on the Bloomington-Monroe County urban area includes (1) significant decade-long losses of federal-fund allocations supporting critical local needs, and (2) continued social inequities which local jurisdictions must solely address without federal support for the linkage of environmental and social justice communities populations to jobs, education, health care, and greater respective jurisdictional communities.

Table 1 - Monroe County Census Tracts - Environmental Justice Population Estimates*

2013-2017 Census Tract	Estimated Population	Estimated White Only**	Estimated Non-White	Estimated % Minority	Est. Population Below Poverty Level	Est. % Population Below Poverty Level
1	5,248	4,651	597	11.4%	3,942	75.1%
2.01	323	53	270	83.6%	243	75.2%
2.02	60	45	15	25.0%	36	60.0%
3.01	3,930	3,332	598	15.2%	1,292	32.9%
3.02	2,871	2,733	138	4.8%	946	33.0%
4.01	4,171	3,329	842	20.2%	1,111	26.6%
4.02	4,697	3,744	953	20.3%	877	18.7%
5.01	4,370	3,903	467	10.7%	699	16.0%
5.02	3,450	2,781	669	19.4%	456	13.2%
6.01	3,956	2,822	1134	28.7%	2,024	51.2%
6.02	3,428	2,748	680	19.8%	1,842	53.7%
7.00	3,021	2,792	229	7.6%	316	10.5%
8.00	5,713	4,818	895	15.7%	1,223	21.4%
9.01	3,262	2,393	869	26.6%	1,357	41.6%
9.03	5,198	4,145	1053	20.3%	1,622	31.2%
9.04	5,434	3,214	2220	40.9%	2,256	41.5%
10.01	5,604	4,601	1003	17.9%	564	10.1%
10.02	6,032	4,814	1218	20.2%	721	12.0%
11.01	5,775	4,276	1499	26.0%	2,147	37.2%
11.02	4,422	3,322	1100	24.9%	610	13.8%
11.03	2,955	2,762	193	6.5%	328	11.1%
12.00	5,994	5,702	292	4.9%	314	5.2%
13.01	5,780	5,376	404	7.0%	407	7.0%
13.03	5,931	5,677	254	4.3%	303	5.1%
13.04	4,278	4,036	242	5.7%	853	19.9%
13.05	2,122	2,029	93	4.4%	198	9.3%
14.01	2,082	2,018	64	3.1%	115	5.5%
14.02	5,749	5,566	183	3.2%	564	9.8%
15.01	5,593	5,237	356	6.4%	492	8.8%
15.02	2,910	2,818	92	3.2%	326	11.2%
16	4,953	4,336	617	12.5%	3,790	76.5%
TOTAL	129,312	110,073	19239	14.9%	31,974	24.7%

*Source: U.S. Census Bureau, ACS 2013-2017 Five-Year Estimate, Poverty Status in the past 12 months, December 2019.
**White alone, not Hispanic or Latino

Figure 1 - Monroe County, Indiana - Environmental Justice Census Tracts *



*Source: U.S. Census Bureau, ACS 2013-2017 Five-Year Estimate, Poverty Status in the past 12 months. Prepared December 2019.

Appendix F: Air Quality & Climate Change Scientific Assessments

Overview

The Clean Air Act of 1970 (CAA 1970) requires the development of a State Implementation Program (SIP) for achieving National Ambient Air Quality Standards (NAAQS) in non-attainment areas. The relationship between transportation planning and air quality planning formalized with the Clean Air Act Amendments of 1990. Locally, this led to the establishment of a direct relationship between projects in the Bloomington-Monroe County Metropolitan Planning Organization's (BMCMPO) Transportation Improvement Program (TIP) and air quality compliance.

Air quality conformity determinations are required under current federal requirements for major transportation investments in designated air quality "non-attainment" and "maintenance" areas. The composite of major transportation investments contained in a Metropolitan Planning Area's (MPA) Long Range Transportation Plan (LRTP) must therefore demonstrate air quality improvement or, at minimum, no degradation in air quality relative to the "Existing Plus Committed" transportation network. The BMCMPO study area that includes the urbanized area within Monroe County is an air quality attainment area.

The State of Indiana's Ambient Air Quality Monitoring Network includes the operation of one (1) air quality monitoring site within the Bloomington-Monroe County Metropolitan Planning Area. This monitoring site, located at Binford Elementary School (Figure F1) and active since April 1, 2009 (https://www.in.gov/idem/airquality/files/monitoring_network_description.xls), continuously samples fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$) in hourly increments. The creation of this fine particulate matter primarily originates from industrial processes and fuel combustion.

As noted by the Indiana Department of Environmental Management (IDEM), "the annual standard for $PM_{2.5}$ is 12.0 micrograms per cubic meter ($\mu g/m^3$). Attainment is determined by evaluating the average of the annual arithmetic means over a three-year period. The three-year average of the weighted annual mean of $PM_{2.5}$ concentrations from a single monitor must be less than or equal to 12.0 $\mu g/m^3$. A monitor that measures 12.05 $\mu g/m^3$ or higher identifies as nonattainment. The annual site design value is the average of the annual mean over three-years. An annual mean is the average of that year's four quarterly averages, unrounded. A quarterly mean is the average of all available data from the respective quarter. The annual site design value rounds to one decimal place. The United States Environmental Protection Agency (USEPA) revised the annual standard for fine particulate matter on December 14, 2012. This standard was effective March 18, 2013. Therefore, design values are not comparable to the new annual standard until the year ending 2013."

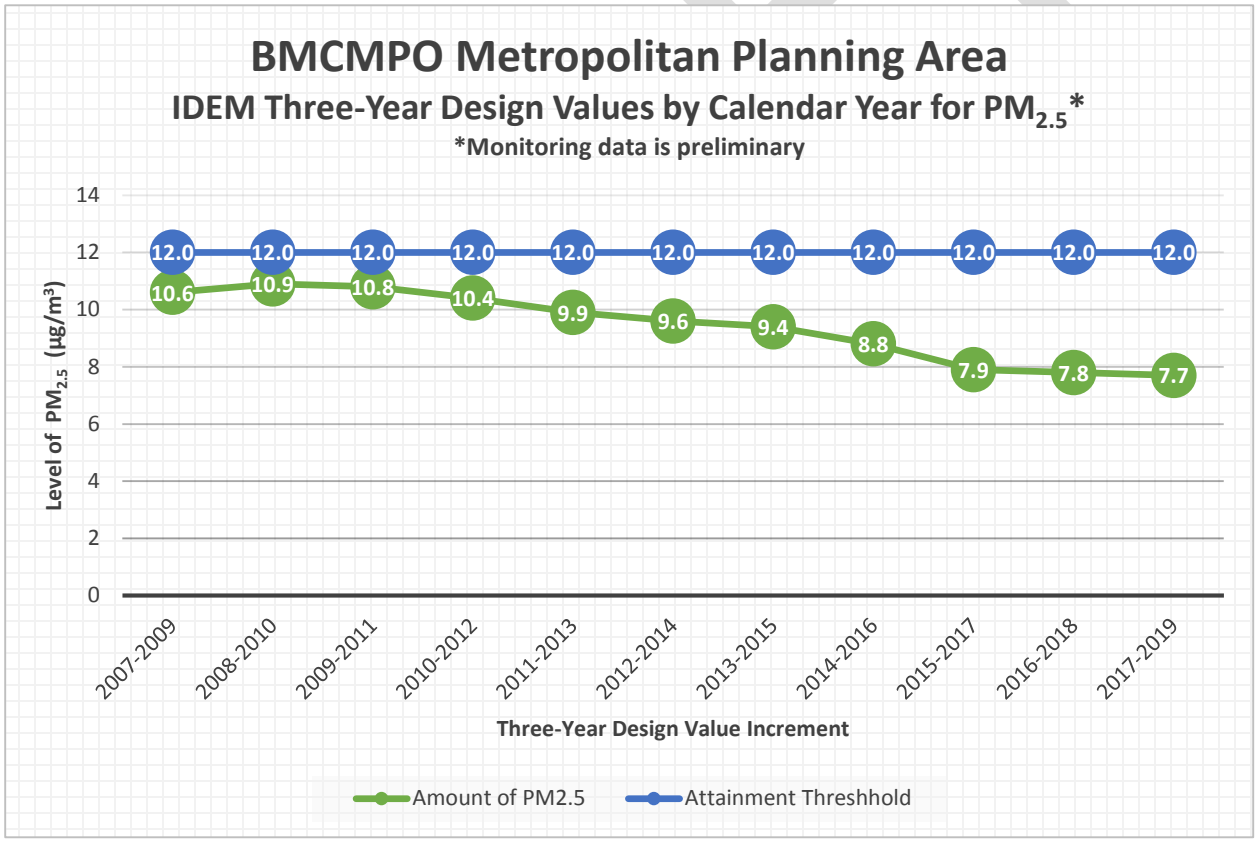
IDEM's $PM_{2.5}$ Annual Monitoring Data from April 2009 through July 31, 2019 for the Bloomington-Monroe County Binford Elementary School site show a consistent $PM_{2.5}$ decline within the urban area from 10.62 µg/m^3 to 7.70 µg/m^3 (Table F1). As previously noted, a monitor that measures 12.05 µg/m^3 or higher achieves nonattainment status.

