CITIZENS ADVISORY COMMITTEE

November 16, 2022
6:30 pm - 8:00 pm
Hybrid Meeting - McCloskey Conference Room and via Zoom
Join Zoom Meeting
https://bloomington.zoom.us/j/86305107816?pwd=a0szV0dPWlFYT2QzWElnUmFqTlpydz09
Meeting ID: 863 0510 7816
Passcode: 605862
One tap mobile: +13017158592,,86305107816# US (Washington DC)
Dial by your location: +1 312 626 6799 US (Chicago)
Find your local number: https://bloomington.zoom.us/u/kd2KR6WClQ
Clicking on the link will take you to the meeting. You will automatically receive a dial-in number if you want to use your phone for audio and not your computer microphone.

Agenda

I. Call to Order and Introductions

II. Approval of Meeting Agenda*

III. Approval of Minutes*
   a. September 28, 2022

IV. Communications from the Chair and Vice Chair

V. Reports from Officers and/or Committees

VI. Reports from the MPO Staff
   a. 2023 BMCMPO Committee Meeting Schedules
   b. FHWA FY 2022/2023 Electric Vehicle (EV) Infrastructure Deployment Plans (https://www.fhwa.dot.gov/environment/nevi/ev_deployment_plans/)

VII. Old Business
   a. INDOT 2 and 4-Year Pavement and Bridge Transportation Management Targets*

VIII. New Business
   a. BMCMPO FY 2022 - 2026 Transportation Improvement Program (TIP) Amendments*
      (1) Indiana Department of Transportation
         (a) DES# 1901888 - New Signing Along I-69 at Various Locations Throughout the Seymour District
         (b) DES# 2000447 - SR46 HMA Overlay from 0.23 mile E of US231 (Crane Rd) to 5.67 miles E of SR43 (Red Hill Rd)
         (c) DES# 2101774 - Wrong Way Ramp Initiative for I-69 at the Fullerton Pike interchange and I-69 at the SR45/West Bloomfield Road Interchange

IX. Public Comment on Matters Not Included on the Agenda (non-voting items)
Limited to five minutes per speaker, and may be reduced by the committee if numerous people wish to speak.

X. Communications from Committee Members on Matters Not Included on the Agenda (non-voting items)
   a. Communications
   b. Topic Suggestions for Future Agendas

XI. Upcoming Meetings
   a. Technical Advisory Committee - January 25, 2023 at 10:00 a.m. (Hybrid)
   b. Citizens Advisory Committee - January 25, 2023 at 6:30 p.m. (Hybrid)
   c. Policy Committee - February 10, 2023 at 1:30 p.m. (Hybrid)

XII. 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.

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CITIZENS ADVISORY COMMITTEE
Meeting Minutes
September 28 2022
6:30 - 8:00 p.m.
Virtual Location via Zoom

Suggested Time:

Citizens Advisory Committee minutes reflect transcriptions in a summarized outline manner. Audio recordings of the meeting are available in the Planning & Transportation Department for reference.

~6:30 p.m.

Members present: Paul Ash, Elizabeth Cox-Ash, Mary Jane Hall, Sarah Ryterband, John Kennedy

Guests: Jeff Jackson (COB), Margaret Clements, Scott Faris, Pam Judd, Andrew Gunther

Staff present: Pat Martin, Ryan Clemens

I. Call to Order and Introductions: 6:30pm

II. Approval of Meeting Agenda*
****Mary Jane Hall motioned to approve of the meeting agenda. Elizabeth Cox-Ash seconded. Motion passed by a unanimous roll call vote 4-0.****

~7:00 p.m.

III. Approval of Minutes*
****Mary Jane Hall moved to approve the August 10, 2022 meeting minutes. Elizabeth Cox-Ash seconded. Motion passed by a unanimous roll call vote 4-0.****

IV. Communications from the Chair and Vice Chair – None.

V. Reports from Officers and/or Committees - None

VI. Reports from the MPO Staff – Staff reported on the following developments:

~7:30 p.m.

a. FHWA FY 2022/2023 Electric Vehicle (EV) Infrastructure Deployment Plans (https://www.fhwa.dot.gov/environment/nevi/ev_deployment_plans/)
b. Bloomington Transit Discretionary Capital Grant Award (https://bloomington.in.gov/news/2022/08/25/5279)
c. 3rd Street and Grant Street - Bicycle & Pedestrian Safety Improvements Project
d. 2022 City of Bloomington ADA Transition Plan (https://bloomington.in.gov/accessible)

VII. Old Business

a. BMCMPO Public Participation Plan - Final

~8:00 p.m.

(1) Ryan Clemens presented the final draft of the BMCMPO Public Participation Plan. Discussion ensued. ****Mary Jane Hall moved to approve the BMCMPO Public Participation Plan as presented. Elizabeth Ash Cox seconded. Motion passed by a unanimous roll call vote 4-0.****

b. FY 2022 - 2026 Transportation Improvement Program (TIP) Amendments
   (1) Rural Transit
   (2) Monroe County
   (3) City of Bloomington

Staff updated CAC members of the Policy Committee's amendment action taken on September 9, 2022 approving the allocation of FY22 Additional Infrastructure Investment & Jobs Act (IIJA) fund applications for Rural Transit, Monroe County, and the City of Bloomington. Discussion ensued.

VIII. New Business

a. Bloomington Transit Alternative Fuels and Infrastructure Assessment Study Presentation - Staff presented the Bloomington Transit (BT) Alternative Fuels Study prepared under a BT consulting services contract. Discussion ensued.
b. GO Bloomington Travel Demand Management Program Presentation - Jeff Jackson (COB) presented the GO Bloomington Program. Discussion ensued.
c. Staff presented INDOT 2 and 4-Year Pavement and Bridge Transportation Management Targets* - Staff presented the INDOT 2 and 4-Year management targets. ****Mary Jane Hall moved to approve the INDOT Targets as presented. Paul Ash seconded. Motion passed by a unanimous roll call vote 4-0.****
d. BMCMPO FY 2022 - 2026 Transportation Improvement Program (TIP) Amendments*
   (1) DES# 2000311 - SR46 Replace Superstructure at Jacks Defeat Creek WBL 6.04 Mile W of SR 37
   (2) DES# 1900331 - SR46 HMA Overlay Structural from SR 446 to W Junction of SR 135, Right-of-Way Acquisition
   (3) DES# 1900331 - SR46 HMA Overlay Structural from SR 446 to W Junction of SR 135, Construction
   (4) DES# 2001983 - SR46 Small Structure Replacement 5.05 Mile E of SR 446
   (5) DES# 1901791 - Pavement Markings at Various Locations in Seymour District

   Staff presented the proposed FY 2022 - 2026 TIP amendments for the four (4) INDOT projects. Discussion ensued. ****Mary Jane Hall moved to approve the INDOT Targets as presented. Paul Ash seconded. Motion passed by a unanimous roll call vote 4-0.****

IX. Public Comment on Matters Not Included on the Agenda *(non-voting items) - None.*

X. Communications from Committee Members *(non-agenda items)* - None

XI. Upcoming Meetings

a. Policy Committee - October 14, 2022 at 1:30 p.m. (Hybrid)
b. Technical Advisory Committee - October 26, 2022 at 10:00 a.m. (Hybrid)
c. Citizens Advisory Committee - October 26, 2022 at 6:30 p.m. (Hybrid)

Adjournment

Mary Jane Hall motioned 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.

2023 BMCMPO Committee Meeting Schedules

	POLICY COMMITTEE	TECHNICAL ADVISORY COMMITTEE	CITIZENS ADVISORY COMMITTEE
January	**WINTER RECESS**	1/25/2023, 10:00 am	1/25/2023, 6:30 pm
February	2/10/2023, 1:30 pm	2/22/2023, 10:00 am	2/22/2023, 6:30 pm
March	3/10/2023, 1:30 pm	3/22/2023, 10:00 am	3/22/2023, 6:30 pm
April	4/14/2023, 1:30 pm	4/26/2023, 10:00 am	4/26/2023, 6:30 pm
May	5/12/2023, 1:30 pm	5/24/2023, 10:00 am	5/24/2023, 6:30 pm
June	6/9/2023, 1:30 pm	**SUMMER RECESS**	**SUMMER RECESS**
July	**SUMMER RECESS**	7/26/2023, 10:00 am	7/26/2023, 6:30 pm
August	8/11/2023, 1:30 pm	8/23/2023, 10:00 am	8/23/2023, 6:30 pm
September	9/8/2023, 1:30 pm	9/27/2023, 10:00 am	9/27/2023, 6:30 pm
October	10/13/2023, 1:30 pm	10/25/2023, 10:00 am∞	10/25/2023, 6:30 pm∞
November	11/17/2023,1:30 pm^	11/15/2023,10:00 am*	11/15/2023, 6:30 pm*
December	12/8/2023,1:30 pm∞	**WINTER RECESS**	**WINTER RECESS**

**Meeting moved ahead one week due to holiday; ^Meeting moved back one week due to holiday; ∞Meeting to be held if necessary*

ALL MEETINGS WILL BE HELD IN A HYBRID FORMAT
Policy Committee (2nd Fridays)
Technical & Citizens Advisory Committees (4th Wednesdays)

Bloomington-Monroe County Metropolitan Planning Organization
www.bloomington.in.gov/mpo

U.S. Department of Transportation
Federal Highway Administration

1200 New Jersey Ave., SE
Washington, DC 20590

September 27, 2022

In Reply Refer To:
HEPN-30

Mr. Michael Smith
Commissioner
Indiana Department of Transportation
Indiana Government Center North
100 North Senate Avenue
Indianapolis, IN 46204

Subject: Approval of Indiana Electric Vehicle Infrastructure Deployment Plan

Dear Commissioner Smith:

The Federal Highway Administration (FHWA) has completed the review of the Indiana Electric Vehicle Infrastructure Deployment Plan required under the National Electric Vehicle Infrastructure (NEVI) Formula Program.[1] Based on the review and the recommendations provided by the Joint Office of Energy and Transportation (Joint Office), FHWA has determined that the Indiana Electric Vehicle Infrastructure Deployment Plan is approved for implementation. With this approval, Fiscal Year 2022 funds are now available to Indiana for obligation.

Also, States should be aware that FHWA has posted updated Frequently Asked Questions on our website at: https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/resources/nevi_program_faqs.pdf.

The FHWA and the Joint Office will follow up with States on specific opportunities for improvement in future year plans and will continue to provide technical assistance and guidance as States continue to update plans and begin implementation.

A publicly accessible version of the Indiana Electric Vehicle Infrastructure Deployment Plan and this approval letter will be available on the FHWA website at: https://www.fhwa.dot.gov/environment/nevi/ev_deployment_plans/

[1] The NEVI program is authorized under the Bipartisan Infrastructure Law, enacted as the Infrastructure Investment and Jobs Act (IIJA), (Pub. L. 117-58)

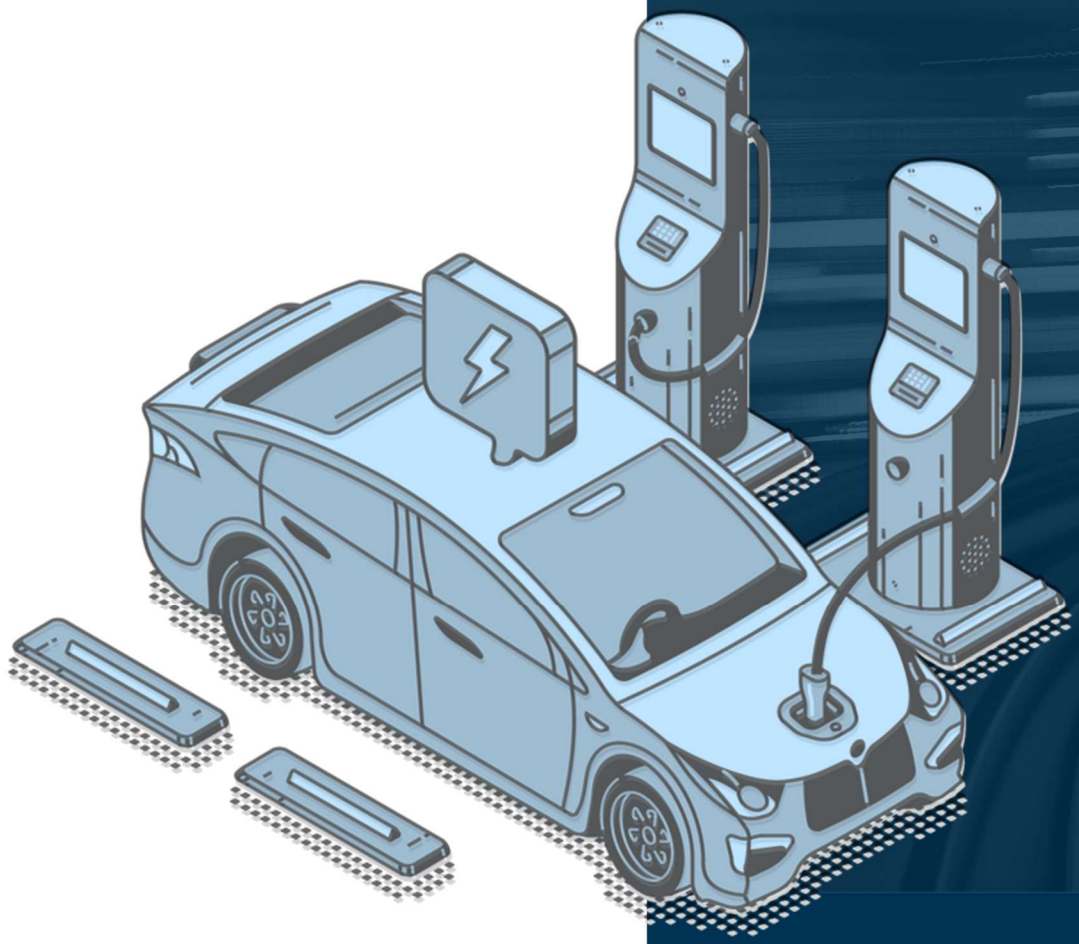
Thank you for putting the United States on a path to a nationwide network of EV chargers that can ensure a convenient, affordable, reliable, and equitable charging experience for all users.

Sincerely,

Gloria M. Shepherd
Associate Administrator
Office of Planning, Environment and Realty

cc:
FHWA: HOA, HCC, HPL, HCF, Indiana Division Office
Joint Office Director: Gabe Klein, Deputy Director: Rachael Nealer

Indiana Electric Vehicle Infrastructure Deployment Plan



July 29, 2022

Indiana Department of Transportation

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Acronyms

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
AFC	Alternative Fuel Corridors
BIL	Bipartisan Infrastructure Law
BRT	Bus Rapid Transit
DAC	Disadvantaged Communities
DBE	Disadvantaged Business Enterprise
DC	Direct Current
DER	Distributed Energy Resource
DERMS	Distributed Energy Resource Management System
EPA	Environmental Protection Agency
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FHWA	Federal Highway Administration
GICC	Greater Indiana Clean Cities, Inc.
HDV	Heavy-Duty Vehicles
IDEM	Indiana Department of Energy Management
IEDC	Indiana Economic Development Corporation
IFA	Indiana Finance Authority
INDOT	Indiana Department of Transportation
IOU	Investor-Owned Utility
ITE	Institute of Transportation Engineers
IURC	Indiana Utility Regulatory Commission
NEVI	National Electric Vehicle Infrastructure
NPRM	Notice of Proposed Rulemaking
NTP	Notice to Proceed
O&M	Operations and Maintenance
OED	Indiana Office of Energy Development
OEM	Original Equipment Manufacturer
P3	Public-Private Partnership
REV	Regional Electric Vehicle
RFI	Request for Information
RFP	Request for Proposal
ROW	Right of Way
TBD	To Be Decided
USDOT	United States Department of Transportation
VMT	Vehicle Miles Traveled
VW	Volkswagen
ZEV	Zero-Emission Vehicle

1.0 Introduction

The November 2021 Bipartisan Infrastructure Law (BIL) created the Joint Office of Energy and Transportation and the National Electric Vehicle Infrastructure (NEVI) program. The NEVI program includes a formula component and a discretionary component. The program will make significant investments in the electric vehicle (EV) charging infrastructure that will put the United States on a path to a nationwide network of 500,000 EV chargers by 2030 and ensure a convenient, reliable, affordable, and equitable charging experience for all users.

Under the NEVI formula program, Indiana expects to receive nearly $100 million in Federal funding. While formula funds are essentially guaranteed, each state is required to submit an EV Infrastructure Deployment Plan that describes how it will use the NEVI formula funds. The plans must be consistent with guidance provided by the Federal Highway Administration (FHWA).

FHWA's guidance prioritizes developing charging networks along designated alternative fuel corridors (AFCs) and providing charging infrastructure for underserved communities. Figure 1 shows Indiana's current AFCs as well as two additional corridors nominated in May 2022. In short, Indiana's AFC network covers all interstates plus US 31. In anticipation of an upcoming Round 7 of AFC nominations, Indiana plans to nominate the U.S. 30 corridor across Northern Indiana for AFC consideration.

Figure 1. Current and Pending AFCs in Indiana

After FHWA certifies that all of Indiana's AFCs are "fully built out" to NEVI compliant standards, Indiana will have the option to use any remaining NEVI formula funds on other public roads.

The Indiana Department of Transportation (INDOT) led the development of the statewide EV Infrastructure Deployment Plan, in cooperation with the Governor's Office, Indiana Utility Regulatory Commission (IURC), Indiana Economic Development Corporation (IEDC), the Indiana Office of Energy Development (OED), the Indiana Department of Environmental Management

(IDEM), metropolitan planning organizations, utilities, energy service providers, industry, and advocacy groups across the state.

INDOT's planning process relied on three key activities:

- Review the current state of EV charging in Indiana.
- Coordinate with state and Federal partners to understand NEVI program requirements.
- Engage with stakeholders and the public to understand priorities from a variety of perspectives.

INDOT began its planning process by reviewing and then incorporating existing EV charging activities and research across the state from the public and private sector. Examples include research by INDOT's Joint Transportation Research Program in partnership with Purdue University and projects that rely on Volkswagen (VW) settlement funds. Key resources are highlighted below:

- Purdue SPR 4509: A Strategic Assessment of Needs and Opportunities for Wider Adoption of EVs in Indiana (In Progress)[1]
- Journal of Transportation Technologies: Analysis of Electric and Hybrid Vehicle Usage in Proximity to Charging Infrastructure in Indiana[2]
- Using connected vehicle data for assessing EV charging infrastructure usage and investment opportunities. Institute of Transportation Engineers (ITE). ITE Journal. 2022;92(3):22-31. ITE Paper (11-state EV).[3]

To complement these existing efforts, INDOT implemented an extensive stakeholder and public engagement process, using various tools to share information and solicit feedback from numerous perspectives. The engagement effort included:

- A request for information (RFI)
- A public survey
- Utility questionnaire
- A virtual open house

[1] Gkritza, Konstantina, and Labi, Samuel, Purdue University/Indiana Department of Transportation JHRP, expected completion date December 30, 2022.

[2] Desai, J., Mathew, J. K., Li, H., & Bullock, D. M. (2021). Analysis of Electric and Hybrid Vehicle Usage in Proximity to Charging Infrastructure in Indiana. Journal of Transportation Technologies, 11(4), 577-596.

[3] Desai J, Mathew JK, Li H, Bullock, Darcy M, P E, Ph D. Using connected vehicle data for assessing electric vehicle charging infrastructure usage and investment opportunities. Institute of Transportation Engineers. ITE Journal. 2022;92(3):22-31. https://www.proquest.com/scholarly-journals/using-connected-vehicle-data-assessing-electric/docview/2638088730/se-2?accountid=13360

- Three in-person engagement meetings
- A virtual engagement meeting
- Numerous one-on-one stakeholder meetings.

In addition, INDOT created an EV page on its website[4] to consolidate all materials for public access, provide answers to frequently asked questions (FAQs), and enable the ongoing collection of input from stakeholders across the state.

Throughout the planning process, INDOT also coordinated with state agencies and Federal partners. The coordination effort included:

- Meeting with the Joint Office of Energy and Transportation through public and invite-only webinars, and during an Indiana-specific question and answer session
- Meeting with the FHWA Indiana Division
- Monthly meetings with an Indiana multi-agency working group made up of IURC, OED, the governor's office, and IEDC to discuss transportation and energy efforts across the state and align these agencies with INDOT's vison for the NEVI program
- One-on-one meetings with the Illinois, Kentucky, and Ohio DOTs to coordinate efforts across adjoining states.

1.1 EV Infrastructure Planning and Implementation Schedule

1.1.1 Dates for the Indiana EV Infrastructure Deployment Plan

Preparation for the plan development process began with the passage of the Infrastructure Investment and Jobs Act (IIJA), Public Law 117-58 (Nov. 15, 2021). In early 2022, INDOT convened Indiana's multi-agency working group and began internal discussions with planning and legislative staff to understand the law, potential impacts, and opportunities. With the publication of the Joint Office Federal guidance on February 10, 2022, INDOT's plan development efforts began with greater urgency, solidifying contractor support to assist with public engagement and plan development. With resources under contract in March 2022, INDOT developed the scheduled summarized in Table 1.

[4] https://www.in.gov/indot/current-programs/innovative-programs/electric-vehicle-charging-infrastructure-network/

Table 1. Milestones in Indiana EV Implementation Plan Development

Milestone/Activity	Date
Request for Information	April 4, 2022 (Open) April 29, 2022 (Closed) May 25, 2022 (Summary)
Outreach and engagement plan development	April 29, 2022
Virtual Open House	May 11, 2022
AFC Round 6 Nominations	May 13, 2022
Public Engagement Survey	May 13-June 8, 2022
Utility Engagement Survey	May 13-June 8, 2022
Incorporate existing research and engagement into plan template	May 27, 2022
Workshop 1 (Northern Indiana)	June 2, 2022
Workshop 2 (Central Indiana)	June 9, 2022
Workshop 3 (Southern Indiana)	June 14, 2022
INDOT Visioning and Goal Setting	May 25, 2022 (Draft) June 17, 2022 (Final)
Draft Implementation Plan	June 24, 2022
Final Implementation Plan	July 8, 2022
Virtual Public Walkthrough of the Final Implementation Plan	July 13, 2022
Final Implementation Plan posted for public comment	July 20, 2022
Final Implementation Plan, Version 2 (if needed)	July 29, 2020

**One-on-one meetings with INDOT were made available throughout plan development (April – July 2022) and not broken out as a separate milestone. A summary of these meetings is provided in Table 4.*

1.1.2 Dates for Indiana EV Infrastructure Implementation

Once Indiana's plan receives Federal approval, INDOT will create a detailed framework for contracting and implementing the build out of the FHWA designated AFCs. Implementation will require several phases to achieve build out over the five years of the program. The activities and dates below are estimated timeframes, assuming plan approval on September 30, 2022.

- Phase 1: October 1, 2022 – September 30, 2023
    - Develop contracting plan to finalize procurement type, requirements, and schedule
    - Expand the public engagement plan and schedule to include additional activities and outcomes with the stakeholder groups identified in Chapter 3 and new stakeholders identified during plan development. Special focus will be placed on DAC communities and community groups, electric utilities, the private sector, and state agencies.
    - Site definition will begin post-plan review. This will include activities to evaluate and prioritize sites, including:

        - Coordinate with utilities to understand existing power availability at candidate locations
        - Define minimum design standards/criteria for NEVI-compliant stations
        - Prioritize general site selection
        - Create corridor groupings
        - Develop evaluation criteria for specific site selection
    - Develop and release Request for Proposal (RFP) for Phase 1 sites (October 1, 2023 to June 30, 2024)
        - Finalize procurement method
        - Identify site hosts and charging providers
        - Make final selections and release funds (multiple awards are expected)
        - Issue notice to proceed (NTP)
- Phase 2: Implement stations in high demand areas (June 30, 2024 to June 30, 2025)
    - High demand areas will be defined in Phase 1 based on average daily traffic and dwell time for EVs, EV adoption in the county, utility readiness, etc.
    - Begin performance measurement for implementation and engagement, including any additional equity measures identified in Phase 1 efforts
- Phase 3: Procure and implement stations in other high priority areas
    - Procurement: September 30, 2024 – June 30, 2025
    - Implementation: June 30, 2025 to June 30, 2026 (and beyond)
    - Priorities will be defined in Phase 1 based on:
        - Proximity to Disadvantaged Communities (DACs)
        - Proximity to key travel stops/destinations
        - Proximity to DC fast charging stations
        - Geographic balance (as needed to fill in gaps, create redundancy, upgrade location's existing infrastructure)
    - Multiple awards are expected

2.0 State Agency Coordination

INDOT's goals for state agency coordination were as follows:

- Collaborate with state partners to define vision and goals
- Understand the potential impacts of EV charging infrastructure buildout on other state agencies and operations

- Define roles and responsibilities for future implementation
- Integrate cross-agency personnel into the plan development process

Table 2 lists the agencies INDOT engaged with during the planning process.

Table 2. Agencies Engaged in Plan Development

Agency	Interests and Impacts	Engagement Activities
Indiana		
Indiana Department of Transportation (INDOT)	- Lead agency for plan development - Contracting/procurement oversight	- Working group chair - Direct communication - Website and program page - "On the DOT" podcast episode 29[5]
Indiana Office of Energy Development (OED)	- Alternative fuel policy - Utility coordination - Grid capacity	- Working group member - Direct communication - Review of draft plan
Governor's Office	- Partner engagement, contracting, labor and workforce considerations, utility coordination	- Working group member - Direct communication - Review of draft plan
Indiana Department of Environmental Management (IDEM)	- Oversight and administration of Volkswagen settlement funds	- Direct communication - Review of draft plan
Indiana Utility Regulatory Commission (IURC)	- Utility coordination, direction, and regulation - Grid capacity and resource availability	- Working group member - Direct communication - Review of draft plan
Indiana Economic Development Corporation (IEDC)	- Private sector engagement - Labor and workforce considerations	- Working group member - Direct communication - Review of draft plan
Indiana Finance Authority (IFA)	- Contracting approach	- Direct communication

[5] https://soundcloud.com/indotpod/may-2022

Agency	Interests and Impacts	Engagement Activities
Regional		
Kentucky Transportation Cabinet	- Exchanging ideas on utility coordination, contracting - Establishing a regional charging network - Avoiding duplication near state borders	- One-on-one phone calls
DriveOhio (Ohio Department of Transportation)		
Michigan Department of Transportation (and plan collaborators		
Illinois Department of Transportation		
REV Midwest	- Regional EV charging coverage - Interoperability and standardization - Collaboration among member states: Indiana, Illinois, Michigan, Minnesota, and Wisconsin - Avoiding duplication near state borders	- Working group member (via IEDC) - Direct communication

Results of state agency coordination include:

- Establishment of an Indiana cross agency working group (INDOT, IURC, OED, and IEDC)
- Ongoing collaboration regarding contracting and procurement, especially between INDOT and Indiana Finance Administration (IFA)
- Identification of FY22-24 Volkswagen settlement-funded EV charging infrastructure (from IDEM) and understanding of the current program status. The planning, coordination, site host agreements, and foundational aspects of the sites will be in place in FY22, with installation ongoing into 2023 and 2024.
- Ongoing collaboration regarding implementation and points of contact for EV charging infrastructure in neighboring states
- Review, input and comment on the draft plan prior to submission to FHWA

3.0 Public Engagement

One of INDOT's primary EV goals is to provide safe, efficient, and high-quality infrastructure in an equitable manner that enables EV drivers to travel throughout the state. The network will give drivers confidence and flexibility when traveling and provide equitable consideration for infrastructure investment in disadvantaged communities. Public engagement was a vital component of INDOT's planning process. Through its public engagement efforts, INDOT:

- Gained insight into market motivations from various stakeholders that drive investment and activity into EV charging
- Gauged the level of interest and need for BIL funding opportunities, participation, and engagement with other Federal funding sources
- Identified key planning considerations for EV charging build-out, such as the public's priorities for charging station amenities
- Began the process of determining the level of interest in servicing specific communities and gauging which communities are likely to be underserved, as outlined by the Justice40 Initiative. Created by Presidential Executive Order 14008 in 2021, the Justice40 initiative establishes a goal that 40 percent of the overall benefits of certain Federal investments flow to disadvantaged, marginalized, underserved, and overburdened communities.
- Assessed delivery readiness to successfully implement EV charging programs
- Obtained feedback on INDOT's proposed vision, goals, metrics, and site locations
- Obtained an in-depth understanding on how INDOT can directly support implementation for various stakeholder groups
- Gather input on preferred EVSE locations and equitable infrastructure build out to ensure benefits of future infrastructure are well-distributed both geographically and socioeconomically

One of the first efforts in the plan development process was to create a public engagement plan that was shared publicly and published on April 29, 2022.[6] The remainder of this section provides insights into the specifics of the engagement plan, including the stakeholders that INDOT engaged and how they contributed.

3.1 Stakeholders Involved in Plan Development

Consistent with FHWA guidelines, INDOT's public outreach included several specific stakeholder groups. Stakeholder engagement supplemented the Federal guidance, existing research, and past EV awareness and engagement efforts with the goal of gathering input and feedback on plan contents. This effort began with the publication of the RFI and included several in-person and virtual events in May, June, and July 2022.

Following are the groups INDOT engaged with during the planning process. Specific attendees at in-person events are noted within Section 3.2.

[6] https://www.in.gov/indot/files/Indiana-EV-Implementation-Engagement-Plan_Final_Web.pdf

- General Public: INDOT made all engagement opportunities (virtual and in-person) open to the public and directed efforts to the entities listed below:
    - Community based, advocacy and industry organizations that consider both urban and rural area representation:
        - Indiana Community Action Association
        - Electrification Coalition
        - Environmental Law and Policy Center
        - Indiana Conservative Alliance for Energy
        - Advanced Energy Economy (AEE)
        - Citizens Action Coalition
        - Sierra Club
        - Earth Charter Indiana
        - Hoosier Environmental Council
        - Creation Care/Evangelical Environmental Network
        - Energy Systems Network
        - East End Crossing Partners
        - Pike High School
        - Lockerbie Square Neighborhood Association
        - Elkhart Environmental Center
        - St. John's Lutheran Church
        - Purpose of Life Ministries
        - PracticewiseMD
        - Thrive West Central
        - Center for Sustainable Energy
        - DriveClean Indiana
        - IN Climate
        - Indiana Food and Fuel Association
        - Indiana Motor Truck Association
    - Grassroots EV Chapters
        - Hoosier Electric Vehicle Association (EVA)
    - Disadvantaged, Underserved or Underrepresented Communities
        - National Association for the Advancement of Colored People (NAACP)
        - Black Lives Matter South Bend
        - Indiana Alliance for Equity, Diversity, and Inclusion for Electric Vehicles and Economic Opportunity
    - Metropolitan Planning Organizations (MPOs)
        - Northeastern Indiana Regional Coordinating Council (NIRCC)
        - Michiana Area Council of Governments (MACOG)
        - Area Plan Commission of Tippecanoe County
        - Anderson MPO
        - Kentuckiana Regional Planning & Development Agency (KIPDA)
        - Terre Haute Area Economic Development Corporation
        - Indianapolis Metropolitan Planning Organization (IMPO)
        - Bloomington/Monroe County Metropolitan Planning Organization
        - Evansville Metropolitan Planning Organization
        - Ohio-Kentucky-Indiana Regional Council of Governments (OKI)

- Region 3-A Development and Regional Planning Commission (R3a)
- Indiana Association of Regional Councils (IARC)
- Northwestern Indiana Regional Planning Commission (NIRPC)

- Municipal and County Governments
  - Indianapolis
  - Fort Wayne
  - Bloomington
  - Carmel
  - Fishers
  - Zionsville
  - Greendale
  - Richmond
  - Evansville
  - Town of Winona Lake
  - City of South Bend
  - Town of Speedway
  - Town of Bargersville
  - Seymour City Council
  - City of Elkhart Indiana
  - City of New Castle
  - Greensburg Redevelopment Commission
  - City of Jeffersonville
  - City of West Lafayette
  - Association of Indiana Counties Inc
  - City of Martinsville
  - Lake County
  - EDC of Greensburg/ Decatur County
  - City of Madison, IN
  - City of Warsaw
  - City of Madison
  - Tippecanoe County Government
  - Town Of Centerville
  - Bartholomew County Government
  - City of Terre Haute
  - Downtown Evansville Economic Improvement District
  - DeKalb
  - Town of Wakarusa
  - City of La Porte
  - La Porte County Government
  - City of Shelbyville, IN
  - Kosciusko County
  - White County Area Plan
  - City of Scottsburg
  - River Hills EDD & RPC
  - Town of Clarksville
  - Town of Cloverdale
  - Town of Hope
  - Town of Orleans
  - Town of Newburgh
  - Pike County EDC
- Public Transit Organizations
  - IndyGo
  - Fort Wayne Citilink
  - Bloomington Public Transit
- EV Product Commission
- 21st Century Energy Task Force

- Labor Organizations
  - Electrical contractors
  - Automobile Association of America (AAA)
  - United Auto Workers (UAW)
  - International Brotherhood of Electrical Workers
- Private Sector
  - Below is a list of one-on-one meetings held, with additional companies also responding to the RFI and attending in-person and virtual events.
    - Electrify America
    - ChargePoint
    - Indiana Manufacturers Association
    - Crossroads Solar
    - Francis Energy
    - Mid-Valley Supply
    - Tesla
    - Blink
    - 1820 Ventures
    - AEE
    - America's Green Line
    - Forsee Power
    - DANNAR
    - Simon Property Group
    - FMI Corporation
    - FII
    - Mid-Valley EV Charging Supply
    - TelTec
    - FoxConn Industrial Internet
    - LHP Engineering Solutions
    - KemKrest
    - CenterPoint Energy
    - LVR International
    - IU Health
    - British Petroleum
    - TotalEnergies
    - Harmon Construction
    - XCharge Energy
  - Original Equipment Manufacturers (OEMs) - Cummins, General Motors, Stellantis, and Blue Bird
- Consumer-Owned and Investor-Owned Utilities
  - Duke Energy Indiana
  - AES Indiana
  - Indiana Michigan Power (I&M)
  - CenterPoint Energy (formerly Vectren)
  - Northern Indiana Public Service Company (NIPSCO)
  - Hoosier Energy
  - Wabash Valley Power Alliance
  - Indiana Municipal Power Agency (IMPA) - serves 61 member communities
  - Indiana Electric Cooperatives (IEC) - serves 38 member cooperatives
  - Indiana Energy Association (IEA)

- Freight and Logistics
    - Indiana Logistics Council (Conexus)
    - Indiana Motor Trucking Association (IMTA)
    - North American Council for Freight Efficiency (NACFE)
    - Green Truck Association (GTA)
    - Environmental Protection Agency (EPA) SmartWay Program
    - Truck stop provider, fleet provider, truck OEMs, transportation network companies (TNC), and convenience / grocery store; for example:
        - Indiana Food and Fuel Association
        - America's Green Line
        - Love's Truck
        - Huck's Market
        - Lassus
        - Fred's Minimart
- Academia
    - Purdue University (PU)
    - Indiana University (IU) Environmental Resilience Institute (ERI)

3.2 Public Outreach

INDOT's public engagement process incorporated strategies to inform and involve stakeholders and interested parties. The process allowed for in-depth electronic communication, in person and virtual sessions, and other strategies. INDOT distributed the following outreach tools to the list of stakeholders presented in the previous section and made the information publicly available through its website. These efforts were a vital part of the planning process. In many instances, INDOT was able to incorporate feedback into this plan. In other cases, INDOT captured the feedback for future consideration as it develops the details of the program in subsequent phases.

Following is a summary of specific outreach activities conducted leading up to the submittal of the draft plan:

- **RFI:** INDOT and OED issued a request for information[7] (RFI) on April 4, 2022, giving interested parties an opportunity to provide comments and data for consideration in

[7] https://content.govdelivery.com/attachments/INDOT/2022/04/01/file_attachments/2120170/INDOT_RFI on NEVI Deployment.pdf

the drafting of the State EV Implementation Plan. RFI responses were due on April 29, 2022. Below are the key takeaways from the responses:

- Respondents indicated Federal funding, sustainability, decarbonization goals and OEM production are driving their interest in EV adoption, DC Fast Chargers, and development of EVSE in rural and underserved areas.
- NEVI funding was overwhelmingly cited by respondents as a key accelerator to EV adoption though respondents were less clear on with whom they intend to partner to access funds. Many respondents stated INDOT was a potential partner, while others are exploring other options.
- Respondents expressed an interest in prioritizing EV build-out at locations and counties with higher EV adoption and areas adjacent to designated AFCs.
- Infrastructure for DC fast and ultrafast chargers along highways is most desired by respondents. There is a desire to avoid building stranded assets and effectively facilitate future charging expansion, respondents seek improved coordination among participants.
- Respondents relayed the need for the public sector to support scaling charging infrastructure for rural and underserved locations through planning guidance and funding.
- Respondents indicated that data gaps and supply chain issues would be the biggest challenges facing delivery readiness.
- Respondents are increasingly incorporating environmental and social metrics into measuring effectiveness of EV charging infrastructure, tying program performance to increases in EV adoption across different communities.
- Respondents expressed a desire for INDOT to provide information on suitable locations and partners, NEVI fulfillment requirements, and data on locations for existing and planned DC Fast infrastructure.
- Respondents highlighted that EV charging can be used as an economic enabler to local communities. They separately shared "best practices" for deploying EV chargers, such as developing partnerships, utilizing solar energy and mobile charging rigs.

- **Program Web page on in.gov Website:** INDOT provided a program-specific web page, titled Electric Vehicle Charging Infrastructure Network[8], on in.gov to keep stakeholders and other interested parties informed while also offering an opportunity to provide

[8] https://www.in.gov/indot/current-programs/innovative-programs/electric-vehicle-charging-infrastructure-network/

feedback and input. Resources, webinar recordings, presentations, and other materials (such as frequently asked questions) were made available as they were developed. In addition, to enable open input and comments, INDOT created a web comment form[9] and provided it on the program web page. Stakeholders were able to submit input and comment on the plan at any time during the planning process.

