

THE TRANSPORTATION TOOLKIT

A Citizen's Guide To Transportation Decision-Making



2018 Ohio Ed.



A Project of the Sierra Club Ohio Chapter Transportation Team

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EXPLORE, ENJOY & PROTECT THE PLANET

Acknowledgements & Disclaimer

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The *Toolkit* is intended to provide a public benefit. It does not represent the legal opinion of the Sierra Club as a whole or any subsection or member thereof on any issue related to the transportation decision-making process or otherwise, nor is it offered or intended as legal advice to any reader who participates in such a proceeding.

Sierra Club

The Sierra Club is a 501(c)(3) organization that has been working since 1892 to protect communities, wild places and the planet itself.

Our Ohio Chapter was established more than 40 years ago and represents more than 25,000 members and volunteers statewide.

The Ohio Transportation Team advocates for sustainable transportation, sensible planning and the reduction of VMT (vehicle miles traveled), so that all Ohioans can enjoy clean air and clean water, and have regular, affordable access to education, jobs and other necessities.

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Executive Summary



In 2014, the Sierra Club **Ohio Chapter** and the **Sierra Club Foundation** created the *Transparency and Citizen Participation In Transportation Planning* Campaign. Our goal is to protect the environment and human health by promoting transparent decision-making and good local governance through citizen participation in state, local and regional transportation planning. The Campaign has three core objectives:

1. Strengthen partnerships and coalitions between the environmental community, labor unions, consumer and social services advocates, bicycle advocates and others in order to broaden support for investing transportation dollars in sustainable transportation options that will simultaneously benefit the economy and the environment, and that will increase transportation equity and accessibility;
2. Generate public demand and grassroots support for the adoption of administrative policies and spending priorities that reduce our dependence on fossil fuels and reduce greenhouse gas emissions in the State of Ohio; and
3. Influence transportation spending and administrative decision-making by increasing public participation and promoting transparency.

We can't achieve these objectives without you. The best policy and spending decisions are made with the broadest public participation.

In the chapters below, you will learn about why Transportation is an important issue for the Sierra Club - an organization that has historically focused on conservation. The *Transportation Toolkit* describes how transportation decisions are made, who makes them, and how you can affect the decision-making process. We hope that the *Transportation Toolkit* will educate, inspire and empower our members, along with citizens and communities throughout Ohio, to advocate for a better environment, a sustainable economy and an equitable system that provides access and opportunities for all.

Glossary of Terms & Acronyms

The transportation world is full of industry-specific terms and an alphabet soup of acronyms. Here is a primer to get you started with the language.

Terms

Active Transportation. Pedestrians, bicycles, etc.

Autonomous vehicle. A vehicle capable of navigating roadways and interpreting traffic-control devices without a driver actively operating any of the vehicle's control systems. There are different levels of autonomy; for example, many "driverless cars" actually require a human occupant to be present and capable of taking over the vehicle.

Bus rapid transit. Combines the speed and reliability of rail with the flexibility and lower costs associated with bus routes. Generally utilizes dedicated lanes, elevated boarding platforms, prepayment options and multiple entry doors.

Charrette. A focused working session involving planners, engineers, members of the public, elected officials and others who collaborate with designers to draft a solution to a transportation problem.

Community benefits agreement. A contract between a project proponent and the community that conditions project approval on the rendition of specific amenities and/or mitigations, and that requires the community to support or not oppose the project. Contracts are usually negotiated after a project has been announced, but prior to governmental approval.

Community impact assessment (CIA). An agency process designed to evaluate the effects of a transportation decision on a community and its quality of life, and to help agencies comply with requirements related to Environmental Justice, Civil Rights, and Public Involvement.

Complete streets. Streets designed and operated to be accessible for all users, including pedestrians, bicyclists, transit riders and motorists of all ages and abilities.

Hub and spoke. The hub and spoke distribution model relies on a system of connections arranged like the spokes on a bicycle wheel, along which traffic moves to or away from the hub at the center.

Funicular. A cable railroad, especially one on a hillside, in which ascending and descending cars are counterbalanced.

Light rail. An urban and usually electrified railway system characterized by its ability to operate single cars or short trains along exclusive rights-of-way at ground level, on aerial structures, in subways, or occasionally, in streets and to board and discharge passengers at car level.

MAP-21 (Moving Ahead for Progress in the 21st Century Act). A 2012 funding and authorization bill that governs federal surface transportation spending.

Metropolitan Planning Organization. Federal law requires metropolitan areas with populations in excess of 50,000 persons to engage in a transportation planning process as a prerequisite for receiving federal funding for regional transportation projects. The organizational structure for conducting this planning process is called a Metropolitan Planning Organization (MPO). MPOs are comprised of local elected officials, operators of major modes of transportation and officials appointed by the Governor, and formally designated as the entity responsible for transportation planning in the metropolitan area. Each MPO prepares a Metropolitan Transportation Plan (MTP) for its area.

Ohio Administrative Code. The rules adopted by agencies of the State of Ohio in order to carry out the policies and intent of laws passed by the General Assembly.