The 2017-2019 three-year design value for the Bloomington-Monroe County $PM_{2.5}$ monitor is 18 µg/m^3. Reference data are available at https://www.in.gov/idem/airquality/files/monitoring_quick_view_pm25.xls.

Air Quality Compliance

Monroe County and the City of Bloomington currently meet federal air quality standards, and the region is therefore in "*attainment*" for criteria pollutants. The NAAQS set limits on atmospheric concentrations of six criteria pollutants—lead, carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, and particulate matter—that cause smog, acid rain, and other health hazards.

Figure F-1: Annual Air Quality Monitoring Data within the BMCMPO Metropolitan Panning Area.



A conformity determination is not required for the Bloomington and Monroe County Metropolitan Planning Area. The projects programmed in the 2045 Metropolitan Transportation Plan should therefore result in an improvement to air quality given a system-

wide investment focus on multimodal safety, maintenance and preservation, public transit, and bicycle/pedestrian facilities. The travel demand model analysis completed for the *2040 Metropolitan Transportation Plan* indicates that vehicle miles of travel (VMT) will increase for the "No-Build, Do-Nothing" (Existing Plus Committed) and alternative transportation network over the next two decades years given forecast assumptions about:

- System-wide roadway network volume-to-capacity ratios;
- Roadway network miles operating below Level-of-Service "C";
- Vehicle-miles of travel on facilities operating on below Level-of-Service "C";
- Congested vehicle-hours of travel; and
- Total vehicle-miles of travel.

The BMCMPO travel demand forecast model suggests that air quality could degrade over the Year 2045 forecast period if agencies within the Bloomington and Monroe County Metropolitan Planning Area make no further major transportation investments for system preservation. This finding assumes a correlation of congestion and air quality to vehicle speeds, total vehicles, and vehicle miles of travel. Simply stated, an increase in mobile source generated carbon monoxide and ozone (hydrocarbons and nitrous oxides) will occur under a "no-build" Transportation Plan alternative scenario.

Conversely, the most favorable of the Travel Demand Model scenario alternatives for air quality (e.g., "Peak Oil", a quantitative decrease of overall urban area vehicle miles traveled or a dedicated policy of a compact urban form, e.g., "Urban Infill") documented in the 2045 MTP focus on public transportation and alternative transportation without adding capacity and focusing on system-wide capacity preservation and maintenance could result in air quality improvements over the no-build condition through the achievement of reductions in:

- System-wide volume-to-capacity ratios;
- Congested roadways;
- Vehicle miles of travel on congested roadways;
- Congested vehicle hours of travel; and
- Continued implementation of federal automobile fuel efficiency standards (i.e., corporate average fuel economy known as "CAFE").

Forecast growth in population, employment, households, and real disposable income will bring about increased transportation demands within the BMCMPO Metropolitan Planning Area during the forecast period extending to Year 2045 under current economic assumptions. The recommendations of the 2045 Metropolitan Transportation Plan will, however, contribute to overall air quality improvement through a systematic application of transportation capacity preservation, minimal capacity expansion projects, and continued multi-modal system growth of the public transportation, bicycle, and pedestrian systems.

One additional note not accounted for in the BMCMPO travel demand modeling process involves a formal national-level rollback of the CAFE (https://www.federalregister.gov/documents/2009/03/30/E9-6839/average-fuel-economy-standards-passenger-cars-and-light-trucks-model-year-2011) fuel economy standards for cars, light trucks and SUVs announced by the U.S. Department of Transportation and the Environmental Protection Agency on March 30, 2020. Final Rules published in the Federal Register (https://www.regulations.gov/docket?D=NHTSA-2018-0067) and (https://www.regulations.gov/docket?D=EPA=HQ-OAR-2018-0283) redirects Corporate Average Fuel Economy (CAFE) standards for vehicle manufacturers. This new federal rule takes effect in late 2020 directs manufacturers achieve a 1.5% annual increase in vehicle fuel efficiency in place of a 5% annual increase under the current rule issued in 2012. Under this final federal rule issuance, new cars would have to average approximately 40 miles per gallon instead of closer to 50 miles per gallon by 2026. The major consequence of this decision is an increased scientific modeling probability of vehicle emission air pollutants and a scientific concomitant increase in atmospheric warming and scientifically documented climate change. A protracted set of near-term legal challenges are expected. The transportation sector of the national economy is the largest source of climate change greenhouse gases in the United States according to USEPA scientifically documented data.

The USEPA *Policy Assessment for the Review of the National Ambient Air Quality Standards for Particulate Matter, External Review* (https://www.epa.gov/sites/production/files/2019-09/documents/draft_policy_assessment_for_pm_naaqs_09-05-2019.pdf) rigorously demonstrated that lowering particulate matter (PM) standards could save upward of 67,000 lives nationally. The USEPA nevertheless announced in April 2020 a proposal to retain, without changes, the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) including both fine particles ($PM_{2.5}$) and coarse particles (PM_{10}).

In July 2020, the Council on Environmental Quality (CEQ) published in the *Federal Register* a Final Rule to modernize National Environmental Policy Act (NEPA) Regulations. The final rule, the first major update to the CEQ regulations since their promulgation in 1978, will become effective on September 14, 2020

The final rule includes significant changes to the analysis of effects and alternatives:

- Changes the definition of “major federal action,” which triggers NEPA review

- Eliminates direct, indirect, and cumulative effects (e.g., climate change), and focusing the analysis on effects that are reasonably foreseeable and that have a reasonably close causal relationship to the proposed action. The terms "reasonably foreseeable" and "reasonably close" are not quantifiably defined thereby leaving them open to legal argument and/or interpretation.