- **Online Survey:** INDOT created an online survey to gather direct feedback from stakeholders and the general public. The survey was distributed electronically to stakeholders on May 13, 2022. Survey responses were due by May 27, 2022. A link to the survey was also published on INDOT's webpage. INDOT received responses from 2,304 individuals representing all counties in the state except for one (Union County). Based on public comments received during the planning process, INDOT evaluated the survey responses in terms of the DAC areas. INDOT received responses from a zip code that overlaps with 419 out of 434 (97%) of DAC areas. Figure 2 shows the number of responses to the survey by zip code.

  Following is a summary of feedback received via the survey.

  - Primary barriers to EV adoption:
    - Availability of charging stations in the community
    - Purchase price of EVs
    - Range of EVs currently available
  - Suggestions for addressing these barriers:
    - Expanding the number and accessibility of charging stations in Indiana

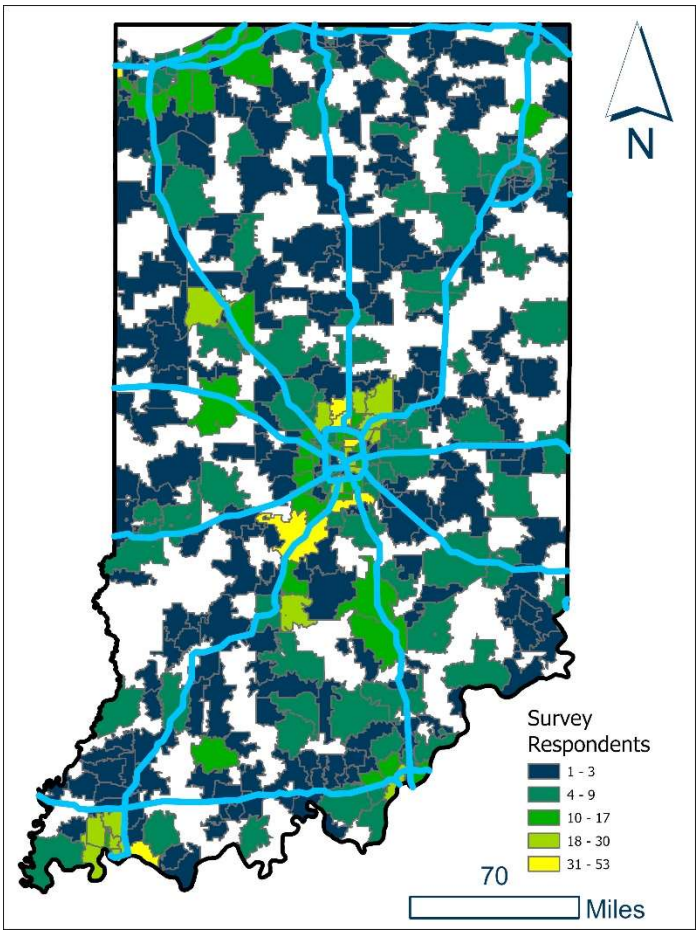


Figure 2. Public Survey Responses by Zip Code

[9] https://in.accessgov.com/indot/Forms/Page/indot/public-survey/0

        - Expanding tax breaks, subsidies, and incentives for charging stations and electric vehicles
        - Encouraging more affordable and efficient charging stations and electric vehicles
        - Increased outreach and education to the public about electric vehicles and charging stations
        - Reducing the registration fee for electric vehicles in Indiana
    - Key amenities sought at EV charging stations:
        - 24-hour access
        - Safety
        - Lighting
        - Restrooms
    - Factor for prioritizing implementation along the AFCs:
        - Addressing gaps in the existing charging network
        - Total traffic volumes
        - EV traffic volumes
        - Increasing EV charging in rural Indiana

Public Survey Responses by Stakeholder Type

- General Public – 78.6%
- Government – 9.4%
- Consumer- or Investor-Owned Utility – 2.9%
- Private Sector – 2.4%
- Academia – 1.4%
- Freight and Logistics – 1.1%
- Did Not Respond – 1%
- Labor Organization - 0.8%
- Media – 0.04%

- **Virtual Open House:** INDOT hosted a virtual open house / informational webinar to share information about the NEVI program, provide additional insight into the progress of the plan development, and further engage key stakeholders. The Virtual Open House was held on May 11, 2022. INDOT posted meeting slides and a recording of the meeting on its web page after the meeting and distributed them electronically to registered attendees. INDOT received 87 questions in the following areas:

  - Procurement and contracting
  - Funding
  - Charging stations, their locations, safety, costs, and fees
  - AFCs
  - Operations and maintenance of the charging stations
  - Public engagement
  - Using renewable energy/emerging technologies
  - Power/grid reliability

Virtual Open House Attendance by Stakeholder Type

- Private Sector 49%
- Government 26%
- General Public 13%
- Academia 4%
- Freight and Logistics 3%
- Utility Groups 3%
- Labor Organizations 1%
- Media 1%

- **Utility Survey:** INDOT developed a questionnaire to gather vital information from Indiana's utility groups relating to funding and incentives, site installation and connection, equity and environmental justice, energy generation, and strategic and long-term planning. Responses were due June 8, 2022. INDOT received four responses to the utility questionnaire, from AES Indiana, Duke Energy Indiana, NIPSCO, and IMPA. IMPA represents 61 towns and cities in Indiana. This feedback was extensive and is presented in detail in Chapter 6.

- **In-Person Stakeholder Meetings:** INDOT engaged directly with stakeholders and the public through three in-person meetings. Each of the stakeholder meetings was held in person in three different geographic regions of the state. The meetings were held at the Plymouth, Indianapolis, and Seymour INDOT facilities, providing opportunities for stakeholders from across the state to participate. Throughout the three meetings, attendees primarily focused questions around the implementation phase of the program, asking questions about the RFP process, preliminary station locations, pricing structures, and local partnerships with city and county governments. In addition, questions were presented focusing on grid upgrades and reliability, coordination with the currently ongoing DCFC VW Settlement project, and equity considerations. INDOT posted meeting slides and written responses to all questions on its website following each meeting. Details on each meeting are shown in Table 3.

Table 3. Summary of In-Person Public Meeting Summaries

Meeting	Date	Attendees	Summary of Feedback
Northern Indiana (Plymouth)	6/2/22	30 attendees representing the following stakeholders: - Private Sector 33% - Labor Organizations 27% - Utility Groups 17% - Government 13% - Freight and Logistics 7% - General Public 3%	- Insight into the accuracy of existing charging location in the region - Utility company input and comment - Electrical worker union input and follow up - MPO inquiry around additional AFC nominations
Central Indiana (Indianapolis)	6/9/22	37 attendees representing the following stakeholders: - Private Sector 45% - General Public 22% - Government 14% - Utility 8% - Labor Organizations 5% - Freight and Logistics 3% - Academia 3%	- Input and feedback on engagement approach - Equity considerations including opportunities for additional future engagement and DBE participation throughout implementation
Southern Indiana (Seymour)	6/14/22	35 attendees representing the following stakeholders: - Private Sector 35% - Government 31% - Utility Groups 20% - General Public 11% - Freight and Logistics 3%	- Interest in site selection, installation, operations, and maintenance (local communities, especially rural) - Interest in site selection and procurement (private sector) - Utility concerns around power availability and reliability

- **Virtual public walkthrough of the draft plan:** Following the development of the draft plan, INDOT held one final virtual public meeting on July 13, 2022, so interested parties from around the state could review draft plan content. The structure of the meeting was a live stream presentation of the plan on INDOT's YouTube channel with a question-and-answer period to conclude the meeting. Presenters walked through summaries of each chapter of the plan, then fielded input and questions from attendees. The meeting was broadcast in the evening to maximize attendance and accommodate public requests. The webinar had 260 concurrent viewers and 650 registrants. A copy of the slide deck and presentation recording was posted to INDOT's NEVI webpage after the meeting. Questions reflected viewers' interest in procurement and contracting; ways businesses and communities, including DAC communities, can stay engaged and be considered as potential site hosts; and charging stations requirements and considerations for potential locations.

Virtual Public Meeting Attendance by Stakeholder Type

- General Public 39%
- Private Sector 36%
- Government 17%
- Academia 3%
- Utility Groups 3%
- Freight and Logistics 2%
- Media 0.3%
- Labor Organizations 0.2%

- **One-on-One Stakeholder Meetings:** INDOT met individually with several stakeholder groups throughout the planning process. Stakeholders could request a meeting through the program web page or by contacting INDOT directly. These meetings served as a means for INDOT to receive information and inputs to the plan and to share insights on the plan development process. Table 4 provides a list of one-on-one meetings.

Table 4. Summary of One-on-One Meetings

General Public: - Indiana Energy Association - Greater Indiana Clean Cities, Inc. - IN Climate - Drive Clean Indiana	Government: - Joint Office of Energy and Transp. - REV Midwest - City of Bloomington - National Renewable Energy Lab (NREL) - KY Transp. Cabinet - Illinois DOT - Michigan DOT - DriveOhio - Mid-America Association of State Transp Officials (MAASTO) - City of Indianapolis - Northwest Indiana Regional Planning Commission - FHWA Indiana Division - Working group with representatives from: IN OED, INDOT, IEDC and IURC - Michiana Area Council of Governments - US Dept of Agriculture - IN Office of Utility Counselor	Private Sector: - Electrify America - ChargePoint - Indiana Manufacturers Association - Crossroads Solar - Francis Energy - Mid-Valley Supply - Tesla - Blink - 1820 Ventures - AEE - America's Green Line - Forsee Power - DANNAR - Simon Property Group - FMI Corporation - FII - Mid-Valley EV Charging Supply - TelTec - FoxConn Industrial Internet - LHP Engineering Solutions - KemKrest - CenterPoint Energy - LVR International - IU Health - British Petroleum - TotalEnergies - Harmon Construction - XCharge Energy	DAC Engagement: - Indiana State Conference of the NAACP - Evansville Branch NAACP 3048-B - Black Lives Matter South Bend - Indiana Chapter, American Association of Blacks in Energy - Habitat for Humanity - Indiana Alliance for Equity, Diversity and Inclusion of EV Infrastructure and Economic Opportunity - EV Noire
Labor Organizations: - Indiana Brotherhood of Electrical Workers	Utilities: - Indiana Michigan Power - Duke Energy - AES Indiana - IMPA	Freight and Logistics: - Conexus - Indiana Food and Fuel Association - Indiana Motor Truck Association	Academia: - Purdue University

- **Communication Methods:** INDOT used social media, webinars, news releases, email listservs, social media accounts, a podcast, and media interviews/outlets to share

communication about the plan, public meetings, and increase awareness for opportunities to engage and provide feedback. Some samples of social media outreach are shown in Figure 3.

Figure 3. Example Social Media Announcements

INDOT will continue its stakeholder engagement efforts throughout the life of the program to communicate progress, educate the public, and solicit additional feedback. The Public Engagement Plan that is posted publicly will be updated to include a schedule of activities planned for the first year of the program, with a focused effort around additional engagement with DAC and rural communities. The specific objective of that outreach will be to meet these communities in person and work together to define measurable outcomes for both engagement and implementation. INDOT will incorporate the results of these additional engagement efforts into the plan's regular updates.

4.0 Plan Vision and Goals

Transportation is recognized as the final frontier for major advancement in energy efficiency. In the United States, the transportation sector accounts for 27% of greenhouse gas emissions (EPA, 2020[10]). As a result, awareness of the environmental impacts of traffic is growing rapidly. Overall, there is an increased consumer demand toward EVs and shifts in the auto

[10] Sources of Greenhouse Gas Emissions | US EPA

manufacturers priorities and offerings to meet this current and future demand. Emphasizing the consumer and industry landscape has a more direct connection to the subsequent vision and goals. Efforts are being made towards reducing emissions, including the improvement of vehicle and fuel technology as well as the promotion of alternative, sustainable modes of transportation. The emergence of EVs is among those technological innovations that can reduce fuel consumption, emissions, and vehicle operating costs. As the owner of Indiana's NEVI program implementation, INDOT took a top-down approach to creating a vision and goals for the plan. This process started with a careful evaluation of the Federal guidance. This guidance described a state vision for strategically deploying EV charging infrastructure that supports the establishment of an interconnected network. According to the guidance, plan goals should ensure:

- Data collection (and data driven, quantifiable outcomes for at least one goal)
- Equitable access
- Network reliability
- Sustainability (i.e., an outlook for the 5-year program and beyond)

With the receipt of the initial Federal guidance and feedback received through its outreach efforts, INDOT defined the following priorities for EV station siting:

- Resolve 50-mile gaps on AFCs
- Provide service in high demand areas, exceeding requirements when warranted
- Provide service in DACs and rural areas
- Leverage existing access to utility service

Next, INDOT reviewed its existing agency vision and goals and collaborated with fellow state agencies to ensure alignment with these priorities and national requirements. Before finalizing them, INDOT discussed the draft vison and goals with FHWA and the OED and presented them at the four stakeholder meetings. The results are provided below.

4.1 Indiana EV Infrastructure Vision

Indiana's proposed vision for EV implementation combines INDOT's agency-wide vision and highlights the collaboration INDOT believes will be required for successful implementation. Alignment with related efforts including the IDEM VW Environmental Mitigation Trust efforts, Indiana House Bill 1221 (which is discussed in more detail in Chapter 7) was sought and will continue to validate this vision as the program moves through the planning process. The intent is for the vision to be forward thinking to be inclusive of future efforts including the

discretionary grant program and other alternative fuel efforts. The vision for EV infrastructure in Indiana is to:

> Collaboratively plan, build, and maintain safe and innovative EV infrastructure that enhances quality of life, drives economic growth, and facilitates the movement of people and goods.

INDOT intends to use NEVI funds to cover all activities needed to achieve this vision, including: 1) planning and engagement efforts that will take place in the first year of the program; 2) infrastructure installation, operations, and maintenance throughout the program; and 3) data collection, evaluation and reporting of outcomes that will be a focus of the latter years in the program. INDOT anticipates that the majority of the funding will be required for infrastructure installation, operations, and maintenance, with the remainder being used for the supporting activities. Section 8 of this Plan defines implementation activities, roles, and responsibilities and explains how they will evolve from the short-term into the longer-term. In the near-term, INDOT's priorities are to complete a more exhaustive engagement effort to ensure the equitable build out of infrastructure, and to work with state and local agencies and the private sector to evaluate and prioritize the preliminary charging locations. As the program moves into implementation, the focus will shift to building the infrastructure so that the 50-mile gaps along the AFCs are all resolved. Longer term, the efforts will focus on operating and maintaining the infrastructure and collecting and sharing data that required to monitor performance of the program.

4.2 Indiana EV Infrastructure Goals

Indiana's proposed EV goals create alignment between INDOTs agency-wide goals, fellow state agency priorities, and Federal program goals. The goals emphasize the need for public-private sector collaboration and acknowledge that data collection will be necessary to track deployment and utilization.

- **Indiana EV Goal #1**: Collaborate and communicate with customers and stakeholders regarding EV infrastructure deployment
- **Indiana EV Goal #2:** Increase understanding of Indiana's position as it relates to the EV industry and undertake initiatives to collect usage data and advance testing and research in the state
- **Indiana EV Goal #3:** Eliminate range anxiety for EVs
- **Indiana EV Goal #4:** Assess vehicle electrification needs as they evolve and update the EV plan regularly to support long-term economic competitiveness and quality of life

- **Indiana EV Goal #5:** Deliver the EV Plan to provide an interconnected, convenient, accessible, affordable, reliable, and equitable charging network
- **Indiana EV Goal #6:** Partner with the private sector so Indiana's workforce can support EV infrastructure

Recognizing that Federal guidance requires measurement and quantification of at least one goal, INDOT developed performance measures for two goals. These goals, measures, and targets are provided in Table 5.

Table 5. INDOT EV Implementation Goals

Goal	Performance Measure	Target
#3: Eliminate range anxiety for EVs	Percent of AFCs miles that are within 50 miles of a charging station	100%
	Percent of Indiana's population that is within 40 miles of a charging station	100%
#5: Deliver the EV Plan to provide an interconnected, convenient, accessible, reliable, and equitable charging network	Number of sites implemented, measured over time	TBD*
	Number of ports implemented	TBD*
	Percent of time at least one port is available at all sites	TBD*
	Number of vehicles served at an EV charging site	n/a

**The TBD goals will be dependent on the final number of sites that will be implemented and the amount of funding available each year. INDOT will set a target for the number of sites and ports to be implemented each year.*

5.0 Contracting

5.1 Contracting Approach

INDOT's contracting strategy involves decomposing the various activities involved in EV charging infrastructure build out, identifying the appropriate internal and external stakeholders involved for each, and determining the appropriate procurement method(s) and requirements.

Consistent with Federal guidance and in alignment with INDOT's priorities presented in Chapter 4, INDOT plans to contract with private entities for the design, construction, installation,

operations, and maintenance of EV charging infrastructure. In addition, INDOT may procure program support throughout the five years of the formula program.

At a high level, INDOT's current timeframe for contracting is summarized below. Following approval of its draft plan by FHWA, INDOT will continue to refine this framework throughout late 2022.

Phase I. Develop contracting plan

a. Potential timeframe:
    i. Q4 2022 through Q4 2023
b. Conduct additional planning work:
    i. Further define site selection criteria, utility coordination, procurement support, bid/site evaluation. The work will include program planning and execution for the expected annual authorizations and the scope, number of stations, and other activities and services needed during each year of the program.
    ii. Expand the public engagement plan to accommodate additional, targeted outreach. The updates will also specify activities, schedule and outcomes for future engagement, especially with respect to targeted in-person outreach in DAC areas with community leaders and diversity, equity and inclusion (DEI) representatives from key stakeholder organizations.
c. Key outcomes may include:
    i. Detailed program plan and schedule which can be used to add information to the future updates of this plan
    ii. Complete list of preliminary site locations with criteria such as potential utilization, power availability and readiness, EV traffic, and dwell time, etc.
    iii. Development of site location groupings (whether bundles of multiple sites within a certain region, bundles of multiple sites around the state, or portions of an AFC with multiple sites), and schedule and priority for their procurement, installation, and launch
    iv. Initial utility coordination to identify power providers and requirements to the sites
    v. Initial site design/development of minimum design standards for EV charging stations
    vi. Testing and verification standards for EVSE
    vii. Draft requirements, RFP, and vendor evaluation criteria
    viii. Claw back provisions for underperformance and non-performance
    ix. Metrics for DBE participation. As discussed in Chapter 10, INDOT's overall

goal for DBE participation is 10.1%. INDOT may also work with their Equity Initiative Service (EIS) division and Chief Equity Officer to develop a specific metric related to DBE participation for EV implementation.

x. Metrics for DAC community involvement. As discussed in Chapter 10 and 13, INDOT will measure engagement and benefits to DAC communities. INDOT will develop specific, quantifiable metrics for DAC engagement and involvement in the planning and implementation of the EV infrastructure.

Phase 2: Implement stations in high demand areas

a. Potential timeframe:
   i. RFP: Q3 2023
   ii. NTP: Q2 2024
   iii. Go-live: Q2 2025 (assuming 12-18 months lead and construction time)
b. General Scope:
   iv. All equipment and services including EVSE (hardware and software, network – including security and cybersecurity), installation, and operations and maintenance (O&M)
   v. Final site selection and site host agreements/right of way (ROW)
   vi. Final site design
   vii. On-site utility coordination (from site to EVSE)
   viii. Installation, construction (including environmental permitting, if necessary)
   ix. Testing
   x. 5-years term for O&M with INDOT defined performance and reporting requirements
c. Assumptions:
   xi. RFP to cover a group of sites (groupings to be determined in Q2 of 2023)
   xii. 20% cost share, from private entities when possible
   xiii. Direct revenue from the charging stations to be returned to the proposing team, in line with Federal requirements
   xiv. Right of way to be secured by the proposing team

Phase 3. Procure and implement stations in other high priority areas

a. Potential timeframe:
   i. RFP: Q3 2024
   ii. NTP: Q2 2025
   iii. Go-live: Q2 2026 (assuming 12 months lead and construction time)

b. General Scope:
    iv. All equipment and services including EVSE (hardware and software, network – including security and cybersecurity), installation, and operations and maintenance (O&M)
    v. Final site selection and site host agreements/right of way
    vi. Final site design
    vii. On-site utility coordination (from site to EVSE)
    viii. Installation, construction (including environmental permitting, if necessary)
    ix. Testing
    x. 5-year term for O&M with INDOT defined performance and reporting requirements
c. Assumptions:
    xi. RFP to cover a group of sites (groupings to be determined in Q2 of 2023)
    xii. 20% cost share, from private entities when possible
    xiii. Direct revenue from the charging stations to be returned to the proposing team, in line with Federal requirements
    xiv. ROW will be secured by the proposing team

Additional procurements will be held depending on the outcome of the site evaluation and phasing completed in the previous phases. Additional procurements will be conducted as needed during the later years of the five-year program until the AFCs are fully built out.

5.1.1. Plans for Contracting with Private Entities

INDOT plans to use a public-private partnership (P3) model in contracting with private entities. Through this model, INDOT will create a contractual agreement that it enables it to fully leverage private sector expertise and resources. INDOT anticipates the model will require the private sector to share some of the project risks such as design, construction, partial financing, long-term operation, and revenue. INDOT anticipates the P3 contracts will cover final design, installation, construction, and O&M.

While details of the procurement process will not be finalized until Q2 of 2023, INDOT anticipates deploying some combination of design-build-operate-maintain and design-build-operation-maintain-finance contracts.

Small Business

INDOT anticipates the RFP will encourage participation by small business and/or disadvantaged business enterprise (DBE). More information on this topic is provided in the Labor and Workforce section below.

5.1.2 Alignment with Plan Vision and Goals

INDOT will design and implement a procurement process that satisfies several elements of its EV infrastructure vision and goals:

- Collaborate and communicate with customers and stakeholders regarding EV infrastructure deployment
    - Collaborate with private entities on the implementation of EV infrastructure, to include the data collection necessary to track and report key metrics related to usage and deployment on a regular basis, and to empower INDOT and their partner agencies to share these results with their key stakeholders.
    - While private sector cost share is desired, INDOT will consider all options for the 20% cost-share requirement, whether that is offered by private companies, charging providers, site hosts, utility companies, local/county municipalities or others.
    - A shared requirement in private sector contracting mechanisms to participate and collect data regarding the engagement of communities in the infrastructure deployment.
- Increase understanding of Indiana's position as it relates to the EV industry, and undertake initiatives to collect usage data and advance testing and research in the state
    - This goal specifically prioritizes the collection of data, a requirement that will flow down to the entities supporting implementation.
- Eliminate range anxiety for EVs
- Assess vehicle electrification needs as they evolve and update the EV plan regularly to support long-term economic competitiveness and quality of life:
    - The flexibility to include value-added offerings from private entities proposing on these activities can directly advance Indiana’s economic competitiveness and quality of life. Proposals that highlight small business and DBE participation or incentivize and/or train site hosts and localities in the areas of O&M are examples of actions to support this goal.
    - In-depth planning and evolution of this implementation plan will help Indiana to

incorporate emerging and evolving technologies and expand the program to public transit and freight transportation beyond the five years of the Federal grant.

- Deliver the EV Plan to provide an interconnected, convenient, accessible, reliable, and equitable charging network
    - Detailed planning regarding preliminary site locations, with stakeholder input for the specific site selection (from all entities involved in deployment, including private sector, utilities, communities, and the general public). The process will ensure that NEVI minimum requirements are met, thus providing convenient and accessible charging infrastructure for all Hoosiers.
    - INDOT will define minimum O&M requirements to ensure reliability and equity in the infrastructure and its network.
    - INDOT will measure and report on engagement efforts consistent with Federal guidance.
- Partner with the private sector so Indiana's workforce can support EV infrastructure
    - Indiana's overall contracting approach is the key method by which this goal will be satisfied.

5.2 Contract Management

INDOT will define the specific procurement method and contract terms in 2023. To ensure efficient ongoing O&M, the contract language will outline a minimum of 5 years of operations and maintenance requirements. The contracts may also include considerations for ownership/operations issues after the 5-year O&M period to ensure sustainable operations and availability after the initial O&M term is over.

Potential contracting mechanisms under consideration include:

- Milestone based payments
- Potential utilization of:
    - Incentives
    - Penalties
- Performance measurement/data collection requirements with regular reporting:
    - Infrastructure operations and maintenance
    - Engagement report to demonstrate collaboration with communities
- Minimum O&M requirements, such as:

  - Site access (24x7 the minimum)
  - Preferred charging fee structure
  - Availability of equitable payment options (i.e. non-card based payment options)
  - Minimum downtime (recent guidance indicates 97%)
  - Minimum response time for intermittent/unplanned repairs (to be defined)
  - Warrant period
  - Equipment cleaning
- Labor and workforce considerations, including contributions to equity and community engagement requirements.
  - Proposals that indicate the voluntary engagement of the communities (both businesses and residents) in their approach may be prioritized.
  - DBE participation relative to requirements

6.0 Existing and Future Conditions Analysis

This section provides important context for the planning process and addresses several specific topics required by Federal guidance.

6.1 State Geography, Terrain and Climate

6.1.1 Geography and Terrain

Indiana is in the Midwest between Ohio, Kentucky, Illinois, and Michigan. It borders Lake Michigan at its northwest corner and the Ohio River to the south. Since Lake Michigan serves as a barrier to east-west travel and due to its location in the U.S., Indiana is frequently referred to as the Crossroads of America. More interstate highways pass through Indiana than any other state.

Indiana has relatively low elevation overall, with the elevation above sea level ranging from 320 feet at the Ohio River to 1257 feet at Hoosier Hill in Wayne County. Generally, the terrain is flat in the northern and central areas of the state transitioning to rolling terrain and hills in the southern half. Indiana's terrain does not impede or create a challenging environment for general passenger vehicle transportation or EV operations, as both passengers and freight travel freely through and around the state year-round.

6.1.2 Current and Future Temperature and Precipitation

Indiana's climate varies by region, with temperatures typically cooler in the north and warmer in the south. Temperatures can be extreme, from below zero to more than 100 degrees, but typically only for short periods. Indianapolis, near the center of the state, averages 28 degrees in January and 72 degrees in July. On average, Indiana gets approximately 43 inches of rain and 22 inches of snow per year.[11]

The Indiana Climate Change Impacts Assessment (IN CCIA) describes historical climate trends and provides future projections of how Indiana's climate is likely to change. Some conclusions around climate trends in Indiana referenced in the report[12] include:

- Precipitation: Since 1895, average annual precipitation in Indiana has increased by about 15%, or about 5.6 inches, based on a linear trend.
- Temperature: Similarly, since 1895, Indiana's statewide annual average temperature has risen by 1.2°F, or about 0.1°F per decade. The warming trend has sped up in recent decades. Since 1960, the average annual temperature has risen 0.4°F per decade, with warming trends identified in all four seasons.
- Weather Events: Indiana has about 15 tornadoes per year that rate at least EF1 on the Enhanced Fujita scale, in which EF5 tornadoes are the most damaging. Since 1960, tornadoes have been seen in every month, but mostly in April to June. There is significant variation year to year and no obvious trend in tornado activity.

In general, Indiana's relatively mild climate conditions are welcoming for EV. As with many areas of the U.S., weather could have an influence for short periods during winter since cold temperatures affect battery life and range.[13]

6.2 Land Use Patterns

Land use patterns across Indiana are shown in Figure 4. Approximately 22% of Indiana's population is rural, i.e., occupying locations with a population of less than 50,000. In Indiana, 46 of 92 counties are considered rural.

[11] https://www.weather-us.com/en/indiana-usa-climate

[12] https://docs.lib.purdue.edu/climatetr/2/?_ga=2.261156868.86504781.1654896817-443183128.1653997887

[13] https://www.consumerreports.org/hybrids-evs/how-much-do-cold-temperatures-affect-an-evs-driving-range-a5751769461/

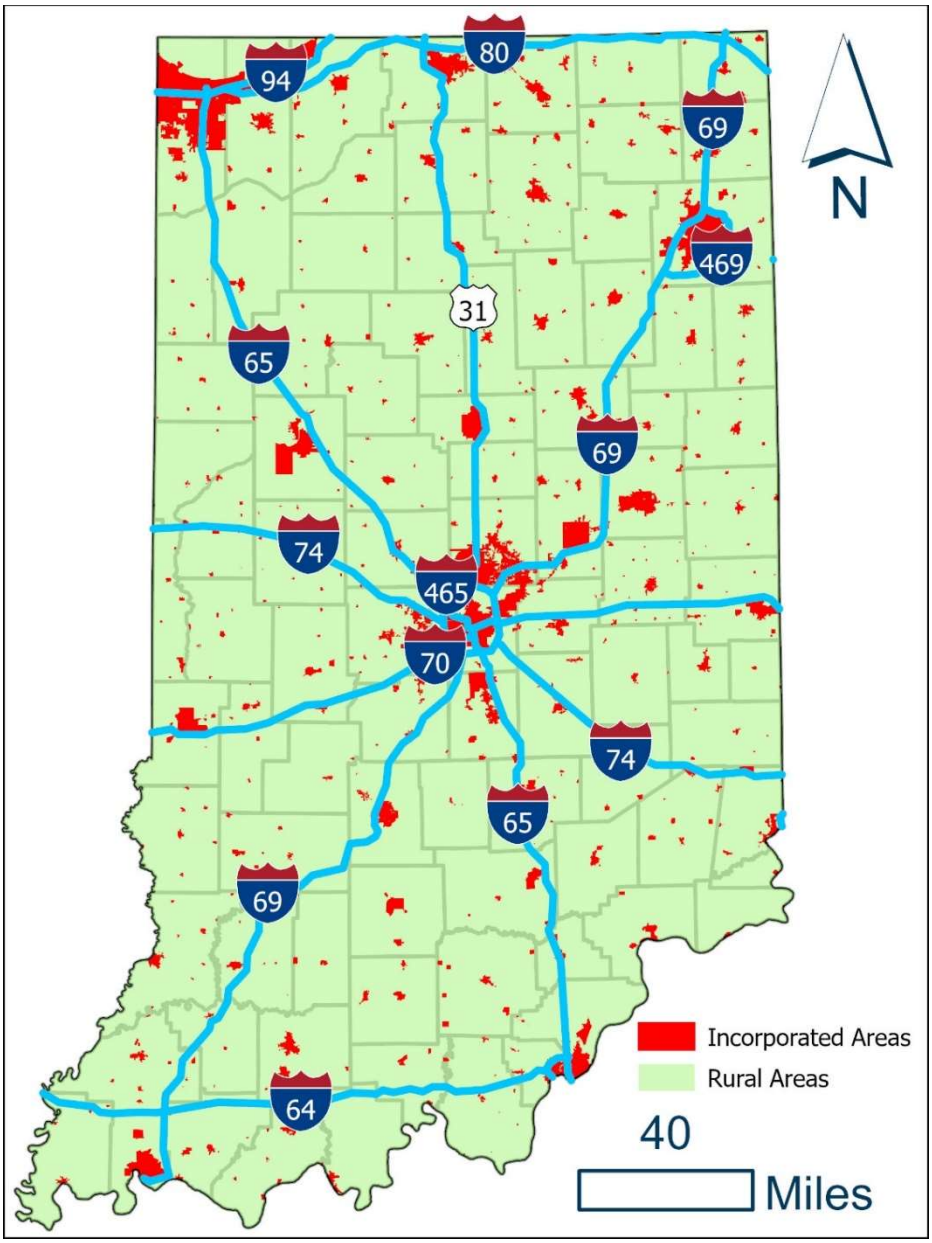


Figure 4. Land Use in Indiana[14]

[14] https://maps.indiana.edu/

Population density is shown in Figure 5 which shows the alignment of the population in and around the incorporated areas shown in Figure 4. The state's population is projected to grow by roughly 660,000 residents by 2050.[15]

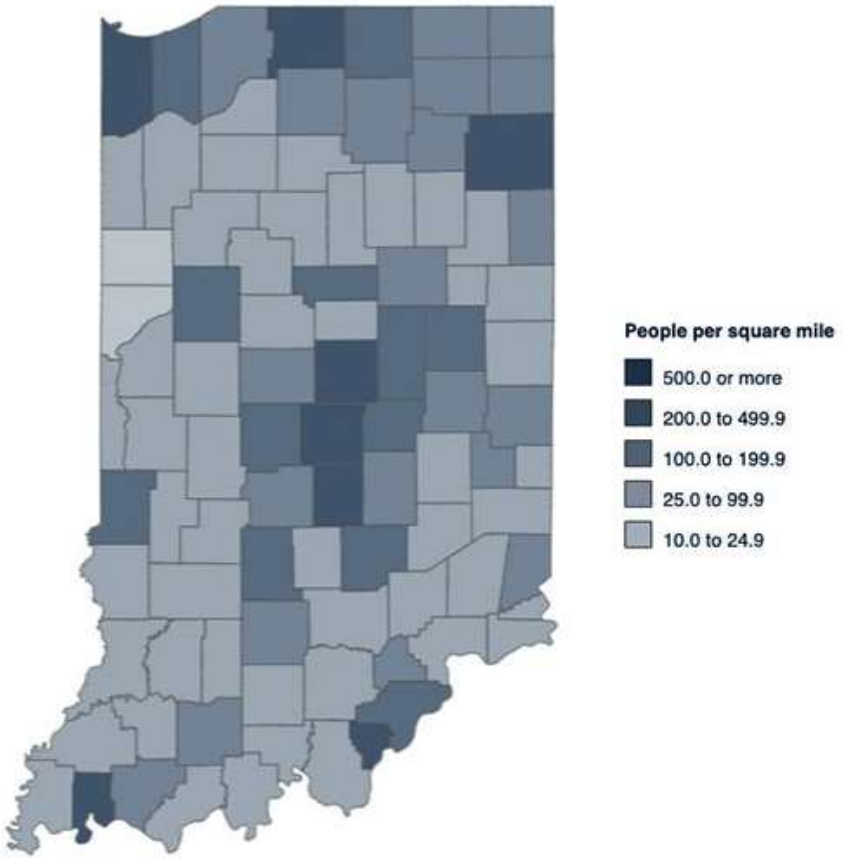


Figure 5. Indiana Population Density (2022)

6.3 EV Market Conditions in Indiana

6.3.1 EV Ownership and Availability

The total light duty EV market in Indiana was around 3% (including battery electric, hybrid electric, and plug-in hybrid EVs) in 2019 (Alliance of Automobile Manufacturers, 2019). The total number of EV registrations as of May 2022 was 6,990[16]. Figure 6 shows the battery and hybrid electric light duty market share in Indiana from 2013-2019. The total EV share in 2019 was 0.68% for battery electric and 2.39% for hybrid EVs. This share in 2019 was higher than the share in 2018 but just under the share in 2013. The majority of EVs are hybrid followed by battery EVs.

[15] https://www.stats.indiana.edu/maptools/projections.asp

[16] https://afdc.energy.gov/data/10962

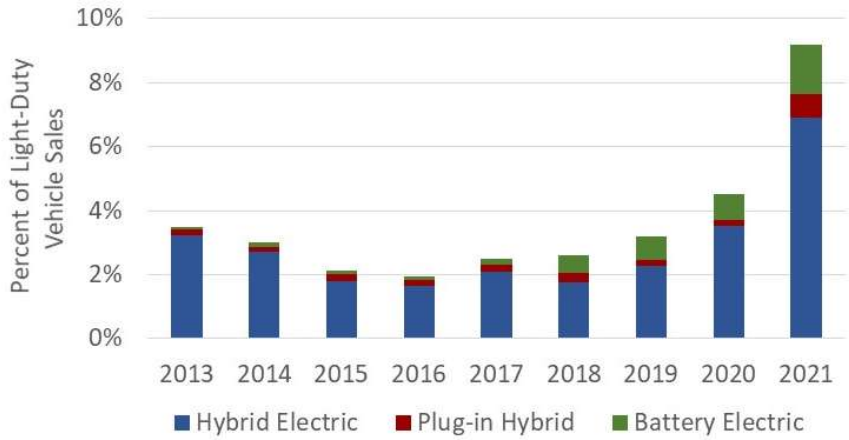


Figure 6. EV Light Duty Vehicle Market Share (2013-2019). Source: Alliance of Automobile Manufacturers, 2019.

Purdue's study "A Strategic Assessment of Needs and Opportunities for Wider Adoption of Electric Vehicles in Indiana," which is being finalized in 2022, concluded there is limited information regarding future trends for EV market penetration in Indiana (see Figure 7). Purdue's SPR 45 Analysis Results analyzed current trend and statistics for EVs in Indiana and concluded:

- There is limited information regarding future trends for EV market penetration
- There are multiple initiatives in the state that have started to explore green transportation technologies as well as programs with the goal to accelerate EV adoption
- There is difficulty in performing real-world projections for the impact of EVs on electric grids

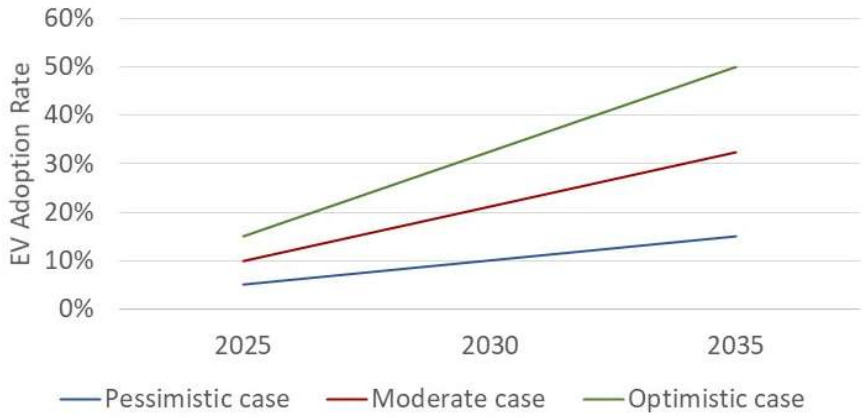


Figure 7. Projected EV Adoption Rate in Indiana. Source: Purdue University 2022

A second study completed for Duke Energy considered two different EV penetration levels between 2030 and 2050. These scenarios include a "business as usual" scenario of modest EV penetration that is based on the Energy Information Administration's (EIA) current estimates of future EV sales. The study also detailed a more aggressive scenario based on the EV penetration

that would be required to get the state onto a trajectory to reduce light duty greenhouse gas emissions by 70-80% from current levels by 2050. Duke estimated EVs could reach from 6% (for the moderate scenario) to 95% (for the aggressive scenario) of the registered vehicles in Indiana by 2050.[17] This wide range is consistent with Purdue's findings that projecting future rates is difficult.