Ohio Revised Code. The general laws of the State of Ohio, organized into 31 titles that are subdivided into chapters dealing with individual topics of law and sections which contain the text of individual statutes.

Protected bicycle lane. A bicycle lane on or adjacent to the street and that is physically separated from automobile traffic. "Like a sidewalk for bicycles."

Public-Private Partnership (P3). A partnership between a government agency and one or more private sector companies for the purpose of funding and/or operating a transportation project.

Regional Transportation Planning Organization (RTPO). Similar to MPOs, these organizations are responsible for transportation planning in non-metropolitan areas.

Sharrow. A street marking placed in the lane of traffic to indicate that motorists and bicycles should share the road.

Streetcar. A public rail transit vehicle powered by overhead electric wires.

Tax Increment Financing (TIF). A public financing mechanism that is often used to pay for transportation infrastructure.

Transit-oriented development. A type of community development that includes a mixture of housing, office and/or retail space and that is integrated into a walkable neighborhood and located within a half-mile of public transportation.

Transportation Improvement Program (TIP). A four-year list of priority transportation projects that are developed by the state and an MPO, and that includes all regionally significant transportation projects that receive funds and/or approval from the federal government, as well as projects that do not receive federal funds but that are consistent with the MTP.

Vision Zero. A goal to design a roadway system that suffers zero traffic-related fatalities.

Acronyms

ACOE: Army Corps of Engineers

ADA: Americans with Disabilities Act

BRT: Bus Rapid Transit

CAFE: Corporate Average Fuel Economy

CBA: Community Benefits Agreement

CMAQ: Congestion Mitigation and Air Quality Improvement Program

CNG: Compressed Natural Gas

DOI: Department of the Interior

DOT: Department of Transportation

EIS: Environmental Impact Statement

EJ: Environmental Justice

EV: Electric Vehicle

FAA: Federal Aviation Administration
FAST Act: Fixing America's Surface Transportation Act
FHWA: Federal Highway Administration
FRA: Federal Railroad Administration
FTA: Federal Transit Administration
GHG: Greenhouse Gas
MAP-21: Moving Ahead for Progress in the 21st Century Act
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MPG: Miles Per Gallon
MPO: Metropolitan Planning Organization
MTP: Metropolitan Transportation Plan
NAAQS: National Ambient Air Quality Standards
NEPA: National Environmental Policy Act
NHPA: National Historic Preservation Act
NPDES: National Pollutant Discharge Elimination System
ODOT: Ohio Department of Transportation
OH EPA: Ohio Environmental Protection Agency
ORC: Ohio Revised Code
P3: Public Private Partnership
ROD: Record of Decision
ROW: Right of Way
SAFETEA: Safe, Accountable, Flexible, Efficient Transportation Equity Act
SWPPP: Stormwater Pollution Prevention Plan
TDM: Transportation Demand Management
TIF: Tax Increment Financing
TIP: Transportation Improvement Program
TOD: Transit-Oriented Development
TRAC: Transportation Review Advisory Committee
US DOT: United States Department of Transportation
US EPA: United States Environmental Protection Agency
VMT: Vehicle Miles Traveled

I. Introduction



“Transportation: (n) means of conveyance or travel from one place to another; public conveyance of passengers or goods” - Merriam-Webster Dictionary

Decisions about **transportation** affect all of us on a regular basis - transportation systems connect us to jobs and schools and families, transportation consumes more or less of our time each day according to congestion and traffic conditions, transportation dictates land use and patterns of development, it affects the air we breathe and the water that flows through our State, and it even affects climate patterns and our global environment. The transportation choices that we make every day reverberate for generations.