- Redefines "reasonable alternatives" must demonstrate technical and economic feasibility, and meet the proposed action purpose and need.

- Repeals the specific requirement to consider cumulative effects normally used for climate change analysis thereby undercutting substantive scientifically documented climate change data published since the mid-1800s in the United States.

- Newly emphasizes the "need for disclosure" in contrast to a traditional focus on public participation. Specifically, public comments must have high specificity, and comment submissions must occur during prescribed comment periods. Agencies need only respond to "*substantive*" comments. Comments or objections not submitted within prescribed definitions will be deemed "*forfeited as unexhausted*." Agencies would have the *discretionary* need for public meetings or hearings, formally a critical element in the development of an EIS. The CEQ proposed rule additionally *eliminates* a mandatory 30-day comment period on Final Environmental Impact Statements (FEISs).

Climate Change Scientific Assessments

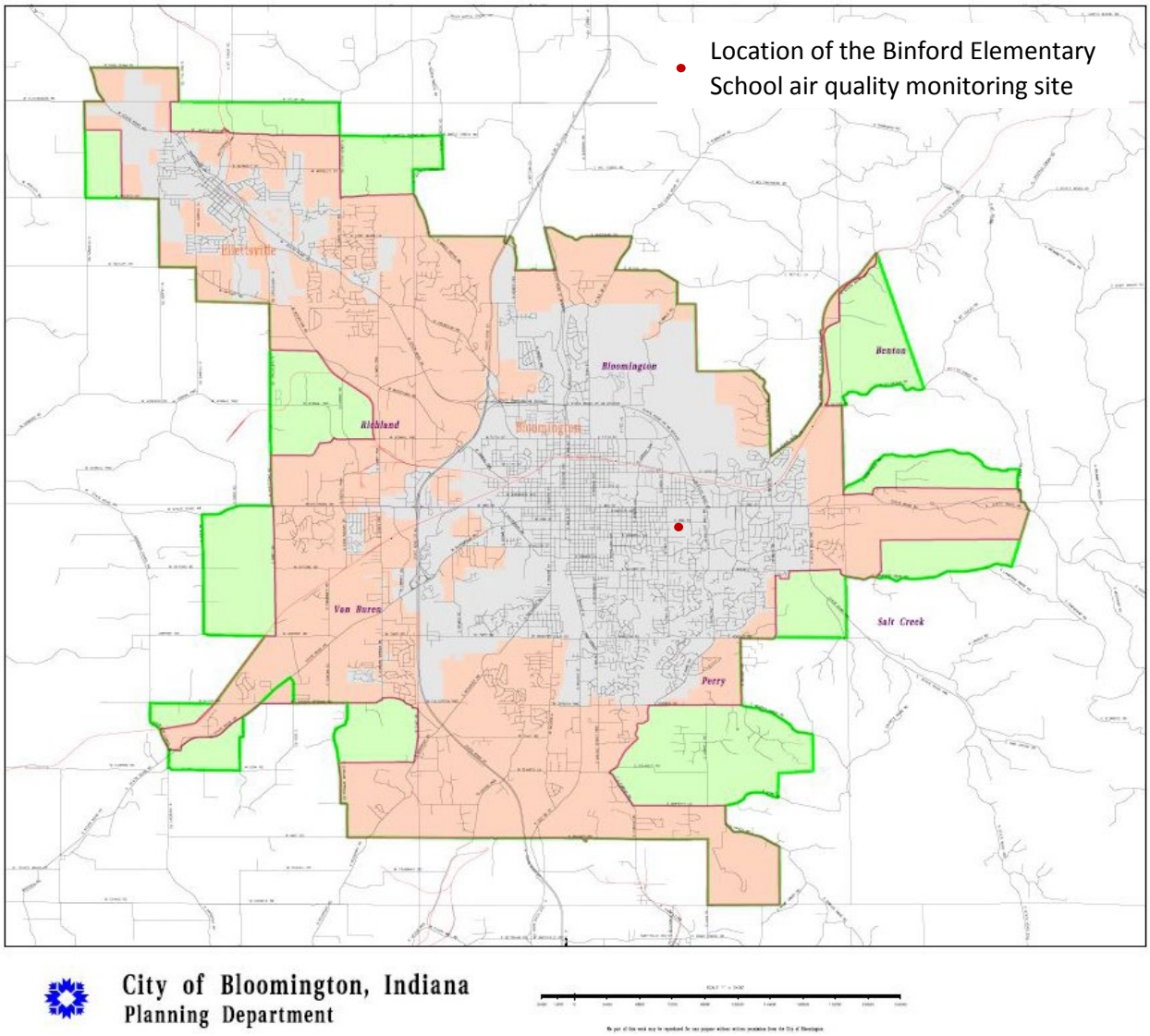
Climate Change is a critical concern of the Bloomington-Monroe County Metropolitan Planning organization. Climate change represents an immediate, near-term, and long-term threat to human health, welfare, existing public infrastructure investments, public water resources, agriculture and forestry, energy generation and use, foreseen urban environments, and aggregate regional ecosystems. Climate change within the context of the 2045 MTP means the long-term rise in the average temperature of the Earth's climate system, a major aspect of climate change scientifically demonstrated by direct temperature measurements and by measurements of various effects of the warming.

The *Indiana Climate Change Impacts Assessment* (https://docs.lib.purdue.edu/climatetr/2/) identifies rising average annual temperatures and rising average annual precipitation for more than a century as the most significant climate change threats to the State of Indiana's residents. The conclusion of this March 2018 scientific study notes:

- *"This assessment documents that significant changes in Indiana's climate have been underway for over a century, with the largest changes occurring in the past few decades. The findings in this assessment highlight the projected future changes using two scenarios representing the rise of heat-trapping gases over the next century. These projections generally suggest that the trends that are already occurring will continue*

and the rates of these changes will accelerate. They indicate that Indiana's climate will warm dramatically in the coming decades, particularly in summer. Both the number of hot days and the hottest temperatures of the year are projected to increase markedly. Indiana's winters and springs are projected to become considerably wetter, and the frequency and intensity of extreme precipitation events are expected to increase, although more research is needed in this area to better determine the details."

Climate change vulnerabilities for Monroe County documented through additional independent scientific research by the Indiana University Environmental Resilience Institute (https://hri.eri.iu.edu/index.html and (https://hri.eri.iu.edu/climate-vulnerability/index.html?placeid=MONROE%20County#climateExpoHead) includes primary community metrics in a geographic information system (GIS) format identifying forecast events of extreme temperatures, precipitation levels, land use, and sociological/demographic individualities.



Appendix G: Projects

Background

This appendix provides a central reference point for the identification of recommended BMCMPO 2045 Metropolitan Transportation Plan multi-modal projects administered by Monroe County, the Town of Ellettsville, the City of Bloomington, Bloomington Transit, Indiana University Campus Bus, Area 10 Agency on Aging Rural Transit, and the Indiana Department of Transportation.

Complete Streets Policy Consideration

The list of current *FY 2020-2024 Transportation Improvement Program* projects identified within this appendix were subject to a BMCMPO *Complete Streets Policy* review. Complete Streets are roadway projects designed to accommodate all users, including, but not limited to, pedestrians, bicyclists, users of public transit, and individual mobility devices, people with disabilities, the elderly, motorists, freight providers, emergency responders, and adjacent land users. Through complete streets, the safety and mobility for vulnerable road users is as much of a priority as all other modes.