Indiana by the numbers:

- Percentage of registered vehicles that are electric: 0.11%
- Total registered EVs: 6,990 (#25 state overall)
- Number of statewide charging stations: 354 (#29 overall)
- Number of charging ports per 100 EVs: 13.6 (#38 overall)
- Registration fees: $150 annual fee for EVs; $50 for hybrids and PHEVs.

6.3.2 Grid Capacity

Purdue SPR 4509 concluded that grid management and renewable energy integration should be a high priority as EV adoption increases and especially, as electric commercial vehicle adoption increases. Other conclusions noted in this study[18] related to grid capacity include:

- With the current adoption rates, there is currently no need for major grid updates
- Close collaboration between utility companies and the public sector is crucial, especially in the future, with increased adoption rates
- Commercial fleet electrification was the main area for which stakeholders expressed concerns regarding future grid needs
- Grid management would be of high priority as EV adoption increases
- EVs should become a grid asset with technologies like vehicle-to-grid (V2G), on-site energy generation, and on-site energy storage
- Renewable energy should be an integral part of the transportation electrification process

[17] M.J. Bradley & Associates. (2018). Electric vehicle cost-benefit analysis. Plug-in electric vehicle cost-benefit analysis: https://mjbradley.com/sites/default/files/IN%20PEV%20CB%20Analysis%20FINAL.pdf

[18] Konstantinou et al. A Strategic Assessment of Needs and Opportunities for Wider Adoption of Electric Vehicles in Indiana. February 14, 2022.

6.3.3 Electric Utilities

Three types of electric utilities exist in Indiana:[19]

- Investor-owned utility (IOU): private businesses with shareholders
- Municipal: owned and managed by cities and towns
- Rural Electric Membership Cooperatives (REMC): organizations where each customer is a voting member and an owner of the business

Oversight and regulation are provided by:

- OED (Indiana Office of Energy Development): OED focuses on energy planning with support for a strong and growing economy. OED was a member of INDOT's EV working group and an active participant in plan development.
- IURC (Indiana Utility Regulatory Commission): IURC ensures utilities provide safe and reliable service at just and reasonable rates. IURC was also a member of INDOT's EV working group.

There are 5 IOUs in Indiana[20]:

- Northern Indiana Public Service Company (NIPSCO)
- AES Indiana (formerly Indianapolis Power and Light)
- Duke Energy Indiana
- CenterPoint Energy (Vectren)
- Indiana Michigan Power (I&M)

Thirty-eight rural electric distribution cooperatives operate in Indiana and generally receive generation and transmission electric services from either Hoosier Energy or Wabash Valley Power Alliance. [21,22,23] Seventy-two municipally owned electric distribution utilities provide electricity in Indiana, and 60 receive generation and transmission services through the Indiana

[19] https://www.in.gov/iurc/files/IURC-Utility-Guide-LoRes_2-min.pdf

[20] https://www.in.gov/oed/indianas-energy-landscape/electricity/investor-owned-utilities/

[21] https://www.hoosierenergy.com/about/

[22] https://www.wvpa.com/who-we-are/

[23] https://www.indianaec.org/who-we-are/members/

Municipal Power Agency. [24,25] The remaining municipally owned utilities have contractual arrangements with nearby investor-owned utilities for generation and transmission services.

Figure 8 provides a map showing the location of investor-owned, municipal, and REMC electric utilities in Indiana.

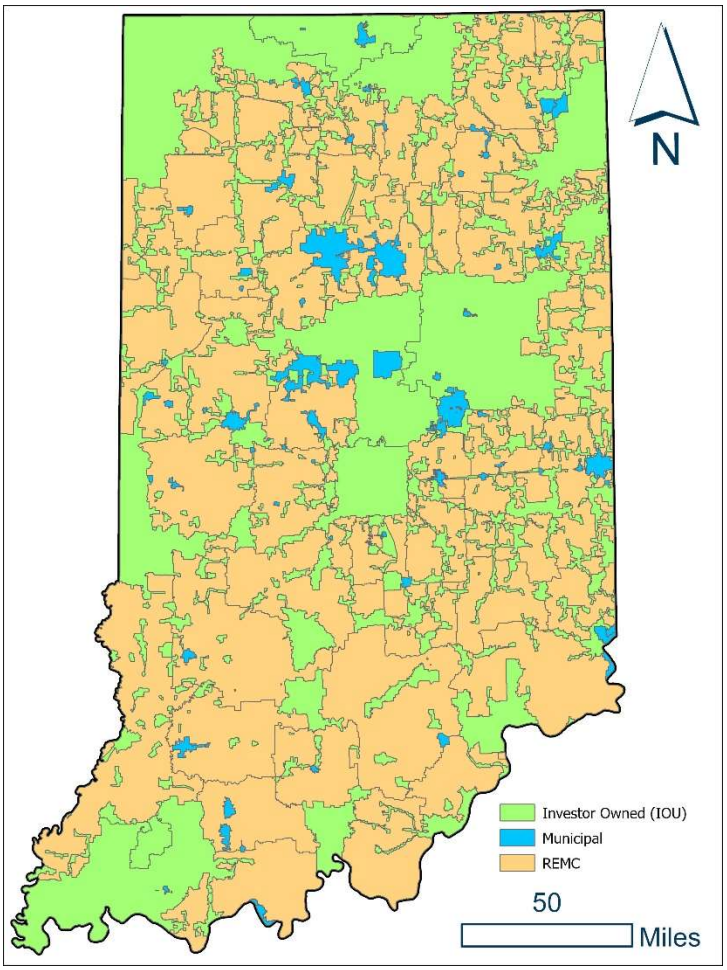


Figure 8. Utility Providers and Service Areas in Indiana[26]

Indiana recognizes the critical role of the utility providers in the deployment of EV infrastructure and as such, made efforts to engage directly with the during the development of this plan. Many utilities are engaged in the deployment of EV infrastructure already through their partnership with IDEM and the VW-funded program. IDEM awarded the collaborative effort of eight utilities the most recent VW award for the deployment of sixty-one (61) DC Fast

[24] https://www.in.gov/iurc/energy-division/electricity-industry/

[25] https://www.impa.com/about-impa

[26] https://maps.indiana.edu/previewMaps/Infrastructure/Energy_Electric_Service_Territories.html

chargers. These projects are currently in various stages of progress from site host agreements through ground-breaking.

Following is a summary of INDOT's outreach to utility providers:

- A May 2022 survey of Indiana's utility companies yield four responses.
- Nine providers attended the three in-person meetings. Attendees at these meetings included:
    - Wabash Valley Power Alliance
    - Bartholomew County REMC
    - Fulton County REMC
    - Northeastern REMC
    - NiSource (NIPSCO)
    - Tipmont Wintek REMC
    - Clark County REMC
    - Hoosier Energy
    - Johnson County REMC
- One-on-one meetings, including:
    - Indiana Michigan Power
    - AES Indiana
    - IMPA
    - Duke Energy
- Engagement with utility advocates via in-person and virtual events, including:
    - Citizens Action Coalition (Virtual Open House Webinar and Plan Walk Through Webinar)
    - Indiana Utility Regulatory Commission (Virtual Open House Webinar)
    - Indiana Office of Utility Consumer Councilor (Plan Walk Through Webinar)

Key feedback noted during these exchanges is summarized below:

- Some but not all utilities noted a willingness and ability to provide local match. Some utilities are proceeding with owning and operating the initial charging stations implanted within the DCFC Utility Group Grant Project funded through the VW settlement. The amount of utility investment would determine if PUC action would be a requirement prior to proceeding going forward.

- All providers expressed that utility groups should be communicated with early and often for EVSE Installation projects, noting that 24-month or more advance notice would be ideal. The information requested relating to installation projects includes expected load, long term plan, on peak off peak charging times, staged/all on/all off, the anticipated use of the installed infrastructure, and the exact location of proposed stations. A clear timeline for the EV charger in-service date would be beneficial since some electrical components, such as transformers, have substantial lead times (over 1 year).
- Normally new utility-owned lines and equipment will be installed by the company at no cost to the customer, provided that the total estimated cost of the installation does not exceed the estimated revenue for the first 2½ years. If the estimated cost of the installation exceeds the estimated revenue, the customer must pay the difference in advance of construction.
- Utilities estimated investment between $50,000 to $125,000 to serve 600kW per station with locations requiring significant system upgrades totaling greater than $1 million. Upgrades could include new transformers, trenching, concrete/asphalt work, conduit, underground vaults, new conductor, and other miscellaneous equipment to serve the DCFC. Respondents expressed they would not deny an installation from proceeding. However, as expressed above, costs may be prohibitive for the prospective customer at certain locations.
- Most utilities are considering load balances to encourage charging during off-peak times and some are also planning to use metering infrastructure to allow for more load balancing capabilities for customers. There is interest in exploring off-peak pricing offers through pilot efforts.
- There are resiliency efforts underway across the various utilities in the state. For example:
    - AES Indiana is investing 1.2 billion dollars in grid modernization upgrades to support future load growth and reliability.
    - Duke Energy Indiana is wrapping up a $1.4 billion first round investment in infrastructure, with plans in place to begin, in 2024, a second round of investments over six years and worth 2.1 billion dollars, with $158 million dedicated toward economic development. Other efforts at Duke include:
        - Duke Energy has multiple battery storage locations in service today, including three in Indiana and roughly 10 more within its other regulated service territories.

        - Duke Energy's proposal at the IURC to study and support V2G for school buses and a pilot to test various off-peak pricing offers was just approved.

    - Since 2016, NIPSCO has been investing a total of 2.89 billion dollars across two separate plans, which spreads across a decade ending in 2026.
    - CenterPoint Energy Indiana (formerly Vectren) is engaged in a seven-year, $446 million effort to upgrade infrastructure and reaffirm reliability across its southwest Indiana footprint, which will conclude in 2024.
- From a DCFC infrastructure standpoint, the utilities believe weather related resiliency should be one among many factors taken into consideration when issuing an RFP for equipment.
- Coordinated group conversations and an information portal were suggested to improve collaboration between DOTs, EV charging station providers, businesses, broadband companies and utility companies. Like INDOT's permitting portal, this approach would allow all groups to receive the same information in a timely manner.
- It was noted that maps showing three-phase power in utility service areas are proprietary and are not shared externally.

6.4 State Travel Patterns, Public Transportation Needs, Freight and Other Supply Chain Needs

6.4.1 Light-Duty Vehicle / Passenger Travel

Annual average daily traffic (AADT) patterns mimic the distribution of land use and population density in the state, exceeding 47,000 vehicles per day in and around urbanized areas. AADT as of 2019 is shown in Figure 9.

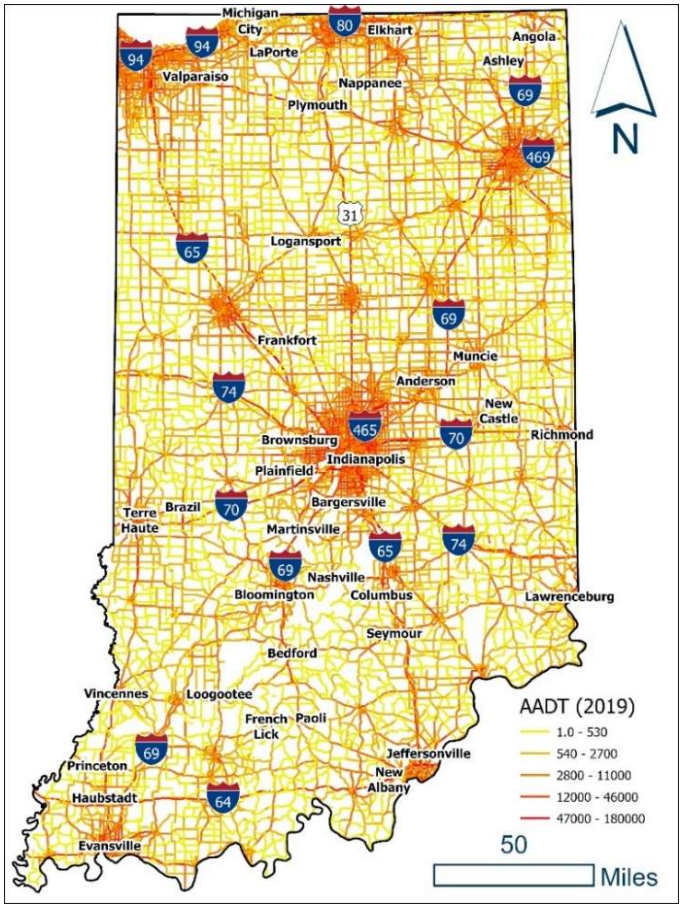


Figure 9. 2019 Travel Patterns (Annual Average Daily Trips) (Source: INDOT)

6.4.2 EV Passenger Travel

Purdue analyzed the number of trips and the dwell time at all interchanges along Indiana's AFCs using a third-party data set. The top 50 interchanges (as of May 2022) are shown in Figure 10 and Figure 11. Purdue's methodology for this analysis is described in more detail in the September 2021 Journal of Transportation Technologies article.[27] The analysis and results include trips for EV and hybrid vehicles (HV). As expected, the traffic volumes coincide with incorporated, population dense areas.

[27] Desai, J., Mathew, J.K., Li, H. and Bullock, D.M. (2021) Analysis of Electric and Hybrid Vehicle Usage in Proximity to Charging Infrastructure in Indiana. Journal of Transportation Technologies, 11, 577-596. https://doi.org/10.4236/jtts.2021.114036

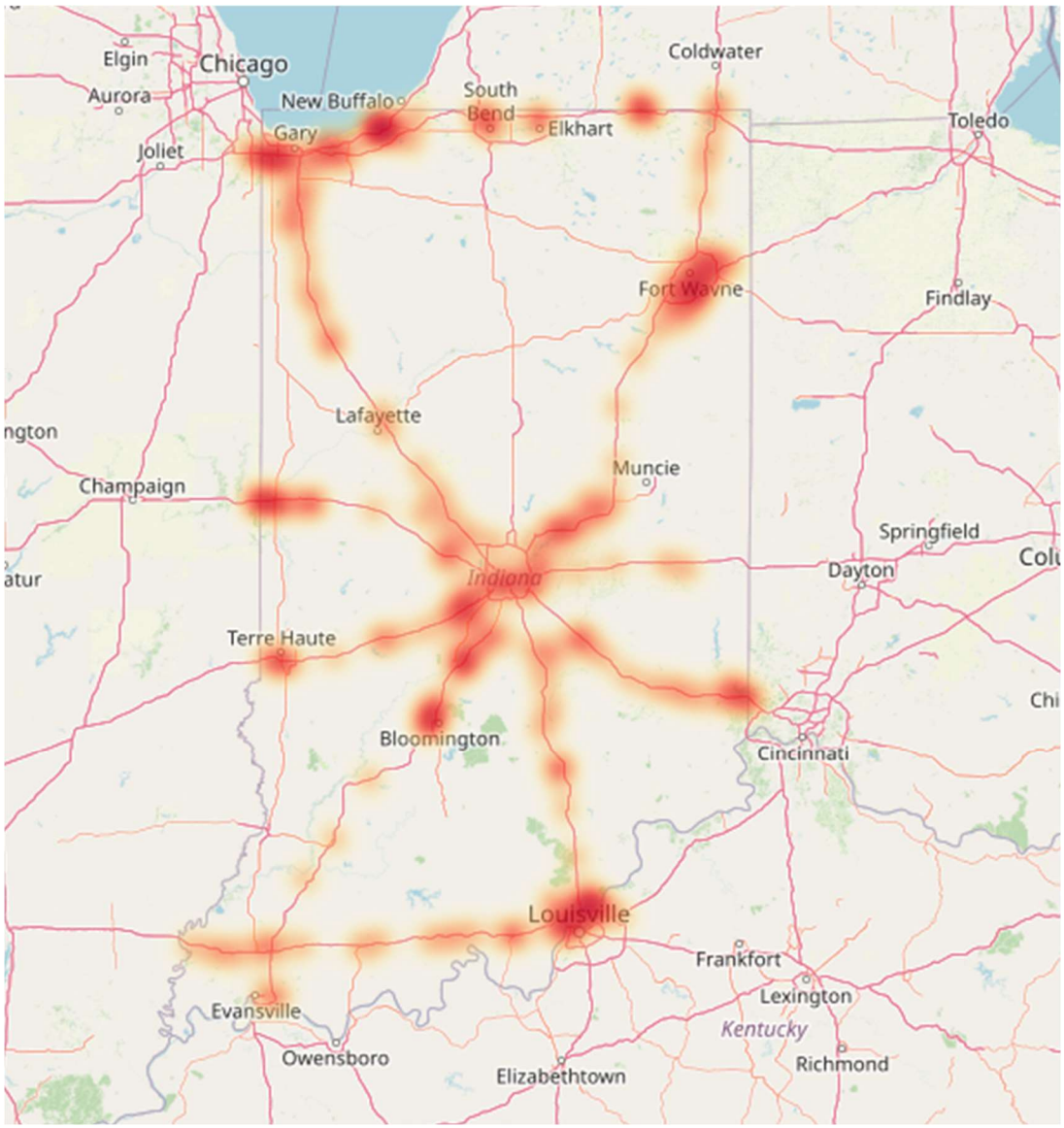


Figure 10. Heatmap of Sampled Connected Vehicle Dwell Sessions (5 mins – 3 hours) for Indiana's Interstate System (Source: Purdue University)

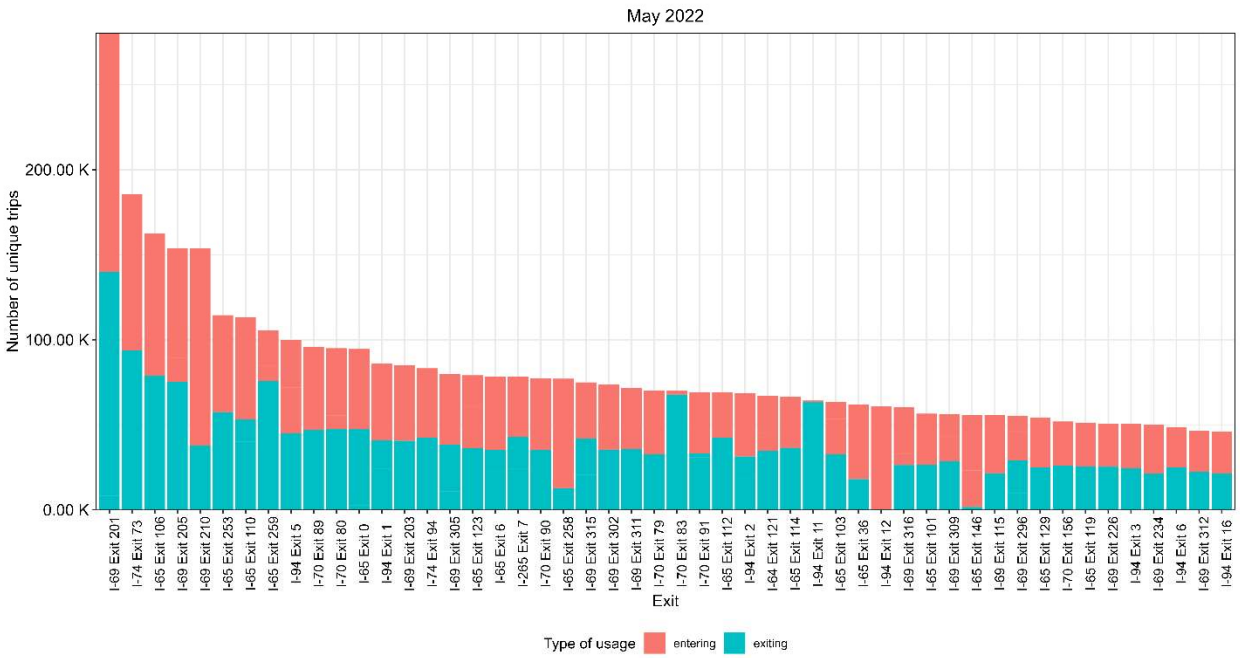


Figure 11. Top 50 Exits Utilized by Sampled Connected Vehicles on Indiana's Interstate System (Source: Purdue University)

Table 6 below shows the number of trips and dwell sessions for each of Indiana's AFCs.

Table 6. Number of Trips and Dwell Sessions by AFC, May 2022 (Source: Purdue University)

Interstate Route	Unique Sampled Trips Utilizing Exits	Dwell Sessions (5mins – 3hrs)
I-64	291,692	1,408
I-65	2,427,481	337
I-69	2,224,051	567
I-70	1,053,975	1,230
I-74	647,349	118
I-90	196,714	248
I-94	817,671	3,743
I-265	240,577	357
I-469	213,963	244

6.4.3 Public Transportation Considerations

There are 63 public transportation providers in the state of Indiana.[28] Three major public providers participated in planning process. These are listed below along with a brief description of their service area and electrification activities:

[28] https://www.in.gov/indot/multimodal/transit/indiana-public-transit-systems/

- IndyGo: IndyGo is striving to become one of the most electrified transit systems in the Midwest.[29] IndyGo currently has 31 electric buses running on its express bus rapid transit (BRT) Red Line. The Red Line is the longest electric bus line in the Midwest. There was a plan for Indianapolis to switch to an entirely electric fleet of public buses by 2035, but this is currently in question due to problems with range. There are also discussions for the upcoming Purple Line addition to the BRT, which is likely to add 30 electric buses. The Blue BRT line is currently in planning and is also likely to be electric or alternative fuel. IndyGo is exploring the potential of wireless/inductive charging capabilities[30] as well as other alternative fuel solutions such as hydrogen. In July 2021, IndyGo and Allison Transmission announced a partnership to deliver 24 electric hybrid buses to the agency for non-BRT service lines, although a delivery timeframe has not yet been publicized.[31]
- Bloomington Transit has received public funding to electrify buses in their fleet. The current fleet consists of 80% diesel vehicles and 20% hybrid. In August 2020, the Federal Transit Administration awarded the local public transit system $3.2 million to purchase electric buses and charging stations, which would allow the city to purchase four buses. As of March 2022, the city has only purchased two and plans to conduct a study to measure the practicality of electric buses before purchasing more.[32]

Regarding other public transportation efforts around the state, different local EV projects have been initiated. Some relevant highlights include:

- The Indianapolis airport operates nine electric buses serving passengers between the ground transportation center and long-term parking. Buses can handle about 120 miles, which allows an eight to 12-hour shift (Indianapolis International Airport, 2017). Their charging time is about six hours. This project is supported by Federal grants ($3.6M) under the ZEV program along with IDEM's VW trust program awards. In addition to the EV charging stations already on-site for traveler's use, the Indianapolis airport is also installing charging equipment in the cargo handling bays for airline use starting with the VW trust funded project with United Airlines transitioning at least eight cargo "tugs" from diesel to electric.

[29] https://grist.org/sponsored/beyond-the-line-how-an-all-electric-bus-rapid-transit-system-is-transforming-indianapolis/

[30] https://www.indygo.net/indygo-implements-inductive-charging-along-the-red-line-to-charge-buses-en-route/

[31] https://www.wishtv.com/news/local-news/indygo-to-unveil-new-electric-hybrid-bus/

[32] https://www.heraldtimesonline.com/story/news/education/2022/03/28/mccscs-new-electric-buses-may-fare-better-than-bloomington-transit/7077017001/

- Bargersville police department is among the first to implement EVs into its fleet. The fleet includes a 2019 Tesla Model 3 car (May & Clark, 2021). It has been reported that the car will save the department more than $20,000 over the next six years.
- In early 2019, the city of Carmel's police department began switching its fleet of patrol cars from regular gasoline powered vehicles to Ford hybrid interceptors (Carmel Indiana, 2019). This will provide annual savings of nearly $400,000 once the entire 130-car fleet is replaced. There is also a plan to add 41 hybrid police patrol vehicles.

6.4.4 Freight Considerations

INDOT is currently updated Indiana's 2018 Multimodal Freight Plan with an anticipated publication date of early 2023. The 2018 plan reflects the following key statistics regarding freight – specifically highway – in the state of Indiana:

- Indiana ranks first in the U.S. with 13 pass-through interstates.
- 75% of U.S. and Canadian populations live within a day's truck trip of Indiana.
- 79 billion vehicle miles traveled[33]
- By 2035, freight traffic is expected to increase substantially on state routes and U.S. highways with growth along key freight corridors in the state. The state's highway freight corridors are shown in Figure 12 and projected 2035 truck volumes are shown in Figure 13.

[33] U.S. Department of Transportation, State Transportation Statistics, 2015

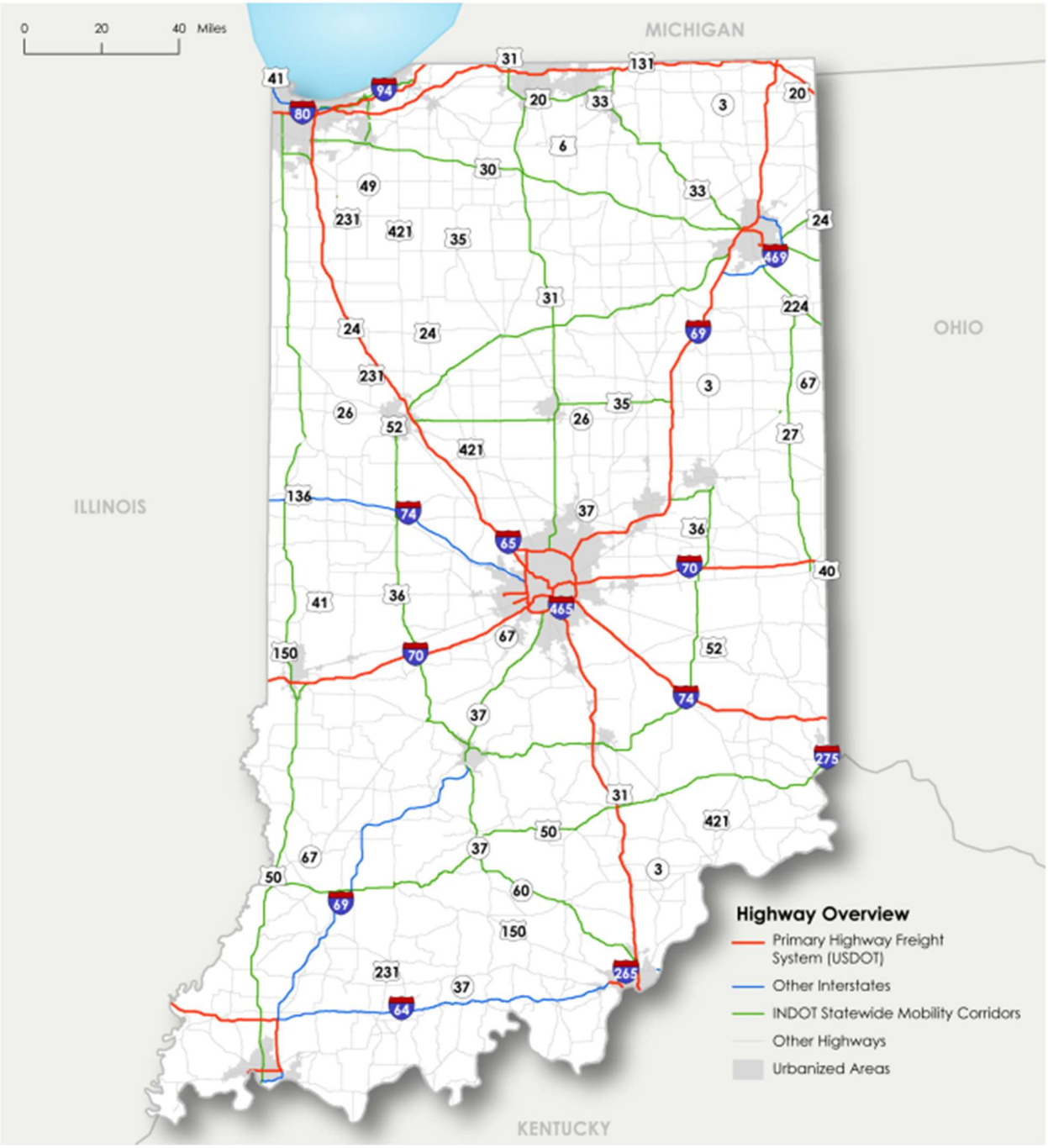


Figure 12. Indiana's Highway Freight Corridors[34]

[34] https://www.in.gov/indot/files/IN2018SFP-Chapter-2.pdf

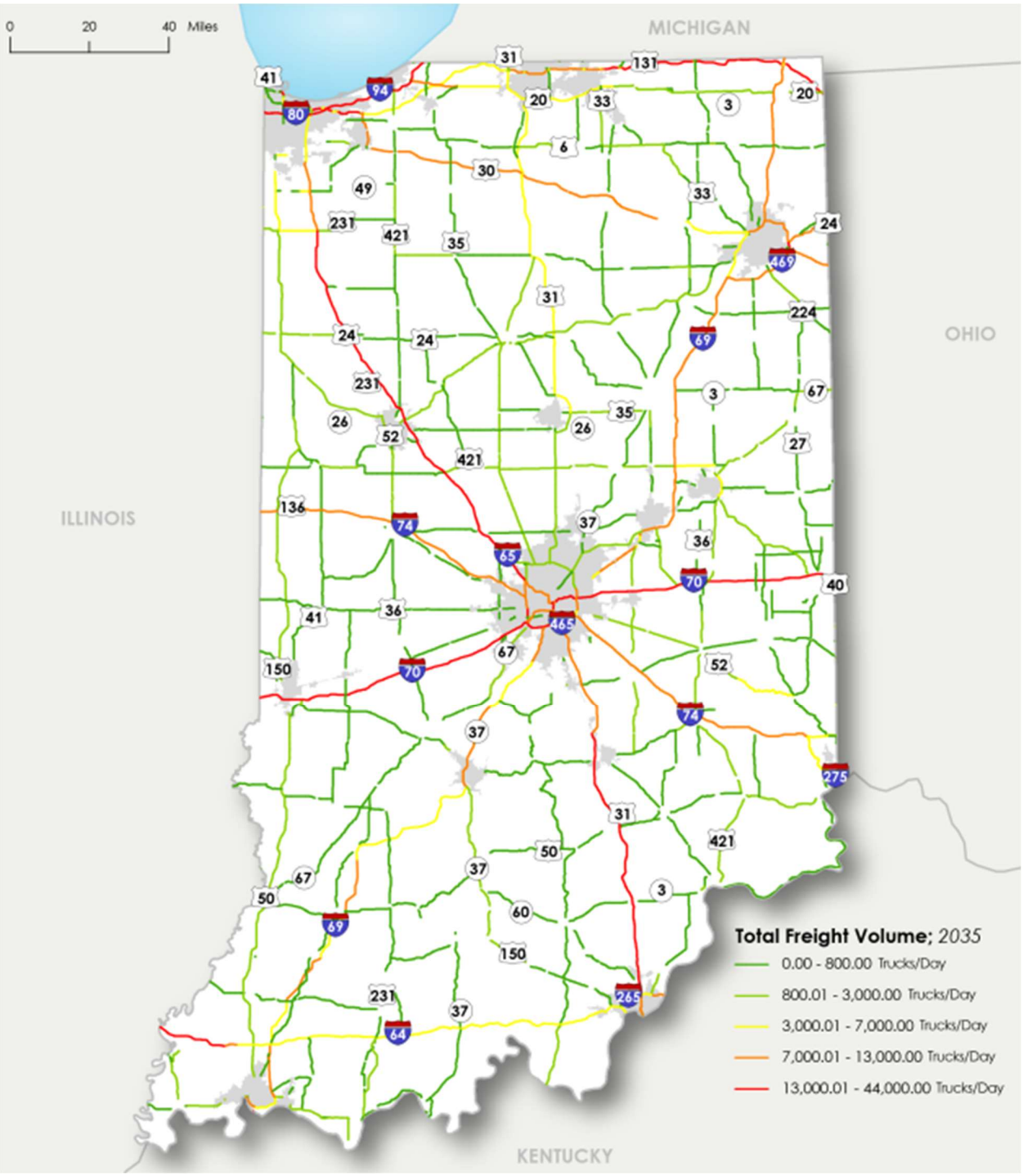


Figure 13. Projected Daily Truck Traffic (2035) (Source 2018 INDOT Freight Plan)

INDOT has identified several EV considerations that need to be addressed further with freight and commercial vehicle stakeholders through additional engagement. Examples include the location and design of the charging infrastructure that should be considered as part of the NEVI program. The issues mainly revolve around designing with commercial vehicles (especially

heavy-duty vehicles, HDV) in mind to future proof the EVSE equipment and station design as well as the power sources that they rely on. The focus on HDV assumes that a majority of light- and medium-duty fleet and freight EVs that perform local delivery and service would be charged via on-premise infrastructure, whether Level 2 or DC fast chargers.

These considerations include:

- Proximity to freight related infrastructure such as ports, distribution centers, warehouses, and rail yards.
- Gathering and prioritizing the needs of HDV charging (such as turning radius, truck parking, amenities for fleet operators) to identify if and where these needs can be accommodated in preliminary charging station design.
- Deployment of higher power DC Fast Charging, where supported by current and future demand, to accommodate CV needs as technology evolves.
- Incentive programs that accommodate CVs as well as infrastructure and light duty vehicles.
- Utility-related considerations[35], including:
    - Prioritizing DER and DERMS (Distributed Energy Resource Management System) installation requirements at public and private charging locations to support local utility grid resiliency and reliability.
    - Working with utility and charging providers to develop EV charging policies that support commercial vehicle needs including rate design (reduces cost per kWh) and make-ready and charger incentive programs that decrease the cost of infrastructure development.
    - Prioritizing utility upgrades at some preliminary locations (based on anticipated EV HDV adoption) by incentivizing innovative infrastructure solutions such as load monitoring software to prevent peak loading, which results in demand fees, and to manage energy requirements for commercial EV charging.

[35] http://www.calstart.org/

6.5 AFC – Alternative Fuel Corridor Networks

Figure 14 shows the AFCs in Indiana. All of Indiana's nine interstates (I-64, I-65, I-69, I-70, I-74, I-80, I-94, I-465 and I-469) and one US route (US-31) are AFCs.

Figure 14. Indiana AFCs

6.6 Existing Locations of Charging Infrastructure Along AFCs

Indiana's EVs are currently served by the state's 325 public charging stations and 892 charging outlets (includes proprietary and non-proprietary providers). These charging stations include DC fast and level 2. These numbers refer to charging stations with public access that can be Federal or state government owned, jointly owned, local/municipal government owned, privately owned, or utility owned. The charging stations are either non-networked or networked with one of the following EV networks: ChargePoint, EV Connect, Blink, Greenlots, Tesla, Electrify America, SemaCharge, and EVgo.[36]

Information dissemination regarding the availability of the current charging station network is available through individual providers. General station information is available through third-party sites such as PlugShare and ChargeHub, through utility providers (such as AES), and on the AFDC fuel corridors page.[37] These sites do not necessarily provide data on availability or reliability of the existing infrastructure.

Regarding Tesla specifically, engagement with Tesla indicates the potential for some of these stations to be opened for public use. Therefore, Figure 15 contains the current locations of Tesla stations. This information also carries through to Chapter 7, where the table of preliminary locations identifies overlap with a current Tesla station. These locations may be opportunities to leverage Tesla infrastructure if it is opened to the public during program implementation.

[36] Alternative Fuels Data Center, n.d-c.

[37] https://afdc.energy.gov/stations/#/corridors

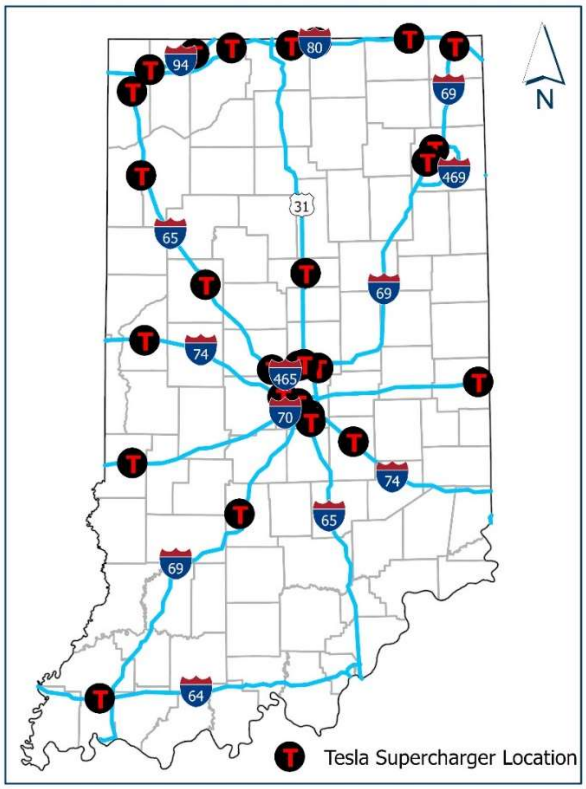


Figure 15. Tesla Supercharger Locations

When removing proprietary infrastructure, there are currently 241 Level 2 and DC Fast Charging stations around the state, as shown in the first map of Figure 16. Of these, 23 stations are DC Fast charging stations. Of those, 5 stations are NEVI compliant (located within 1 mile off an AFC). These stations are show in the third map in Figure 16.

