

EV Readiness Plan (Sept 2022)

Introduction

The purpose of the Electric Vehicle (EV) Readiness Plan is to describe how the Flagstaff region can best prepare for and facilitate vehicle electrification and transition to clean transportation technologies. The EV readiness plan builds off the EV section in the literature review and makes it actionable for the Flagstaff area. It is broken into three parts: (1) EV Fleet Types, (2) EV Infrastructure, and (3) Public Funding Resources and Implementation Strategies.

Ultimately, the EV Readiness Plan should align with the region's energy policy, including timing and phasing, and the transition to renewables, given the goals of the City's Carbon Neutrality Plan to holistically reduce all carbon emissions by 2030. Moreover, the Plan will help MetroPlan achieve the new state requirement¹ to have an EV Plan in place by August 2022.

Planning Context

MetroPlan and the City of Flagstaff have policy positions supportive of and requiring the management of transportation demand, the encouragement of multimodal transportation choices, and the reduction of transportation emissions to address climate change. The City's and MetroPlan's policy documents supporting these positions include:

- The **Blueprint 2040 Regional Transportation Plan** (2017) calls for a renewed commitment to multimodalism, protecting the environment, and greater investments in managing transportation demand. It is important to note that MetroPlan: Stride Forward, the next iteration of the regional transportation plan, is underway and climate action is central to this effort.
- The **Flagstaff Carbon Neutrality Plan** (CNP, 2021) calls for a Big Shift in transportation and land use planning, to prioritize walking, biking and transit and reduce automobile dependency. CNP success depends on vehicle miles traveled being reduced to 2019 levels

¹ <https://illumeadvising.com/azte/>



and maintaining that level of vehicle travel over the coming decades. This will require a transformation in the planning of development and transportation systems, and the way Flagstaff residents and visitors get around town. The plan details actions that the city will take in nine target areas, including electric mobility:

- EM-1: Advance the electrification of buses across Flagstaff.
 - EM-2: Welcome electric micro-mobility devices as legitimate, healthy, affordable, and low-carbon modes of transportation.
 - EM-3: Support residents, businesses and institutions in the transition to electric vehicles
- The **Active Transportation Master Plan** (pending adoption) sets a policy framework and guidance for developing regulations and standards that better support bike and pedestrian transportation and provides guidance on key infrastructure investments.
 - The **Flagstaff Regional Plan 2030** (2014) sets a vision for a sustainable, resilient community that encourages efficient transportation modes, better connectivity, and active stewardship. Policies relevant to a more balanced transportation system include, but are not limited to:
 - Policy E 1.5. Promote and encourage the expansion and use of energy-efficient modes of transportation: Public transportation, bicycles, pedestrians.
 - Policy CC 4.1. Design streetscapes to be context sensitive and transportation systems to reflect the desired land use while balancing the needs of all modes for traffic safety and construction and maintenance costs.
 - Policy T 1.1. Integrate a balanced, multimodal, regional transportation system.
 - Policy T 1.2. Apply Complete Street Guidelines to accommodate all appropriate modes of travel in transportation improvement projects.
 - Policy T 1.6. Provide and promote strategies that increase alternate modes of travel and demand for vehicular travel to reduce peak period traffic.
 - Policy T 3.1. Design and assess transportation improvement plans, projects, and strategies to minimize negative impacts on air quality and maintain the region's current air quality.
 - Policy T 3.2. Promote transportation systems that reduce the use of fossil fuels and eventually replace them with carbon neutral alternatives.
 - Policy T 3.8. Promote transportation options such as increased public transit and more bike lanes to reduce congestion, fuel consumption, and overall carbon emissions and promote walkable community design.
 - Goal E&C 2: Achieve carbon neutrality for the Flagstaff community by 2030.
 - Policy E&C 2.2. Promote investments that create a more connected and efficient community, decrease emissions from transportation and building energy, and strengthen climate resiliency.



- Policy E&C 2.3. Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce community greenhouse gas emissions.