The BMCMPO's adopted Complete Streets Policy creates an equitable, balanced, and effective transportation system for all types of users integrated with adjacent land uses where every roadway user can safely and comfortably travel throughout the local community. The adopted Complete Streets Policy website posting is https://bloomington.in.gov/sites/default/files/2019-02/BMCMPO%20Complete%20Streets%20Policy%20-%20FINAL%20-%20ADOPTED%2011-09-18.pdf.

The following **Table G-1**, Recommended Place Measures and Metrics, is inspired, adapted by, and adopted from *Evaluating Complete Streets Projects: A Guide for Practitioners*, a resource created by American Association of Retired Persons (AARP) and Smart Growth America (SGA) for measuring the results of alternative transportation projects. Place Measures adopted by the BMCMPO fall under the macro-level headings of "Place", "Crash Risk", and "Equity." Application scales consider project and network levels. Detailed applicable project and network "metrics" represent the foundation of each Place Measure and relevant application scale. **Table G-2** details the Transportation Improvement Program Project Prioritization Criteria using Complete Streets guidance reaffirmed by the Policy Committee in 2019.

Table G-1: Recommended Place Measures and Metrics*

PLACE MEASURE	APPLICATION SCALE	METRIC
PLACE Being aware of community context, including existing and plane land use and buildings can result in streets that are vital public spaces. Place-based focused measurements ensure a product that is compatible and enhances the community.		
Quality of bicycling environment	Project	• Width of bicycle facilities • Pavement condition of bicycling facility • Bicyclist level of comfort. Comfort is in accord with separation of traffic, volume and speed of cars • Right turn on red restrictions
Quality of pedestrian environment	Project	• Crossing distance and time • Presence of enhanced crosswalks • Wait time at intersection • Width of walking facility • Right turn on red restrictions • Planting of new or maintaining existing trees
Quality of transit environment	Project	• Transit Level of Service/Multimodal Level of Service (MMLOS) at segment and/or intersection • Quality of accommodations for passengers at stops • Presence of wayfinding and system information • Real-time arrival information • Off-board payment option
Resident participation	Project	• Number of responses gathered • Number of people at meetings
Quality of automobile trips	Project	• Travel lane pavement condition
CRASH RISK Safe travel is a fundamental transportation goal. Safety measures should watch for elements associated with injurious crashes and those associated with perceptions of safety.		
Compliance with posted speed limit	Project	• Percentage of drivers exceeding the posted speed limit • Match between target speed, design speed, and 85th percentile
Crashes	Project	• Number of crashes by mode on project (before and after) • Crash severity by mode and location
Crashes	Network	• Total Number • Rate and location by mode
Fatalities	Project	• Number of fatalities by mode on project (before and after)
Fatalities	Network	• Number of fatalities suffered by all modes

Table G-1: Recommended Place Measures and Metrics (continued)

PLACE MEASURE	APPLICATION SCALE	METRIC
EQUITY Transportation services impact some populations and neighborhoods more than others. In project selection and evaluation, the distribution of impacts and benefits should examine the needs for traditional disadvantaged populations.		
Auto trips	Project	• Driving trips as portion of total trips along project
Auto trips	Network	• Driving trips to primary and secondary schools • Vehicle Miles Traveled (VMT) per capita • Driving commutes to work as portion of total commutes to work
Bicycle trips	Project	• Bicycling trips as portion of total trips along project
Bicycle trips	Network	• Bicycling trips as portion of total trips • Bicycling commutes to work as portion of total commutes to work
Transit trips	Network	• Transit trips as portion of total trips • Transit commutes to work as portion of total commutes to work
Walk trips	Project	• Walk trips as portion of total trips along project
Walk trips	Network	• Walk trips as portion of total trips in community • Walk commutes to work as portion of total commutes to work

Source: BMCMPO, Complete Streets Policy, November 2019.

The following Complete Streets Policy Project Prioritization Criteria serves the BMCMPO Citizens Advisory Committee, the Technical Advisory Committee, and the Policy Committee as a guiding prioritization framework for the placement of projects into the Transportation Improvement Program (TIP).

Table G-2 BMCMPO Transportation Improvement Program – Project Prioritization Criteria

BMCMPO TIP - Project Prioritization Criteria		
	Weighting	**Yes = 1, No = 0**
System Preservation and Maintenance		
Project improves upon *existing* infrastructure or serves to retrofit missing infrastructure (e.g. filling in sidewalk gaps)	15%	
Project addresses a maintenance need (e.g. repaving, bridge repair)		
Project is located within existing right of way		
	Total	**0**
Safety		
Project addresses a known high crash risk location	20%	
Project location is identified in the most recent MPO Crash Report's top 50 crash locations		
Project location is identified in the most recent MPO Crash Report's top 15 bicycle and pedestrian crash locations		
Project incorporates strategies that reduce crash risk		
Geometrical improvement for motorized safety		
Geometrical Improvement for non-motorized safety		
Signalization Improvement		
Signage/Wayfinding		
Project improves safe travel to nearby schools (within 1 mile)		
Other improvements with rationale as to how the project reduces crash risk		
	Total	**0**
Multi-Modal Options		
Project incorporates Multi-Modal solutions	20%	
Project located along existing transit service		
Project located along existing pedestrian/bicycle facility		
Project reduces modal conflict (e.g. traffic signals, grade separation, dedicated lanes)		
Project includes transit accommodations (e.g. pullouts, shelters, dedicated lanes, signal priority)		
Project includes sidewalk improvements		
Project includes bicycle facility improvements		
Project contains high comfort bicycle infrastructure appropriate to facility function (e.g. protected bike lane, multi-use path)		
Project contains high comfort pedestrian infrastructure appropriate to facility function (e.g. curb extension, refuge island, crosswalk enhancement)		
Project makes a connection to an existing active mode facility		
	Total	**0**
Congestion Management		
Project incorporates congestion management strategies	10%	
Grade separation or dedicated travel space for individual modes		
Improvements to access management		
Signalization improvement		
Improves parallel facility or contributes to alternative routing		
Provides capacity for non-motorized modes		
Adds transit capacity		
Other strategies		
	Total	**0**
Health and Equity		
Project provides increased accessibility for people with a low income & minorities	10%	
Project corrects ADA non-compliance		
Project promotes physical activity		
Project reduces vehicle emissions		
Project will not have a negative impact for a natural resource		
Project will not have a negative impact for a socio-cultural resources		
	Total	**0**
Consistency with Adopted Plans		
Project located along planned transit service	10%	
Project located along planned pedestrian/bicycle facility		
Local Master Thoroughfare Plan Priority		
Transit Plan Priority		
Bicycle/Pedestrian Plan Priority		
Project supports goals and principles of MPO Metropolitan Transportation Plan		
Project supports goals and principles of local land use plans		
Other applicable planning documents		
	Total	**0**
Context Sensitivity and Land Use		
Project contributes to the sense of place and matches the surrounding land use	15%	
Project balances the need to move people with other desirable outcomes		
Project involves minimal disruption to the community (e.g. limited land acquisition, limited change in traffic circulation)		
Project is seen as adding lasting value to the community		
Project supports high quality growth and land use principles		
Project improves accessibility and/or connectivity to existing land use development		
Project location supports infill/redevelopment		
Project contributes to transportation network grid development/roadway network connectivity		
	Total	**0**
	Overall Total	**0**

Source: BMCMPO, Complete Streets Policy, November 2019.