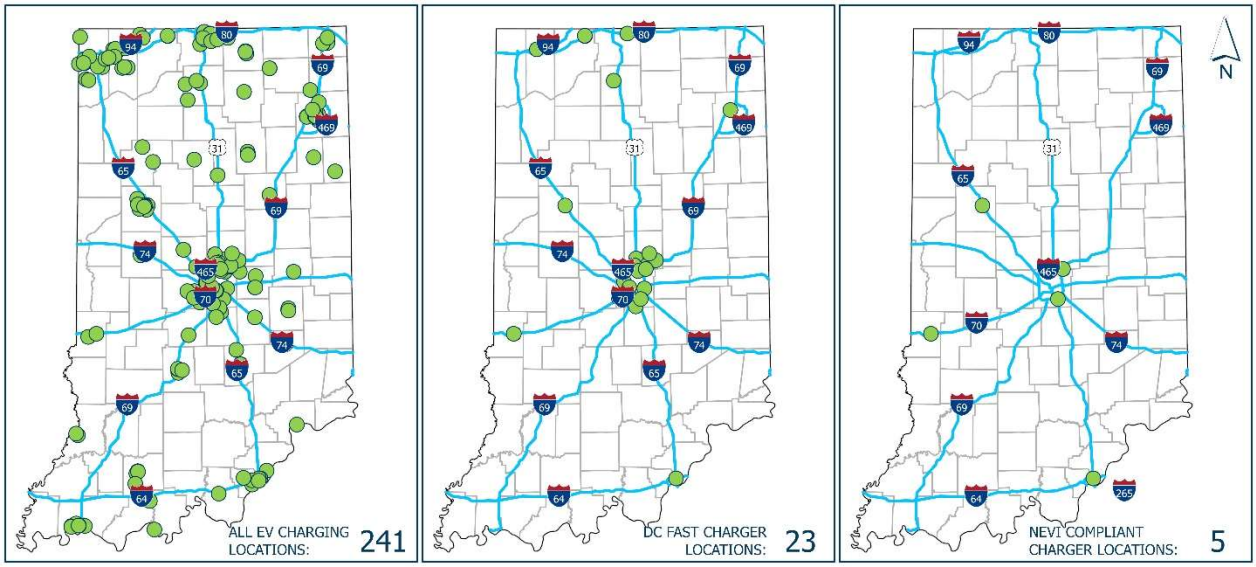


Figure 16. Location of Existing EV Charging Infrastructure in Indiana (Level 2, DC Fast Chargers, NEVI-Compliant DC Fast Chargers) (as of 7/15/2022)

Figure 17 shows the coverage area of the existing four NEVI-compliant charging stations. The shaded areas represent the 50-mile driving range of each station.

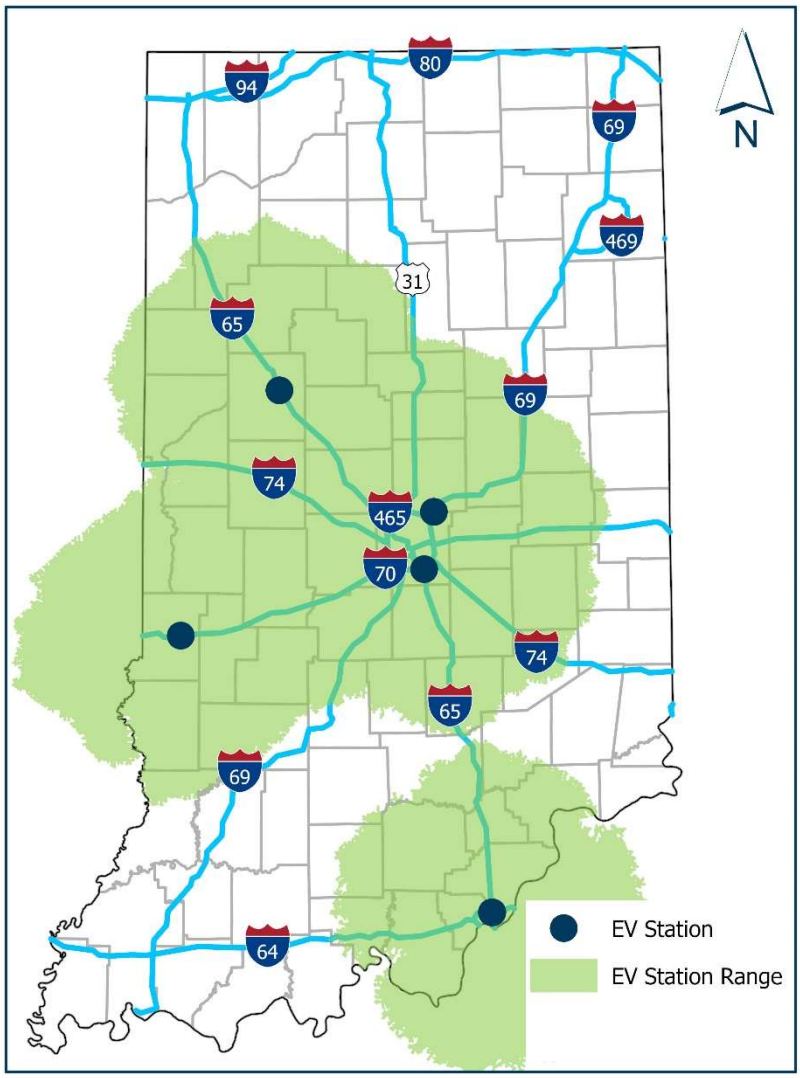


Figure 17. Coverage of Existing NEVI-Compliant Charging Stations

6.7 Known Risks and Challenges

This section defines the known risks and challenges in this early stage of Indiana's EV infrastructure deployment planning. The risks and challenges warrant additional research to identify the likelihood of occurring, impacts, and mitigation strategies. INDOT will complete its risk assessment process after the submittal of this plan. INDOT will develop this risk management approach prior to beginning procurement of any EVSE so that the public and private sector can work together to implement feasible solutions during the deployment process.

Known risks and challenges include:

- Availability and readiness of power to preliminary charging locations in terms of:
    - Availability of three phase power at preliminary locations
    - Utility coordination and transmission facilities direct to the site
    - Support and resiliency of the distribution networks and substation to the power providing companies
    - Aligning EV charging infrastructure deployment with planned utility upgrades throughout the state
- Overbuilding infrastructure where demand has not indicated a significant need (for either the number of sites or amount of power being provided), especially in rural areas
- Effective management of stakeholder coordination. This is a broad risk that affects many areas including:
    - Final, specific site selection
    - Roles and responsibilities for stakeholders, including site hosts, site operators, Tier 1 and Tier 2 suppliers, utility companies, O&M staff, etc.
    - Definition of equity-related outcomes and benefits
- Uncertainty and availability of technology with respect to EVSE:
    - Potential for rapid technology change in EVSE
    - Ability to meet Buy America requirements for required equipment given INDOT and their state agency partners to utilize U.S. made supply equipment.
        - IEDC, a state agency partner, indicated in their draft plan review the priority of the BuyAmerica requirement, a priority shared by other state agency partners. A commitment to U.S. made equipment will be carried forward into procurement, and Indiana does not intend to seek exceptions to the requirement, if this is considered by the Joint Office.
    - Uncertain availability of EVSE and associated components (such as microchips, conduit, fiber, and transformers) due to supply chain issues and increased demand

7.0 EV Charging Infrastructure Deployment

Indiana's plan will leverage the available funding of over $99M ($99,605,738) in formula funding to deploy the appropriate number of stations that satisfy both Federal and state priorities. INDOT will continue to work with state and Federal partners, along with the stakeholders identified in Chapter 3 of this plan, to continue preliminary site selection. INDOT's

objective is to identify the appropriate number of stations to develop an effective strategy for operations and maintenance so that Indiana's network of charging infrastructure may self-sustain at the end of the five-year formula program. This section outlines the various elements of deployment Indiana has begun and will continue to work through in the first year of the program.

7.1 Funding Sources

NEVI program guidance requires 20 percent non-Federal match for the formula funds. As described in the contracting section above, Indiana will require leveraging private-sector matching funds as part of a competitive selection process. Proposing teams could be scored in part based on the percentage of matching funds proposed above the required 20 percent.

Second, INDOT will continue to engage with local, utility, and MPO leadership to identify and understand interest in these entities contributing to the 20% non-Federal match requirements. During initial stakeholder engagement activities, some of these entities indicated interest in a financial investment in EV charging infrastructure. These opportunities are one item that will be considered and potentially added to the evaluation criteria for prioritization of preliminary sites.

Third, Indiana will continue to coordinate with the VW-funded charging infrastructure deployments. If the timing and location of the planned stations align with preliminary locations contained in this plan, there may be opportunity to leverage this funding to upgrade some of these deployments. As with the availability of local entities, MPOs, or utility companies, INDOT will continue to coordinate with the VW-funded projects to identify opportunities for project and potentially funding alignment. Any alignment between the VW-funded stations and the preliminary locations shown later in this chapter are also noted in Table 8.

7.2 Planned Infrastructure Deployments/Upgrades

The EV infrastructure planned for deployment in 2022-2023 is primarily being funded through the Volkswagen (VW) Mitigation Settlement fund, overseen in Indiana by the Indiana Department of Environmental Management (IDEM). The Indiana VW Committee was formed in 2017 to help disburse Indiana's share of the funds from Volkswagen's settlement over clean air violations. While most of those funds were earmarked to be used for HDVs — such as electric school buses, city buses, and heavy-duty trucks — states were able to designate up to 15% for EV charging infrastructure. Indiana dedicated the full 15%, or $6.15 million to charging infrastructure, awarding $600,000 for level 2 chargers and $5.5 million for DC fast chargers. Thus far, there have been two procurements, the second of which was released in May 2022.

The specific location of the planned charging stations (and their schedule to be operational) is still being finalized with site hosts and utility companies, but high-level information is presented in Figure 18 and Table 7. These stations will be installed beginning in late 2022. Installation will continue through 2023 and 2024.

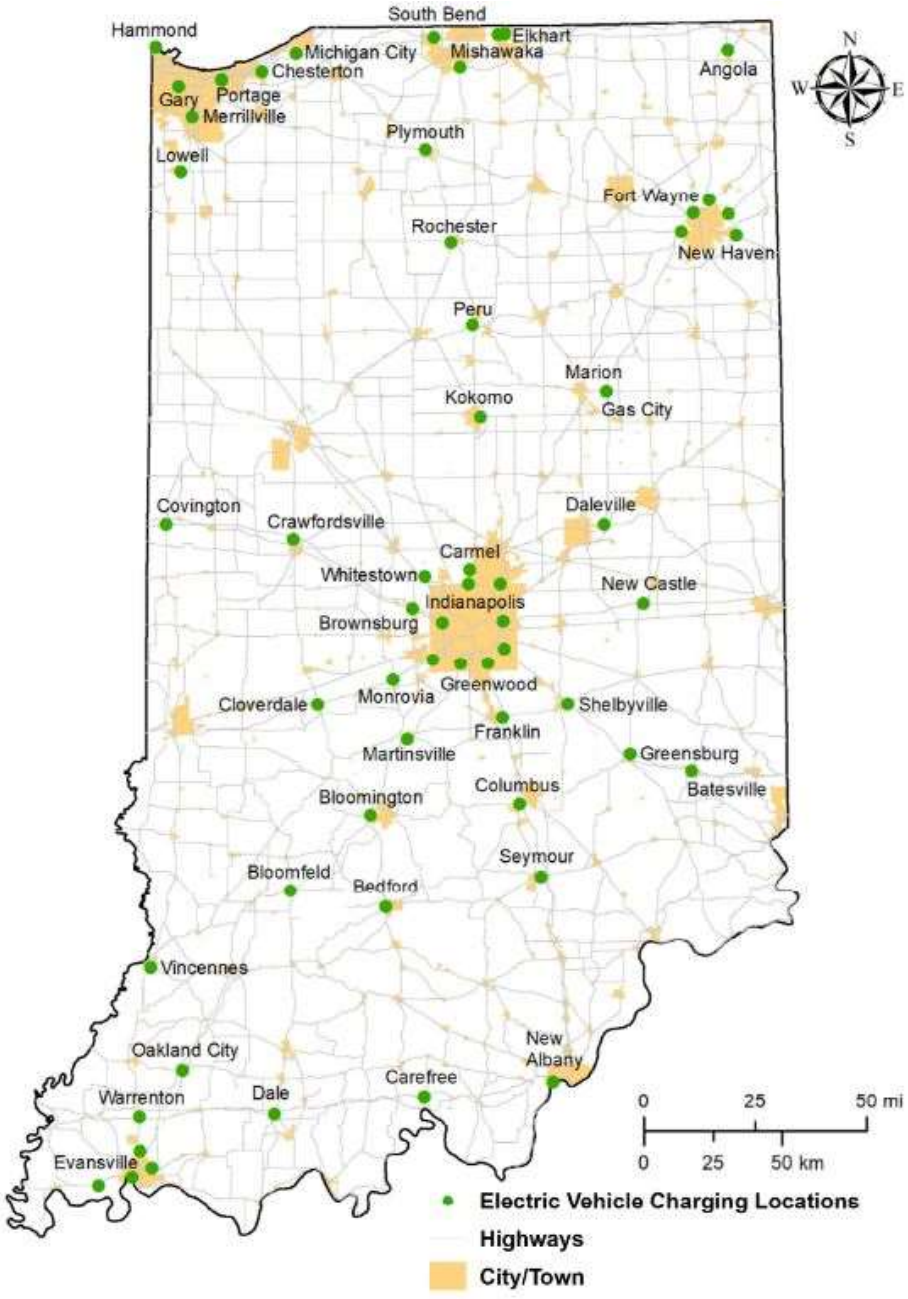


Figure 18. FY22-23 Planned Infrastructure Deployments (VW-Funded)

Table 7. IDEM/Indiana Utility Group - Volkswagen Master EV Fast Charge List - Updated 3/8/2021

#	Site City	Approximate Location	Utility	Amenities	Site Host Contacted	Draft Site Plan Completed	Letter of Support
1	Rochester	US31 & SR25	DUKE	Restaurants, Retail	Yes	Yes	Yes
2	Kokomo	US31 & SR22	DUKE	Restaurants, Retail	Yes	Yes	Yes
3	Franklin	I65 & SR44	DUKE	Restaurants	Yes	Yes	In Progress
4	Columbus	I65 & SR46	DUKE	Restaurants, Retail	Yes	Yes	In Progress
5	Seymour	I65 & US50	DUKE	Restaurants, Retail	Yes	Yes	Yes
6	Bedford	US50 & SR37	DUKE	Restaurants, Retail, Healthcare	Yes	Yes	Yes
7	Bloomington	I69 & 3rd St.	DUKE	Grocery, Retail	Yes	Yes	In Progress
8	Martinsville	I69 & Ohio St.	DUKE	Restaurants, Retail, Grocery	Yes	Yes	Yes
9	Carmel	US31 & Old Meridian	DUKE	Restaurants, Retail, Grocery	Yes	Yes	Yes
10	Cloverdale	I70 & Main St.	DUKE	Restaurants	Yes	Yes	Yes
11	Brownsburg	I74 & N. Green St.	DUKE	Restaurants, Retail	Yes	Yes	Yes
12	Shelbyville	I74 & SR44	DUKE	Restaurants, Retail	Yes	Yes	In Progress
13	Greensburg	I74 & SR3	DUKE	Restaurants, Retail	Yes	Yes	Yes
14	Batesville	I74 & Walnut St.	DUKE	Restaurants, Retail, Grocery	Yes	Yes	Yes
15	Vincennes	US41 & Hart St.	DUKE	Restaurants, Retail, Grocery	Yes	Yes	Yes
16	Carefree	I64 & SR66	DUKE	Restaurants	Yes	Yes	Yes
17	New Albany	I64 & Main St.	DUKE	Restaurants, Retail	Yes	Yes	Yes
18	Dale	I64 & US231	HOOSIER	Restaurants, Hotels	Yes	Yes	Yes
19	Bloomfield - GAP Fill	I69 & US231	HOOSIER	Convenience Store, Hotel	Yes	Yes	Yes
20	New Castle - Gap Fill	I70 & SR3	HOOSIER	Armory, Restaurants, Convenience Store	Yes	Yes	Yes
21	South Bend	I80 & US31	IM	Restaurants, Retail	Yes	Yes	Yes
22	Mishawaka	I80 & Cassopolis St.	IM	Restaurants, Retail	Yes	Yes	No
23	Elkhart	I80WB & Edwardsburg Rd.	IM	Restaurants	Yes	Yes	No
24	Mishawaka	US20 & SR 331	IM	Restaurants, Retail	Yes	Yes	Yes
25	Muncie/Daleville	I69 & SR67	IM	Restaurants, Retail	Yes	Yes	No
26	Marion/Gas City	I69 & SR18	IM	Restaurants, Retail	Yes	Yes	No
27	Fort Wayne	I469 & US30	IM	Restaurants, Retail	Yes	Yes	No
28	Fort Wayne	I69 & SR3	IM	Restaurants, Retail	Yes	Yes	Yes
29	Fort Wayne	I69 & SR14	IM	Restaurants, Retail	Yes	Yes	Yes
30	Fort Wayne	I69 & SR1	IM	Restaurants, Retail	Yes	Yes	Yes

#	Site City	Approximate Location	Utility	Amenities	Site Host Contacted	Draft Site Plan Completed	Letter of Support
31	Fort Wayne	US24 and SR37	IM	Restaurants, Retail	Yes	Yes	Yes
32	Elkhart	I80EB & Edwardsburg Rd.	IM	Restaurants	Yes	Yes	No
33	I74 W	I465 & Crawfordsville Rd.	IPL	Restaurants, Retail, Grocery, Hotel	Yes	No	No
34	I70 SW	I70 & Ameriplex Pkwy	IPL	Restaurants, Retail, Hotel	Yes	No	No
35	I69S	I69 & Southport Rd.	IPL	Restaurants, Retail, Grocery	In Progress	No	No
36	I 65 S	I65 & Southport Rd.	IPL	Restaurants, Retail, Grocery, Hotel	Yes	No	Yes
37	I 74 SE	I74 & Post Rd.	IPL	Restaurants, Car dealer	Yes	No	No
38	I70E	I70 & Post Rd.	IPL	Restaurants, Retail	Yes	No	No
39	I69 NE	I69 & 96th St.	IPL	Restaurants, Retail, Grocery, Hotel	Yes	No	Yes
40	Indianapolis (off I465)	I465 & US31	IPL	Restaurants, Retail, Hotel	Yes	No	No
41	Gary	I94 & Burr St.	NIPSCO	Restaurants, Retail, Wi-Fi, entertainment	Yes	Yes	Yes
42	Chesterton	I94 & SR49	NIPSCO	Restaurants, Retail, Grocery, Convenience Store	Yes	Yes	In Progress
43	Michigan City	US20 & US421	NIPSCO	Restaurants, Retail, Grocery, Convenience Store	Yes	Yes	Yes
44	Hammond	I90 & US41	NIPSCO	Restaurants, Retail, Wi-Fi, entertainment	Yes	Yes	In Progress
45	Portage	I90EB & I94	NIPSCO	Restaurant, Convenience Store, Wi-Fi, Restrooms	Yes	Yes	In Progress
46	Portage	I90WB & I94	NIPSCO	Restaurant, Convenience Store, Wi-Fi, Restrooms	Yes	Yes	In Progress
47	Angola	I69 & SR127	NIPSCO	Restaurants, Retail, Grocery	Yes	Yes	Yes
48	Plymouth	US30 & Oak Dr.	NIPSCO	Restaurants, Retail, Grocery	Yes	Yes	In Progress
49	Merrillville	US30 & SR53	NIPSCO	Restaurants, Retail, Grocery	Yes	Yes	Yes
50	Lowell	SR2 & Clark St.	NIPSCO	Restaurants, Retail, Grocery	Yes	Yes	In Progress
51	Evansville	SR62 & Green River Rd.	Vectren	Grocery, Retail	Yes	No	yes
52	Oakland City	SR57 & Co Rd 350 S.	Vectren	Restaurants, Retail	No	No	No
53	Warrenton	I64 & US41	Vectren	Restaurants, Retail	No	No	No

#	Site City	Approximate Location	Utility	Amenities	Site Host Contacted	Draft Site Plan Completed	Letter of Support
54	Evansville University Blvd - USI	SR62 & Franklin Rd.	Vectren	Grocery, Retail	Yes	No	Yes
55	Downtown Evansville	Vet. Mem. Pkwy & W. Lloyd Expy	Vectren	Restaurants, Retail	Yes	No	Yes
56	Hwy 41 (Evansville airport)	US57 & US41	Vectren	Restaurants	No	No	No
57	Peru	US31 & US24	WVPA	Restaurant, Convenience Store, Wi-Fi, Restrooms	Yes	Yes	Verbal
58	Covington	I74 & SR63	WVPA	Restaurant, Convenience Store, Wi-Fi, Restrooms	In Progress	Yes	No
59	Whitestown	I65 & Whitestown Pkwy	WVPA	Restaurant, Convenience Store, Grocery, Wi-Fi, Restrooms	Yes	Yes	Yes
60	Monrovia	I70 & SR39	WVPA	Restaurant, Convenience Store, Wi-Fi, Restrooms	In Progress	Yes	No
61	Crawfordsville - GAP Fill	I74 & US231	Crawfordsville Muni	Restaurant, Convenience Store, Wi-Fi, Restrooms	Yes	Yes	Yes

7.2.1 Upgrades of Corridor Pending Designations to Corridor Ready Designations

As depicted in Section 6.5 of this plan, the following AFCs are currently considered corridor-ready per the prior definition (every 50 miles and within 5 miles of the interstate) as of 2022:[38]

- I-465
- I-94
- I-80 from South Bend to the IN/IL border

As shown in Figure 19, the remainder of Indiana's AFCs currently have "corridor-pending" status for EV.

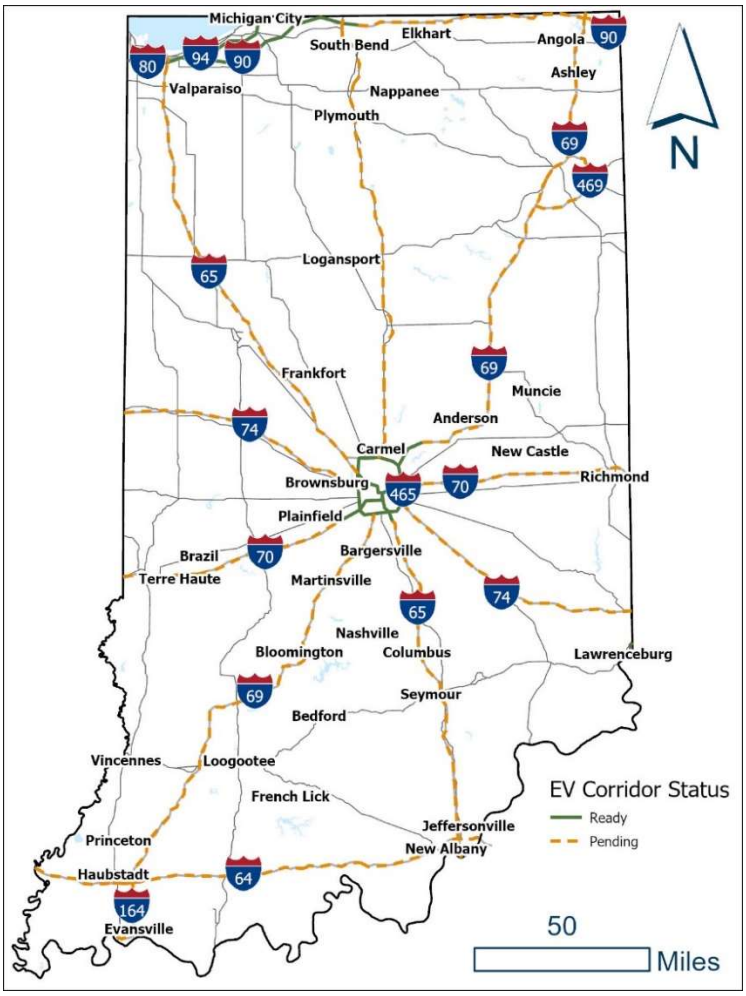


Figure 19. AFCs with "Corridor Pending" Status

[38] https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/ready/

The focus of Indiana's efforts during this formula program will be to ensure the state's current "corridor-ready" AFCs are compliant with the new NEVI requirements, as well as upgrading the state's current "corridor-pending" designations to "corridor-ready." This was validated by the RFI results which indicate most respondents support the build out of DC fast and ultra-fast chargers along highways for light duty vehicles.

7.2.2 Increases of Capacity/Redundancy Along Existing AFCs

Indiana's near-term goal will be to prioritize initial investment to resolve charging network gaps in the AFC network, first focused on filling the 50-mile gaps in each corridor (i.e., Indiana's interstate system and US 31). These gaps will be prioritized, with specific criteria and methodology being developed in Indiana's initial planning efforts during the first year of the program. Indiana will continue the selection process for preliminary (candidate) sites, using both a data- and stakeholder-driven approach, as described earlier in this plan.

Adding redundancy or exceeding requirements where demand warrants is one of Indiana's priorities following the resolution of the 50-mile gaps in AFC network as discussed in the Plan Vision and Goals section of this plan. This priority was validated by both the public survey and the RFI responses conducted in April-May 2022.

7.2.3 Electric Vehicle Freight Considerations

As shown in Figure 20, RFI respondents articulated a direct link between DC Fast Charging to support not only public charging along AFCs, but also to support truck charging depots and government and corporate fleets. This will contribute to sustaining the charging stations and scaling them to additional use cases. Certain stakeholders such as the utilities understand that freight considerations are important, but not as urgent currently. If some elements of station infrastructure can accommodate the future needs of freight stakeholders, this helps to future-proof the design. Therefore, freight considerations, especially proximity of final charging locations to freight-significant interchanges, may be considered as INDOT refines the preliminary locations identified in this plan during the first year of the program. This may also be a greater focus of guidance developed for the discretionary grant program, once announced.

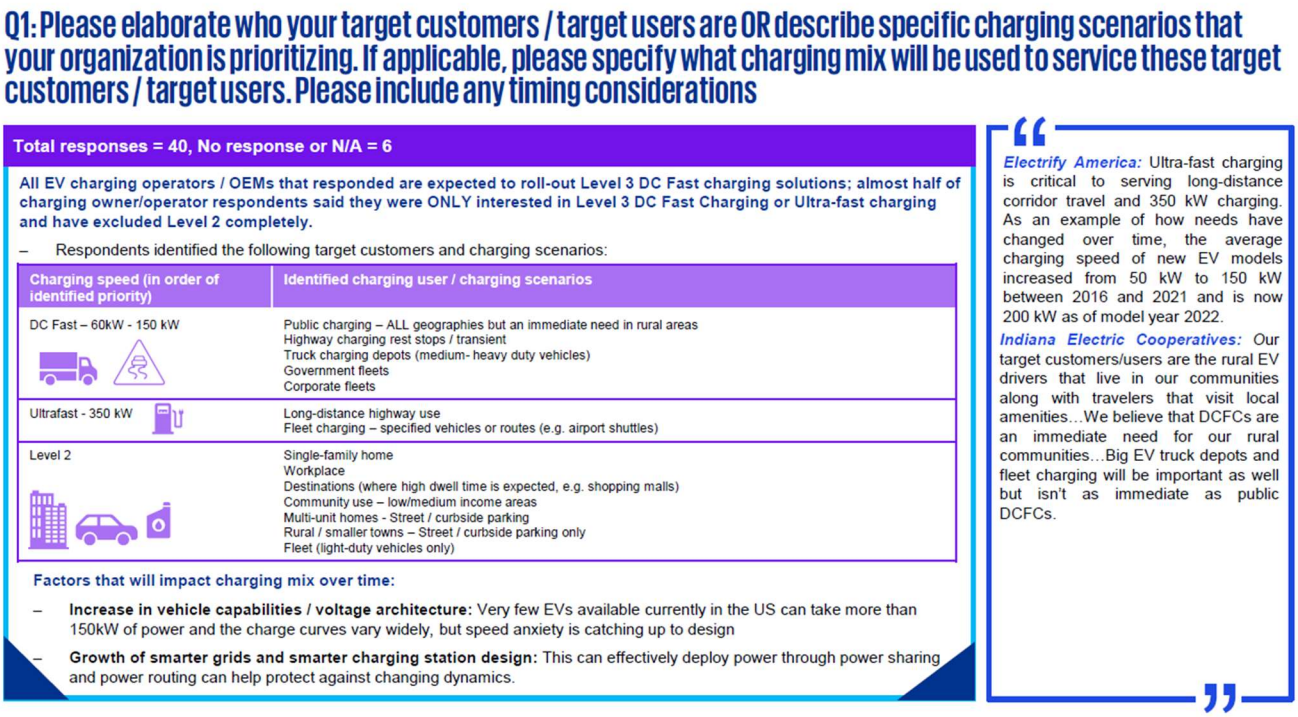


Figure 20. Freight Considerations for EV Charging Implementation

7.2.4 Public Transportation Considerations

For later deployments (FY23-26), RFI respondents did indicate a desire a focused EV build-out for DC fast and ultra-fast chargers along highways for light duty vehicles apart from some municipalities citing a need locally for their bus fleets. An interest in developing Level 2 chargers at residential and workplace locations was also noted. Therefore, public transportation may be a factor in final selection in terms of identifying the most optimal locations.

7.3 FY 23-36 Infrastructure Deployments

VW settlement funds will be used to deploy an additional 61 stations beginning in early 2023 with full buildout expected to be completed by early 2024. The planned locations of these stations are shown in Figure 18.

Additionally, there is private investment that continues to take place. These deployments will be further pinpointed to understand the specific power and design considerations of these stations. For example, Chase Bank announced in April 2022 that they will pilot electric vehicle charging stations at 50 of its branches this summer, including in Indiana, Illinois, and California, among others, providing access to 100kW and 350kW chargers. These stations are expected to

be operational by the end of 2023, although details about the number of stations and their location in Indiana is not yet public information.[39]

Figure 21 below shows preliminary locations that would account for the placement of EV charging infrastructure every 50-miles along the currently designated AFCs.

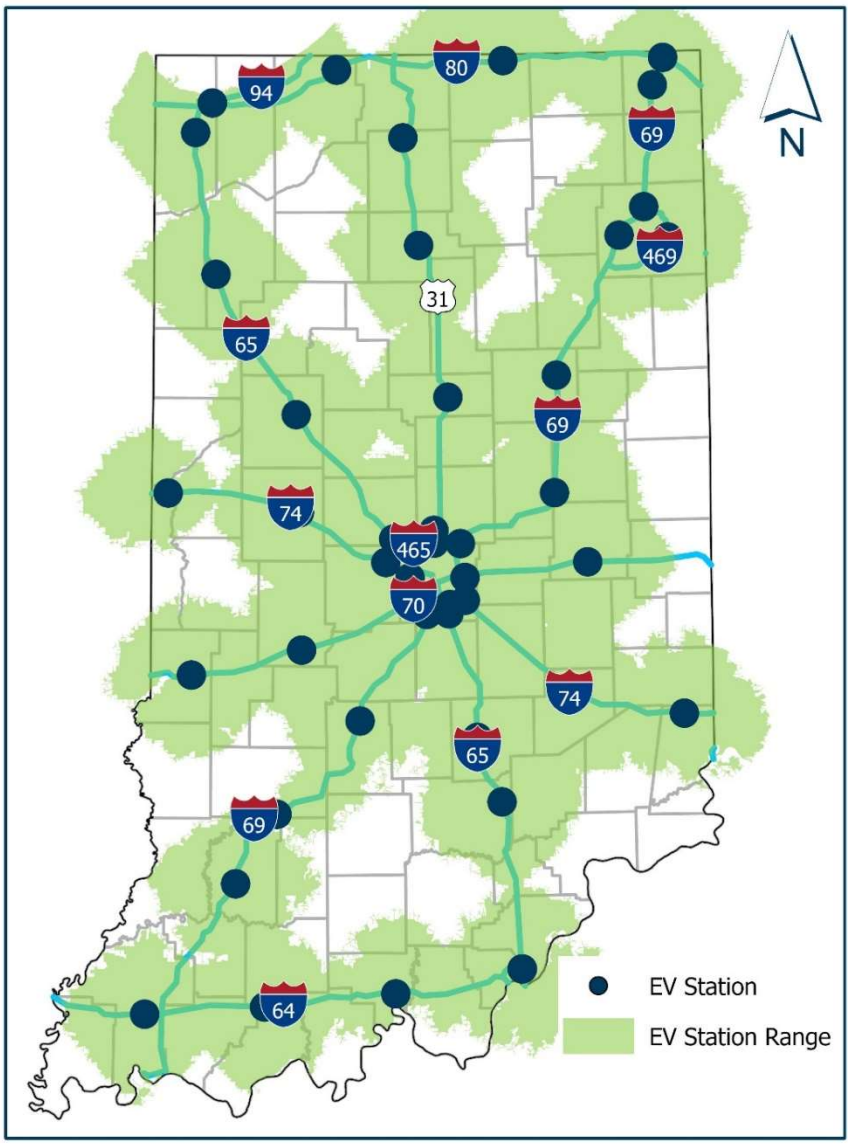


Figure 21. Preliminary EV Charging Infrastructure

[39] https://www.insideindianabusiness.com/articles/chase-to-pilot-electric-vehicle-charging-stations

There are still many details to be determined regarding utility access, anticipated station ownership, and funding per station. Therefore, INDOT has identified a set of alternate station locations if a preliminary location is not feasible due to one of these variables. These alternate locations, identified with yellow dots in Figure 22, may also serve as potential candidates for additional station locations to add capacity near high-use areas.

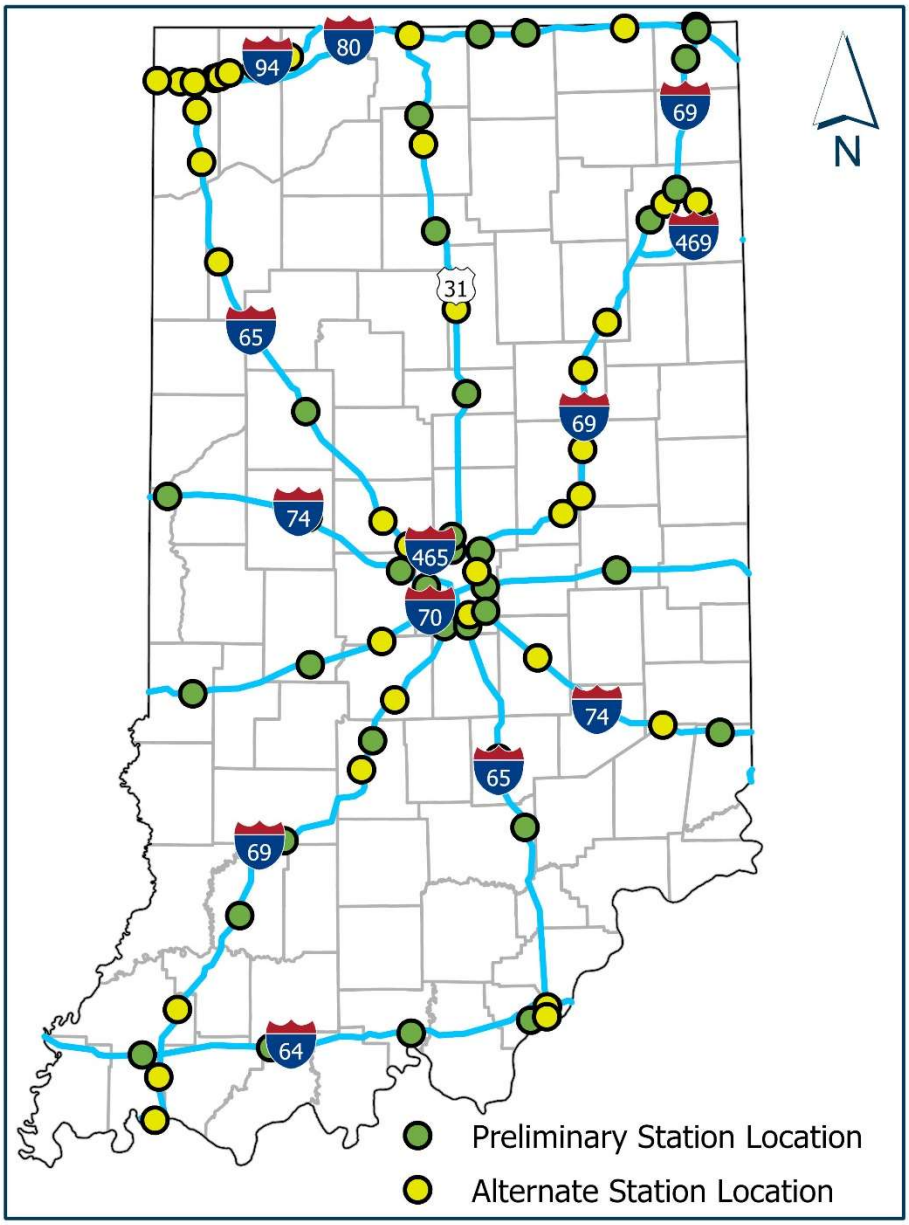


Figure 22. Preliminary and Alternate Station Locations

Table 8 identifies the general location of both the preliminary and alternate NEVI charging station installations shown in the preceding figures. (Maps of each location are provided in Appendix A.) At this point, INDOT has not identified some of the information requested by the

guidance including anticipated EV network, utility territory and the potential funding amount. Likewise, INDOT and their partner agencies have not yet identified specific existing or planned VW locations that may be upgraded to meet minimum NEVI Formula Program standards. These may be identified in the additional planning and preliminary site location analysis to be conducted in the first year of the program.

With some details still to be determined, Table 8 provides a location identifier, AFC, and interchange for each location. At this point, anticipated station ownership is all assumed to be private, although this is another item that may change during the procurement process. The table also shows the locations that align with the planned VW-funded and existing Tesla stations and whether the station is a preliminary or alternate location, as identified in Figure 22. An asterisk (*) on the unique identifier denotes an existing NEVI-compliant stations that are shown on Figure 17.