Additionally, other MetroPlan agency partners have or are working on their own climate goals, all of which will benefit from a more balanced transportation system and a more resilient Flagstaff.

- **Northern Arizona University's (NAU) Climate Action Plan** is expected to specify a goal for carbon neutrality by 2030 or 2035, and is strongly supported by NAU President Cruz Rivera.
- **Mountain Line's 5-Year Plan** notes the importance of reducing emissions through reduced driving and greater transit ridership. Mountain Line also adopted a **Zero Emissions Bus** plan calling for the conversion of its fleet to zero emission vehicles.
- On October 26, 2021, the **Coconino County** Board of Supervisors directed staff to develop the County's first climate goals.

Flagstaff Carbon Neutrality Plan – Energy Policies

One of the main pillars of the Carbon Neutrality Plan² (CNP) is to establish clean energy sources, including (1) Building fuel switching, (2) Electric mobility, and (3) Clean electricity. The last category, "Clean electricity," speaks to the importance of the aligning this EV plan with the CNP's clean energy sources policies to maintain a holistic approach to reducing carbon emissions.

Figure 2 illustrates the clean electricity focus area policy actions from the 2030 CNP.

² <https://www.flagstaff.az.gov/DocumentCenter/View/66105/Flagstaff-Carbon-Neutrality-Plan-for-adoption-6-15-21?bidId=>



Figure 2 – Clean Electricity Focus Area Policy Actions in the 2030 CNP



Coordination with other agencies, especially utilities, is critical to the successful transition to electric vehicles. For example, if Flagstaff were to electrify all its public fleets tomorrow, followed by businesses and households, there would be an immediate surge in demand for the power grid that may lead to problems.

Working closely with electrical utilities to meet and mitigate additional electrical demand will be critical to the successful adoption of EV. Strategies might include:

- Systems that facilitate charging vehicles when the utility's electrical system has capacity, such as during the night when other usage is lower, can help balance demand for electricity.
- Ensuring clean electrical generation capacity for EV charging. Some forms of electrical generation, if used to charge EVs, might increase total carbon emissions.³

³ <https://www.nature.com/articles/s41597-020-00665-1>



EV Fleet Types

The three fleet types to consider for electrification, or other zero emission technologies, include public fleets, businesses, and households in Flagstaff.

1. Citywide Public Fleets

Local and regional agencies can have a significant direct influence on this fleet category. Agencies can lead by example to build awareness and create a culture of clean fuels. Fleets can include buses, public safety and public works vehicles, City maintenance vehicles, and trash pick-up/waste management.

Mountain Line already operates all service through the Downtown Connection Center (DCC), thus a central location for charging is already available. In addition, the master planning is currently underway to replace and modernize the current DCC facility. Mountain Line also has a 2-phase Zero Emission Bus (ZEB) Plan.⁴ The RTP model will indicate what percentage this fleet contributes to the region in terms of VMT and greenhouse gas (GHG) emissions.

The New York City DOT provides an example of transitioning to green fleets and infrastructure to achieve the goal of carbon neutrality by 2050. The plan promotes sustainable transportation options through installing a network of DC fast and Level 2 charging stations, reducing the municipal fleet and transitioning to EVs, and incentivizing commercial and fleet vehicles to reduce emissions.⁵ GoEVCity Colorado provides a toolkit to help local agencies in Colorado advance the transition to EVs, including recommendations for electrifying municipal fleets and transit, increasing installation of and improving access to EV chargers, promoting EV use through education and awareness, and working with utilities.⁶

2. Privately Owned Businesses and Independent Operators

Private fleets might include tourist shuttles for hotels/skiing, rental cars, car-sharing programs, freight and package delivery, construction and maintenance companies, and large employers. Micromobility options, such as e-bikes and e-scooters, can provide additional electric