Project Cost Estimation

Project cost estimation is a critical step for project selection, project programming, and project scheduling. As an overall long-range guiding document, the *2045 Metropolitan Transportation Plan* relied on project cost estimates from the Local Planning Agencies and the Indiana Department of Transportation. The BMCMPO uses this process for the *FY 2020-2024 Transportation Improvement Program* and future Transportation Improvement Program publications where multiple steps determines individual infrastructure project cost estimates.

Federal Funding Sources

Projects programmed within the Transportation Improvement Program (TIP) categorize project phases by fiscal year along with the associated federal funding source accompanied by its appropriate local match as is necessary. Project phases will normally include:

- Preliminary Engineering (PE)
- Right-of-Way Acquisition (RW)
- Construction Engineering (CE)
- Construction (CN)

Projects use various Federal transportation sources based on the type of project. In most circumstances, each Federal funding source requires a certain percentage of local or State matching funding. The following narrative briefly highlights major transportation funding sources found under current Transportation Improvement Program legislation.

- *Surface Transportation Program* (STPB) funds projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge/tunnel project on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including bus terminals.

- *Highway Safety Improvement Program* (HSIP) funds projects with the goal of achieving a significant reduction in traffic fatalities and serious injuries on all public roads including non-State-owned public roads.

- *Bridge Programs* (BR) funds bridge safety, inspection and improvement projects on state and local jurisdictional levels.

- *Transportation Alternatives Program* (TAP) funds a variety of alternative transportation projects such as transportation enhancements, recreational trails, and Safe Routes to School.

- *Public Mass Transit Fund* (PMTF) funds projects that promote and develop public transportation within Indiana and targeted to increase local financial involvement and encourage the delivery of efficient, effective transportation.

- *National Highway Performance Program* (NHPP) funds construction of new facilities on the National Highway System. These funds ensure that investments in Federal-aid funds in highway construction support progress toward the achievement of performance targets established in a State's asset management plan for the National Highway System.

- *Recreational Trails Program* (RTP) funds projects that develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses.

2045 Metropolitan Transportation Plan Projects

The projects within this Appendix currently reside within the planning horizon of the *2045 Metropolitan Transportation Plan*. Unless otherwise noted as "Illustrative", all identified projects represent current FY 2021 programming of the BMCMPO FY 2020-2024 TIP and the current FY 2021-2025 *Indiana Statewide Transportation Improvement Program* (INSTIP).

This project index is not all-inclusive nor does it necessarily represent a formal investment commitment by governmental entities or governmental entity partners pending further engineering study, priority establishment, funding availability, and formal programming within the framework of the local and state transportation improvement programming process.

This Appendix further considers non-programmed "illustrative" or non-funded TIP and INSTIP projects in their current form pending formal programming commitments by specific Local Planning Agencies (LPAs) and the Indiana Department of Transportation. All projects nevertheless reflect a central reference point of local and state project intentions.

The estimated costs for all currently programmed projects includes federal, state, and local sources. Many local public agency projects have substantial local fund commitments greatly beyond federal fund matching fund requirements since the demand for federal funds greatly exceeds the supply of federal funds allocated to Monroe County, the Town of Ellettsville, and the City of Bloomington.

The type of activity scheduled and the Federal funding category determine locally initiated project priorities. Additional project prioritization influences include state and local policy-level decision-making and the availability of Federal, State, and local funds. Wherever possible, technical and non-technical factors jointly determine projects which have the greatest need for implementation.

Table G-3: BMCMPO Project Index: FY 2021-2025 *

DES#	Project	Project Type	Estimated Cost [mil]	Notes
1802977	Fullerton Pike Phase 3 with Bridge	New Roadway Connectivity	$16.7	FY2020-2024 programmed
1700733	Curry Pike/Woodyard Road/Smith Pike Roundabouts	Safety	$2.3	FY2020-2024 programmed
1702957	Vernal Pike Connector	New Roadway Connectivity	$11.0	FY2020-2024 programmed
1900405	Karst Farm Greenway, Phase II -B, Section 1	Multiuse Pathway	$0.26	FY2020-2024 programmed
1900493	Bicycle Safety Inlet Repair	Safety	$0.1	FY2020-2024 programmed
1500210	Bridge Safety Inspection & Inventory	Preservation	$0.3	FY2020-2024 programmed
500398	Jackson Creek Trail	Multiuse Pathway	$2.4	FY2020-2024 programmed
1700735	B-Line Trail Extension	Multiuse Pathway	$2.7	FY2020-2024 programmed
1900402	17th Street Multimodal Improvements	Modernization & Multiuse Pathway	$4.6	FY2020-2024 programmed
1900404	Guardrail Improvement Project	Safety	$0.5	FY2020-2024 programmed
1900403	Downtown Curb Ramps - Phase 3	Safety	$0.6	FY2020-2024 programmed
1900400	Signal Timing Project	Safety	$0.5	FY2020-2024 programmed
1900399	1st Street Reconstruction	Modernization & Multiuse Pathway	$5.0	FY2020-2024 programmed
1700976	Crosswalk Improvements	Safety	$0.7	FY2020-2024 programmed

*Estimated cost includes all fund sources.

Table G-4: BMCMPO Public Transit Project Index: FY 2021-2025*

DES#	Project	Project Type	Estimated Cost [mil]	Notes
Multiple	BT Access Operating Assistance	Operating	$38.5	FY2020-2024 programmed
Multiple	BT Major Vehicle Components	Capital	$0.9	FY2020-2024 programmed
Multiple	BT Access Vehicles	Capital	$0.7	FY2020-2024 programmed
Multiple	BT Support Vehicle Replacement	Capital	$0.2	FY2020-2024 programmed
Multiple	BT Battery Electric Buses	Capital	$7.4	FY2020-2024 programmed
Multiple	BT Fare Collection Equipment	Capital	$1.6	FY2020-2024 programmed
Multiple	BT Small Replacement Bus	Capital	$0.1	FY2020-2024 programmed
Multiple	BT Grimes Lane Facility Modernization	Capital	$0.3	FY2020-2024 programmed
Multiple	RT Operating Assistance	Operating	$5.7	FY2020-2024 programmed

*Estimated cost includes all fund sources.

Table G-5: BMCMPO/INDOT Project Index: FY 2021-2025 *

DES#	Project	Project Type	Estimated Cost [mil]	Notes
1800198	SR 45 @ Ison Road & Bunger Road	Safety	$1.0	FY2020-2025 TIP/STIP
1700198	SR 45/46 Arlington Road) to Kinser Pike	Intersection	$0.3	FY2020-2025 TIP/STIP
1800199	SR 45 @ Pete Ellis Drive	Intersection	$1.8	FY2020-2025 TIP/STIP
1800208	SR 46 @ Smith Road	Intersection	$0.7	FY2020-2025 TIP/STIP
1702627	SR 37 Bridge Deck Overlay S of Clear Creek	Bridge	$1.1	FY2020-2025 TIP/STIP
1800730	SR 37 Bridge Deck Overlay S of Clear Creek	Bridge	$1.1	FY2020-2025 TIP/STIP
1801171	SR 37 Bridge Deck Overlay S of SR45	Bridge	$0.2	FY2020-2025 TIP/STIP
1801172	SR 37 Bridge Deck Overlay S of SR45	Bridge	$0.2	FY2020-2025 TIP/STIP
1802826	Statewide On-call Consultant Review	Planning	$6.3	FY2020-2025 TIP/STIP
1900710	SR 46 Bridge Deck Overlay	Bridge	$0.4	FY2020-2025 TIP/STIP
1900711	SR 46 Bridge Deck Overlay	Bridge	$0.4	FY2020-2025 TIP/STIP
1900717	SR 46 Bridge Deck Overlay	Bridge	$0.3	FY2020-2025 TIP/STIP
1900718	SR 46 Bridge Deck Overlay	Bridge	$0.3	FY2020-2025 TIP/STIP
1900098	SR 46 Superstructure Replacement	Bridge	$2.1	FY2020-2025 TIP/STIP
1900331	SR 46 HMA Overlay/Structural	Roadway	$15.2	FY2020-2025 TIP/STIP
1800371	SR 37 @ Dillman Road	Intersection	$1.8	FY2020-2025 TIP/STIP
1902018	District-wide Raised Pavement Markings	Roadway	$0.5	FY2020-2025 TIP/STIP
1902890	District-wide Bridge Maintenance	Bridge	$1.0	FY2020-2025 TIP/STIP
2000220	SR 46 Signals @ SR 446	Intersection	$1.5	FY2020-2025 TIP/STIP
1902884	I-69 Cable Safety Barriers	Roadway	$1.0	FY2020-2025 TIP/STIP
2001708	Statewide Safety Consulting	Various	$0.9	FY2020-2025 TIP/STIP
2001709	Statewide Safety Consulting	Various	$0.3	FY2020-2025 TIP/STIP