Table 8. Preliminary and Alternate Locations of EV Charging Infrastructure FY24-26

State EV Charging Location Unique ID	Route (note AFC)	Location	Anticipated Station Ownership	VW Site?	Tesla Site?	Preliminary or Alternate Location?
I46501601	I-465	Exit 16 /US 136	P	Yes	Yes	Preliminary
I46502701	I-465	Exit 27 /US 421	P	No	No	Alternate
I46503101	I-465	Exit 31 /US 31	P	Yes	No	Preliminary
I46504001	I-465	Exit 40 /56th St	P	No	No	Alternate
I46505201*	I-465	Exit 52 /Emerson Ave	P	No	Yes	Alternate
I46901901	I-469	Exit 19 /US 30	P	Yes	No	Preliminary
I46902501	I-469	Exit 25 /SR 37	P	No	No	Alternate
I06402501	I-64	Exit 25 /US 41	P	Yes	Yes	Preliminary
I06405701	I-64	Exit 57 /US 231	P	Yes	No	Preliminary
I06409201	I-64	Exit 92 /SR 66	P	Yes	No	Preliminary
I06412301	I-64	Exit 123 /State St	P	Yes	No	Preliminary
I06500101	I-65	Exit 1 /Eastern Blvd	P	No	No	Alternate
I06500401*	I-65	Exit 4 /Veterans Pkwy	P	No	No	Preliminary
I06505001	I-65	Exit 50 /US 50	P	Yes	No	Preliminary
I06506401	I-65	Exit 64 /SR 58	P	No	No	Preliminary
I06506801	I-65	Exit 68 /SR 46	P	Yes	No	Alternate
I06510301	I-65	Exit 103 /Southport Rd	P	Yes	Yes	Preliminary
I06513001	I-65	Exit 130 /Whitestown Pkwy	P	Yes	Yes	Preliminary
I06513901	I-65	Exit 139 /SR 39	P	No	No	Alternate
I06517201*	I-65	Exit 172 /SR 26	P	No	Yes	Preliminary

State EV Charging Location Unique ID	Route (note AFC)	Location	Anticipated Station Ownership	VW Site?	Tesla Site?	Preliminary or Alternate Location?
I06521501	I-65	Exit 215 /SR 114	P	No	No	Preliminary
I06524001	I-65	Exit 240 /SR 2	P	No	No	Alternate
I06525301	I-65	Exit 253 /US 30	P	No	Yes	Preliminary
I06900301	I-69	Exit 3 /Green River Rd	P	No	No	Alternate
I06901501	I-69	Exit 15 /New Harmony Rd	P	No	No	Preliminary
I06902301	I-69	Exit 23 /SR 64	P	No	No	Alternate
I06906201	I-69	Exit 62 /US 150	P	No	No	Preliminary
I06908701	I-69	Exit 87 /US 231	P	Yes	No	Preliminary
I06911801	I-69	Exit 118 /SR 48	P	Yes	Yes	Alternate
I06912601	I-69	Exit 126 /Sample Rd	P	No	No	Preliminary
I06913801	I-69	Exit 138 /Ohio St	P	Yes	No	Alternate
I06916001	I-69	Exit 160 /Southport Rd	P	Yes	No	Preliminary
I06920201*	I-69	Exit 202 /96th St	P	Yes	No	Preliminary
I06923301	I-69	Exit 233 /SR 67	P	Yes	No	Preliminary
I06926401	I-69	Exit 264 /SR 18	P	Yes	No	Preliminary
I06927801	I-69	Exit 278 /SR 5	P	No	No	Alternate
I06930501	I-69	Exit 305 /SR 14	P	Yes	Yes	Preliminary
I06931101	I-69	Exit 311 /US 27	P	Yes	Yes	Alternate
I06931601	I-69	Exit 316 /SR 1	P	Yes	No	Preliminary
I06934801	I-69	Exit 348 /US 20	P	No	No	Preliminary
I06935701	I-69	Exit 357 /Lake George Rd	P	No	No	Alternate
I06924501	I-69	Exit 245 /US 35	P	No	No	Alternate
I06922601	I-69	Exit 226 /SR 109	P	No	No	Alternate
I07001101*	I-70	Exit 11 /SR 46	P	No	Yes	Preliminary
I07004101	I-70	Exit 41 /SR 231	P	Yes	No	Preliminary
I07005901	I-70	Exit 59 /SR 39	P	Yes	No	Alternate
I07009101	I-70	Exit 91 /Post Rd	P	Yes	No	Preliminary
I07012301	I-70	Exit 123 /SR 3	P	Yes	No	Preliminary
I07400401	I-74	Exit 4 /SR 63	P	Yes	No	Preliminary
I07403401	I-74	Exit 34 /US 231	P	Yes	No	Alternate
I07403901	I-74	Exit 39 /SR 32	P	No	No	Preliminary
I07406601	I-74	Exit 66 /SR 267	P	Yes	No	Preliminary
I07409601	I-74	Exit 96 /Post Rd	P	Yes	No	Preliminary
I07411301	I-74	Exit 113 /SR 9	P	No	Yes	Alternate
I07413401	I-74	Exit 134 /SR 3	P	Yes	No	Preliminary
I07414901	I-74	Exit 149 /SR 229	P	Yes	No	Alternate

State EV Charging Location Unique ID	Route (note AFC)	Location	Anticipated Station Ownership	VW Site?	Tesla Site?	Preliminary or Alternate Location?
I07416401	I-74	Exit 164 /SR 1	P	No	No	Preliminary
I08000101	I-80	Exit 1 /SR 41	P	Yes	No	Alternate
I08000601	I-80	Exit 6 /Burr St	P	Yes	No	Alternate
I08001001	I-80	Exit 10 /SR 53	P	No	No	Alternate
I08001501	I-80	Exit 15 /SR 51	P	Yes	No	Preliminary
I08002201	I-80	Exit 22 /Travel Center	P	Yes	Yes	Alternate
I08005601	I-80	Exit 56 /Travel Center	P	No	Yes	Preliminary
I08007201	I-80	Exit 72 /US 31	P	Yes	No	Alternate
I08009001	I-80	Exit 90 /Travel Center	P	Yes	Yes	Preliminary
I08010101	I-80	Exit 101 /SR 15	P	No	No	Preliminary
I08012601	I-80	Exit 126 /Travel Center	P	No	Yes	Preliminary
I08014401	I-80	Exit 144 /I-69	P	No	No	Alternate
I09401901	I-94	Exit 19 /SR 249	P	No	No	Alternate
I09403401	I-94	Exit 34 /US 421	P	No	No	Alternate
U03112701	US-31	Exit 127 /W Main St	P	Yes	Yes	Preliminary
U03116201	US-31	Exit 162 /SR 22	P	No	Yes	Preliminary
U03118301	US-31	Exit 183 /US 24	P	Yes	No	Alternate
U03120301	US-31	Exit 203 /SR 25	P	Yes	No	Preliminary
U03122501	US-31	Exit 225 /US 30	P	No	No	Alternate
U03123301	US-31	Exit 233 /US 6	P	No	No	Preliminary

7.4 State, Regional, and Local Policy

Relevant state regional and local policies regarding EV charging infrastructure are provided below. INDOT will reference these policies as required during contracting, procurement, and plan updates.

7.4.1 State Policies Related to EV

- States legislature
    - HB 1221 – Electric Vehicles and Electricity Pricing (signed into law March 2022. Public Law 94.)
    - HB 1220 – Establishes the 21st Century Energy Policy Development Taskforce (signed into law April 2021. Public Law 131.)
    - HB 1168 – Establishes the Indiana EV Product Commission (signed into law April 2021. Public Law 128.)

- Utilities
    - Indiana is a traditional utility regulation state, meaning state laws allow energy public utility monopolies and provide for regulatory oversight. With this exclusive service territory for utilities, comes an obligation to meet all requests for service within a utility's service territory with prices, terms, and conditions of service set by the regulatory agency. In Indiana, the regulatory agency is known as the Indiana Utility Regulatory Commission (IURC).[40]

7.4.2 Regional Policies Related to EV

INDOT will continue engagement with external partners to collaborate on regional policy and continue coordination of EV infrastructure buildout. These efforts will include:

- Continued work with REV Midwest Coalition. The REV Midwest Coalition is an MOU between the states of Illinois, Indiana, Minnesota, Michigan, and Wisconsin signed in September 2021 that creates a regional framework to accelerate vehicle electrification in the Midwest. REV Midwest provides the foundation for cooperation on fleet electrification along key commercial corridors to safeguard economic security, reduce harmful emissions, improve public health, and advance innovation. REV Midwest will future proof the region's manufacturing, logistics, and transportation leadership and position the region to realize additional economic opportunity in clean energy manufacturing and deployment.

- Continued participation in Mid-America Association of State Transportation Officials (MAASTO), especially the EV working group. This engagement has been ongoing and will continue to share best practices and lessons learned while understanding the progress of member states as they work toward implementation of NEVI-compliant infrastructure build out.

- Continued work with the Lake Michigan Electric Vehicle (EV) Circuit Tour. Established through an MOU, this tour is a multistate collaboration project between Illinois, Indiana, Michigan, and Wisconsin to build the best new road-trip for EV drivers in America. The states will work together with a united effort to design, facilitate the development, maintenance, and marketing of a scenic route with reliable light-duty vehicle charging options along the Lake Michigan coastline (the "Lake Michigan EV Circuit Tour"). The Lake Michigan EV Circuit Tour will target electric vehicle service equipment (EVSE) installations at key coastal communities and tourism attractions such as event venues,

[40] https://indianaenergy.org/energy-overview-public-utility/

parks, lighthouses, resorts, lodging, eateries, and small businesses. The Tour's main goal is to link the new EVSE sites together with existing charging infrastructure networks at tourist attractions in population centers along the Lake Michigan EV Circuit Tour route.

- With initial one-on-one meetings held with Indiana's immediate neighboring states during the development of this plan, INDOT will also plan for regular coordination calls (at least annually) with border states Michigan, Ohio, Kentucky and Illinois. The purpose of these calls will be to continue coordination as site selection moves from preliminary to final to ensure proper placement of infrastructure.

7.4.3 Local Policies Related to EV

Local policies will be reviewed with respect to the zoning and permitting required for the final sites that are selected. As such, stakeholder engagement with these entities will continue during the planning process as site selection proceeds. INDOT has compiled a list of example local policies that represent both best practices and roadblocks that can require additional time to resolve. These examples provide a representative sample of local policies that deployment teams can expect to encounter:

- Examples of supportive policies:
    - City of Bloomington Climate Action Plan EV goals: Strategy TL 2-B: Support and encourage electric vehicle and alternative fuel (hybrid/ hybrid electric, plug-in hybrid electric) vehicle adoption citywide. [41]
    - Bloomington MPO 2045 Metropolitan Transportation Plan "The community further supports the installation of additional electric vehicle charging stations within the urban area in preparation for a new generation of personal, commercial, and fleet vehicles." [42]
    - Unified Development Ordinance [43]
- Example of local funding sources:
    - Local Income Tax[44]
    - Local Infrastructure Bonds[45]

[41] City of Bloomington Climate Action Plan EV goals

[42] Bloomington MPO 2045 Metropolitan Transportation Plan

[43] Unified Development Ordinance

[44] Local Income Tax

[45] Local Infrastructure Bonds

8.0 Implementation

INDOT envisions a phased approach to deploying EV charging infrastructure along the AFCs. The steps below are outlined at a high level in these early stages. INDOT will repeat the detailed planning process in some fashion for each phase of sites that are procured.

8.1 Strategies for EVSE Operations and Maintenance

8.1.1 Planning: INDOT Lead

Since the announcement of the Federal NEVI program, INDOT has considered their role in implementation. Ultimately, INDOT will facilitate the integration of EV charging infrastructure into statewide transportation through a careful and considerate planning process. INDOT will lead the process during the first year of the program, with the additional stakeholder engagement necessary to move from preliminary to final site selection, structure and execute a competitive, vendor-agnostic procurement. INDOT's initial planning efforts will include:

- Develop and implement a methodology to evaluate and prioritize the preliminary sites
- Compile and analyze additional data as needed to support the prioritization process, such as:
    - Location of key tourist and visitor destinations, both public and private
    - Location of health care facilities
    - Location of job centers
    - Locations of major truck stops and truck parking areas
    - Location of major transportation hubs, both public and freight transportation focused
    - County boundary locations
    - Average Annual Daily Traffic (AADT) and vehicle miles travelled (VMT) for both traditional and EVs.
    - Utility coverage areas
    - Vehicle registration data
- Develop high-level site design and site requirements
- Conduct additional engagement with DAC communities. The first year of program will expand outreach efforts to:
    - Include more in-person meetings in DAC communities and with the community- and faith-based organizations within them

  - Engagement of INDOT's Chief Equity Officer (within the EIS office) to define measurable outcomes
  - One-on-one meetings with DEI representatives from public and private stakeholder companies to help define outcomes and share best practices and lessons learned
  - Expansion of DAC and DEI stakeholders. For example, INDOT has already arranged a one-on-one meeting with EVNoire after plan submittal to engage in conversation about engagement practices and implementation ideas relative to equity and EV infrastructure.
  - In conducting this outreach, INDOT will follow best practices and national guidance for maximining opportunities for participation. Examples include providing adequate public notice of public involvement activities; holding public meetings at convenient times and in convenient and accessible locations; using visualization techniques to describe the plan; making public information available electronically; demonstrating how public input is incorporated into the plan; considering the needs of those traditionally underserved by existing transportation systems; and periodically reviewing the effectiveness of the public engagement process.
- Develop collaboration tools and forums to foster public-private partnerships while understanding potential risks and opportunities that may inform the procurement process
- Develop minimum operations and maintenance requirements, including but not limited by the guidance in the NEVI Notice of Proposed Rulemaking (NPRM) released on June 8, 2022:[46]
  - Site access (is 24x7 the minimum)
  - Preferred charging fee structure
  - Requirement for equitable payment options (i.e., non-card-based payment options)
  - Minimal downtime
  - Response time for intermittent/unplanned repairs
  - Equipment Certification (per NEVI guidelines):
    - EVSE certified by an Occupational Safety and Health Admin National Testing Lab

[46] FHWA (23 CFR Part 680 [Docket No. FHWA-2022-0008] RIN 2125-AG10)

        - LII EVSE Energy Star Certified
    - Warranty
    - Equipment cleaning
- Outcomes:
    - Procurement plan to document schedule and approach
    - Draft RFP
    - Site selection criteria
    - Update(s) to EV Implementation Plan
    - Updates to AFC nominations, if necessary

8.1.2 Procurement: INDOT Transitions to Private Sector

INDOT will manage and execute the procurement for EV charging infrastructure. INDOT envisions a competitive procurement process for EVSE installation, operations, and maintenance. Using the procurement plan and approach created in the planning process, INDOT will determine the number, type, and schedule for each procurement/contract. INDOT anticipates there will be multiple procurements over the five years of the program.

INDOT will evaluate potential requirements such as:

- Availability/provision of spare parts inventories
- Maintenance procedures, including seasonal and snow removal considerations
- Expanded safety protocols
- Availability of skilled labor
- Commitment to local and economic hiring consistent with FHWA guidance[47] and offering training opportunities to engage this labor.
- Availability of data related to state and national performance measures including how and how often it is provided. For example:
    - Real-time operational feed
    - Publicly available metrics
- Processes for incidents and maintenance inspections
- Processes for software and hardware updates
- Innovative cybersecurity practices

[47] Bipartisan Infrastructure Law – Section 25019(a) "Local Hiring Preference for Construction Jobs" - Contract Administration - Construction - Federal Highway Administration (dot.gov)

- Use of independent verification of station performance
- Availability of an asset information and tracking mechanism
- Outcomes:
    - Regular reporting of key metrics (as defined by NEVI guidance)
    - Continued identification of potential exceptions and charging stations that may be upgraded (based on usage)
    - Continued engagement to gather stakeholder feedback

In some cases, INDOT may formalize these issues into contractual requirements. In others, INDOT may use them when evaluating the proposals that provide value beyond the minimum requirements. Key outcomes of this phase will be:

- RFP(s)
- Contract(s)

8.1.3 Installation, Operations and Maintenance: Private Sector with INDOT Oversight

After procurement, INDOT's primary role will be to manage the contracts and provide oversight throughout the O&M phase. INDOT will also monitor the performance of the charging infrastructure and update the Deployment Plan as needed throughout the life of the program.

8.2 Strategies for Identifying Electric Vehicle Charger Service Providers and Station Owners

In preparation for procurement, INDOT will engage EV charging service providers, installation/construction entities, local communities, utility companies, and potential site hosts. This is a key area where INDOT can provide support and build relationships. During the in-person meetings described earlier in this document, INDOT heard a need and desire from various stakeholders to continue participating. They are interested in events that help to inform the final station locations and potential partnerships to bid on the installation, operations, and maintenance. Therefore, INDOT's strategies are rooted in a robust engagement strategy. They include:

- Regular and frequent communication:
    - Coordinating with vendors, suppliers, site hosts, etc. – each with targeted outcomes:
        - Vendors: business models, operations, and maintenance criteria
        - Suppliers: opportunities for complementary infrastructure

        - Site hosts: moving from high level to specific locations
    - Soliciting feedback on site selection methodology and phasing
    - Identifying cost-share opportunities
- Tools and methods to encourage communication and facilitate teaming:
    - Web page available through INDOT
    - Potential vendor prequalification (development of criteria and list of vendors)
    - Industry forums, vendor days and/or open house that provide networking opportunities
    - Regular information sessions to report status and notify stakeholders of opportunities for engagement
    - Mailing list and social media campaigns
    - Direct engagement and communication through INDOT's EIS to notify and discuss opportunities with the DBE community
- Competitive and transparent procurements within the boundaries of the final procurement approach

8.3 Strategies for EVSE Data Collection and Sharing

INDOT will define data requirements that align with Federal requirements and INDOT goals and performance measures during the planning process. INDOT will vet draft requirements with stakeholders during additional engagement efforts. Final requirements will be included in the procurement process to support contracting, performance monitoring, and potential innovation. INDOT will develop data strategies to accomplish the following:

- Align with recent NPRM (6/8/22) to the extent possible
    - Continue engagement with EVSE vendors and suppliers and utilities to understand implications of the data and reporting frequency required
- Define data sharing requirements and expectations for companies who will be supporting implementation, operations, and maintenance for inclusion in contracting documents
- Monitor operational performance, such as equipment down time and contractor response time
- Monitor trends and conditions impacting future deployments, such as:
    - Charing station usage
    - Adoption rates
    - EV vehicle miles travelled

  - EV traffic assessment along AFCs (including most travelled interchanges and dwell times)
  - Land use
  - Utility and roadway improvements
- Track and report the progress of plan implementation

8.4 Strategies to Address Resilience, Emergency Evacuation, Snow Removal and Seasonal Needs

When developing the procurement documents, INDOT will evaluate potential strategies related to the resiliency of future EV charging infrastructure and, when appropriate, incorporate them into the procurement process and/or subsequent plan updates. Examples include:

- Resilience:
  - Considerations for complementary renewable energy alternatives such as solar panels
  - Considerations for energy storage capacity to provide backup options such as solar power, generator hookups, and battery storage and recycling.
  - EVSEs who can help adapt to areas lacking necessary power
  - Encouraging and prioritizing innovative maintenance procedures – see list above related to asset management systems, etc.
- Evacuation:
  - Prioritization of AFC build out
  - Consideration for additional AFCs (such as US 30) to fill remaining gaps
  - Coordination with neighboring states
- Snow removal and seasonal needs:
  - Options for including snow removal at charging stations in the O&M contracts
  - Options for hardening stations to withstand storms and ensure operator safety, such as auto station shut-off, waterproofing, and structures built to withstand severe thunderstorms and tornadoes

8.5 Strategies to Promote Strong Labor, Safety, Training, and Installation Standards

Section 11 of this plan addresses specific considerations for labor, training, and workforce including Indiana's plan for creating opportunities for small and disadvantaged businesses. Indiana's strategy relative to the labor, safety, training, and installation standards will leverage the Federal NEVI requirements. These requirements reference application of existing standards such as the Electric Vehicle Infrastructure Training Program (EVITP), which provides training and certification for electricians installing electric vehicle supply equipment. Both the local and national leadership of the International Brotherhood of Electrical Workers (IBEW) have adopted this training to mandate it as part of the apprenticeship program, which means that all journeymen electricians will eventually receive this training. In the development of the contracting strategy and in alignment with final Federal rulemaking, Indiana may require this training as part of competitive bids.

Second, during the additional planning and engagement that will continue beyond the submittal of this draft plan, INDOT will continue stakeholder engagement with electric utilities, EV infrastructure providers, site hosts, trade associations, environmental groups, educational institutions, and other interested parties. This ongoing engagement will be key to creating educational, apprenticeship, and awareness opportunities consistent with INDOT's goal to develop their 21st century workforce. For example, the Ivy Tech Community College's (Ivy Tech) Expanding Registered Apprenticeship Programs (ERAP) effort will establish a statewide apprenticeship hub to promote apprenticeship as a viable postsecondary education-to-career option and expand employer use of apprenticeship as a recruitment, training, and retention strategy. The project will work with all sectors with special focus on EV production, maintenance and infrastructure development and maintenance. This program also aims to increase access to underrepresented and diverse populations in apprenticeship with a special emphasis on females and minorities.

Additional planning efforts may include training and workforce focused efforts and collaborations to develop and expand programs extending to utilities, other public agencies, and academia (including trade schools and technical colleges).

9.0 Civil Rights

Indiana is committed to compliance with all Federal and state civil rights laws. These are specified in the subsections below. INDOT will have oversight and responsibility for compliance, which will flow down to private entities that will work on the installation, operations, and

maintenance of the charging infrastructure. These requirements will be incorporated into the procurement and contract documents.

9.1 Applicable Laws

9.1.1 Federal

Per the NEVI NPRM, all applicable Federal statutory and regulatory requirements from USDOT apply including, but not limited to:

- U.S. Code Title 23, Part 200
- Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970
- National Environmental Policy Act (NEPA)
- Title VI/VIII of the Civil Rights Act OF 1964
- "Americans with Disabilities Act of 1990," 104 Stat. 327, 42 U.S.C.A. 1210
- Section 504 of the Rehabilitation Act of 1973, 29 U.S.C. 794

9.1.2 State

In addition to the Federal statutory and regulatory requirements, the state of Indiana has relevant civil rights legislation that will be referenced. This legislation originated in 1961 and has been updated and expanded over time, most recently in the mid-1990s. Indiana civil rights laws and regulations include:[48]

- Indiana Code (IC) 22-9
- Administrative Code 910

Likewise, INDOT has stated requirements for compliance with relevant civil rights legislation including:[49]

- Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. Section 2000d et seq., 49 CFR part 21, and all related regulations and directives.
    - Assures that no person shall on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity under any INDOT program, activity, or service.

[48] https://www.in.gov/icrc/about-icrc/indiana-civil-rights-laws-and-regulations/

[49] https://www.in.gov/indot/multimodal/transit/transit-related-civil-rights/

- Title II of the Americans with Disabilities Act as amended (ADA) of 1990 (42 U.S.C. §§12101 et seq.) and Section 504 of the Rehabilitation Act of 1973, as amended (Section 504) (29 U.S.C. §794) and implementing regulations found in 28 CFR 35 and 49 CFR 27
    - INDOT does not discriminate against qualified individuals with disabilities in its policies, or in the admission of, access to, treatment of or employment in its programs, services, or activities.

In addition to referencing and requiring compliance with these relevant regulations in procurement and contract documents, INDOT will also ensure that relevant implementation requirements contribute to meeting these requirements. For example:

- Minimum design standards for EV charging stations to ensure compliance with ADA guidelines
- Additional engagement based on Section 504
- DBE goals during contracting and procurement (see Section 11).

10.0 Equity Considerations

Justice40 is a Federal effort to deliver at least 40% of the overall benefits from Federal investments in climate and clean energy to Disadvantaged Communities (DACs). Executive Order 14008 and the Federal NEVI guidance use publicly available data sets to identify DACs. In these areas, the population is characterized by lack of access to health or transportation, are economically or equitably disadvantaged, carry a negative energy burden, or are adversely impacted by fossil dependence, resilience, and environmental and climate hazards.

10.1 Identification and Outreach to DACs

Engagement and outreach conducted as part of the planning process focused on DACs in Indiana. With approximately 59% of Indiana's population in a DAC and/or rural area[50], equitable deployment of charging infrastructure is one of the state's primary priorities.

Indiana's plan was developed (and will be updated in the future) through engagement with stakeholders representing rural and disadvantaged communities to ensure that diverse views were heard and considered throughout the planning process. Continued engagement will ensure that the deployment, installation, operation, and use of EV charging infrastructure achieves equitable and fair distribution of benefits and services. Table 9 lists the groups that

[50] Some DAC areas are also rural, but not all rural areas are also classified as a DAC per the Federal mapping and project tools.

specifically represent DAC communities that INDOT engaged with as part of the planning process. Participants reiterated the need to continue engagement with these stakeholders, define additional equity metrics, and develop a strategy for encouraging DBE participation throughout implementation.

Table 9. Summary of Outreach to DACs

Stakeholder	Date(s)
NAACP (State)	5/27/22, 6/17/22
Indiana State Conference of the NAACP	5/27/22, 6/17/22
Evansville Branch of NAACP 3048-B	5/27/22, 6/17/22
Black Lives Matter South Bend	5/27/22, 6/17/22
Indiana Chapter, American Association of Blacks in Energy	6/9/22
Indiana Alliance for Equity, Diversity, and Inclusion of EV Infrastructure and Economic Opportunity	5/27/22, 6/17/22
Rural community representation at in-person meetings (City of Scottsburg, Seymour, Hope)	6/14/22

10.2 Process to Identify, Quantify, and Measure Benefits to DACs

Indiana will extend the quantifiable outcomes from the program to specifically track them for DAC communities. These include:

- Percent of AFC miles that are within 50 miles of a charging station (and AFC miles in a DAC community). The goal for proximity is 100% by the end of the NEVI program.
- Percent of Indiana's population (and DAC community population) that is within 40 miles of a charging station. The goal is 100% by the end of the NEVI program.
- Metrics for robust and reliable infrastructure. These metrics will be applied consistently for all stations regardless of location.
    - Number of sites implemented (total and in and near a DAC)
    - Number of ports implemented (total and in and near a DAC)
    - Percent of time at least one port is available at all sites (total and in and near a DAC)

In addition, INDOT will conduct additional engagement with DAC and rural communities to identify other potential benefits that could be incorporated into subsequent planning and

implementation phases. This work will be done in a collaborative fashion working with DAC communities, faith-based and community organizations, DEI experts from partners and stakeholders, and through the sharing of best practices with other states in the region. Potential metrics may include:

- Metrics related to EV education and awareness
- Metrics related to the clean energy job pipeline and training opportunities
- Metrics related to contracting with DBEs
- Site selection criteria which avoid or minimize residential areas, helping to mitigate potential gentrification-induced displacement due to new charging infrastructure

10.2.1 Equity Resources and Tools

INDOT has identified several resources and tools to help in evaluating equity considerations for the EV program. The following tools were either used as part of the planning process and/or have potential to support subsequent efforts such as finalizing site selection and vetting projects once procurement begins.

- Mapping tools:
    - Low- and moderate-income (LMI) communities: https://www.arcgis.com/home/item.html?id=92e085b0953348a2857d3d3dac930337
    - Environmental justice (EJ) communities: https://ejscreen.epa.gov/mapper/
        - Map descriptions: https://www.epa.gov/ejscreen/ejscreen-map-descriptions
        - Layer descriptions: https://www.epa.gov/ejscreen/ejscreen-map-descriptions
    - EV Charging Justice40 Mapping Tool: https://www.anl.gov/es/electric-vehicle-charging-equity-considerations
- Equity-related data sources:
    - Persistence poverty tracts: https://www.transportation.gov/RAISEgrants/raise-app-hdc
    - Transportation disadvantaged tracts: https://usdot.maps.arcgis.com/apps/dashboards/d6f90dfcc8b44525b04c7ce748a3674a

- Project screening tools:
    - FHWA Equity Analysis Screening Tool (aka Screening Tool for Equity Analysis of Projects (STEAP)): https://hepgis.fhwa.dot.gov/fhwagis/buffertool/
    - EPA EJScreen tool: https://ejscreen.epa.gov/mapper/
    - Low-Income Energy Affordability Data (LEAD) Tool: https://www.energy.gov/eere/slsc/low-income-energy-affordability-data-lead-tool

10.3 Benefits to DACs Through This Plan

Figure 23 presents the relationship between the preliminary charging station location and the DAC and rural areas in Indiana. A few key metrics identified with the current AFC's and these preliminary station locations include:

- Approximately 13% of AFC mileage is within a DAC area
- 100% of the preliminary sites are in or within 15-miles of at least one DAC area
- 62% the preliminary sites are in or within 5 miles of a DAC area

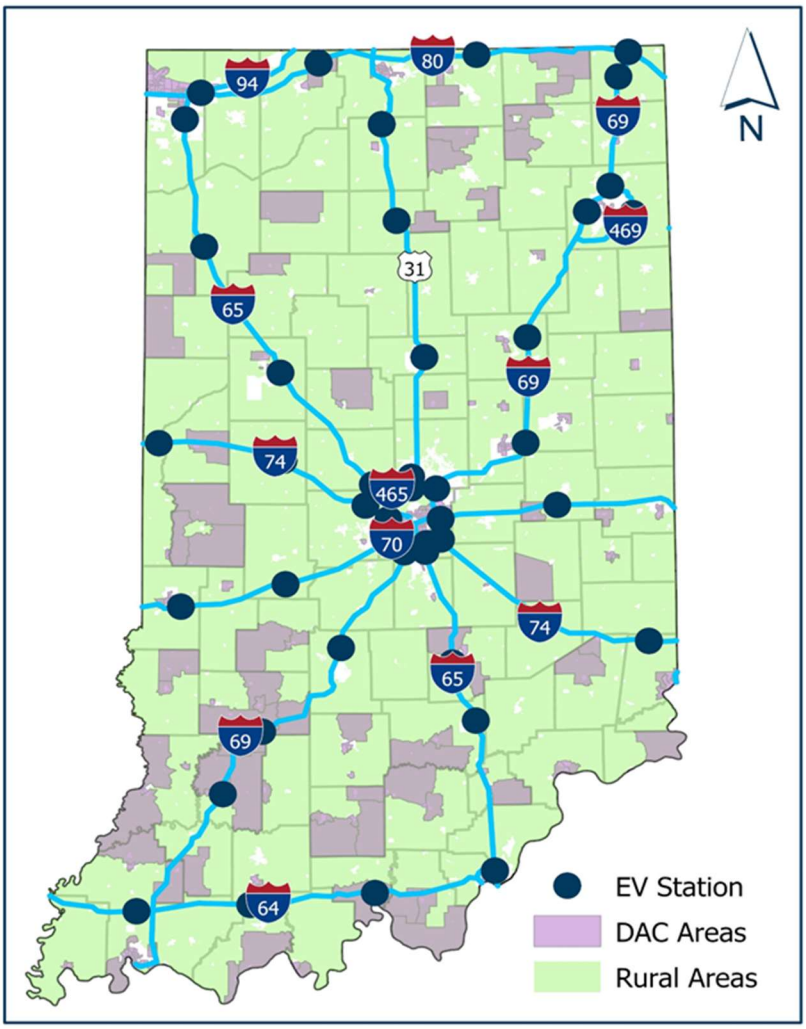


Figure 23. Preliminary Charging Locations Relative to DAC Areas

Additionally, metrics and findings specific to the DAC- and rural focused outreach conducted as part of plan development include:

- Of the 2,200+ public survey responses, 419 out of 434 (97%) of the DAC areas overlapped or was within a zip code area that was represented in the survey. Key findings include:
    - Respondents indicated several suggestions related to adoption barriers that readily reflect the concerns of DAC and rural communities including:
        - Expanding the number and accessibility of charging stations in Indiana
        - Expanding tax breaks, subsidies, and incentives for charging stations and electric vehicles
        - Encouraging more affordable and efficient charging stations and electric vehicles

        - Increasing outreach and education to the public about electric vehicles and charging stations
        - Reducing the registration fee for electric vehicles in Indiana
    - Respondents ranked criteria INDOT should consider when prioritizing alternative fuel corridors. The top four criteria included addressing gaps in the existing charging network, total traffic volumes, EV traffic volumes, and increasing traffic in rural Indiana. The full ranking is below, with DAC and rural criteria highlighted in **bold.**
        - Addressing gaps in the existing charging network (18%)
        - Total traffic volumes (14%)
        - EV traffic volumes (10%)
        - **Increasing EV charging in rural Indiana (10%)**
        - Population density (8%)
        - **Proximity to communities with air quality concerns (7%)**
        - Proximity to job centers (7%)
        - Proximity to tourism destinations (7%)
        - Add capacity at existing charging locations (7%)
        - Proximity to health care facilities (7%)
        - **Increasing EV charging in disadvantaged communities (6%)**

11.0 Labor and Workforce Considerations

Per INDOT's NEVI goals, INDOT seeks to enable the private sector equal opportunities to develop the workforce needed to support EV infrastructure. As with equity, INDOT will evaluate opportunities to incorporate labor and workforce considerations as an evaluation metric for EVSE installation, operations, and maintenance procurement. The remainder of this section descries elements that may be included as evaluation criteria, either as a requirement or a value-add feature.

11.1 Training

To ensure that the workforce that will install/construct, operate, and maintain charging infrastructure is adequately trained, INDOT will likely encourage or adopt the Federally recognized training curriculum called EVITP, Electrical Vehicle Infrastructure Training

Program.[51] This training is targeted to the workforce that constructs and maintains Level 2 and DC fast charging for both light- and medium-duty vehicles.

INDOT may authorize the cost of this training to be a part of the bid package and if so, this opportunity will be noted in the procurement documents.

11.2 Experience

The previously referenced FHWA NPRM released on June 8, 2022, provides additional guidance on the experience related to installation, operations, and maintenance of EVSE. In terms of technician qualifications, the guidance would provide minimum skill, training, and certification standards for technicians installing, operating, and maintaining EVSE to ensure consistency around quality installation and safety across the network.

Engagement with vendors and installers who have supported EVSE installation in Indiana suggest additional qualifications and experience questions that INDOT should consider as part of procurement and potentially prequalify or categorize vendor eligibility. This is an element of the planning process INDOT intends to further define as part of the additional planning activities during the first year of the program. Potential considerations relative to the experience of the companies interested in supporting EVSE installation, operations, and maintenance include:

- Does the company have working knowledge of utilities?
- Does with company have staff and subject matter experts with experience installing charging stations?
- Can the company provide examples of completed site plans that demonstrate quality planning that has been vetted and verified with end customers?
- Has the company been involved in selecting specific sites for EVSE and can they demonstrate an understanding of the local environment in terms of a site that benefits drivers, visitors, and residents alike?
- Can the company demonstrate quality and specifications of their proposed product(s) with respect to the following:
    - Backup and support, testing, inspection, etc.
    - Type and approach to maintenance
    - Resources to fix it and timeframe for repair

[51] https://evitp.org/

11.3 Diversity

Title 49, Part 26 of the US Code of Federal Regulations requires recipients of Federal transportation funding to develop a DBE program. INDOT has established a DBE program that meets these requirements. It is the policy of INDOT to ensure that DBEs have an equal opportunity to receive and participate in contracts that use Federal funds, without regard to race, color, national origin, or sex.

INDOT regularly submits a DBE goal and methodology report to the FHWA. The latest report covers Federal fiscal years 2020 through 2023. While DBE goals often vary within the state based upon the availability of firms in a specific geographic area and the types of expertise required, INDOT's overall goal for DBE participation is 10.1%. INDOT's Equity Initiative Service (EIS) Division will develop an approach for incorporating this goal into the EV program. When implementing this approach, INDOT will leverage its existing DBE certification process.

Additionally, INDOT's EIS Division strives to provide opportunities to traditionally underrepresented people and businesses through education, certification, and workforce development. INDOT EIS provides services such as DBE certification, resources for Federal aid contractors, on-the-job training, and external workforce programming. Their external workforce programming ensures contractors provide training and improve the skills of minorities, women, and disadvantaged persons (as defined by Federal guidelines) so they have access to skilled trade jobs and journey-level positions in highway construction classifications.[52] This is in alignment with stated goals from the International Brotherhood of Electrical Workers (IBEW), who, through direct engagement, indicated that they are programming a requirement for the EVITP training into their curriculum for the apprenticeship program.

12.0 Cybersecurity

The NEVI Notice of Proposed Rule Making issued on June 8, 2022, included the following requirements for cybersecurity and data privacy:

- Cybersecurity
    - Strategies "may address" user identity and access management, encryption systems, malware detection, event logging, management of software updates, and secured operations during communication outages
- Customer data privacy:

[52] https://www.in.gov/indot/doing-business-with-indot/equity-initiative-services/what-we-do2/

- Only gather personal info "strictly necessary" to provide charging service
- Must take all reasonable measures to safeguard data

Looking beyond this guidance, privacy of the individuals using the EV charging stations is of utmost importance to INDOT. Providing cybersecurity and privacy will be a major consideration in how the NEVI program will be implemented. INDOT will develop requirements for cybersecurity as part of its RFP development effort. INDOT will develop these requirements based on state guidance, such as the State of Indiana Cybersecurity Strategic Plan[53], and in consultation with stakeholders such as Indiana Office of Technology and Indiana Cybersecurity Hub.

In addition, the Indiana Executive Council on Cybersecurity (IECC) includes additional stakeholders (many of whom were engaged in the development of this plan). The stakeholders who overlap in areas related to EV charging infrastructure and cybersecurity include:

- Indiana Economic Development Corporation
- Indiana Utility Regulatory Commission
- Indiana Energy Association
- Purdue University

In 2021, the IECC developed an implementation plan for cybersecurity in Indiana[54] which will serve as an overall guidepost for the requirements in this area. One of the council's committees was focused on energy and outlined specific deliverables and objectives that specifically affect this industry. Elements of the committee's work that will help inform INDOT's approach include:

- Critical Infrastructure Information:
  - Review state policy changes to protect critical infrastructure information while maintaining public access and freedom of information.
- Training:
  - Identify needs and opportunities specific to training the energy industry in the area of cybersecurity (at all levels: state, vocational, higher education).