⁴ <https://mountainline.az.gov/about-us/reports-plans/>

⁵ <https://onenyc.cityofnewyork.us/>

⁶ [GoEV City Policy Toolkit 08.27.18.pdf \(swenergy.org\)](https://www.swenergy.org/GoEV-City-Policy-Toolkit-08.27.18.pdf)



transportation options. BlueLA,⁷ a car sharing with over 100 EVs and 200 charging stations, provides an example of electric car sharing to meet everyday needs in Los Angeles. PG&E, the California utility, provides a tool to calculate the fuel savings of electrifying a fleet and connects prospective businesses and organizations with funding resources.⁸ PG&E also has incorporated EVs and other clean fleet technologies into their own utility fleet, increasing employee and community awareness of EV technology while reducing emissions.⁹

3. Household Passenger Vehicles

Residences include single family and multifamily units. Single family homes tend to be better equipped for EVs as they typically provide easy outlet access for Level-1 EV charging. Level-2 charging requires the homeowner to install a special utility hookup usually costing in the range \$800 to \$1,200 while the cost of the charging station itself will cost an additional \$400 to \$2000 depending on the vendor and rate of charge. Residents living in multifamily homes such as apartment complexes may face additional hurdles to EV adoption. Some apartment complexes have EV charging stations but typically only one or two plugs, while other do not have charging stations.

EV Infrastructure

A major hurdle to EV sales is public concern over the availability and convenience of charging stations. Charging electric vehicles at home may take the entire night; while public fast chargers may take only twenty minutes, they are still much slower than gas pumps and much less common. The typical range of an EV is 250 miles, which is sufficient for typical commuter use but drivers have concerns whether a charging station will be available over long trips. The U.S. Department of Energy estimates the country has about 41,400 EV charging stations, only 5,000 of these are considered fast chargers, compared to the roughly 150,000 gas stations estimated in the U.S. by the National Association of Convenience Stores (NACS).

The City of Flagstaff currently has nine electric vehicle public charging stations, mostly concentrated at municipal buildings such as City Hall. EV owners can access information on the internet through sources like Google to find not only the location of the charge stations but also

⁷ <https://blinkmobility.com/>

⁸ <https://fleets.pge.com/>

⁹ https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/putting-energy-efficiency-first/greening-vehicles.page



the charge level and station owner. The City of Flagstaff owns two publicly available dual charge stations at City Hall. The city is currently constructing four more at the Aquaplex on the east side of town and planning another six to ten stations at the airport. The City of Flagstaff-owned charging stations were part of the Arizona Public Service (APS) Take Charge AZ pilot program, which offers free electric vehicle charge station installments to non-single family residential APS customers. The program is intended to supply EV charging opportunities to fleet vehicles, employees, and multifamily communities. Applicants of the program do not pay for the equipment or installation costs, just the cost of the electricity used. An EV manufacturer, Tesla, has charging stations in the City of Flagstaff at a few hotels. These Tesla stations use a proprietary plug; users without Teslas would have to purchase adapters to use the Tesla charging stations.

Electric bicycles, scooters, and other vehicles also require charging. In addition to electric vehicle charging stations, having electrical charging capacity (e.g., 120v outdoor outlets) available in covered bicycling parking areas could facilitate use. No information is available on the availability of charging infrastructure for privately-owned electric bicycles and scooters.

EV Charging Infrastructure Guidelines

Public agencies can play a role in helping to provide sufficient EV charging infrastructure to facilitate adoption of private electric vehicles. While the private sector will provide much of the charging infrastructure, agencies can assess demand, identify gaps, and help fill geographic or demographic gaps in the network that are not served by the market.

Infrastructure Needs by User Type

In order to address gaps in the EV network, it is important to identify the needs of the intended users.

Multifamily Residents/Residents without Chargers at Home

Multifamily residents who do not have access to charging infrastructure at home could be served by installing publicly available chargers in areas with high concentrations of multifamily residences or to install a higher proportion of DC fast chargers that would function similarly to a gas station, allowing users to stop to “fill up” their vehicle in a relatively short amount of time, approximately 20-30 minutes. DC fast chargers would also allow multiple vehicles to use one charger per day.