Table G-7: BMCMPO LPA Illustrative Project Index: FY 2026-2045

DES#	Project	Project Type	Estimated Cost [mil]	Notes
TBD	Church Lane @ Rogers Street	Intersection & Pathway	$1.5	Illustrative
TBD	Church Lane- Rogers to Old SR 37	Multiuse Pathway	$0.6	Illustrative
TBD	Kirby Road - Airport Road to SR 45	New Roadway Connection	$5.4	Illustrative
TBD	Old SR 37 – Orchard Ln to Fairfax Road	Intersection & Pathway	$1.0	Illustrative
TBD	Airport Rd – SR 45 to Leonard Springs	New Roadway Connection	$5.4	Illustrative
TBD	Fairfax Rd – Old SR 37 to Walnut Pike	Multiuse Pathway	$0.4	Illustrative
TBD	Jackson Creek/Clear Creek Connector	Multiuse Pathway	$1.5	Illustrative
TBD	Monroe Lake Trail – SR 446/Moore's Pike to Paynetown SRA	Multiuse Pathway	$13.7	Illustrative
TBD	Leonard Springs Rd. & Fullerton Pike Roundabout or Signalized Intersection	Intersection	$1.5	Illustrative
TBD	That Rd. – Rogers to Rail Trail	Multiuse Pathway	$0.5	Illustrative
TBD	Sanders-Smithville Greenway	Multiuse Pathway	$8.8	Illustrative
TBD	Adams St - Countryside to Allen	Roadway Modernization & Multiuse Pathway	$7.0	Illustrative
TBD	Pedestrian Signal Heads and Timers @ Various COB Intersections	Safety	TBD	Illustrative

The inclusion of additional federal-aid projects in the *Metropolitan Transportation Plan* and the *Transportation Improvement Program* will reflect the program investment needs of local and state transportation development partners.

Appendix H: Glossary

3C Planning means the Comprehensive, Cooperative, and Continuous transportation planning process.

Air Quality Conformity means a determination required under current federal requirements for major transportation investments in designated air quality "non-attainment" and "maintenance" areas.

Alternative Transportation Funds means the City of Bloomington's established funding mechanism exclusively for pedestrian and bicycle infrastructure maintenance, preservation, and facility expansions more than a decade ago. Fund allocations come through annual municipal budget approvals.

Analysis Area means any geographic area such as a zone or group of zones combined for the purpose of making an analysis.

Apportionment means any method for dividing federal funds by an established formula. An apportionment operates like a line of credit to sub-federal governments.

Authorization means the level of funding designated by Congress for specific legislation.

Average Daily Traffic (ADT) means the average number of vehicles passing a specified point during a 24 hour period.

Bike Lane means a portion of the road designated and designed for the exclusive use of bicycles with distinct signage and pavement markings.

Bloomington Transit (BT) is a municipal corporation that provides public transportation within the City of Bloomington limits.

Bottleneck means the point of minimum capacity along a highway segment.

Build Condition, Option, Alternative, or Alternate means a transportation plan, program, or alternative involving a major capital investment.

Capacity means the maximum rate of flow at which persons or vehicles reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions, usually expressed in persons per hour or vehicles per hour.

Capacity Expansion Project means a major transportation investment that expands the capacity of any highway or transit system to accommodate additional vehicles. Highway expansion projects involve projects that add through travel lanes including major roadway widening, new roadways, new freeway interchanges, and substantial realignments of existing roadways.

Capacity Preservation Project means a transportation investment to preserve the capacity of the existing highway or transit system. Such projects include bridge rehabilitation and replacement, pavement rehabilitation and reconstruction, and low capital cost investments such as traffic signal improvements or safety improvements (e.g. guardrails and minor horizontal/vertical curve realignments). Typical transit projects involve bus and equipment replacement, transit shelters, and garage facility maintenance.

Carpool means any vehicle (usually a car) or arrangement in which two or more occupants, including the driver, share use or cost in traveling between fixed, multiple, or variable points (also referred to as ridesharing).

Census Tract means an area with generally stable boundaries, defined within counties and statistically equivalent entities, usually used to analyze smaller regions of a population. The U.S. Census Bureau establishes census tracts as relatively homogeneous with respect to population characteristics, economic status, and living conditions.

Central Business District (CBD) means an area of a city that contains the greatest concentration of commercial activity. The traditional downtown retail, trade, and commercial area of a city or an area of very high land valuation, traffic flow, and concentration of retail business offices, theaters, hotels, and services compared to adjacent land uses.

Citizens Advisory Committee (CAC) is a committee, organized under the Metropolitan Planning Organization comprised of citizens representing a broad spectrum of the community tasked with providing recommendations to the Policy Committee and Technical Advisory Committee on transportation-related topics within the Metropolitan Planning Area and that affect the Metropolitan Planning Organization.

Climate Change means the long-term rise in the average temperature of the Earth's climate system, a major aspect of climate change demonstrated by direct temperature measurements and by measurements of various effects of the warming. The *Indiana Climate Change Impacts Assessment* (https://docs.lib.purdue.edu/climatetr/2/) identifies rising average annual temperatures and rising average annual precipitation as the most significant climate change impacts in the state. The climate vulnerabilities for Monroe County include extreme heat and extreme precipitation leading to adverse impacts on the built environment and people (https://hri.eri.iu.edu/climate-ulnerability/index.html?placeid=MONROE%20County#climateExpoHead and https://hri.eri.iu.edu/doc/hri-readiness-assessment-20200124.pdf). Learn more about climate change impacts in Bloomington at bloomington.in.gov/sustainability.

Committed Improvement means funded transportation investments including under construction, but not yet open for operation. Committed projects may additionally involve projects for which design is completed and any environmental clearances approved for construction bid letting.

Complete Streets means a transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation. Complete Streets allow for safe travel by those walking, cycling, driving automobiles, riding public transportation, or delivering goods.

Comprehensive Planning means a planning process that requires inclusion of land use, transportation, water and sewage, education, health, and other elements.