[53] https://www.in.gov/cybersecurity/executive-council/indiana-cybersecurity-strategic-plan/

[54] https://www.in.gov/cybersecurity/files/cybersecurity-plan-2021.pdf

- IURC Cybersecurity Forum:
    - IURC has recently hosted a cybersecurity forum for small natural gas utilities to share industry information and best practices.
    - IURC is currently planning to host a Cybersecurity Forum in October 2022 with larger utilities.
- Resource Guide:
    - The IECC Energy Committee will define emerging technology and supply chain issues related to the grid in Quarter 3, 2022.
    - The IECC Energy Committee will determine whether best practices and information are widely available Qtr. 3 2022.
    - The IECC Energy Committee will develop an industry specific resource guide Qtr. 4 2022.

Regarding implementation, it is likely that the third-party contractors installing the EV charging stations will be required to submit a cybersecurity plan and obtain approval before installation begins. INDOT anticipates that these cybersecurity plans will demonstrate what data will be received and how the contractors will maintain and store the data collected. The plan will demonstrate how the contractors will maintain cybersecurity throughout the life cycle of the NEVI program. INDOT will require disclosure of any security or privacy breach and how the issue will be handled following all rules and guidelines listed in the cybersecurity plan. The third-party contractors will be responsible for updating the cybersecurity plan with any ongoing changes in any local, state, and Federal law related to cybersecurity or privacy.

During the operations and maintenance phase, contracts may require regular cybersecurity audits or reviews to ensure adherence to these requirements. Additionally, INDOT anticipates requiring reports and debriefs for any security or privacy breaches to understand the cause, impact, and future mitigations implemented to ensure future protection.

While INDOT will rely heavily on state cybersecurity policy and strategies, it will also review national resources to ensure alignment with the requirements and priorities of the Joint office. Examples include:

- NIST Cybersecurity Framework (referenced in the DriveElectric tool kit)[55]
- US DOE Resources on EVSE Cybersecurity R&D, Challenges, Best Practices[56]

[55] https://www.nist.gov/cyberframework

[56] https://www.osti.gov/servlets/purl/1706221

- US DOT Volpe Report on EVSE Cybersecurity57
- Symposium on Federally Funded Research on Cybersecurity of EVSE – NIST report[58]
- Office of Energy Efficient and Renewable Energy's Federal Fleet Cybersecurity[59]

13.0 Program Evaluation

FHWA, in its release of a NPRM, proposed to outline quarterly and annual data submittal requirements for projects funded under the NEVI Formula Program. INDOT is committed to complying will all program evaluation requirements. Following are the potential requirements, as provided by FHWA.[60] In general, these align and will support the measurement of the quantified outcomes identified in Chapter 4.

- **Quarterly Data Submittal**. States must ensure the following charging station use, cost, reliability, and maintenance data are collected, maintained, and submitted on a quarterly basis in a manner prescribed by the FHWA:
    - Charging station location identifier associated with the data
    - Charging session start time, end time, and successful session completion (yes/no) by port
    - Energy (kWh) dispensed to EVs per session by port
    - Peak session power (kW) by port
    - Charging station uptime calculated in accordance with the equation in §680.116(b) for each of the previous 3 months
    - Cost of electricity to operate per charging station in each of the previous 3 months
    - Maintenance and repair cost per charging station for each of the previous 3 months
    - Charging station real property acquisition cost, charging equipment acquisition and installation cost, distributed energy resource acquisition and installation cost, and grid connection and upgrade cost on the utility side of the electric meter

[57] https://rosap.ntl.bts.gov/view/dot/43606

[58] https://nvlpubs.nist.gov/nistpubs/ir/2020/NIST.IR.8294.pdf

[59] Federal Fleet Cybersecurity | Department of Energy

[60] NEVI Formula Program, NPRM

  - Distributed energy resource installed capacity, in kW or kWh as appropriate, of asset by type (e.g., stationary battery, solar, etc.) per charging station

- **Annual Data Submittal**. States must ensure the following data are collected, maintained, and submitted on an annual basis in a manner prescribed by the FHWA for each charging station:
  - The name, address and type of private entity involved in the operation, maintenance, and installation of EVSE.
  - For private entities (as specified in the Federal guidance,) identification of and participation in any state or local business opportunity certification programs including but not limited to minority-owned businesses, Veteran-owned businesses, woman-owned businesses, and businesses owned by economically disadvantaged individuals.
- **Community Engagement Outcomes Report**. States must make an annual report publicly available in a manner prescribed by the FHWA. The report must describe the community engagement activities conducted as part of the development and approval of their most recently submitted State EV Infrastructure Deployment Plan, including engagement with DACs. This report should include community engagement type, date, number of attendees, communities represented by attendees, and how information on that engagement was reflected in the State's EV Infrastructure Deployment Plan.

INDOT will also collect the any additional data to measure and report on the quantitative program outcomes provided in Section 4.2. INDOT may define additional performance measures and targets as planning continues, and the data necessary to measure these outcomes will be added in future updates to this section. For example, as charging infrastructure moves from implementation to operations, INDOT will collect the necessary financial data to calculate the amount of charging leverage per Federal dollar.

INDOT will review its evaluation process regularly and adjusted it as necessary throughout the life of the program.

14. Discretionary Exceptions

To date, INDOT has not identified any specific discretionary exceptions. However, INDOT will continue to evaluate the need for exceptions during their first year of planning. Specific areas of focus will be the location of the final charging stations and the type and amount of charging proposed at each one. For example, the following potential scenarios and associated exceptions were identified through the INDOTs' stakeholder engagement process:

- Scenarios where a combination of individual stations within proximity may satisfy the station requirement of 4 ports of 150 kW each.
- Scenarios where a station or combination of stations may satisfy operational requirements but are located more than 50 miles apart
- Scenarios where a station or combination of stations may satisfy operational requirements but are located more than 1 mile from the AFC.

INDOT plans to work with stakeholders and potential EVSE vendors, utilities, and communities to identify these potential exceptions during the planning activities of the first year of the program so specific locations can be documented and justifications are built out.

15. Conclusion

This document presents a plan for how Indiana will deploy EV infrastructure over the next 5 years and beyond leveraging nearly $100 million in Federal NEVI funding. This plan will enable INDOT to achieves its EV vision, which is to:

> Collaboratively plan, build, and maintain safe and innovative EV infrastructure that enhances quality of life, drives economic growth, and facilitates the movement of people and goods.

The plan:

- Reflects INDOT's understanding of the current state of EV charging in Indiana
- Was developed in coordination with Federal partners to ensure compliance with Federal requirements
- Incorporates input INDOT received through an extensive stakeholder outreach and public involvement process

After submittal of this plan, INDOT will continue to develop the details needed for a successful EV program and provide additional opportunities for interested parties to continue to participate in the process. This plan is living document that INDOT will update throughout the life of the program.

Appendix A. Potential Charging Site Locations

This appendix contains maps of each preliminary and alternate station location. It is available as a separate file.

Appendix B. Check List of Federal Requirements

INDOT developed this Plan in accordance with FHWA's NEVI Formula Program Guidance memorandum dated February 10, 2022. This appendix lists the requirements provided in the memorandum and shows where in the Plan INDOT addressed each requirement. INDOT addressed all requirements in the Plan.

Plan Requirements

1. Each State is required to develop a Plan in accordance with this guidance and submit their final Plan not later than August 1, 2022 to the Joint Office.

   Requirement addressed in Plan: Yes
   Section: N/A
   Notes: INDOT submitted the final Plan to the Joint Office on July 29, 2022.

2. States should work directly with the Joint Office during Plan development and to remedy any issues with their Plans before submitting final Plans not later than August 1, 2022.

   Requirement addressed in Plan: Yes
   Section: N/A
   Notes: INDOT met with the Joint Office on April 8, 2022 to discuss its planning process and ask clarifying questions regarding the national guidance. Subsequently, INDOT participated in all Joint Office office hours sessions. INDOT sent a Draft to FHWA Indiana Division on July 1, 2022 and to the Joint Office on July 8, 2022. INDOT met with the Joint Office on July 20, 2022 to review its comments and incorporated feedback into the final Plan.

Plan Format

Introduction

3. This section of the Plan should introduce the Plan and the Plan development process to include a discussion of topics such as the Plan's study area, the dates of the analysis and adoption.

   Requirement addressed in Plan: Yes
   Sections:
   - Discussion of the Plan's study area: Section 1
   - Dates of analysis: Section 1.1.1
   - Dates of adoption: Section 1.1.2

State Agency Coordination

4. The Plan should describe how the State DOT has coordinated with the State's energy and/or environment department in the development and approval of the Plan.

   Requirement addressed in Plan: Yes
   Section: Section 2
   Notes: INDOT coordinated with several state agencies, including both Indiana's energy and environmental departments.

5. The Plan should address any steps the State's DOT has taken or plans to take to maximize opportunities to utilize U.S.-made EV supply equipment.

   Requirement addressed in Plan: Yes
   Section: Section 6.7
   Notes: The Plan flags the ability to meet Buy America requirements for required equipment as a risk.

Public Engagement

6. This section should discuss the involvement of particular stakeholder groups in the Plan's development to include the general public, governmental entities, federally recognized Tribes, labor organizations, private sector/industry representatives, representatives of the transportation and freight logistics industries, state public transportation agencies, and urban, rural, and underserved or disadvantaged communities.

Requirement addressed in Plan: Yes
Sections:

- Overview of involvement approach: Section 3.0
- List of stakeholder groups involved in Plan development: Section 3.1
- Feedback received from stakeholder groups: Section 3.2

7. States should engage stakeholders and communities to ensure the deployment, installation, operation, and use of EV charging infrastructure achieves equitable and fair distribution.

   Requirement addressed in Plan: Yes
   Sections:
   - Addressed in overall public engagement strategy - Sections 3.0, 3.1, and 3.2
   - Summary of targeted outreach to DACs - 10.1

Plan Vision and Goals

8. The Plan should describe how it supports a convenient, affordable, reliable, and equitable statewide and national EV network.

   Requirement addressed in Plan: Yes
   Section: Section 4.2
   Notes: This requirement is addressed in Indiana EV Goal #5

9. The Plan should describe how the State intends to use the funds distributed under the NEVI Formula Program to carry out the Program in each fiscal year in which funds are made available.

   Requirement addressed in Plan: Yes
   Section: Section 5, Section 7, and Section 8

10. Each State should provide 5-year goals for the duration of the program that include at least one outcome-oriented goal with a quantitative target.

    Requirement addressed in Plan: Yes
    Sections:
    - Goals – Section 4.2
    - Outcome-oriented goal with a quantitative target – Section 4.2

    Notes: The Plan includes 2 goals that have quantitative targets.

11. This section of the Plan should also identify the overall vision and goals specific to the geography, demographics, and network of the State as consistent with the NEVI Formula Program.

    Requirement addressed in Plan: Yes
    Sections: Section 4.2 and Section 10.2
    Notes: This requirement is addressed in Indiana EV Goal #5 and in the quantifiable outcomes listed in the Equity section of the Plan.

Contracting

12. The Plan should detail whether the State intends to contract with third-party entities, and if so, how the State will ensure that those entities deliver EV charging infrastructure in a manner that leads to efficient and effective deployment against Plan goals.

    Requirement addressed in Plan: Yes
    Section: Section 5.1

13. This section should also include a strategy for achieving efficient delivery and deployment and ongoing operation and maintenance. A contracting strategy that makes maximal efficient use of Federal funding will be an important consideration for approval of State plans.

    Requirement addressed in Plan: Yes
    Section: Section 5.2

14. This section should also discuss how States will ensure that third-party entities contracted to install, operate, or maintain EV charging infrastructure will engage communities where EV charging infrastructure will be installed.

    Requirement addressed in Plan: Yes
    Section: Section 5.1.2
    Notes: INDOT intends to require the third-party entities to compile data required to engage communities.

15. Plans should also include a discussion of how the State will include opportunities for small businesses as provided at 23 U.S.C. 304.

    Requirement addressed in Plan: Yes
    Sections: Section 5.1.1 and Section 5.1.2, and Section 8.5

Existing and Future Conditions Analysis

16. This section should identify the existing conditions within the study area at the time of the Plan creation. It should include the best available information regarding the State's geography and terrain as it pertains to its EV charger deployment vision and challenges, current and future temperature and precipitation patterns, industry/market conditions (to include an overview of the existing state of EV charging, current and projected EV ownership, the location of existing EV charging, and a discussion of the roles of DC Fast Charging stations), public transportation needs, freight and other supply chain needs, grid capacity necessary to support additional EV charging infrastructure, electric utilities that service the study area, land use patterns, travel patterns, EV charging infrastructure, information dissemination about the EV charging station availability.

    Requirement addressed in Plan: Yes
    Sections:
    - State's geography and terrain – Section 6.6.1
    - Current and future temperature and precipitation patterns – Section 6.1.2
    - Industry/market conditions – Section 6.3
    - Public transportation needs – Section 6.4.3
    - Freight and other supply chain needs – Section 6.4.4
    - Grid capacity necessary to support additional EV charging infrastructure – Section 6.3.2
    - Electric utilities that service the study area – Section 6.3.3
    - Land use patterns – Section 6.2
    - Travel patterns – Section 6.4
    - EV charging infrastructure – Section 6.6
    - Information dissemination about the EV charging station availability – Section 6.6

17. This section should also include a discussion on known risks and challenges for EV deployment.

    Requirement addressed in Plan: Yes
    Section: Section 6.7

EV Charging Infrastructure Deployment

18. This section should discuss EV charging infrastructure installations and associated policies to meet the vision and goals of the Plan.

Requirement addressed in Plan: Yes
Sections

- Installations – Section 7.3
- Policies - Section 7.4

19. The Plan does not need to include a list of exact EV charging infrastructure locations, but rather should include an overall strategy for installations along designated corridors that prioritizes build-out along the Interstate Highway System.

    Requirement addressed in Plan: Yes
    Section – Section 7.3

20. Components of this section should include information about planned new EV charging infrastructure deployment location types, as well as existing EV charging infrastructure locations planned for upgrade or expansion.

    Requirement addressed in Plan: Yes
    Section: Section 7.1, and Section 7.2
    Notes: While INDOT currently has no specific plans for upgrading existing charging locations, Section 7.1 describes the how INDOT will be evaluating upgrade opportunities at the planned VW locations identified in Section 7.2.

21. Plans should also identify which utility's territory the planned installations or upgrades are located in.

    Requirement addressed in Plan: Yes
    Section: Section 6.3.3

22. The section should also include a map of the corridors that are planned for EV charging infrastructure installation or upgrade. The Joint Office can provide assistance to States to help develop these maps. Specifically, maps should include:
    a. Approximate locations of planned EV charging infrastructure;
    b. Approximate locations of existing EV charging infrastructure along those corridors, specifically noting existing EV charging infrastructure targeted for upgrade or improvement to meet the requirements of the NEVI programs;
    c. EV charging infrastructure density along Alternative Fuel Corridors and the Interstate Highway System; and
    d. Analysis on anticipated usage rates and peak demand, if available.

Requirement addressed in Plan: Yes
Sections:

- Approximate locations of planned infrastructure – Section 6.6 and Section 7.3
- Approximate location of existing EC charging infrastructure – Section 6.6
- EV charging infrastructure density – Section 6.6
- Anticipated usage rates and peak demand – this information is not yet available. Section 6.4.2 summarizes existing demand

23. This section should also identify the source of non-federal funding for EV charging infrastructure deployments. It can include both immediate and longer-term actions but should identify actions to build-out Alternative Fuel Corridors, particularly those along the Interstate Highway System.

    Requirement addressed in Plan: Yes
    Sections: Section 7.1

24. It can include both immediate and longer-term actions but should identify actions to build-out Alternative Fuel Corridors, particularly those along the Interstate Highway System.

    Requirement addressed in Plan: Yes
    Sections: Section 7.3

25. It should also include actions that will be taken after the build-out of the State's Alternative Fuel Corridors has been accomplished, including ensuring that any portions of the Interstate Highway System not part of the designated Alternative Fuel Corridors for electric vehicles will be fully built-out. Funding topics covered should include funding amounts and sources (including the NEVI Formula Program at a minimum), use of public-private partnerships, and information about EV charging infrastructure ownership.

    Requirement addressed in Plan: Not applicable, because INDOT's AFC network covers all interstates
    Section: Section 1.0

26. Funding topics covered should include funding amounts and sources (including the NEVI Formula Program at a minimum), use of public-private partnerships, and information about EV charging infrastructure ownership.

    Requirement addressed in Plan: Yes

Sections:

- Funding amounts and sources – Section 7.0 and Section 7.1
- Use of public-private partnerships – Section 5.1.1
- EV charging infrastructure ownership – Section 7.3

27. The overarching goal of the NEVI Formula Program is a seamless national EV charging network, so the Plan should also address how a State will coordinate and connect regionally with other States and adjoining networks.

    Requirement addressed in Plan: Yes
    Section: Section 7.3

Implementation

28. Implementation considerations should include EV charging operations and maintenance programs, and EV charging infrastructure data collection and sharing. The Plan should identify installation, maintenance, and ownership responsibilities for the charging infrastructure and take into account how those roles will ensure the long-term sustainability of the station. Critical to this will be the State's strategy to contract with private entities in a way that makes efficient use of Federal funds to ensure maximal deployment at efficient unit cost.

    Requirement addressed in Plan: Yes
    Sections: Section 8.1, Section 8.3

29. The Plan should also demonstrate how the implementation will promote strong labor, safety, training, and installation standards as well as opportunities for the participation of small businesses.

    Requirement addressed in Plan: Yes
    Section: Section 8.5, Section 11.1, and Section 5.1.1

30. The Plan should also address emergency and evacuation needs, snow removal and seasonal needs, and ways for EV charging to support those needs.

    Requirement addressed in Plan: Yes
    Section: Section 8.4

31. The Plan should also describe strategies for resilience for operation during emergencies and extreme weather.

Requirement addressed in Plan: Yes
Section: Section 8.4

Civil Rights

32. This section of the Plan should discuss how the State planning and implementation will ensure compliance with State and Federal civil rights laws, including Title VI of the Civil Rights Act and accompanying USDOT regulations, the American with Disabilities Act, and Section 504 of the Rehabilitation Act.

    Requirement addressed in Plan: Yes
    Section: Section 9.0

Equity Considerations

33. The Plan should be developed through engagement with rural, underserved, and disadvantaged communities and stakeholders, including relevant suppliers and contractors, and describe how the Plan reflects that engagement.

    Requirement addressed in Plan: Yes
    Sections: Section 3.0, Section 3.1, Section 3.2, Section 8.1 and Section 10.1

Labor and Workforce Considerations

34. This section of the Plan should consider the training, experience level, and diversity of the workforce that is installing and maintaining EV charging infrastructure. See Section III-D for additional information.

    Requirement addressed in Plan: Yes
    Sections:
    - Training – Section 11.1
    - Experience – Section 11.2
    - Diversity – Section 11.3

Cybersecurity

35. This section of the Plan should discuss how the State will address cybersecurity. The Plan should identify considerations when software updates are made to ensure the station or vehicle is not compromised by malicious code, or that a vehicle infects other stations during future charges.

Requirement addressed in Plan: Yes
Section: Section 12

Program Evaluation

36. This section of the Plan should describe the State's schedule and plan for evaluating performance in achieving its 5-year goals and vision. Evaluation of the effectiveness of this plan should include monitoring performance metrics, such as EV charging infrastructure usage, EV charging infrastructure reliability, customer satisfaction, equitable distribution and access to EV charging infrastructure within the State, greenhouse gas emissions, or other metrics that support creating a national network. This should include an assessment of a State's efficient use of Federal funding, measured by the amount of charging leveraged per Federal dollar.

    Requirement addressed in Plan: Yes
    Sections: Section 13, Section 4.2, and Section 10.2

Discretionary Exceptions

37. As part of the development and approval of State Plans, and in very limited circumstances, a State may submit a request for discretionary exceptions from the requirement that charging infrastructure is installed every 50 miles along that State's portion of the Interstate Highway System within 1 travel mile of the Interstate, as provided in the Alternative Fuel Corridors request for nominations criteria. All approved exceptions will be supported by a reasoned justification from the State that demonstrates the exception will help support a convenient, affordable, reliable, and equitable national EV charging network. Exceptions must be clearly identified and justified in State plans.

    Requirement addressed in Plan: Yes
    Section: Section 14

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N758
Indianapolis, Indiana 46204

PHONE: (855) 463-6848

Eric Holcomb, Governor
Michael Smith, Commissioner

September 27, 2022

To: Anderson MCCOG, Bloomington BMCMPO, Cincinnati OKI, Columbus CAMPO, Evansville EMPO, Fort Wayne NIRCC, Indianapolis IMPO, Kokomo KHCGCC, Lafayette TPAPC, Louisville KIPDA, Muncie DMMPC, Northwest Indiana NIRPC, South Bend MCAG, Terre Haute THAMPO, Southwest Michigan SWMPC, Chicago CMAP

CC: Illinois DOT IDOT, Michigan DOT MDOT, Kentucky TC KYTC

Subject: Indiana 2- and 4-year PM 3 Targets

The Indiana Department of Transportation (INDOT), in collaboration with relevant MPO and State DOT partners, and pursuant to 23 CFR 490, has established new 2- and 4-year PM 3 targets as set below.

Performance Measure	2024 2 Year Target	2026 4 Year Target
Interstate Percentage of Person-Miles Reliable (LOTTR)	93.0%	93.5%
Non-Interstate Percentage of Person-Miles Reliable (LOTTR)	93.0%	93.5%
Truck Travel Time Reliability Index (TTTR)	1.32	1.30
Annual Hours of Peak Hour Excessive Delay (PHED) Chicago/NW Indiana UZA	15.6	15.9
Annual Hours of Peak Hour Excessive Delay (PHED) Louisville/Southern Indiana UZA	10.0	10.0
Annual Hours of Peak Hour Excessive Delay (PHED) South Bend/SW Michigan UZA	2.00	2.00
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel: Chicago/NW Indiana UZA	32.4	32.6
Total Emission Reductions: PM2.5	3.0	4.0
Total Emission Reductions: NOx	690.0	725.0
Total Emission Reductions: VOC	590.0	600.0
Total Emission Reductions: PM10	0.02	0.03
Total Emission Reductions: CO	330.0	520.0

INDOT has been in contact with the appropriate MPOs and neighbor state DOTs in establishing these targets as part of a collaborative process.

MPOs are asked to direct any questions, comments, or resolutions in support of these targets to:

Reliability, PHED:
Nathan Shellhamer (NShellhamer@indot.in.gov), Corridor Development Office

Non-SOV, Emissions:
Jay Mitchell, (JayMitchell@indot.in.gov), Long Range Planning Office

MPO's have 180 days from the date of this letter to formally support INDOT's targets or establish their own.

Thank You,

Louis E Feagans Jr

Louis Feagans, INDOT
Managing Director of Asset Management

APPENDIX H

PERFORMANCE MEASURES

FFY 2019 Traffic Safety Performance

Background:
INDOT has been proactively engaged regarding safety targets with FHWA from the beginning of the proposed rulemaking for establishing safety performance measures in 2014 through the promulgation of final rules in March 2016. Within months of the final rules promulgation, INDOT initiated dialogs with our state partners in target setting. Between August 2016 and June 2017, INDOT coordinated with the Indiana Criminal Justice Institute to ensure targets for fatalities, fatality rate, and suspected serious injuries will match in reports to NHTSA and FHWA. During the same period, INDOT coordinated with Indiana Metropolitan Planning Organizations regarding the state's methodology for establishing safety targets for the succeeding year. This coordination established the sources of data and the methodology for the calculating performance targets, as well as options for MPOs to accept state targets or establishing local targets.

In 2012, the short-term surface transportation funding legislation, Moving Ahead for Progress in the 21st Century – better known as MAP-21 was passed at a time when the nation was fresh off "The Great Recession" and there was great interest in being strategically frugal. It established requirements that state's use of federal transportation funds report on traffic safety performance. The National Highway Transportation Safety Administration and the Governor's Highway Safety Association's 2008 report on Traffic Safety Performance Measures became the source referenced in MAP-21 for safety measures. There were 14 measures, which centered on NHTSA focused traffic safety initiatives.

Table 7: INDOT SAFETY PERFORMANCE TARGETS

Number of Fatalities	**907.7**
Data Source: Fatality Analysis Reporting System	
2009-2015 FARS Final File Count	
2016 FARS Annual Report File	
2017 Indiana State Police FARS Report	
For the purpose of comparison to the SHSO annual report, the 5 year average performance target listed above is based on a projected calendar **2020 value of (965)** as described in the following methodology. Baseline projections are calculated using fatality counts and applying an equation to generate predictive values for 2019-2020. This was accomplished by the software built into Microsoft Excel for applying a logarithmic trend line with a forward forecast of two years. The equation is of the form [y = A*ln(x) + B]. The resulting equation is then adjusted to more closely fit recent peak years by shifting the value of B to produce a matching value for the recorded peak. INDOT estimates seven fatalities annually may be influenced by	

every .1% change in annual unemployment. Recent economic forecasts indicate an additional decrease in annual unemployment of .2% during the 2018-2020 period can be reasonably anticipated in Indiana. Consequently, the fatality count projections include an additional seven fatalities each year in anticipation of an improving economic climate influencing greater risk-taking and unfortunately increased severe crash outcomes.

Number of Serious Injuries	**3467.4**

Data Source: Automated Reporting Information Exchange System (ARIES)

2009- 2013 the “As reported” count of “Incapacitating Injuries”

2014-2017 an estimated count amounting to 7.2% of all non-fatal injuries

For the purpose of comparison to the SHSO annual report, the 5 year average performance target listed above is based on a projected calendar **2020 value of (3,628)** as described in the following methodology. Baseline projections are calculated using incapacitating injury counts (or estimations) and applying an equation to generate predictive values for 2014-2018. This was accomplished by the software built into Microsoft Excel for applying a logarithmic trend line with a forward forecast of four years. The equation is of the form [y = A*ln(x) + B]. The resulting equation is then adjusted to more closely fit recent peak years by shifting the value of B to produce a matching value for the recorded peak.

Fatality Rate	**1.097**

Data Source: Fatality Analysis Reporting System

The NHTSA calculated and reported values through 2016.

For the purpose of comparison to the SHSO annual report, the 5 year average performance target listed above is based on a projected calendar **2020 value of (1.154)** as described in the following methodology. Estimated/Predicted values for 2018-2020: The FHWA approved VMT for 2017 was significantly lower than the INDOT reported value there for an adjustment was made to the projection of annual Vehicle Miles Traveled (VMT) growth rate estimates. For 2018 a growth of 1.2% was used as in past years however for each of the next two years growth is estimated to be 1.05% to account for the effect on projections due to the last FHWA approved (2017) VMT of 817.52 hundred million VMT. INDOT’s Technical Planning Support & Programming Division estimates VMT by averaging the last 5 years of Annual Growth Rates for each of five factor groups and then averaging them. The Office of Traffic Safety uses those predicted annual estimates along with estimated fatalities then evaluated with the projected VMTs for their respective future years to produce predicted fatality rates per 100-million VMT.

Serious Injury Rate	**4.178**

Data Source: Automated Reporting Information Exchange System (ARIES)

The INDOT calculated and reported values through 2013. Using estimated incapacitating injuries and the FHWA VMT values for 2014-2018.

The 5 year average performance target listed above is based on a projected calendar **2020 value of (4.342)** as described in the following methodology.

Estimated/Predicted values for 2017-2020: The FHWA approved VMT for 2017 was significantly lower than the INDOT reported value there for an adjustment was made to the projection of annual Vehicle Miles Traveled (VMT) growth rate estimates. For 2018 a growth of 1.2% was used as in past years however for each of the next two years growth is estimated to be 1.05% to account for the effect on projections due to the last FHWA approved (2017) VMT of 817.52 hundred million VMT.

INDOT's Technical Planning Support & Programming Division estimates VMT by averaging the last 5 years of Annual Growth Rates for each of five factor groups and then averaging them. The Office of Traffic Safety uses those predicted annual estimates for incapacitating injuries along with the projected VMTs for their respective future years to produce predicted fatality rates per 100-million VMT.

Total Number of Non-Motorized Fatalities and Serious Injuries	**405.9**

Data Source: Fatality Analysis Reporting System (Non-motorist persons)
2009-2014 FARS Final File Count
2016-2017 FARS Annual Report File
2018 Indiana State Police FARS Report
Data Source: Automated Reporting Information Exchange System (ARIES) (Non-motorist persons)*
2009-2013 the "As reported" count of "Incapacitating Injuries"
2014-2018 an estimated count amounting to 13% of all non-fatal injuries

"The 5 year average performance target listed above is based on a projected calendar 2019 value of (420) as described in the following methodology." Baseline projections of Non-Motorist Fatalities are calculated using FARS Fatality counts and applying an equation to generate predictive values for 2018-2020. This was accomplished by the software built into Microsoft Excel for applying a logarithmic trend line with a forward forecast of two years. The equation is of the form [$y = A*\ln(x) + B$]. The resulting equation is then adjusted to more closely fit recent peak years by shifting the value of B to produce a matching value for the recorded peak.

Non-Motorist incapacitating injuries are projected logarithmically as above for 2019-2020 with non-motorist incapacitating injuries projected as 13% of projected all non-motorist non-fatal injuries.

*In addition to persons classified as pedestrians or pedal-cyclists, persons classified as animal drawn vehicle operators are included in the calculation. This is due to the significant number of crashes involving these vehicles across Indiana.

*Based on 2016 – 2020 five--year average

Three years later in the Fixing America's Surface Transportation Act or "FAST Act“ advocates for non-motorized transportation lobbied for greater transportation funding, and so performance measures needed to be created to determine impacts of federal funds used to improve those modes. About a year after the FAST Act became law, US DOT promulgated regulations on what data states must monitor, establish target goals for, and report on progress to achieve those targets. When the regulations were published only three of the original 14 performance measures noted in MAP-21 were deemed appropriate for performance management targets involving DOT’s. Two new measures were established for a total of five.

The first three come from 2008 NHTSA/GHSA Traffic Safety Performance Measures report,

- The Number of Fatalities as determined by Final FARS counts, or if unavailable the FARS Annual Report File, or if unavailable the state’s crash records system.
- The Rate of Fatalities per 100 million vehicle miles traveled using projected VMT data.
- The Number of “Suspected Serious Injuries”

The next two were added to address FHWA requirements.

- The Rate of Suspected Serious Injuries per 100 million vehicle miles traveled.
- Finally the number of Non-motorized Fatalities and Non-motorized Suspected Serious Injuries.

The first three performance measures are required for reporting to NHTSA and FHWA must match, requiring the state reporting agencies to collaborate and agree upon the data, methodology, and resulting targets. The final two performance measure targets are only required in state reports to FHWA.

The reports of safety targets in the Indiana Highway Safety Plan (HSA) to NHTSA is due July 1st and then in the Highway Safety Improvement Program (HSIP) to FHWA annual report August 31 of each year.

Note that these projections are not Indiana’s Traffic Safety Goals, rather they are projections of what is estimated to occur based upon past performance and other anticipated influences.

Data Sources:

Fatalities: Preference - Fatality Analysis Reporting System when available followed by the ARIES System

1. FARS Final File
2. FARS Annual Report File
3. Indiana State Police FARS Report

Suspected Serious Injuries (KABCO “A”) - Preference - Automated Reporting Information Exchange System (ARIES)

1. For years up through 2013, the “As reported” count of “Incapacitating Injuries”
2. For years from 2014 to the present, an estimated count amounting to 7.2% of all non-fatal injuries

Vehicle Miles Traveled - Preference - FHWA Highway Statistics Series when available followed by INDOT Volume Projections

1. For years up through a period two years before the prior year, the FHWA Table VM-2 total for Indiana (FHWA VMT)
2. For projections made from the prior year through the target year a VMT growth rate is estimated by INDOT
   (current growth rate is estimated to be 1.2% per year)

Fatality Rate: Fatality Analysis Reporting System

1. The NHTSA calculated and reported values through the two prior years.

INDOT calculates a rate for the prior year and projects rates for the current and succeeding years.

Suspected Serious Injury Count Issue:

In October 2014, Indiana’s electronic police motor vehicle crash reporting system implemented a change that redefined an “Incapacitating injury.” To replace a reporting police officer’s subjective rating of injury level, the Indiana Traffic Records Coordinating Committee and Indiana State Police agreed to make the immediate transport of any driver, passenger, pedestrian, animal drawn vehicle operator, or bicyclist from the scene of the crash for medical treatment constituted an “Incapacitating injury.” The effect was an increase in “Incapacitating injuries” as now people are counted who are transported out of an abundance of caution seeking a doctor’s evaluation of their unknown level of injury.

Regulations promulgated under 23 CFR 1300 to support the administration of federal transportation funding included a requirement that states report Suspected Serious Injuries using the criteria established in the fourth edition of the Model Minimum Uniform

Crash Criteria (MMUCC). This linkage of an advisory document's definition to a federal regulation put Indiana's wider non-subjective definition of incapacitating (serious) injury out of compliance.

Specifically, the definition states, a suspected serious injury is an injury other than fatal which results in one or more of the following:

- Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood,
- Broken or distorted extremity (arm or leg),
  Crush injuries,
- Suspected skull, chest or abdominal injury other than bruises or minor lacerations,
- Significant burns (second and third degree burns over 10% or more of the body),
- Unconsciousness when taken from the crash scene, or
  Paralysis.

The Indiana State Police and it's contractor maintaining the motor vehicle traffic crash report system are developing changes that will maintain Indiana's collection of the non-subjective "Incapacitating Injury" because of transport from the scene, while adding a data element to identify if the transport was due to one of the injury types specifically defined as a "Suspected Serious Injury" or for some other reason. This modification will put Indiana in compliance with the current federal law. Deployment of new Officer Reporting software (ARIES 6.0) is anticipated in 2019-2020. In order to allow for trend analysis, an estimated count of KABCO "A" (Suspected Serious Injuries) was developed after consultation with federal and state partners.

In this proxy for missing data, Indiana analyzed an injury count that remained consistent across all years, the total number of non-fatal injuries. The number of KABCO "A" level injuries "Incapacitating injuries" were evaluated to establish the percentage of non-fatal injuries they contributed. The annual average percent contribution of "A" injuries prior to the definition change the contribution was 7.1%. Weighting this value to account for recent increases in injury counts in the most recent three years, the value is adjusted to 7.2%.

Indiana uses that percentage of non-fatal injuries for each year to represent the number of "Suspected Serious Injuries." This percentage contribution is valid only when examining all crashes on all roads in Indiana. A value for any regional subset of the data will require its own historic analysis to establish the percentage contribution of "A" injuries to all non-fatal injuries in the subset.

In the case of *Non-Motorist A Injuries* as a percentage of *All Non-Motorist Non-Fatal Injuries* the statewide percent was found to average 13.0% of all Non-Fatal Injuries (Years 2004-2013). For *Non-Motorist Fatalities* as a percentage of All Fatalities the average is 10.5% (Years 2004-2015). Again, any regional subset of the data will require its own historic analysis to establish the percentage contribution.

The projections produced by this methodology represent a mathematical baseline before further adjustments to reflect consideration of non-highway influences that affect highway travel and traveler risk-taking. These influences would include, but are not limited to, economic change, technology proliferation, and weather.

Project Methodology

Fatality/Injury Count: Indiana's electronic crash report data is reliable back to January 1, 2004, however 2009 was selected as the base year for projection of injury counts. It is a reasonable starting point as 2009 was the bottom of "the great recession" and represents the most recent low point for highway traffic crashes in Indiana. With the economic recovery, Indiana has experienced an increase in highway traffic and consequently increased motor vehicle crashes. It follows that projections of highway traffic safety performance acknowledge and reflect increased exposure.

Baseline projections are calculated using fatality and "A" injury counts (or estimations) and applying an equation to generate predictive values for the current and target years. This was accomplished by the software built into Microsoft Excel for applying a logarithmic trend line with a forward forecast of four years. The equation is of the form [$y = A*\ln(x) + B$]. The resulting equation is then adjusted to more closely fit recent peak years by shifting the value of B to produce a matching value for the recorded peak.
Fatality/Injury Rate: The predicted annual counts for fatalities and "A" injuries are then evaluated with the projected traffic volumes for their respective future years to produce predicted injury rates per 100-million VMT.

Vehicle Miles Traveled: The predicted annual Vehicle Miles Traveled (VMT) growth rate for each of the next five years is estimated to be 1.20% from the FHWA approved VMT in 2015. INDOT's Technical Planning Support & Programming Division arrived at this figure by averaging the last 5 years of Annual Growth Rates for each of five factor groups and then averaging those to arrive at 1.20%. The contributing Annual Growth Rates are calculated from the data collected at Indiana's 100+ Continuous Data Collection Sites around the State across a variety of Functional Classes.

Non-Motorists Fatalities and Suspected Serious Injury's: For the purposes of counting non-motorist deaths and serious injuries, in addition to persons classified as pedestrians or pedal-

cyclists, persons classified as animal drawn vehicle operators are included in the calculation. This is due to the significant number of crashes involving animal drawn vehicles across Indiana. Current and target year Non-Motorist Fatalities are projected logarithmically as above. Non-motorist “A” injuries are projected as 13% of all non-fatal non-motorist “A” injuries.

Adjustment for other factors: Since the recent recession, traffic crash studies have been conducted to research the influence of employment on crash frequency and severity. Since 2006, the INDOT Office of Traffic Safety has monitored the influence on traffic crashes from changes in employment.

INDOT estimates seven fatalities annually may be influenced by every .1% change in annual unemployment. Recent economic forecasts indicate an additional decrease in annual unemployment of .1% during the next two year period can be reasonably anticipated in Indiana. Each year the unemployment rate will be checked for comparison to Indiana’s historic high monthly employment level of 2.9% recorded during September and October 2000 (2.9% unemployment). Consequently, the fatality count projections include an additional seven fatalities each year in anticipation of an improving economic climate influencing greater risk-taking and unfortunately increased severe crash outcomes.

The adjustment for unemployment percentage is the only factor used for target projections that is not within the traditional engineering, education, enforcement, and emergency response areas of influence.