Commuters

Commuters that need to charge their vehicle for several hours during the workday could be served by a lower cost Level 2 charger at a park and ride or at an employment site.



Vehicle Type

The type of vehicle will affect which charger will be most appropriate.

- Plug-in hybrid vehicles can use up to a Level 2 charger
- Shorter-range vehicles need to charge more often but can use different types of chargers;
- Longer-range vehicles do not need to charge frequently but users may prefer a fast charger or a destination that allows a longer period for charging when they do charge.

Residents with Chargers at Home

People who have chargers available at home to charge overnight may not need chargers during the day, although they may be useful for higher-mileage days, depending on the range of the vehicle.

Infrastructure Siting

EV infrastructure needs vary greatly by geography, types of chargers, types of EVs, and other underlying assumptions. An analysis by the International Council on Clean Transportation found that “various studies’ projections indicate a range of 12 EVs to 129 EVs per public charger, with an average of about 37 EVs per public charger” and that “each public charger supports more EVs over time... as more convenient matches between EVs and charging stations resulted in increased utilization.” The same study found that major metropolitan areas require higher charger densities than rural areas, and that “the share of non-home chargers in lower-income communities will need to grow from 28% in 2020 to 39% in 2030... to reflect the more limited access to home charging.”¹⁰

While there is not a one-size-fits-all approach to EV charger siting, the following locations should be considered for installation of additional charging stations for EVs and electric micromobility options to help facilitate electric vehicle adoption in the region:¹¹

- Medical Campuses
- Higher Education
- Public Sector, including Transit Centers

¹⁰ <https://theicct.org/publication/charging-up-america-assessing-the-growing-need-for-u-s-charging-infrastructure-through-2030/>

¹¹ MetroPlan 2045 RTP Literature Review, p. 36



- Neighborhood Centers
- Leisure Destinations

The Arizona Department of Transportation (ADOT) is developing a long-range plan to implement a statewide network of EV charging stations. The program is funded through the National Electric Vehicle Infrastructure (NEVI) Formula Program¹² and focuses on establishing publicly accessible EV fast charging stations along designated alternative fuel corridors throughout the state. These corridors currently include the interstates, but additional corridors can be added in the future. Corridor segments that are designated as “signage-ready” have public DC Fast Charging, no greater than 50 miles between one station and the next on the corridor, and segments and are “signage-pending” have public DC fast charging or Level 2 chargers separated by more than 50 miles.¹³

The U.S. Department of Energy’s Alternative Fuels Data Center provides the online Electric Vehicle Infrastructure Projection Tool (EVI-Pro) Lite, which estimates the number of Public DC fast chargers, Level 2 Workplace chargers, and Level 2 Public chargers that metropolitan areas would need. However, this tool will only provide an estimate of chargers needed when the number of EVs is less than 10 percent of the light duty vehicles on the road in the area as of 2016.

For the Flagstaff area, the tool estimates that 377 Workplace Level 2 chargers, 301 Public Level 2 chargers, and 82 Public DC Fast chargers would be needed to support 7,399 plug-in electric vehicles, based on 74,000 light-duty vehicles on the road in 2016 and assuming 75 percent of drivers with access to home charging.¹⁴

A more detailed planning study specific to Arizona and the Flagstaff area could be conducted using the more robust Electric Vehicle Infrastructure Projection Tool (EVI-Pro).¹⁵ A 2017 national

¹² https://www.fhwa.dot.gov/bipartisan-infrastructure-law/nevi_formula_program.cfm

¹³ <https://azdot.gov/planning/transportation-planning/alternative-fuel-corridors>

¹⁴ <https://afdc.energy.gov/evi-pro-lite>

¹⁵ <https://www.nrel.gov/transportation/evi-pro.html>



analysis using the EVI-Pro estimated total EV chargers needed by community type, as shown in **Table 1**.¹⁶

Table 1: Non-Residential EV Charger Estimates Needed by Community Type

| | Plug in Electric Vehicle (PEV) Total | Work Level 2 Plugs | Public Level 2 Plugs | Public DC Fast Charger Plugs |
|----------------|--------------------------------------|--------------------|----------------------|------------------------------|
| Cities | 12,411,000 | 278,000 | 173,000 | 19,000 |
| Towns | 1,848,000 | 56,000 | 43,000 | 4,000 |
| Rural Areas | 642,000 | 28,000 | 23,000 | 2,000 |
| Arizona | 345,000 | 8,200 | 5,500 | 720 |
| National Total | 15,000,000 | 362,000 | 239,000 | 25,000 |

Source: National Renewable Energy Laboratory.