COVID-19 means the global novel Coronavirus infectious disease which originated in 2019 which is a severe acute respiratory syndrome primarily spread by close personal contact. January 2020 marked the first reported United States COVID-19 case with a subsequent evolution into a once-in-a-century national public health crisis of over 6.1 million documented cases and 185,000 deaths nationwide as of September 1, 2020. Documented cases are increasing unabated. Locally, as of September 1, 2020, Monroe County has had at least 1,180 confirmed cases of COVID-19 resulting in 36 deaths attributed to the disease. In many cases, survivors will experience long-term respiratory and health related symptoms. https://coronavirus.jhu.edu/map.html

Cross-Town Routes means a non-radial bus or rail service which does not enter the Central Business District.

Cumulative Bridge Funds provide revenues for construction, occasional maintenance, and repair of bridges, approaches, and grade separations. Cumulative bridge fund receipts come from a tax levied on each one hundred dollars ($100) assessed valuation of all taxable personal and real property within the county or municipality.

Cumulative Capital Development Funds are sometimes used for major roadway capital investments or other purposes prescribed by the Indiana General Assembly.

Daily Vehicle Miles Traveled (DVMT) means the total number of miles driven per day in a specified area by all vehicle types.

Deadhead Miles means the miles a transit vehicle travels without passengers or cargo on board, often to and from a garage or from one route to another.

Discrimination means any intentional or unintentional act, or any failure to act, which has the effect of excluding or denying a person from participation in benefits, or has otherwise

subjected a person to unequal treatment under any program or activity because of, but not limited to, race, color, or national origin.

Divided Highway means a multi-lane facility with a positive barrier median, or a median that is four (4) feet or wider.

Economic Recession means a periodic decline in industrial production, employment, real income, and wholesale-retail trade as defined by the National Bureau of Economic Research (NBER). The current United States national recession began in March 2020 with a sharp downturn of economic activities brought about by the COVID-19 pandemic.

Environmental Justice means the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Equity means the just and fair inclusion into a society in which all can participate, prosper, and reach their full potential. In the context of the 2045 MTP, transportation equity means achieving the goal of sustainable mobility providing access to employment, education, healthcare, and an improved quality of life for all residents.

FAST Act means the Fixing America's Surface Transportation Act enacted on December 4, 2015, funding surface transportation programs authorizing a $305 billion investment over fiscal years 2016 through 2020 with provisions for streamlining, performance-based measurements and multi-modal transportation.

Federal Fiscal Year (FFY) means a twelve month period from October 1st to September 30th.

Federal Highway Administration (FHWA) is part of the U.S. Department of Transportation and is responsible for administering federal-aid transportation funds and programs.

Federal Transit Administration (FTA) is part of the U.S. Department of Transportation and is responsible for administering federal-aid public transportation funds and programs.

Geographic Information System (GIS) means spatial data, presented in an electronic map format, which geographically represents the geometry of the roadways, and its geographically referenced component attributes data integrated through cartography and technology to perform analysis.

Grant means an agreement between the federal government and a state or local government, whereby the federal government provides funds or aid-in-kind to carry out specified programs.

Headway means the time between consecutive services. If one catches a transit vehicle that "comes every half hour", then the service you catch has a headway of 30 minutes.

Highway Safety Improvement Program (HSIP) is the FHWA's "core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance. The HSIP consists of three main components, the Strategic Highway Safety Plan (SHSP), State HSIP or program of highway safety improvement projects, and the Railway-Highway Crossing Program (RHCP). In addition, some states also have a High Risk Rural Roads (HRRR) program if they had increasing fatality rate on rural roads."

Indiana Department of Transportation (INDOT) is the agency that administers and funds multimodal transportation needs within the State of Indiana.

Indiana Statewide Transportation Improvement Program (INSTIP) is Indiana's multi-year program of transportation projects that is comprised of the Transportation Improvement Programs from all of the State's Metropolitan Planning Organizations.

Land Use means the purpose or use for land or a structure.

Level of Service (LOS) means a qualitative measure describing operational conditions within a traffic flow stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience and safety. Typically, a scoring system of A through F describes the level of service. For highways, the LOS definitions found in the *Highway Capacity Manual* (Transportation Research Board Special Report 209) are used.

Local Road and Street means the account used exclusively for engineering, land acquisition, construction, resurfacing, restoration, and rehabilitation of highway facilities. Local Road and Street account (LRS) funds, including accelerated allocations, are available for capital investment; however, a portion of the funds must be set aside for preservation projects such as resurfacing, intersection/signalization, and safety improvements.

Local Share and Local Match means the non-federal matching funds provided by a local entity for federal matching funds.

Long Range Transportation Plan (LRTP, Plan or MTP) means the official multi-modal transportation plan adopted by the MPO for the metropolitan area in accordance with Federal metropolitan transportation planning guidelines. As a minimum, the transportation plan must have a twenty (20) year horizon and updated every five years (every three years in air quality non-attainment areas). INDOT and FHWA/FTA primarily use LRTP. MPOs interchangeably use the term MTP (Metropolitan Transportation Plan).

Maintenance Area means any geographic region of the United States designated as non-attainment pursuant to the Clean Air Act Amendments of 1990 (Section 102e, United States Code 7410 et seq.), and subsequently re-designated to attainment status subject to the

requirement to develop a maintenance plan under Section 175 of the Clean Air Act as amended.

Major Bridge Fund means (established under IC8-16-3.1) a special fund to address a major obstruction between commercial or population centers which is capable of causing an economic hardship because of excess travel time to conduct a normal level of commerce between the two (2) centers. A major bridge is defined as a structure of 200-feet or longer or 100-feet in a qualified city. The tax levy shall not exceed $0.0333 per $100 assessed valuation within the eligible county.

Major (Metropolitan) Transportation Investment means a high-type highway or transit improvement of substantial cost that is expected to have a significant effect on capacity, traffic flow, level of service, or mode share at the transportation corridor or sub-area scale.

Mass Transportation/Mass Transit means the provision of general or special transportation service, either publicly or privately, to the public on a regular and continuing basis in an urban area. This does not include a school bus, charter, or sightseeing service.

Management System means a systematic process, designed to assist decision-makers in selecting cost effective strategies/actions to improve efficiency and safety of, and protect the investment in the nation's infrastructure. Typical management systems include the pavement management system, bridge management system, transit management system, congestion management system, safety management system, and intermodal management system.

MAP-21 means Moving Ahead for Progress in the 21st Century Act signed into law in July 2012. MAP-21 consolidated federal funding programs by two thirds, streamlined environmental reviews, altered bicycle and pedestrian funding, granted development of a national freight policy, and allowed for greater use of innovative financing.

Metropolitan Planning Organization (MPO) means the forum for cooperative transportation decision-making for the metropolitan planning area. An MPO, designated by the governor of each state, is composed of the chief-elected officials of the metropolitan planning area.

Metropolitan Planning Area (MPA) is the transportation planning area designed by the MPO. As a minimum, the MPA must cover the Urbanized Area (UZA) and the contiguous areas as likely urbanized within a minimum twenty (20) year forecast period covered by the metropolitan transportation plan.

Metropolitan Transportation Plan (MTP) means the official inter-modal transportation plan developed and adopted through the metropolitan transportation planning process for the metropolitan area. The MTP is a long range transportation plan with a minimum twenty (20) year horizon.

Motor Vehicle Highway Account (MVHA) means the account which derives receipts from motor vehicle registration fees, licenses, driver's and chauffeur's license fees, gasoline taxes, auto transfer fees, certificate of title fees, weight taxes or excise taxes, and all other special taxes, duties, or excises of all kinds on motor vehicles, trailers, motor vehicle fuel, or motor vehicle owners or operators.