Pavement - Selection of Projects

INDOT owns 11,058 miles, representing 28,600 lane-miles, of pavement in Indiana, as shown in Figure 4. The pavement on roadways owned by INDOT consists of both concrete and asphalt, as shown in Figure 5 There are 37 additional miles, representing 126 lane-miles, of NHS pavement owned by local government entities, as shown in Figure 6.

INDOT inspects all state highways and local NHS roads once a year with an outside contractor. This inspection determines the current pavement condition. Once INDOT receives this data it analyzes the condition of the road to determine pavement condition relative to INDOT’s targets. Once we have the new data INDOT utilizes its pavement modeling system to analyze the network to determine the next program year of projects based upon the current business rules. Once the list is developed for the amount of proposed funding the list is sent out to the field engineers. The field engineers review the list and field check the candidates either providing confirmation or added value information for the proposed treatment and year. The field engineers also at this time submit other project needs that were not in the model. During this verification of the program the district staff will coordinate with the other asset managers and when possible with the locals agencies. Once this review is completed and the projects are

selected INDOT updates the model to verify that the selected projects still meets the short and long term goals for the agency. Once this is analysis is completed INDOT reviews the business rules and makes any updates that are required.

Figure 4: Inventory of Pavement Owned by INDOT

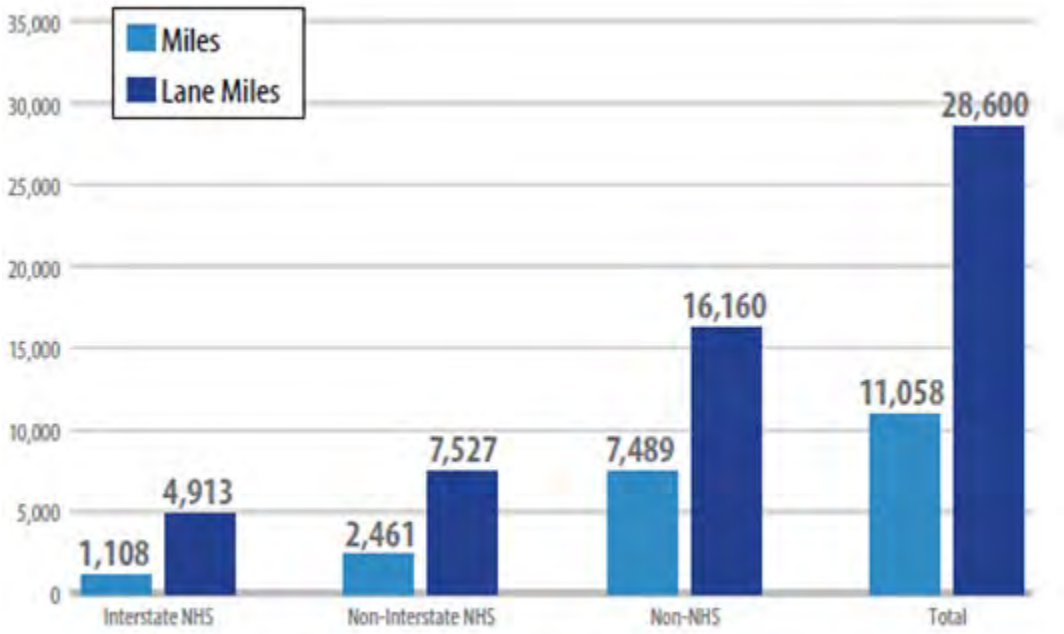


Figure 5: Pavement Type of Indiana Roads

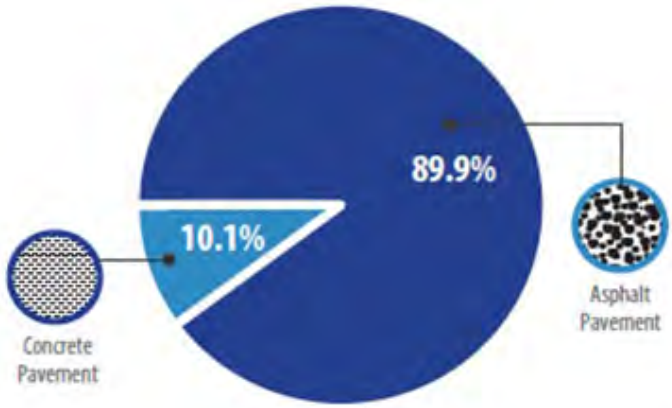
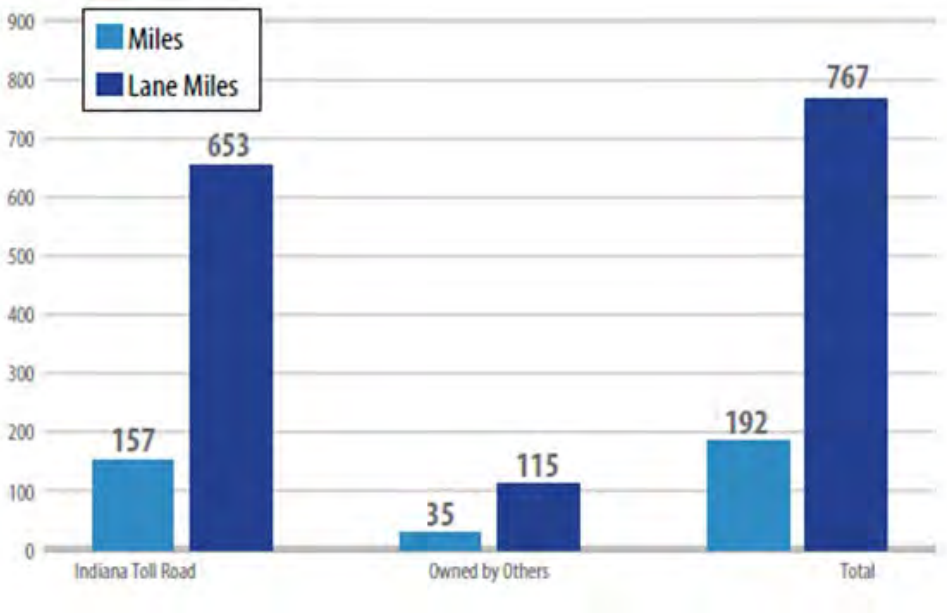


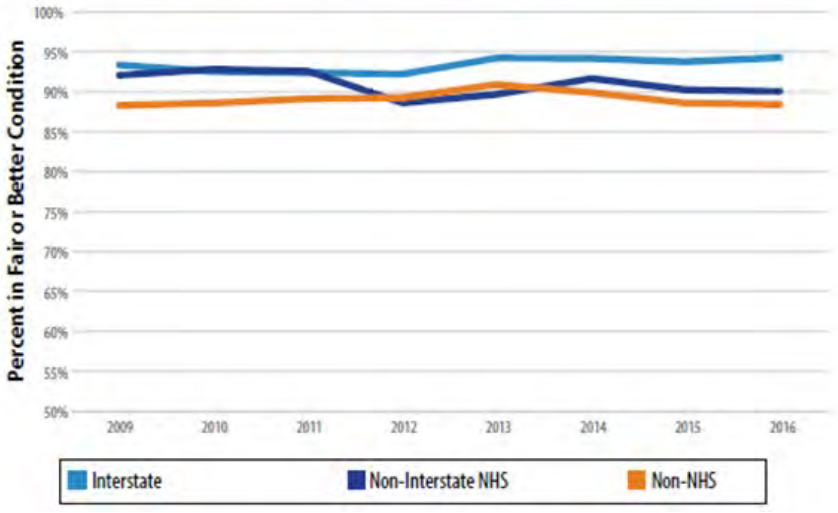
Figure 6: Inventory of NHS Pavement Not Owned by INDOT



Current Pavement Conditions

The condition of INDOT's interstate pavement has improved slightly between 2009 and 2016 to 94 percent in fair or better condition, as shown in Figure 7. Meanwhile, the condition of the non-interstate NHS declined between 2009 and 2012, from 92 percent to 89 percent in fair or better condition, and has remained fairly steady since 2012 at 90 percent in fair or better condition. Non-NHS pavement owned by INDOT has remained at 88 percent in fair or better condition from 2009 to 2016, with a slight improvement in 2013 to 91 percent.

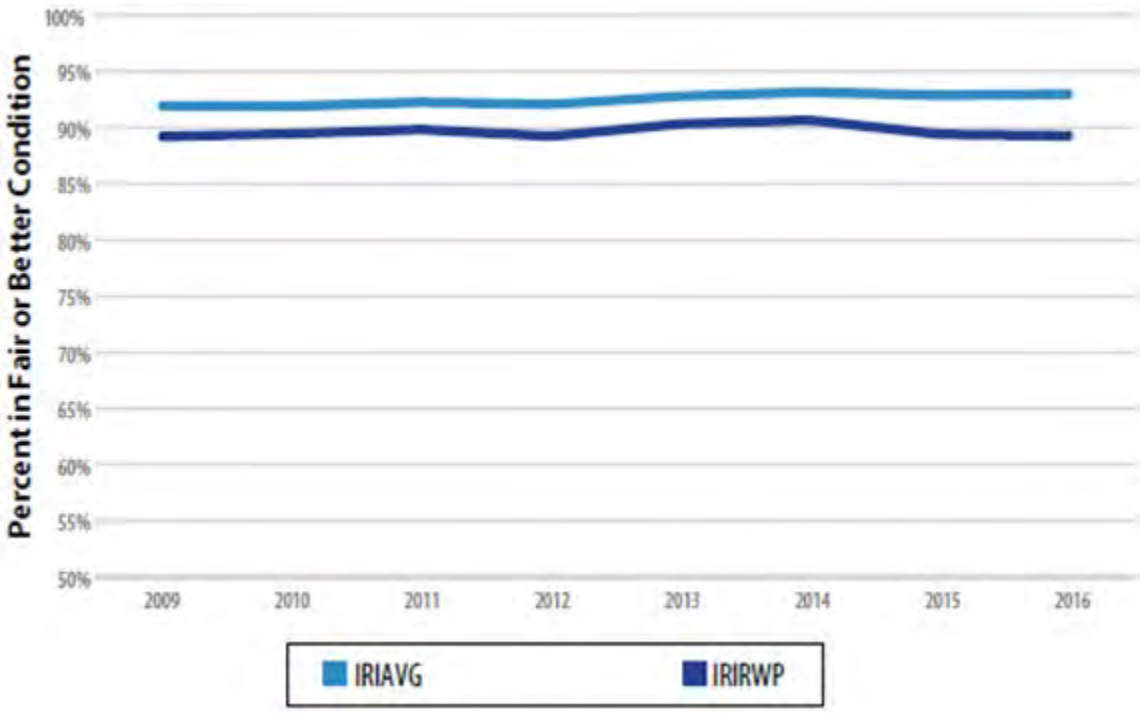
Figure 7: Pavement Conditions History



INDOT also breaks down the IRI measurement by the average IRI and the IRI of the RWP. IRI measures the roughness of roadway pavement in order to track how poor pavement affects roadway users. Figure 8 shows the percent of miles of all INDOT roads that are in fair or better condition based on the average IRI and the IRI RWP from 2009 to 2016.

In terms of average IRI, the conditions have improved slightly since 2009, while the conditions of IRI RWP have remained fairly constant over time.

Figure 8: Condition of Pavement, IRIAVG and IRIRWP



INDOT has set a condition target for all pavement to determine how well pavement is being maintained. INDOT follows two steps for adopting condition measures and targets:

1. planning processes that include a formal public comment period; and
2. an internal review and approval by a designated asset management group. When adopting or modifying condition measures and targets, INDOT carefully considers existing commitments, relative priorities, and trade-offs among assets. During the planning process, INDOT determined that different condition targets for urban and rural pavement is not appropriate.

Following this process, INDOT has set a ten-year pavement condition target of 96.1 percent of its interstate NHS pavement and 93.1 percent of its non-Interstate NHS pavement in fair or better condition by 2028.

Table 8: INDOT has set a ten-year pavement condition

INDOT Statewide Performance Target for the Percentage of Pavements of the Interstate System in Good Condition	
The 4-year target for the statewide percentage of pavements of the Interstate System in Good condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	50%
Statewide Performance Target for the Percentage of Pavements of the Interstate System in Poor Condition	
The 4-year target for the statewide percentage of pavements of the Interstate System in Poor condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	0.8
Statewide Performance Target for the Percentage of Pavements of the Non-Interstate NHS in Good Condition.	
The baseline statewide percentage of pavements of the Non-Interstate NHS in Good condition. [23 CFR 490.107(b)(1)(ii)(B)] For the first performance period, FHWA has calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	68.3
The 2-year target for the statewide percentage of pavements of the Non-Interstate NHS in Good condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	78.7
The 4-year target for the statewide percentage of pavements of the Non-Interstate NHS in Good condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	0.8
Statewide Performance Target for the Percentage of Pavements of the Non-Interstate NHS in Poor Condition.	
The baseline statewide percentage of pavements of the Non-Interstate NHS in Poor condition. [23 CFR 490.107(b)(1)(ii)(B)] For the first performance period, FHWA has calculated this value using IRI, only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	5.3
The 2-year target for the statewide percentage of pavements of the Non-Interstate NHS in Poor condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	3.1
The 4-year target for the statewide percentage of pavements of the Non-Interstate NHS in Poor condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	3.1%

Bridge – Selection of Projects

INDOT owns and maintains 5,747 bridges in the state of Indiana (see Table 6). There are an additional 268 bridges in Indiana on the NHS, including ITR bridges, bridges led by other state agencies, local bridges, and one privately owned bridge (see Table 7). INDOT oversees the inspection of both State and local bridges every two years per the National Bridge Inspection standards. Data is stored in BIAS and provided to FHWA once a year. INDOT uses the data to evaluate the condition of the bridges both State and local on the NHS and State off the NHS relative to the goals of agency. INDOT utilizes its bridge modeling system (dTIMS) to analyze the system to recommend projects for the next program year based on the current business rules and condition goals. Once the draft list is developed, it is reviewed by the district bridge asset engineers. The district bridge asset engineers review the list to either confirm the proposed treatments and years or modify them. The district bridge asset engineers may also submit other project needs that were not in the model. During this verification of the proposed program, the district bridge asset engineers will coordinate with the other asset managers and when possible with the local agencies. Once this review is completed and the projects are selected for the available funding, INDOT updates the model to verify that the selected projects still meet the short and long term goals for the agency. Once the projects are selected for a given program year, INDOT reviews the business rules and makes any updates that are required.

Table 6: Bridge Inventory, Owned by INDOT

Highway System	Number of Bridges	Deck Area (Square Feet)
Interstate NHS	1,427	18,318,566
Non-Interstate NHS	1,326	12,654,093
Non-NHS	2,969	20,969,024
Border Bridges[5]	25*	3,294,283
Total	**5,747**	**55,235,966**

*INDOT is the lead state for 18 border bridges. Other states are the lead for the seven other border bridges.

Table 7: Bridge Inventory, NHS Bridges Owned by Others

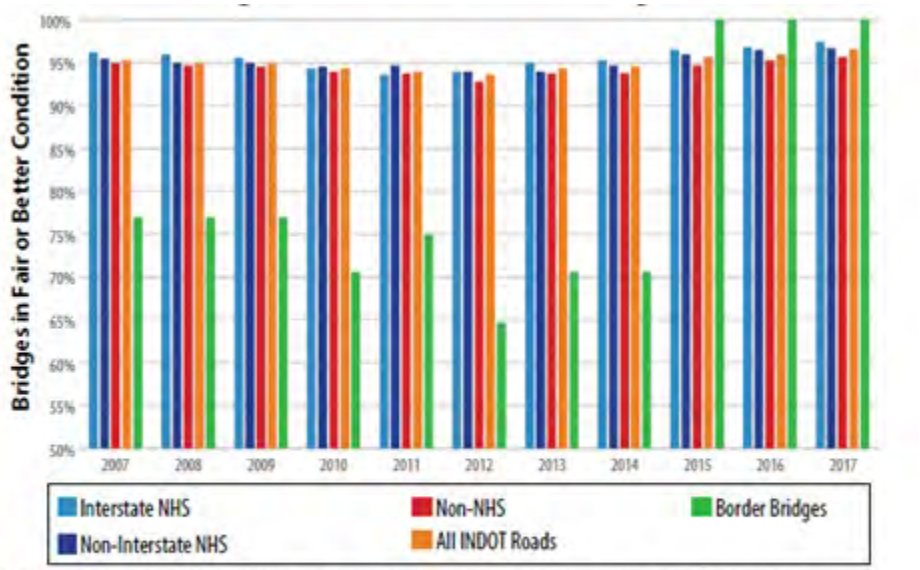
Highway System	Number of Bridges	Deck Area (Square Feet)
Indiana Toll Road	241	3,208,207
Other State Agencies	13	157,540
Local	13	128,331
Private	1	17,441
Total	**268**	**3,511,519**

Current INDOT Bridge Conditions

INDOT assesses the condition of bridges in the following categories: Interstate NHS, non-Interstate NHS, non-NHS, all INDOT roads,7 and border bridges. Figure 9 shows the condition of INDOT's bridges. Overall, 97 percent of INDOT's bridges were in fair or better condition in 2017.

Over the past 10 years, INDOT's bridges have remained in a consistently well maintained condition. The largest improvement in condition lies with the border bridges, which have seen significant improvement in condition since 2014, from 71 percent in fair or better condition to a full 100 percent in fair or better condition.

Figure 9: Condition of INDOT Bridges



* The condition ratings for 2007 to 2017 were developed using INDOT's system which is based on the condition of bridge elements (deck, superstructure, substructure). Starting in 2018, INDOT is transitioning to the FHWA bridge condition ratings system based on condition by deck area percentage. Using the FHWA system, 97.3 percent of INDOT's bridges are in fair or better condition in 2018.

INDOT evaluates the current condition of its assets against the condition targets it sets to determine if any performance gaps exist. INDOT maintains two steps for adopting condition measures8 and targets:

1. Planning processes that include a formal public comment period; and

2. An internal review and approval by the PMG. When adopting or modifying condition measures and targets, INDOT carefully considers existing commitments, relative priorities, and trade-offs among all resources.

During the planning process, INDOT determined that different condition targets for urban and rural bridges are not appropriate.

After completing the process, INDOT set a ten-year condition target of 96.1 percent of its bridges in fair or better condition by 2028. The target was based on the NHS established in 2018 and may change as INDOT updates the NHS routes.

Table 8: INDOT Statewide Performance Target for Bridges on the NHS Classified as in Good Condition

The baseline statewide percentage of deck area of bridges on the NHS classified as in Good condition. [23 CFR 490.107(b)(1)(ii)(B)]	50.0
The 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	48.3
The 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	47.2
INDOT Statewide Performance Target for Bridges on the NHS Classified as in Poor Condition	
THE Baseline statewide percentage of deck area of bridges on the NHS classified as in Poor condition. [23 CFR 490.107(b)(1)(ii)(B)]	2.3
The 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	2.6
The 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition that INDOT has established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(1)(ii)(A)]	3.1

Introduction to the Methodology for INDOT PM-3 Determination and Reporting

For coordination and documentation purposes, this procedure document has been written to outline the methodology involved in determining Indiana's National Performance Management Measures to assess system performance, freight movement, and the CMAQ program, otherwise known as PM-3. Per 23 CFR Part 490, Subparts E, F, G, and H, the six performance measures are:

1) Subpart E, System Performance: % of Person-Miles Traveled on Interstate that are Reliable (LOTTR Interstate);
2) Subpart E, System Performance: % of Person-Miles Traveled on Non-Interstate that

are Reliable (LOTTR Non-Interstate);
3) Subpart F, Freight: Truck Travel Time Reliability (TTTR);
4) Subpart G, CMAQ Traffic Congestion: Peak Hour Excessive Delay (PHED);
5) Subpart G, CMAQ Traffic Congestion: % of Non-Single Occupancy Vehicle (Non-SOV) Travel;
6) Subpart H, CMAQ On-Road Mobile Source Emissions: Emission Reductions.

The first four measures (LOTTR, TTTR, and PHED) rely on travel time data derived from the National Performance Management Research Data Set (NPMRDS), whereas percent of non-SOV travel and emission reductions are based on the ACS survey and CMAQ Public Access System, respectively. The initial cycle for PM-3 completed in 2018 produced these baseline conditions (generally 2017) and two-year (2018-2019) and four-year (2018-2021) targets:

Table 9: Summary of Performance Measures and Targets

Performance Measure	Baseline	2-Year	4-Year
Percent of the Person-Miles Traveled on the Interstate That Are Reliable	93.8%	90.5%	92.8%
Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable			89.8%
Truck Travel Time Reliability (TTTR) Index	1.23	1.27	1.30
Annual Hours of Peak Hour Excessive Delay Per Capita: Urbanized Area 1			15.4
Annual Hours of Peak Hour Excessive Delay Per Capita: Urbanized Area 2			5.7
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel: Urbanized Area 1	30.6%	31.4%	31.9%
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel: Urbanized Area 2	16.3%	16.3%	16.3%
Total Emission Reductions: PM2.5 (daily kg)	179.165	20.000	30.000
Total Emission Reductions: NOx (daily kg)	4576.370	1600.000	2200.000
Total Emission Reductions: VOC (daily kg)	2641.019	1600.000	2600.000
Total Emission Reductions: PM10 (daily kg)	4.068	0.300	0.500
Total Emission Reductions: CO (daily kg)	13939.447	200.000	400.000

Freight

Indiana's State Freight Plan was recently updated for 2018 and serves as the basis for identifying truck freight bottlenecks. The 2018 State Freight Plan document was uploaded to the PMF.

The baseline truck travel time reliability (TTTR) index, for the Interstate routes, was calculated using baseline calendar year 2017 NPMRDS travel time data. The TTTR index for the 2-year and 4-year targets utilized INDOT's planned construction projects for 2017 and the future years. This information was used to understand the impact these projects have on truck reliability on the Interstate system in Indiana. This was accomplished by determining an exposure factor in day-miles. The projects in 2017 were used for a baseline exposure and the ratio of the future year exposure compared to the base year exposure was used to adjust the reliable percent of person-miles traveled to create Indiana's 2-year and 4-year targets.

TTTR Calculation Example (Interstate only):

Step 1: Calculate the **50th and 95th** percentile travel times for the following time periods for each TMC: 6 a.m. - 10 a.m., weekdays; 10 a.m. - 4 p.m., weekdays; 4 p.m. - 8 p.m., weekdays; 6 a.m. - 8 p.m., weekends; 8 p.m. - 6 a.m., all days.

Step 2: Calculate **TTTR measure** for each time period for each TMC by: TTTR = 95^{th} Percentile/50^{th} Percentile. Then for each TMC, determine the time period with the maximum TTTR.

Step 3: Calculate the **TTTR index** using the following equation:

TTTR Index = ∑ All segment length weighted TTTR / ∑ All Segment Lengths

Where: Segment length weighted TTTR = Segment Length X Max TTTR

This is completed for the full extent of the Interstate system.

Peak Hour Excessive Delay (PHED)

The State of Indiana currently has two urbanized areas (Chicago, IL-IN and Indianapolis, IN) that are required to establish targets and report progress for PHED. In coordination with INDOT, the agencies that established the unified 4-year PHED target were the Illinois Department of Transportation (IDOT), Northwestern Indiana Regional Planning Commission (NIRPC), and the Chicago Metropolitan Agency for Planning (CMAP) for the Chicago area; and the Indianapolis Metropolitan Planning Organization (IMPO) for the Indianapolis urbanized area.

For the Chicago area, NIRPC and CMAP led the effort in establishing the Peak Hour Excessive Delay (PHED) four year target, in consultation with INDOT and IDOT. Trend line analysis of

recent historical data making use of the NPMRDS data set was applied to arrive at a rational 4-year target. The 4-year PHED target was set at 15.4.

For the Indianapolis area, INDOT and IMPO coordinated to determine the four year PHED target for the Indianapolis urban area. The baseline Peak Hour Excessive Delay (PHED) for the Indianapolis Urban Area was calculated using the calendar year 2017 travel time data from NPMRDS. The National Highway System (NHS) was recently updated for Indiana, though was not reflected in the NPMRDS NHS road network available in 2018 for 2017 performance. Therefore, the baseline NPMRDS network, hence travel time data, used the previous version of Indiana's NHS. The impacts of this significant change required extra steps to create a 4-year target to include the reduction in number and extent of TMC's on Indiana's updated NHS, as it applies to the final three years of the 4-year evaluation period.

PHED Calculation Example:

PHED (Peak Hour Excessive Delay): Amount of time spend in congested conditions by comparing a speed threshold that are lower than a normal delay threshold. Calculations are to be completed for: all vehicles; weekdays only; two peak periods, 6 a.m. - 10 a.m. and 3 p.m. - 7 p.m.

Step 1: Calculate the **Threshold Speed:** Threshold Speed is the greater of (0.6*Posted Speed Limit for TMC) or 20 MPH

Step 2: Calculate the **Excessive Delay Threshold Travel Time (EDTTT)**: EDTTT (sec) = (TMC Length/Threshold Speed)*3600 (sec/hr)

Step 3: Calculate **Travel Time Segment Delay (RSD)**: RSD (Sec) = Measured Travel Time – EDTTT

Step 4: Calculate **Excessive Delay**: Excessive Delay (hrs) = (RSD/3600 (sec/hr)) when RSD is greater than or equal to zero. If RSD is less than zero then Excessive Delay is 0.

Step 5: Calculate **Total Excessive Delay** (Each TMC): Total Excessive Delay (Person-Hours) = Excessive Delay*15 Minute Volume*Average Vehicle Occupancy (AVO) [where AVO = (%cars*AVOcars)+(%buses*AVObuses)+(%trucks*AVOtrucks)]

15 Minute Volume Calculation Procedure:

Step A: Determine AADT to use for 15 minute volume calculation. If the facility type of the TMC equals 1 (ramp or one-way road), then use the provided AADT for that TMC. If the facility type does not equal 1 (two-way facility), the divide the provided AADT by 2.

- AADT

Step B: Multiply **Step A** by the seasonal adjustment factor for the given month utilizing 2016 factors

- (AADT)*Seasonal Adjustment Factor for month and classification of roadway

Step C: Multiply **Step B** by the day of the week factor for the given month and day of the NPMRDS data

- (AADT)*Seasonal Adjustment Factor for month and classification of roadway*day of the week factor for given day of the week in the given month from NPMRDS

Step D: Multiply **Step C** by the hourly distribution factor provided by Traffic Statistics to convert daily volumes into hourly volumes

(AADT)*Seasonal Adjustment Factor for month and classification of roadway*day of the week factor*hourly distribution factor for given hour **Step E:** Divide **Step D** by 4 to get 15 minute volumes.

- [(AADT)*Seasonal Adjustment Factor (per month and functional classification of roadway)*day of the week factor (per month, day, and functional classification)*hourly distribution factor (per functional classification)]/4

Step 6: Calculate **PHED:** PHED = Sum of Excessive Delays (per urban area)/population of urban area

Non-SOV Travel

The State of Indiana currently has two urbanized areas (Chicago, IL-IN and Indianapolis, IN) that are required to establish targets and report progress for non-SOV travel. In coordination with INDOT, the agencies that established the unified non-SOV target for the urbanized areas were the Illinois Department of Transportation (IDOT), Chicago Metropolitan Agency for Planning (CMAP) and the Northwestern Indiana Regional Planning Commission (NIRPC) for the Chicago area; and the Indianapolis Metropolitan Planning Organization (IMPO) for the Indianapolis area. The data collection method for the percent of non-SOV travel for both areas was the American Community Survey (ACS).

For the Chicago area, the basis for the two year and four year targets established for the 2018-2021 performance period for the percent of non-SOV travel involved INDOT and IDOT coordination with the two MPOs (CMAP and NIRPC). CMAP has an aggressive 2050 plan to double transit ridership by 2050; both CMAP and NIRPC felt comfortable at setting aggressive goals to increase non-SOV travel based on past performance of the area that has seen a nearly 0.2% per year increase in non-SOV travel, and the CMAP 2050 plan strategies. Those values were initially inadvertently based on a performance period 2019-2022. The final established targets of 31.4 and 31.9 are correctly based on the performance period 2018-2021.

For the Indianapolis area, regarding the basis for the 2-year and 4-year targets established for the 2018-2021 performance period for the percent of non-SOV travel, INDOT and the IMPO

agreed the non-SOV travel should remain constant based on historical comparison of data from 2012-2016 that shows this percentage being stagnant.

Emissions

Currently, the State of Indiana has areas designated as non-attainment or maintenance for PM10 (of which both NOx and VOC are a significant contributor to PM10 emissions); non-attainment or maintenance for CO; and non-attainment or maintenance for ozone. Three MPOs in Indiana are currently required to submit a CMAQ performance plan to INDOT: Indianapolis MPO (IMPO); Northwest Indiana Regional Planning Commission (NIRPC); and Ohio-Kentucky-Indiana Regional Council of Governments (OKI). The performance plans as shown in the next section were uploaded to the PMF.

The performance measure established in the January 18, 2017, final rule for the purpose of carrying out the CMAQ Program and to use to assess on-road mobile source emissions is "Total Emissions Reduction," which is the 2-year and 4-year cumulative reported emission reductions, for all projects funded by CMAQ funds, of each criteria pollutant and applicable precursors (PM2.5, PM10, CO, VOC, and NOx) under the CMAQ program for which the area is designated nonattainment or maintenance. The measure applies to areas designated as nonattainment or maintenance for ozone, carbon monoxide or particulate matter. For INDOT, this is the 24-hour PM 10, PM 2.5 (1997), Ozone (2008) and CO.

The data used to calculate the Total Emission Reduction measure came from the Indiana reporting table that was entered into the CMAQ Public Access System which includes the applicable nonattainment or maintenance area; the applicable MPO; and the emissions reduction estimated for each CMAQ funded project for each of the applicable criteria pollutants and their precursors for which the area is nonattainment or maintenance.

Methodology Used to Set the INDOT CMAQ Emissions Targets

INDOT formed a CMAQ performance measure task group to coordinate efforts between INDOT and the MPOs in setting the INDOT CMAQ targets. The task group included three representatives from INDOT's Technical Planning and Programming; a representative from the Indianapolis and Northwestern Indiana MPOs, the two larger MPOs with over 1 million in population subject to the rule; and two representative members from the Indiana MPO Council (Fort Wayne and Evansville). A representative from the Indiana Division of the FHWA also participated in the task group. During the INDOT CMAQ target setting process, the group first met on a weekly basis and later, less frequently as the data collection and analysis was refined.

As noted, the data source used to calculate the Total Emission Reduction measure comes from the Indiana reporting table extracted from the CMAQ Public Access System. This table includes the applicable nonattainment or maintenance area; the applicable MPO; and the emissions

reduction estimated for each CMAQ funded project for each of the applicable criteria pollutants and their precursors for which the area is nonattainment or maintenance. The baseline Report Period is October 1, 2013 - September 30, 2017. The targets are based on the cumulative emission reductions for a period of time in kg using 2013 to 2017 data and the 2018 to 2023 projections. Those federal fiscal year 2018 to 2023 projections were estimated using programmed CMAQ projects from MPO TIPs and the State STIP. The task group was then able to focus on the pollutants applicable to the Indiana MPOs that had been designated as non-attainment and maintenance for PM2.5, PM10, CO, VOC, and NOx.

Using the data, calculations were completed for the annual mean, the 2-year mean and the 2014 to 2017 reporting period and for the projected emission reductions. The group then applied the annual, the two year means and the projections as a guide in establishing the 2-year and 4-year targets.

Calculation of Total Emissions Reduction Measure

The Total Emission Reductions performance measure was calculated by INDOT and MPOs to carry out CMAQ on-road mobile source emissions performance-related requirements. The Total Emission

Reductions measure for each of the criteria pollutant or applicable precursor for all projects reported to the CMAQ Public Access System are then calculated to the nearest one thousandths, as follows:

$$Total\ Emission\ Reduction_p = \sum_{i=1}^{T} Daily\ Kilograms\ of\ Emission\ Reductions_{p,i}$$

Where:
i = applicable projects reported in the CMAQ Public Access System for the first 2 Federal fiscal years of a performance period and for the entire performance period, as described in in § 490.105(e)(4)(i)(B);

p = criteria pollutant or applicable precursor: PM2.5, PM10, CO, VOC, or NOx;

Daily Kilograms of Emission Reductions p, i = total daily kilograms, to the nearest one thousandths, of reduced emissions for a criteria pollutant or an applicable precursor “p” in the in the first year the project is obligated;

T = total number of applicable projects reported to the CMAQ Public Access System for the first 2 Federal fiscal years of a performance period and for the entire performance period, as described in § 490.105(e)(4)(i)(B); and

Total Emission Reductionpp= cumulative reductions in emissions over 2 and 4 Federal fiscal years, total daily kilograms, to the nearest one thousandths, of reduced emissions for criteria pollutant or precursor “p.”

The FY 2020 - 2024 STIP includes projects on Interstates and non-Interstates that are intended to improve PM3 performance during the life span of the TIP and contribute towards making progress to reach the established targets. Projects listed in the STIP that will positively impact performance include interchange improvements, intersection improvements, integrated/intelligent technologies, passing lanes, and roadway widening.

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N758-Exec
Indianapolis, Indiana 46204

PHONE: (855) 463-6848

Eric Holcomb, Governor
Michael Smith, Commissioner

INDIANA DEPARTMENT OF TRANSPORTATION
PLANNING PROCESS CERTIFICATION

The Indiana Department of Transportation hereby certifies that the transportation planning process is being carried out in accordance with all applicable requirements of:

(1) 23 U.S.C. 134 and 135, 49 U.S.C. 5303 and 5304, and this part;

(2) Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d-1) and 49 CFR part 21;

(3) 49 U.S.C. 5332, prohibiting discrimination on the basis of race, color, creed, national origin, sex, or age in employment or business opportunity;

(4) Section 1101(b) of the FAST Act (Pub. L.114-357) and 49 CFR part26 regarding the involvement of disadvantaged business enterprises in DOT funded projects;

(5) 23 CFR part 230, regarding implementation of an equal employment opportunity program on Federal and Federal-aid highway construction contracts;

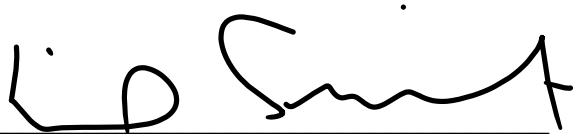
(6) The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) and 49 CFR parts 27, 37, and 38;

(7) In States containing nonattainment and maintenance areas, sections 174 and 176(c) and (d) of the Clean Air Act, as amended (42 U.S.C. 7504, 7506(c) and (d)) and 40 CFR part 93;

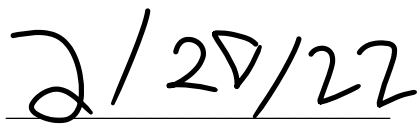
(8) The Older Americans Act, as amended (42 U.S.C. 6101), prohibiting discrimination on the basis of age in programs or activities receiving Federal financial assistance;

(9) 23 U.S.C. 324, regarding the prohibition of discrimination based on gender; and

(10) Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and 49 CFR part 27 regarding discrimination against individuals with disabilities.



Michael Smith, Commissioner
Indiana Department of Transportation



Date

STIP AMENDMENT and/or MODIFICATION REQUEST

	Amendment
	Modification

Date: 10/27/2022

Requestor: *Cat Seely*

Sponsor	DES	Route	Work Type	Location	County	District	Miles	Federal Category	Asset Program - (State Projects Only)	Phase	Federal	Match	2022	2023	2024	2025	Estimated Cost Left to Complete Project	Remarks	Letting Date	MPO	Start Lat	Start Long	End Lat	End Long
INDOT	1901888	Various	Signing	New signing for I-69 from RP 0+0-RP 135+0.	Various	Seymour	135	NHS	Statewide	CN	$1,620,270.00	$180,030.00		$1,800,300.00					01/19/23	BMCMPO	Various	Various	Various	Various
INDOT	1901888	Various	Signing	New signing for I-69 from RP 0+0-RP 135+0.	Various	Seymour	135	NHS	Statewide	PE	$42,048.00	$4,672.00		$46,721.00					01/19/23	BMCMPO	Various	Various	Various	Various

FY 2022 - 2026 Transportation Improvement Program
Project Request Form

Mail: Bloomington - Monroe County MPO
401 N Morton Street, Suite 130
Bloomington, Indiana 47402
Email: clemensr@bloomington.in.gov
Fax: (812) 349-3530

Section 1: Local Public Agency Information

- ☐ City of Bloomington
- ☐ Monroe County
- ☐ Town of Ellettsville
- ☐ Indiana University
- ☐ Bloomington Transit
- ☐ Rural Transit
- ☒ INDOT
- ☐ _____

Employee in Responsible Charge (ERC): Karlei Metcalf
Phone: 812-525-1748
Email: kmetcalf1@indot.in.gov

Section 2: Verification

I hereby certify that the information submitted as part of this form is complete and accurate. Furthermore, if applicable, I certify that the project complies with the BMCMPO Complete Streets Policy.

Karlei Metcalf — 11/10/2022
Employee in Responsible Charge (ERC) — Date

Section 3: Project Information

A. Project Name: SR 46 HMA Overlay

B. Is project already in the TIP?
☐ Yes ☒ No

C. DES # (if assigned): 2000447

D. Project Location (detailed description of project termini): 0.23 mile E of US 231 (Crane Rd) to 5.67 miles E of SR 43 (Red Hill Rd)

E. Please identify the primary project type (select only one):

- ☐ Bicycle & Pedestrian
- ☐ Bridge
- ☐ Road – Intersection
- ☐ Road – New/Expanded Roadway
- ☐ Road – Operations & Maintenance
- ☒ Road – Reconstruction/Rehabilitation/Resurfacing
- ☐ Sign
- ☐ Signal
- ☐ Transit

F. Project Support (local plans, LRTP, TDP, etc.): N/A

G. Allied Projects: N/A

H. Does the Project have an Intelligent Transportation Systems (ITS) component?

☐ Yes ☒ No

If yes, is the project included in the MPO's ITS Architecture?