Public Funding Resources and Implementation Strategies

Funding Options

Several funding resources are available at the federal, state, and local levels that can assist with EV adoption. For example, the region could consider the recently passed Inflation Reduction Act of 2022,¹⁷ Transportation Secretary Pete Buttigieg’s 500,000 charging station goal,¹⁸ grant funding programs under the Bipartisan Infrastructure Law, such as the Federal Transit Authority’s Low or

¹⁶ <https://www.nrel.gov/docs/fy17osti/69031.pdf>, p. 16, 51

¹⁷ <https://www.cnn.com/2022/08/13/how-to-qualify-for-inflation-reduction-act-climate-tax-breaks-rebates.html>

¹⁸ <https://grist.org/transportation/bidens-500000-ev-charging-stations-get-a-5-billion-start/>



No Emission Bus and Bus Facilities Grant,¹⁹ state programs such as Take Charge AZ²⁰ and the Statewide Electrification Plan,²¹ and local programs such as Power Up Flagstaff. The incentives available through these programs could be used to fund:

- Charging infrastructure
- Electric vehicle purchases
- Smart grids
- Transit fleet conversion
- Home charging infrastructure, possibly including
 - Smart meters that facilitate charging at non-peak electricity times
 - Solar panels to provide a renewable energy source
- Utilities
- Active transportation

Other Implementation Strategies

Beyond installation of charging stations and exploring funding options, the region could consider additional strategies to help accelerate EV adoption and achieve significant reductions in GHGs.

Policies

- Update local policies, zoning, and codes to disincentivize fossil fuel use, including restricting new gas station construction.
- Update local policies to incentivize EV use, including parking spaces for EVs, use of HOV lanes, and zero emission zones, for commercial vehicles or for all vehicles.
- Update zoning and building codes to require a minimum number of charging stations in new developments based on size.
- Update zoning and building codes to require or incentivize pre-wiring for charging stations in new developments
- Provide development incentives to install charging infrastructure beyond the minimum required in new development.

¹⁹ <https://www.transit.dot.gov/lowno>

²⁰ <https://www.aps.com/en/About/Sustainability-and-Innovation/Technology-and-Innovation/Electric-vehicles/Take-Charge-AZ>

²¹ <https://illumeadvising.com/files/Arizona-Phase-1-TE-Report-Final.pdf>



- Streamline the permitting process for charging infrastructure.
- Consider policies that support growth and development patterns favorable to efficient EV and other zero emission travel, including neighborhoods with shorter distances between destinations, lower speed arterials, increased intersection density, infill development, and reduced low-density development.
- Consider policies to promote charging infrastructure for multifamily residences, either through residential, commercial, workplace, or neighborhood chargers, to promote greater community-wide participation and reach a wider range of the community including lower income and younger demographics.
- Consider policies that might allow people living in rental properties to leave vehicles at public charging stations within neighborhoods for longer periods of time.
- Consider policies that facilitate the safe parking of electric bicycles, especially around transit, education, and shopping centers.
- Consider policies to attract EV or EV parts manufacturing facilities.
- Consider policies to facilitate recycling of EV batteries.
- Partner with utilities to consider infrastructure such as smart meters as well as incentives to encourage off-peak charging.
- Align EV strategies with health and safety needs, such as those identified in Flagstaff area Community Health Needs Assessments.²²

Transportation Investments

- Provide direct investment in charging infrastructure at strategic locations.
- Install heavy duty charging stations for freight, not just buses; concurrent installation could help achieve economies of scale.
- Install chargers to attract tourists as well as freight drivers who need to stop to recharge along their route.
- Develop transportation demand models that assess EV use so that users of the data from the models can better plan for EV adoption.
- When constructing bicycle infrastructure, ensure that the design also facilitates electric bicycle use through features such as chargers and secure bicycle parking facilities.