Multi-Use Trail or Path means a hard surface, off-road path for use by bike, foot and other non-motorized traffic typically not within the road right-of-way.

National Highway System (NHS) means a federal transportation program, authorized in 1995, that includes the Interstate Highway System and other roads important to national defense, commerce, and mobility. The NHS in Indiana includes 2,897 miles of roadways developed by the U.S. Department of Transportation, in cooperation with INDOT and the State's MPOs.

No Build Condition, Option, Alternative, or Alternate means a transportation plan, program, or alternative involving no major capital investment, additionally known as the "do-nothing" option. The No Build condition typically includes the existing transportation system plus committed or already programmed improvements to the transportation system.

Non-Attainment Area means a geographic region of the United States that fails to meet National Ambient Air Quality Standards (NAAQS) for transportation related pollutants as designated by the Environmental Protection Agency (EPA).

Operating Expense means the total of all operating costs incurred during the reporting period.

Operating Subsidy means the revenue received through federal, state, and local cash grants or reimbursements to fulfill operating expense obligations not covered by fares or other revenues generated by the transit system.

Operational Improvement means a capital investment for the installation of traffic surveillance and control equipment, computerized signal systems, motorist information systems, integrated traffic control systems, incident management programs, and transportation demand management facilities, strategies, or programs.

Pandemic means the COVID-19 global coronavirus pandemic first identified in the latter half of calendar year 2019 leading to socioeconomic disruptions and a global economic recession bordering on economic depression.

Pathway means a hard surface path physically separated from the road with a grass or tree plot within a road right of way for the use of bicyclists, pedestrians, and other non-motorized users.

Peak Direction means the direction of higher demand during a peak commuting period.

Peak Hour means that one-hour period during which the maximum amount of travel occurs.

Policy Committee is a committee of the MPO which reviews and approves transportation policy. It is composed of local elected and appointed officials from area municipalities, Indiana University, and state and federal transportation agencies.

Preliminary Engineering (PE) means the first phase of a transportation improvement project which defines scope and project design.

Primary Arterial means a class of street serving major movement of traffic, typically carrying over 20,000 vehicles per day.

Primary Collectors means roadways that typically carry 3,000 to 10,000 vehicles per day.

Racial Justice means the systematic fair treatment of people of all races that results in equitable opportunities and outcomes for everyone by ensuring that all people are able to achieve their full potential in life, regardless of race, ethnicity, or the community in which they live. A racial justice framework can move us from a reactive posture to a more powerful, proactive, and even preventive approach. The "Black Lives Matter" movement is an example of people coming together to promote and demand racial justice, and the MTP strives to follow its lead as a guiding principle.

Radial Routes means transit service patterns, in which most routes converge into and diverge from a central transfer point or hub, like spokes of a wheel. Routes timed to arrive and depart at the same time represent a "pulse system".

Regional Transit Authority means a special-purpose district organized as either a corporation chartered by statute, or a governmental agency, created for the purpose of providing public transportation within a specific region.

Revenue means all operating funds associated with the provision of transit service in the context of public transportation.

Roadway means any road, street, parkway, or freeway/expressway that includes right-of-way, bridges, railroad/highway crossings, tunnels, drainage structures, signs, guardrails, and protective structures in connection with highways.

SAFETEA-LU refers to the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: a Legacy for Users. This is the five-year federal transportation program authorizing the annual funding for federal transportation programs and replaced TEA-21.

Secondary Arterial means a street typically carrying 10,000 to 20,000 vehicles per day.

Secondary Collector means roadways in Bloomington that typically carry less than 3,000 vehicles per day.

Sidewalk means a hard-surface path within the street right-of-way designated for the exclusive use of pedestrian traffic.

Signed Bike Routes means a street that is safe for use by both vehicles and bicycles without a designated bike facility. These routes have appropriate signage markings.

Social Justice means that all people should have equal access to wealth, health, well-being, justice, privileges, and opportunity regardless of their legal, political, economic, or other circumstances.

State Fiscal Year (FY) means the State of Indiana's twelve month period from July 1st to June 30th.

Statewide Transportation Improvement Program (STIP) means the official statewide, multi-modal transportation plan developed through the statewide transportation planning process.

Surface Transportation Block Grant Program (STBG) means the FAST Act [FAST Act § 1109(a)] conversion of the Surface Transportation Program (STP) into the Surface Transportation *Block Grant* Program (STBG) that promotes flexibility in state and local transportation decisions and provides flexible funding to best address state and local transportation needs.

Sustainable Development means development that meets the needs of the present without compromising the ability of future generations to equitably meet their own environmental, economic, and social needs.

Sustainability means meeting our own present environmental, economic, and social needs without compromising the ability of future generations to meet their own environmental, economic, and social needs.

Thoroughfare Plan means the official plan for the designation and preservation of major public road rights-of-way in accordance with the Indiana Code (IC 36-7-4-506).

Technical Advisory Committee (TAC) is a committee of the MPO which provides technical advice on transportation projects and programs. It consists of planners, engineers, transit system managers, and other relevant managers from local public agencies from within an MPO metropolitan planning area.

TIF (Tax Increment Financing Funds) refers to taxes payable on assessed value in excess of taxes attributable to the assessed value constituting the base—the "base" being the assessed

value of the property in the area that existed prior to the designation of the area as a designated redevelopment allocation area.

Transportation Alternatives (TA) means a set-aside of Fast Act STBG funding for transportation alternatives encompassing a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to storm water and habitat connectivity. The FAST Act sets aside an average of $844 million per year for TA. Unless a state opts out, it must use a specified portion of its TA funds for recreational trails projects.

Transportation Demand Management (TDM) means strategies or actions taken to reduce or shift the peak-hour of travel demand or to shift the mode of travel demand. Typical actions to shift or reduce the peak-hour of travel demand involve programs to shift work hours, limit the trip generation of new development, and congestion tools. Typical actions to shift the mode of travel include transit fare subsidy programs, control of parking fees, an expansion of transit services, construction and designation of high occupancy vehicle lanes or preferential parking areas, and construction of pedestrian and bicycle facilities.

Transportation Equity Act for the 21st Century (TEA-21) means a former six-year federal ground transportation program covering highways, transit, and transportation enhancement activities. TEA-21 authorized annual funding for federal transportation programs prior to the approval of SAFETEA-LU in 2005.

Transportation Improvement Program (TIP) means the staged, multi-year, multi-modal program of transportation projects which is consistent with the metropolitan transportation plan.

Transportation System Management (TSM) means a variety of low-cost capital investments or programs to preserve roadway capacity including signal system improvements, intersection improvements (adding turn lanes), access control policies, and transportation demand management strategies.

Urbanized Area (UZA) means a statistical geographic area defined by the U.S. Census Bureau that consists of a central core and adjacent densely settled territory containing a population of at least 50,000 people.

Unified Planning Work Program (UPWP) means the document describing urban transportation and transportation related activities undertaken in an area during a specified period of time. The Metropolitan Planning Organization (MPO) prepares the UPWP.

Vision Zero means a multi-national road traffic safety program that aims to achieve a highway system with no fatalities or serious injuries involving road traffic.

Volume to Capacity (V/C) Ratio means the observed number of vehicles or persons passing a point on a lane, roadway, or travel-way compared to the maximum rate of flow at that point.

Wheel Tax means the motor vehicle excise surtax and wheel tax that are county option taxes on motor vehicles which provide revenue to counties, cities, and towns for road construction, reconstruction, repair, or maintenance of streets, roads, and bridges.