☐ Yes ☐ No

I. Anticipated Letting Date: __2/10/2023_____

Section 4: Financial Plan

Identify all anticipated costs for all phases of the project, including any costs anticipated in years beyond the scope of this TIP. All phases must incorporate a four percent (4%) per year inflation factor per BMCMPO policy. All CN phases must include an appropriate amount of funding for construction inspection in addition to project construction costs.

Note: Fiscal Year 2022 begins on July 1, 2021 and ends on June 30, 2022.

Phase	Funding Source	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	*Outlying Years*
PE		$	$	$	$	$	$
		$	$	$	$	$	$
		$	$	$	$	$	$
RW		$	$	$	$	$	$
		$	$	$	$	$	$
		$	$	$	$	$	$
CE		$	$	$	$	$	$
		$	$	$	$	$	$
		$	$	$	$	$	$
CN	NHPP	$	$ 3,465,910.00	$	$	$	$
		$	$	$	$	$	$
		$	$	$	$	$	$
	Totals:	$	$ 3,465,910.00	$	$	$	$

Section 5: Complete Streets Policy

A. Select one of the following:

☐ **Compliant -** This project is subject to the Complete Streets Policy because it involves the new construction or reconstruction of local roadways that will use federal funds through the BMCMPO for any phase of project implementation. *Additional Information items **1-8** (below) must be submitted for Compliant projects*.

☒ **Not Applicable -** This project is not subject to the Complete Streets Policy because it is a transit project, a non-roadway project, a resurfacing activity that does not alter the current/existing geometric designs of the roadway, or is a project that uses federal funds for which the BMCMPO does NOT have programming authority. *No Additional Information items (below) have to be provided for projects to which the Complete Streets Policy does not apply.*

☐ **Exempt –** The LPA is requesting that this project be exempted from the Complete Streets Policy due to certain circumstances or special constraints, as detailed in Section IV of the Complete Streets Policy. Please provide a detailed explanation of why the project should be exempted. *Additional Information items **1, 4-8** (below) must be submitted for Exempt projects*.

Justification for Exemption: _____

B. Additional Information:

Attach to this application form the following information as required by the Complete Streets Policy. If any items are unknown at the time of application, the applicant may indicate that "specific information has not yet been determined." Any required information not provided at the time of this application must be reported to the MPO as soon as it becomes available.

1) Detailed Scope of Work – Provide relevant details about the project that would be sufficient to use when seeking consulting services (detailed project description, vehicular elements, non-vehicular elements, new construction/reconstruction).

2) Performance Standards – List specific performance standards for multimodal transportation, including, but not limited to transit, pedestrian, bicycle, and automobile users, ADA and Universal Design, environmental, utilities, land use, right of way, historic preservation, maintenance of services plan, and any other pertinent design component in relation to current conditions, during implementation/construction, and upon project completion.

3) Measurable Outcomes – Identify measurable outcomes the project is seeking to attain (e.g. safety, congestion and/or access management, level-of-service, capacity expansion, utility services, etc.).

4) Project Timeline – Identify anticipated timelines for consultant selection, public participation, design, right-of-way acquisition, construction period, and completion date.

5) Key Milestones – identify key milestones (approvals, permits, agreements, design status, etc.).

6) Project Cost – Identify any anticipated cost limitations, additional funding sources, project timing, and other important cost considerations not included in the table above.

7) Public Participation Process – Describe the public participation process (types of outreach, number and type of meetings, etc.), and the benchmark goals for the project (participation rates, levels of outreach, levels of accountability and corresponding response methods to input received, etc.).

8) Stakeholder List – Identify the key parties/agencies/stakeholders/interest groups anticipated to be engaged during project development and their respective purpose for being on the list.

STIP AMENDMENT and/or MODIFICATION REQUEST

	Amendm
	~~*Modificati*~~

Date: 10-Nov

Requestor: *Karlei Metcalf*

Sponsor	DES	Route	Work Type	Location	County	District	Miles	Federal Category	Asset Program - (State Projects Only)	Phase	Federal	Match	2022	2023	2024	2025	2026	Remarks	Letting Date	MPO
INDOT	2000447	SR 46	HMA Overlay, Preventive Maintenance	0.23 miles E of US 231 (Crane Rd) to 5.67 miles E of SR 43 (Red Hill Rd)	Monroe	Seymour	6.65	NHPP	Roadway	CN	2,772,728	693,182		3,465,910					02/10/23	BMCMPO

DES#2101774

SECONDARY LOCATIONS (S#): These locations will receive new Wrong Way Signage with LED lights around the outside edge that flash 24/7.

Location Number	Route	Interchange Number	Number of Treatments	Mainline Exit Directions	Intersecting Roadway	Ramp Configuration	Cost per Treatment	Amount	Signalized / Non-signalized	Ramp Lanes: Single/Double, etc.	District	County	MPO	Comments
S10	I-69	115	2	NB & SB	Fullerton Pike	Side by side	$30,000.00	**$60,000.00**	Roundabouts	Single	Seymour	Monroe	BMCMPO	This location needs to be reviewed more with the Traffic Safety Group. It appears that these interchange ramps are controlled by roundabouts now. If not needed here, there are other locations that could benefit from these installations.
S11	I-69	117	2	NB & SB	SR 45/W Bloomfield Rd	Side by side	$30,000.00	**$60,000.00**	Signalized	Single	Seymour	Monroe	BMCMPO	The exit ramps from both I-69 NB & SB to SR 45/W Bloomfield Rd will have new signs only.

Source: INDOT, Major Project Delivery, Operations Director, 11-15-22.

INDIANA DEPARTMENT OF TRANSPORTATION

Memorandum

To: Dan McCoy, Director, Traffic Engineering
Mike Holowaty, Manager, Office of Traffic Safety

From: Taylor Ruble, Engineer, Office of Traffic Safety

Date: September 21, 2020

Re: Wrong Way Interstate Crashes – Identification of High Frequency Areas

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Project Overview and Methodology

Wrong way crashes on the interstate are relatively rare occurrences considering the sizeable number of vehicle miles traveled each year on INDOT's highest-classification roadways. In the past 10 years (2010-2019), there were only 168 crashes on the interstate system coded by the responding officer as "Wrong Way on a One Way". However, these crashes tend to be severe. Those same 168 crashes resulted in 40 fatalities and 149 injuries. There is interest among the traffic engineering teams to develop a low-cost countermeasure that limits the frequency of wrong way instances on the interstate system.

Note: backing crashes made up a large percentage of the wrong way crashes and were removed from the dataset

In order to choose locations to install this new countermeasure, an analysis had to be performed to determine where wrong way crashes occur most frequently. To accomplish this, all wrong way crashes for the past 10 years were pulled from the Traffic Safety Portal. These crashes were then assigned to a route, mile marker, and direction. Using this assignment, a large histogram could be developed for each interstate route, showing which mile marker "bins" contained the most crashes. Since almost all bins have either one or zero crashes in them, a "rolling total" 5 miles long was developed to determine which 5-mile sections contained the most crashes.

The list of interstate segments below shows the most significant clustering of wrong way crashes by direction. All 5-mile segments which had 3 or more wrong way crashes in a single direction are listed. If multiple back to back segments meet the crash threshold, they are listed together. Since these are "rolling totals", the same crash may be listed in multiple bins.

Directional sections with elevated wrong way crashes: (3 or more)

- I-90 EB MM 1-5, 2-6, 3-7 – 5 crashes each
- I-90 EB MM 11-15, 12-16, 14-18, 15-19 – 3-4 crashes each
- I-90 WB MM 1-5, 2-6, 3-7, 4-8, 5-9 – 3 crashes each
- I-465 SB MM 39-43, 40-44 – 3 crashes each
- I-69 SB MM 0-4, 1-5, 2-6, 3-7 – 3-4 crashes each

- I-70 EB MM 71-75, 76-80, 77-81, 78-82, 79-83, 80-84, 81-85, 82-86, 83-87, 84-88, 85-89 – 3-5 crashes each
- I-70 EB MM 147-151, 148-152, 149-153 – 3 crashes each
- I-70 WB MM 73-77, 74-78, 75-79, 76-80, 77-81 – 3-4 crashes each
- I-70 WB MM 119-123, 120-124 – 3 crashes each
- I-65 NB MM 112-116, 113-117 – 3 crashes each
- I-65 NB MM 115-119, 116-120, 117-121, 118-122, 119-123, 120-124, 121-125 – 3-4 crashes each
- I-65 NB MM 166-170, 167-171, 168-172 – 3 crashes each
- I-65 SB MM 0-4, 1-5 – 3 crashes each
- I-65 SB MM 111-115, 112-116, 113-117 – 3 crashes each

The list of interstate segments below shows the most significant clustering of wrong way crashes when both directions are combined. All 5-mile segments which had 6 or more wrong way crashes in both directions are listed. If multiple back to back segments meet the crash threshold, they are listed together.

Bi-Directional sections with elevated wrong way crashes: (6 or more)

- I-90 MM 1-5, 2-6, 3-7, 4-8, 5-9 – 7-8 crashes each
- I-70 MM 73-77 – 6 crashes each
- I-70 MM 76-80, 77-81 – 6-7 crashes each
- I-70 MM 80-84 – 6 crashes each
- I-65 MM 112-116, 113-117 – 6 crashes each

In a wrong way crash, the officer typically does not know where the offending vehicle entered the interstate. Since the countermeasure is to be installed at an interchange, an assumption had to be made that the wrong way driver entered at the previous interchange. For each of the segments with elevated crashes, the adjacent interchanges are listed below. The freeway to freeway interchanges were removed from this list since a vehicle is unlikely to enter the interstate in the wrong direction at this type of interchange. If the interchange is near a segment with crashes in both directions, it is highlighted in RED. If the interchange is of a non-standard layout that may lead to a higher frequency of vehicles entering the interstate in the wrong direction (i.e. folded diamond), it is **BOLD**.

Key interchanges by interchange number:

- I-90 - **0**, **3**, **5**, **10**, **13**, 15, **17**, **21**
- I-465 - **40**, 42, **46**
- I-69 - **0**, **3**, **5**, **9**
- I-70 - 69, 75, 77, **78**, **79**, **81**, 85, 87, **89**, **115**, **123**, 131, 145, 151, **153**
- I-65 - **0**, **1**, 2, 3, **4**, **5**, **111**, 113, 114, **115**, **116**, 117, **119**, 121, 124, 158, **168**, 172, 175

Recommendation:

These lists of segments and interchanges, which are based on the previous 10 years of crash data, should offer a starting point for selecting interchanges to deploy the new countermeasure. Depending on the cost of the countermeasure, all interchanges could be treated or only a targeted selection. If a selection of interchanges is chosen, it is recommended that the focus be on interchanges of a non-standard layout.

Date: September/October 2002
Issue No: Vol. 66 No. 2

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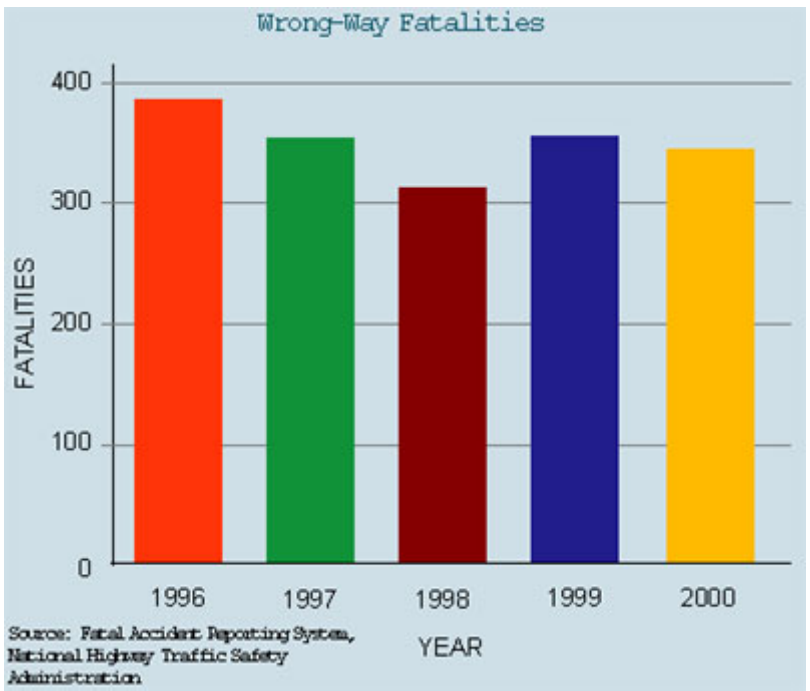
Stop. You're Going The Wrong Way!

by Steve Moler

Tracey Fischer told the Seattle Times that she didn't remember the crash that killed her friend, Erin Klotz, on I-90 east of Seattle, WA, on the night of November 18, 2001. The two women, both 20 years old, were driving westbound on I-90 near Snoqualmie in Fischer's small sedan at around 10 p.m. when the unthinkable happened.

About a mile down the freeway, Debra Acey, driving a 1997 sports utility vehicle (SUV), entered westbound I-90 going the wrong way. Seconds later, Fischer's car slammed head-on into Acey's SUV. The impact hurled both vehicles off the interstate in opposite directions, killing Klotz instantly and seriously injuring Fischer.

As in most wrong-way crashes, investigators couldn't determine exactly how and why Acey drove right past two large "Wrong Way, Do Not Enter" signs and entered the freeway going the wrong way. But one circumstance was certain: Acey's blood-alcohol level was 0.30, more than three times the legal limit of 0.08. Prosecutors charged Acey, 44, with vehicular homicide and vehicular assault, the Seattle Times reported.



A Persistent Problem

Driving the wrong way on freeways has been a nagging traffic safety problem since the interstate highway system was founded in the late 1950s. Despite four decades of highway striping and sign improvements at freeway interchanges, the problem persists.

Studies, such as those performed by the Washington State Department of Transportation (WSDOT), show the vast majority of wrong-way drivers correct their mistakes before causing a crash by

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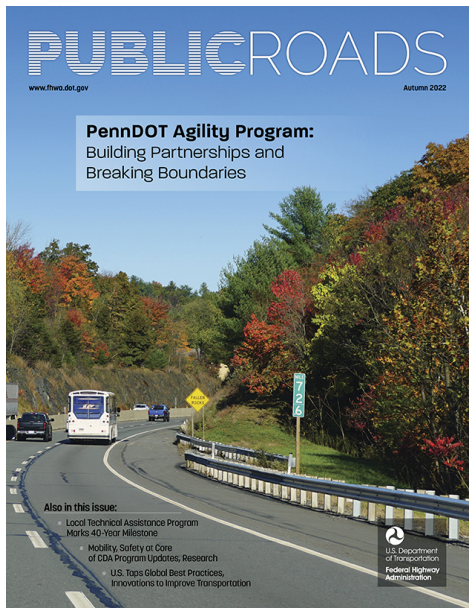

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TaMara McCrae
Editor-in-Chief
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101
United States
Email: PublicRoads@dot.gov

simply turning around and heading in the right direction. But for unknown reasons some drivers, even when sober, head straight into oncoming traffic with devastating consequences.

On average about 350 people are killed each year nationwide in wrong-way freeway crashes, according to an analysis by retired FHWA traffic engineer Dennis Eckhart using the National Highway Traffic Safety Administration's Fatal Accident Reporting System. The 350 figure covers those killed on divided highways, including driving the wrong way on one-way traffic ways such as freeway ramps. From 1996 through 2000, 1,753 people died in wrong-way crashes on the Nation's freeways, according to Eckhart's analysis. Thousands more are injured. In the four-county area where Klotz was killed King, Snohomish, Skagit, and Whatcom counties—136 wrong-way crashes between 1997 and 2000 resulted in 81 injuries and nine fatalities.

"While there are safety programs exclusively for rail crossings and work zones," says Eckhart, "I am not aware of any national-level program to combat the wrong-way problem. However, at the State level, some States such as California do have a wrong-way prevention program that funds safety improvements." State departments of transportation (DOT) across the country have taken additional measures to improve ramp designs, signage, and striping to prevent wrong-way incidents. Other States are experimenting with intelligent transportation system (ITS) technology to address the problem.

Sensor and Video Information for Making Modifications

WSDOT currently is managing two projects, and planning a third, to study wrong-way driver behavior and test various wrong-way countermeasures using ITS technology.

At the I-82/Hwy. 22 interchange near Toppenish in south-central Washington, WSDOT outfitted two exit ramps with sensors and digital video cameras. The system uses two 1.8-meter (6-foot) induction loops connected to a Reno S-Series loop detector to provide directional detection. From the detector a contact closure is connected to a Lanex RVC 2000 digital recorder, which serves as an incident log and recording center. The Lanex is a system designed for bank surveillance and continuously records video to a 30 gigabite hard drive.

Upon receiving a contact closure, the Lanex device enters a time stamp into its system log with the label "wrong way" and saves that portion of the hard drive from being rewritten. At the same time, the recording device increases recording speed from one frame every 2 seconds to two frames every second. This increased speed helps improve image quality for the next recorded minute. By having the device record before the incident, researchers can see the direction the vehicle is coming from and observe the driver's behavior. With this information traffic engineers hope to learn more about how and why drivers wind up heading into oncoming traffic.

A WSDOT study of wrong-way incidents over a 10-year period along a 129-kilometer (80-mile) section of I-82 from Yakima, WA, to the Tri-Cities area (Richland, Kennewick, and Pasco) showed that there were 30 wrong-way crashes from 1986 through 1996 along this corridor, 11 of which involved a total of 15 fatalities and three serious injuries.

WSDOT engineers determined the most probable location for most of the wrong-way entrances was at I-82 and Hwy. 22, classified as a "partial cloverleaf" interchange.

From May-December 2001 the Lanex system recorded 18 wrong-way incidents. Of those, 12 drivers, or 67 percent, turned around and returned, while 5 continued on and disappeared from camera view. The sun shining directly into the camera obscured one incident.

Based on data collected from the videotapes, WSDOT's South Central Region is already making changes to its partial cloverleaf interchanges. The region has several of these looping ramps, which are separated by

concrete barriers and come up to the stop bar. Video taken by the Lanex at the I-82/Hwy. 22 interchange indicates that drivers may be staying to the left of the barrier because they cannot see the on-ramp on the barrier's other side.

WSDOT also has removed about 12 meters (40 feet) of concrete barrier at other interchanges in the region and plans to do the same at the I-82/Hwy. 22 interchange, with video surveillance continuing to determine how the modification affects wrong-way movements.

"I think this study will lead to major innovations in the way we deal with the wrong-way problem," says Jim Mahugh, assistant traffic engineer for WSDOT's South Central Region and manager of the I-82/Hwy. 22 project. "Our best bet for preventing wrong-way incidents is to build into any system a combination of video surveillance and detection."

Mahugh says that a system could be modified so that once a wrong-way vehicle is detected, the video is transmitted to a traffic management center or a highway patrol dispatch center, where an operator then can monitor the incident and send an officer if necessary.

"This is all entirely possible with today's technology," Mahugh says. "We just need to overcome the cost associated with bringing information back from a remote location."

Embedded Sensors, Videos, And Flashing Lights

The second WSDOT project is at I-5 and Bow Hill Road, a rural area about 113 kilometers (70 miles) north of Seattle. When electromagnetic sensors embedded in the ramp pavement detect a wrong-way vehicle, the system performs three primary functions. First, two signs mounted on both sides of the northbound exit ramp begin flashing an alternating red-yellow "Wrong Way" message for several minutes. At the same time, a closed-circuit video camera and time-lapse VCR record the incident to help traffic engineers determine the cause of the wrong-way incident and develop measures to prevent future wrong-way crashes.

Electromagnetic sensors embedded in the pavement (the three dark squares) detect vehicles moving in the wrong direction (above).

When the sensors determine a vehicle is traveling the wrong way, the message sign illuminates a red "Wrong Way" message (right).

Dawn McIntosh, a WSDOT project engineer, was selected to lead the project. After collecting regional crash data, McIntosh developed a list of eight sites where wrong-way incidents were unusually high. The northbound I-5 off-ramp to Bow Hill Road was selected after review of 1997-2000 crash data revealed three wrong-way incidents, one resulting in a double fatality.

Despite a WSDOT engineering review determining the wrong-way warning signs as adequate for this intersection, the westbound Bow Hill Road traffic tends to turn southbound onto the northbound off ramp. Heavy vegetation and the lack of lighting tend to obscure views of the interchange at night, the time when most wrong-way crashes occur.

On July 20, 2001, the Bow Hill ramps were closed, and the system successfully tested. Since the electronic system was installed, no recorded incidents have occurred. Tests indicate that the system activates, but no vehicles appear on the tape. WSDOT maintenance personnel have been working with the manufacturer to determine whether these incidents are false alarms, the result of faulty equipment, or misaligned cameras.

Video Detection System and Flashing Lights

WSDOT is poised to begin testing another wrong-way detection and warning system at the I-90/161st Avenue Southeast interchange, just 32 kilometers (20 miles) west of where Klotz was killed. This project will use a Traficon Video Detection system, which consists of a camera installed on a signal pole. When the video detector is activated, a signal is transmitted to the message sign, which flashes a wrong-way message to the driver while the VCR records the incident.

When a wrong-way vehicle is detected, sensors also activate a closed-circuit video camera.

At the same time, a VCR records the wrong-way incident so traffic engineers can observe the vehicle's movements and the driver's behavior.

The rural Bow Hill Road project is using a solar-powered electrical system. On top of the message sign is a solar panel and at the bottom a battery compartment. A solar-powered system is not being used in the Bellevue project,

WSDOT preferring instead to test a more traditional power system in an urban setting.

After McIntosh reviewed the crash data in the Seattle metropolitan area, I-90 at 161st Avenue Southeast was selected because the evidence suggested that an injury wrong-way crash had occurred recently at the interchange.

WSDOT's studies will assess how successful these new systems are in reducing wrong-way crashes. Monitoring the incidents with cameras and VCRs will enable WSDOT to evaluate the effectiveness of the three types of systems and compare rural-to-urban applications. The studies also will help determine whether the incidents are caused by driver error or interchange deficiencies, or a combination of both. WSDOT intends to reassess those interchange locations not originally selected to determine whether signing and striping changes would help reduce wrong-way movements.

"Due to the high cost of making major changes to interchange geometrics, our goal is to come up with a low-cost system that we can actually put in place elsewhere," McIntosh says. "We won't use the system on a wide level, just at the most problematic interchanges. In doing this we hope we can save lives while minimizing cost to the taxpayer."

The Washington State projects are the brainchild of Eckhart. He conceived the system, then assisted WSDOT in obtaining a $67,000 FHWA grant to launch the demonstration projects.

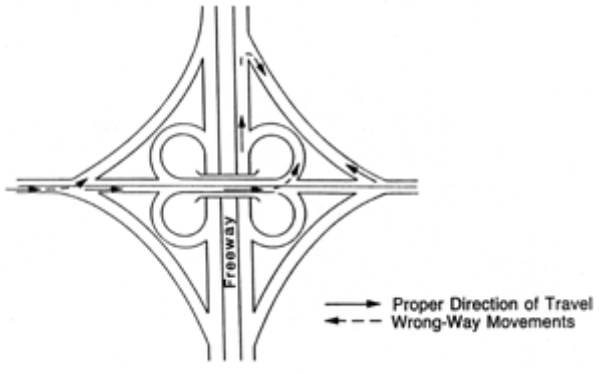
"There's a serious problem out there with respect to wrong-way crashes," he says, "and I always wanted to find ways to do something about it." Eckhart, who retired in 2001 after 37 years with FHWA, adds, "The detection equipment was out there; we just had to figure out how to apply it effectively to wrong-way prevention."

Interchange Designs and Wrong-Way Incidents

In a 1989 Caltrans study, Prevention of Wrong-Way Accidents on Freeways, (Report No. FHWA/CA-TE-89-2) Joyce E. Copelan found that driving under the influence of alcohol or drugs is by far the primary cause of wrong-way crashes. But she also examined the relationship between wrong-way movements and interchange designs and offered suggestions for interchange improvements.

Full Cloverleaf Interchange

This type of interchange is seldom a problem and is considered the most desirable as far as preventing wrong-way movements, especially if reflective markers and a double yellow stripe or other barrier is used on the overcrossing bridge to keep motorists on the proper side.



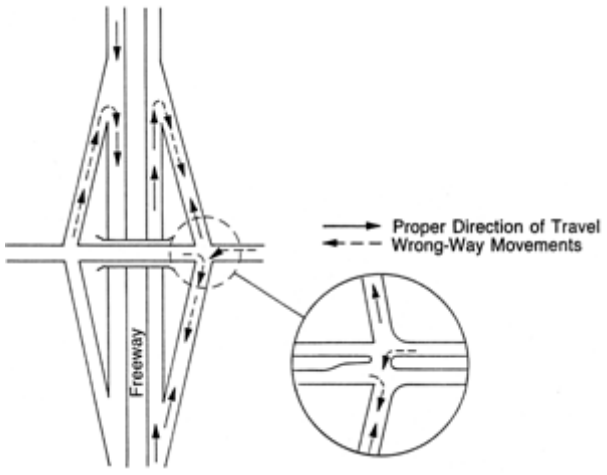
The Two-Quadrant Cloverleaf

The two-quadrant cloverleaf, which developers prefer because it creates properties on the two opposite corners, is less desirable in terms of wrong-way movements. However,

separating the on- and off-ramps can prevent movements, as can designing the orientation of the on-ramp for easy access; constructing a larger, better-lit opening for the on-ramp than the off-ramp; and constructing a curb nose between adjacent ramps.

Full Diamond Interchange

This interchange, though considered a good design, presents some potential problems. Motorists occasionally mistake an off-ramp for a frontage road located parallel to the ramp, and drivers can mistakenly turn left from the over-crossing street on to the off-ramp. An island constructed to partially overlap the off-ramp can prevent this from happening. Proper guide signing and direction pavement arrows are important to direct motorists to the correct lane for left turns on the freeway. Pavement markers also can be installed to direct drivers to the on-ramp entrance and, if space permits, a left turn lane may be provided.

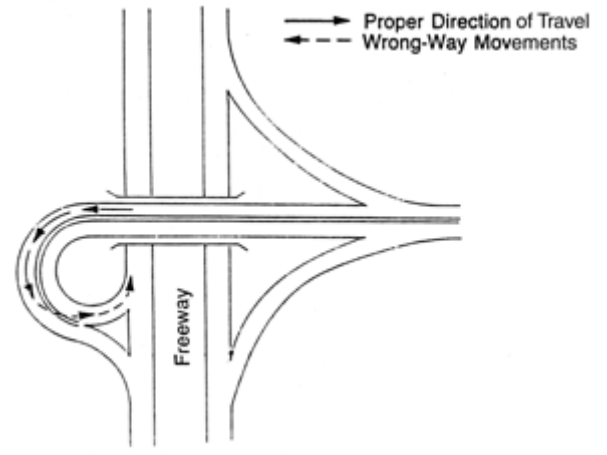


Half-Diamond Interchanges

Good signing is extremely important in this type of interchange. Wrong-way movements can occur if the guide signing does not clearly indicate a safe route for the driver to enter and exit the freeway.

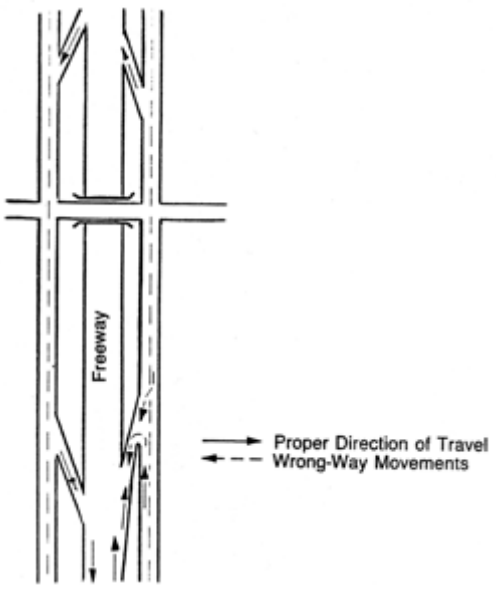
Trumpet Interchanges

Wrong-way movements can be avoided in trumpet interchanges by installing curbed medians on the ramps or by using double-yellow stripe barriers and reflectors. As a last resort, a trumpet interchange can be modified using a concrete median barrier.



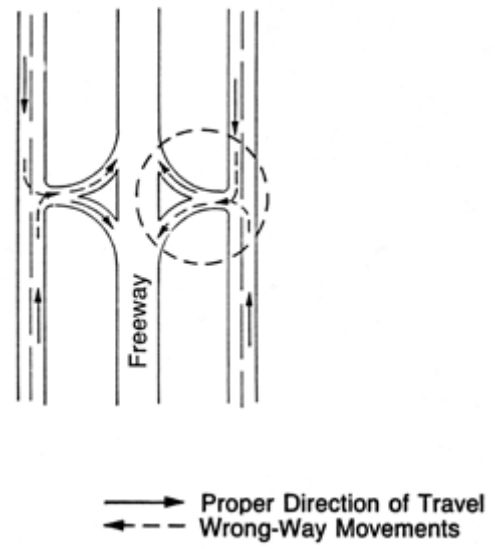
Slip Ramps

Slip ramps have relatively few problems, except in locations where a two-way frontage road terminates at a slip ramp. An elephant's ear with a stop sign may be installed at the end of the road to assist motorists in turning around. Slip ramps entering a frontage road at flat angles are more desirable than those oriented perpendicular to the frontage road because flat angles discourage turns onto the one-way ramp.



Buttonhook Ramps

Buttonhook ramps can be very susceptible to wrong-way movements. Problems can be minimized, however, using signing and a clear separation of the on- and off-ramps. The nose may be reconstructed and the on-ramp made wider and better lit than the off-ramp.



Incomplete and Partial Interchanges

Incomplete and partial interchanges can present problems. The I-82/Hwy. 22 interchange in south-central Washington State is a classic example. The interchange was designed originally as a diamond, but the on-ramp in the northwest quadrant was never constructed. Instead, a loop ramp (partial cloverleaf) was constructed in the northeast quadrant. This configuration eliminates a heavy left turn and makes it into a much safer right turn. However, the design lends itself to more wrong-way entrances. Most of the interchange's wrong-way movements, about 66 percent, occur on the loop ramp.

Interchanges with Short Sight Distance

Interchanges with short sight distance at the decision point have a disproportionate number of wrong-way movements. These locations lack some of the visual cues, such as headlights of oncoming vehicles, that alert wrong-way drivers that they have made a mistake.

Illustrations courtesy of Joyce E. Copelan, California Department of Transportation, Prevention of Wrong-Way Accidents on Freeways, 1989

Projects in Other States

WSDOT isn't the only State DOT currently researching and experimenting with wrong-way detection and warning systems. The Texas Department of Transportation is considering the possibility and feasibility of performing a research project beginning in fiscal 2003 that would examine potential wrong-way countermeasures.

A series of horrific wrong-way head-on crashes on New Mexico freeways in the early and mid-1990s prompted the New Mexico State Highway and Transportation Department (NMSHTD) to examine ways to prevent wrong-way crashes. One of those crashes killed four members of the same family on Christmas Eve 1992.

Maleness Cravens, 31, and her three daughters, ages 9, 8 and 5, were killed and her husband, Paul, seriously injured when their minivan was hit head-on by a drunk wrong-way driver on I-40 near downtown Albuquerque, just a few miles from what the State calls a Directional Traffic Sensor System project. The driver was later convicted of vehicular homicide and vehicular assault and sentenced to 22 years in prison. The accident and subsequent trial became the focal point for reform of the State's drunken driving law.

Additionally, the NMSHTD, in cooperation with the Alliance for Transportation Research (ATR) and New Mexico State University, developed a prototype Directional Traffic Sensor System that has been in use since 1998 on the southbound exits of I-25 at Montgomery Avenue in Albuquerque, NM.

The system uses loop sensors, a modified 3M Canoga (TMI) C400 Vehicle Detector, and standard interstate highway warning signs. When wrong-way traffic is detected, the Canoga detector illuminates two sets of warning lights for 1 minute: A red set faces the wrong-way traffic warning drivers of imminent danger, and a yellow set faces right-way traffic and warns of a possible off-ramp problem. Video recorders are not being used on this project.

Wrong-Way Crashes Extremely Severe

Wrong-way crashes tend to be severe, resulting in a high proportion of deaths and serious injuries. A recent crash in southern California demonstrates this point.

On June 24, 2002, six people were killed and several seriously injured when a van loaded with 27 suspected illegal immigrants drove into oncoming traffic with its headlights off on I-8 east of San Diego, sideswiping two cars before hitting an SUV head-on. The driver of the van was killed along with four of his passengers. The driver of the SUV also was killed and his passenger critically injured. In this single wrong-way crash, 31 people were taken to local hospitals for treatment, the largest trauma event San Diego hospitals faced in 2002.

DUI—One of the Main Culprits

Though law enforcement and traffic safety researchers do not fully understand exactly why and how drivers wind up going the wrong way on freeways, they do know many times alcohol and drugs play a major role. Of the 30 wrong-way crashes in the I-82 Yakima-to-Tri-Cities corridor study, for example, 15 were alcohol- or drug-related.

A 1989 California Department of Transportation (Caltrans) study, one of the most comprehensive wrong-way research projects to date, found that impaired drivers were involved in 59.4 percent of all wrong-way crashes and a whopping 76.8 percent of fatal wrong-way crashes in the State from 1983 to 1987. Most wrong-way crashes, according to the study, happened at night, increasing significantly after 10 p.m. and peaking between 2 a.m. and 3 a.m., just after bars and other drinking establishments close in California.

One of the San Francisco Bay Area's worst Fourth of July holiday weekend crashes occurred just before midnight on July 6 when a suspected drunken driver drove the wrong-way with his headlights off on the Dumbarton Bridge (Hwy. 84) in Fremont. The driver sideswiped a pickup before slamming head-on into a minivan, killing the two adults in the front seats and seriously injuring two children riding in the back seat.

At the time of the report, the California Highway Patrol was still investigating how the driver, despite a concrete barrier separating opposing traffic, got onto the bridge going the wrong way. The driver was charged with vehicular manslaughter, felony drunken driving, and felony hit-and-run.

Wrong-Way Remedies

Though law enforcement and traffic safety experts suspect drunken driving is the main cause of wrong-way crashes, State DOTs are looking at several possible preventative measures. In addition to using the latest in ITS technology, State DOTs have experimented with high-intensity reflective sheeting for signs and thermoplastic, Methyl Methacrolate, and preformed cold-applied-tape wrong-way arrows, all of which are more visible to drivers, including impaired, disoriented, or confused drivers.

In the mid-1970s, Caltrans experimented with using red runway-type pavement lights to warn wrong-way drivers in the San Diego area. The pavement lights proved effective in reducing wrong-way movements, but because the equipment was costly to install, about $10,000 for each unit, and required constant maintenance, the project was discontinued.

Ramp and Interchange Design

The author of the Caltrans study, Joyce E. Copelan, a civil engineer and 18-year Caltrans veteran, examined the role that freeway ramp and interchange designs play in wrong-way movements. Although interchange design is not considered the primary cause of wrong-way crashes, Copelan found that certain interchange types tend to be more susceptible to wrong-way movements than others. For example,

trumpet interchanges and buttonhook ramps are the most susceptible to wrong-way movements, while full cloverleaf and full diamond interchanges seldom have problems.

Spikes and Other Barriers

Shortly after Klotz died in the Snoqualmie, WA, wrong-way crash mentioned earlier, her father, Duane Klotz, called for the State to install slanted spikes that puncture the tires of wrong-way vehicles. Unfortunately, spikes and other types of devices that physically prevent wrong-way entries onto freeways have been impractical and, in some cases, caused more problems than they solved. Parking-lot spike barriers were tested in California in 1965 to determine if they could be used at off-ramps to stop wrong-way vehicles. As it turned out, spikes, even when modified with a fishhook shape, did not cause tires to deflate fast enough to prevent a vehicle from entering the freeway.

Furthermore, the spikes broke in heavy traffic, leaving stubs that damaged the tires of right-way vehicles. Some right-way drivers, upon seeing the spikes, jammed on their brakes, thus creating additional hazards.

In her 1989 Caltrans study, Copelan sent a questionnaire to chief traffic engineers in all 50 State DOTs to find out what each State is doing to reduce wrong-way crashes. She received replies from 40, and none supported using parking-lot spikes, barriers, raised curbs, or similar devices.

MUTCD Adequate for Signs

In the same survey, most traffic engineers agreed that the Manual of Uniform Traffic Control Devices (MUTCD) is adequate for wrong-way markings. Some States have exceeded MUTCD recommendations by installing a second set of "Wrong Way, Do Not Enter" signs farther down the ramp at problem interchanges to give drivers a second chance to realize their mistake.

One of the study's most useful tools is Copelan's "Check List for Wrong-Way Entry Review," in Appendix A of the report, which traffic engineers can use to evaluate and improve interchanges. The check list takes the reader through a 13-part review process that includes such items as reviewing pertinent accident data, inspecting ramps during both daylight and night time conditions, checking signs, evaluating ramp openings, and taking steps to deal with recurring problems. You can obtain a copy of the report at www.dot.ca.gov/hq/traffops/survey/iptest.html.

"The decrease in the allowable blood alcohol limit from 0.10 to 0.08 plus the check list helped us [Caltrans] significantly reduce wrong-way accidents after the report was introduced and implemented," Copelan says. "What's really important is we all need to work together to prevent wrong-way accidents."

Author's Note: Some of the statistics used in this article were from a 1989 comprehensive study of wrong-way crashes, the most recent nationally conducted study available. Although some States have generated more recent research about wrong-way crashes in their own States, the results and countermeasures are not readily accessible in one central location.

Steve Moler is the public affairs specialist at FHWA's Western Resource Center in San Francisco, CA. He has worked in various areas of journalism for more than 15 years, including public relations, media relations, news writing and editing, community outreach, and communications strategic planning. Moler is one of three instructors who teaches the FHWA Media Training Course, which prepares participants to better handle media inquiries, develop main message

points, and prepare for all types of media interviews and public meetings. For more information, call Moler at 415-744-3103 or e-mail him at steve.moler@fhwa.dot.gov.

U.S. DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

1200 NEW JERSEY AVENUE, SE

WASHINGTON, DC 20590

202-366-4000