²² https://www.nahealth.com/sites/default/files/2022_prc_community_health_needs_assessment_report_-_flagstaff_medical_center.pdf



- Make improvements to pedestrian infrastructure in areas with charging stations to facilitate EV users walking to businesses and other destinations while charging.
- Utilize intelligent transportation systems, including infrastructure or mobile apps, to facilitate EV use, such as directing users to open charging stations.
- Explore micromobility options and whether e-scooters and e-bikes can help reduce VMTs from fossil fuel-powered vehicles.
- Prioritize transportation infrastructure funding for projects that that facilitate EV and other zero emission travel, such as EV charging infrastructure, bicycle and pedestrian connectivity investments, and enhancements for e-micromobility. Change the scoring system to rate transportation investment proposals to reflect the goals in this EV plan.

Community EV Adoption

- Communication and advertising, potentially in partnership with automobile, utility, or charging station companies that promote EV adoption. This could include a lottery for a vehicle or electric bicycle.
- Community events, such as car shows and bicycle rides, to provide information and increase familiarity with clean fuel technology.
- Engage local businesses in EV programs, such as incentives to install EV chargers and covered bicycle parking with outlets, which will attract visitors who may linger longer while their vehicle charges.
- Implement education and outreach campaigns to help shift travel behavior to sustainable modes and create a culture of EVs and other sustainable modes.
- Encourage public and private diesel vehicles to reduce idling of diesel engines during the transition period to full conversion by providing opportunities to plug in batteries to keep cargo/cabin cool while engines are off.
- Explore incentive programs for low- and moderate-income potential buyers.
- Include EV questions in community surveys to assess local interest, concerns, and barriers.
- Build awareness about GHG emission, EV programs, and resources to recycle EV batteries and previously owned internal combustion vehicles, such as through car dealer education programs and online resources.
- Consider piloting/demonstrating “clean corridors” or low-emission zones.
- Encourage private sector investments, including local businesses and EV manufacturers.
- Partner with landowners to make land available for charging stations.
- Explore additional grant funding opportunities.
- Explore additional opportunities to provide local incentives.



Design Considerations

There are several other site and design considerations when siting EV-ready parking spaces.

- The electrical capacity and metering at the site needs to be coordinated with the local utility ahead of time to ensure that the site and the local distribution system can handle the additional power requirements of new EV chargers.²³
- Signage, both to direct users to the chargers and regulatory signs, will be necessary once chargers are installed; pavement markings are often used as well.
- Monitoring or enforcement of use. Design should facilitate monitoring for misuse.
- Chargers can be wall mounted or floor mounted (pedestal), and the type of mount may require certain space and clearance minimums as specified by the manufacturer. Some jurisdictions also choose to install protection for the chargers in the form of bollards to keep vehicles from driving into and damaging the chargers.
- Safety. The area should be well-lit to deter crime and improve visibility. It should also accommodate safe movement from the charger to the vehicle. Pedestrian safety in the area should be considered.

These considerations will generally be determined once chargers are installed but should be incorporated into planning and financial estimates for EV-ready spaces.

Impact Assessment Prior to Implementation

As EV strategies are considered, in addition to assessing funding options, it will be important to evaluate the pros and cons, including who will benefit as well as any negative externalities for each option. For example, different location scenarios of EV charger installation may facilitate usage for single family or multifamily residents, or may make chargers more accessible for users who live, work, shop, or recreate in a specific part



²³ [https://www.njtpa.org/NJTPA/media/Documents/Planning/Regional-Programs/Alternative-Fuel-Vehicles/NJTPA-AFV-Readiness-Guidebook_Dec2017_FINAL\(1\).pdf](https://www.njtpa.org/NJTPA/media/Documents/Planning/Regional-Programs/Alternative-Fuel-Vehicles/NJTPA-AFV-Readiness-Guidebook_Dec2017_FINAL(1).pdf)



of the metropolitan area. Similarly, the design of the chargers, payment system, and signage could make the chargers easier or harder to use for different groups. Chargers may also warrant traffic or parking considerations, such as whether EV spots require time limits to open charging opportunities for other vehicles, or whether a concentration of DC fast chargers might warrant a traffic impact study at a specific location.

Monitoring Strategies

After implementation, agencies will need to evaluate the performance of the programs during different phases of implementation and modifying as needed. Monitoring may include checking progress toward performance measures such as rates of EV adoption for each EV fleet category, utilization of charging stations, air quality measures, transportation-related injuries, and VMT. It also may include upstream measures such as having charging infrastructure sufficient for demand, which is essential to support EV adoption.²⁴

Performance Measures

Relevant performance measures to consider when evaluating the overall success of implemented strategies include:²⁵

- Vehicle miles traveled (VMT)
17% reduction by 2030 compared to business as usual (BAU) projections
- Total (%) share of electric vehicles, including both passenger vehicles and electric buses
30% of internal VMT comes from EVs by 2030
- Greenhouse gas emissions from transportation in metric tons of carbon dioxide equivalent (MTCO_{2e})
Reduce GHGs from transportation by 35% compared to 2030 BAU
- Total (%) share of fossil fuel car trips
To be established
- Total (%) mode share of walking/biking/transit trips
56% mode share by 2030
- Bicycle Comfort Index (BCI) and Bicycle Level of Service (BLOS)

²⁴ https://www.c40knowledgehub.org/s/article/How-to-build-an-electric-vehicle-city-deploying-charging-infrastructure?language=en_US

²⁵ MetroPlan 2045 RTP Literature Review, pp. 41-44



- BCI for Title VI areas meet or exceed regional average and/or regional average for different development types*
- Equity Ranking Index (1-10 score)
For example, all new projects/policies in the 2045 RTP capture census tracts that have an equity ranking index score of 5 or higher
 - Person hours of travel
To be established
 - Unequal commute (i.e., access to EVs and charging infrastructure)
For example, residents in disadvantaged areas live within a comparable commute to the region average
 - Bus Service Frequency
Increase Route 5 frequency to every 30 minutes, and Route 7 to every 20 minutes on weekdays
 - Single Occupant Vehicle Trips
Reduce by 11% compared to 2019 baseline (69% mode share)
 - Residential Density
Increase density in residential neighborhoods by 20% in 2030 compared to BAU
 - Transportation-related fatalities and serious injuries per capita
Fatalities: 2% of total crashes, Serious Injuries: 7% of total crashes



Potential Data Sources

Electric Vehicle Registrations

The Alternative Fuels Data Center (AFDC) compiles data from multiple sources to estimate the number of electric vehicle registrations by state and is typically updated each year.

Networked Charging Use Monitoring

While networked chargers are more expensive than non-networked chargers, they provide the ability for agencies to monitor their chargers for maintenance issues and usage. This cost may be worthwhile for the data analysis and tracking abilities afforded by networked chargers.

Air Quality

Arizona Department of Environmental Quality²⁶

Transportation-Related Injuries

Local and state departments of transportation

VMT

Flagstaff Household Transportation Survey.²⁷ Could consider modifying questions to collect specific data regarding EV usage.

Electric Bicycle and Scooter Theft

Theft of electric bicycles and scooters may deter use. Police reports might provide information about where theft is occurring and where to prioritize bicycle parking investments.

Monitor for Changes in Best Practices

Electric vehicles and supporting technologies and policies are rapidly changing. These changes should be monitored, and this plan periodically updated to include new developments and best practices in EV promotion and technology.

²⁶ https://www.azdeq.gov/AQ_Data

²⁷ <https://www.metroplanflg.org/flagstaff-trip-diary-survey>