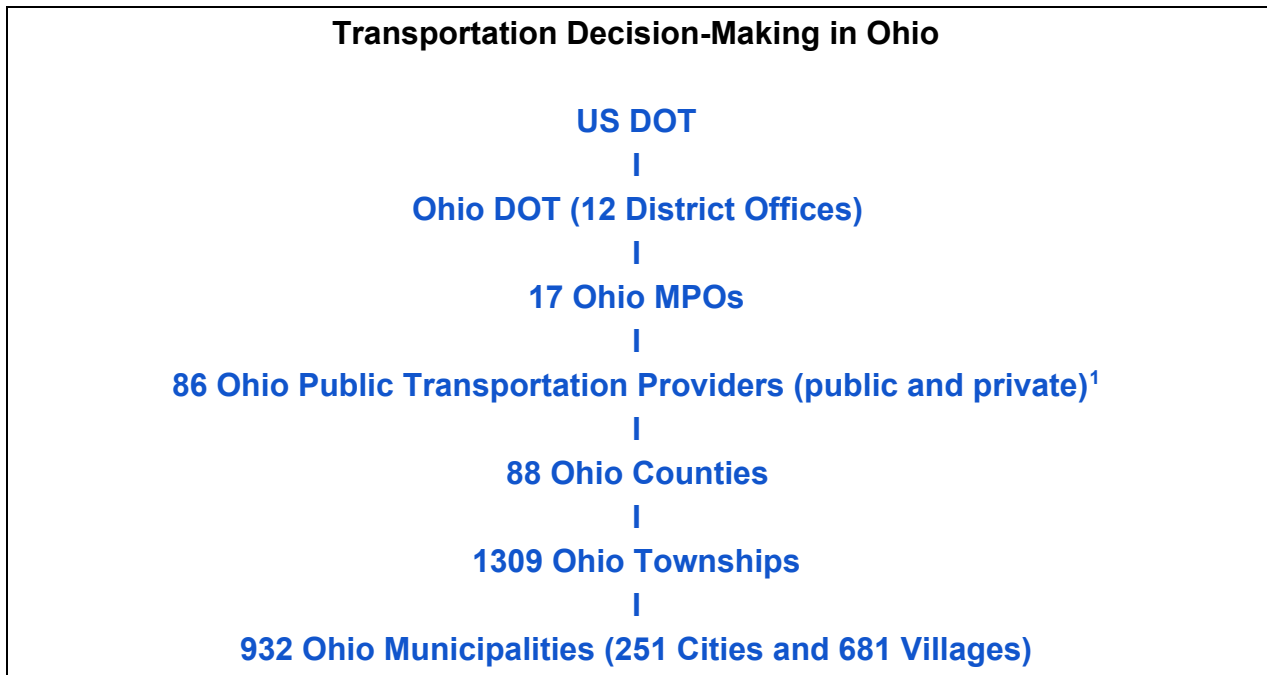
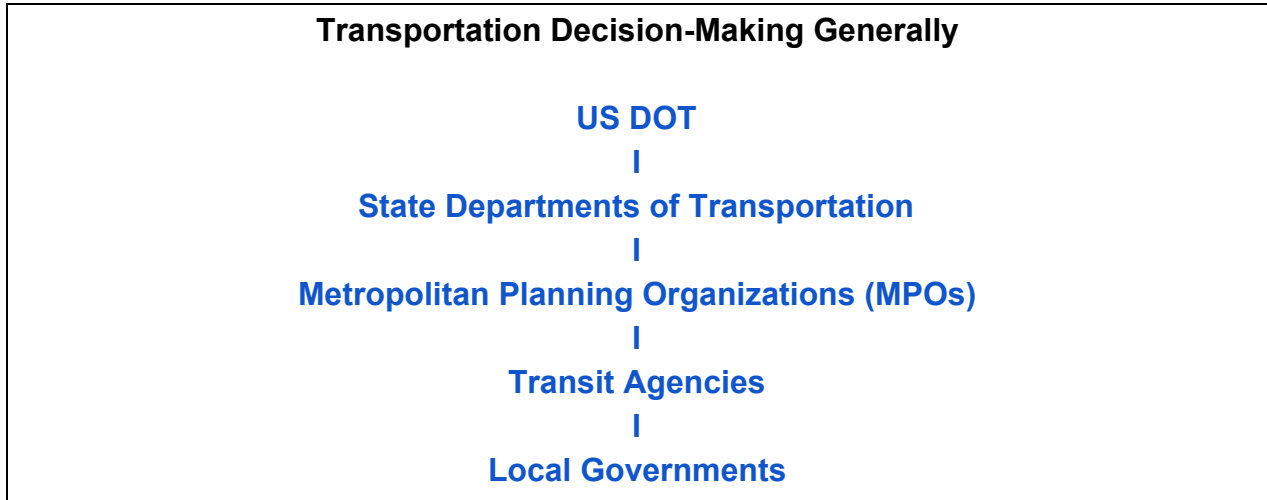
The Sierra Club is focused on the three “Es” of transportation: (1) protecting the **environment**; (2) growing a sustainable **economy**; and (3) promoting **equity** for all people regardless of demographics such as age or ability and regardless of whether they are walking, riding a bike, bus or train, or are driving. We stand united with many more organizations and thousands of individuals who care about human health and the environment, and who need and want access to jobs, education, healthcare, places of worship, recreation and more.

In order to generate the most public good from our transportation systems, every citizen needs to understand and be engaged in the decision-making process.

“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has.” - Margaret Mead

So . . . who makes decisions about transportation?

Transportation is inherently a matter of the public interest. A fundamental purpose of our system of government and taxation is to provide for public infrastructure such as roads, trails and other means of conveyance. Decisions about both transportation policies and specific projects are made at all levels of government, from the US Department of Transportation (US DOT) to your local village or city council.



¹ <https://www.dot.state.oh.us/Divisions/Planning/Transit/Pages/OhioTransitAgencies.aspx>.

What authority is delegated to decision-makers?

Projects and policies that cross state boundaries, or that are funded by federal tax dollars, are generally subject to federal approvals.

Intrastate highways are generally overseen by the Ohio Department of Transportation (ODOT), which also has some jurisdiction over smaller roadways.

Streets and sidewalks usually fall under the authority of local governments.

When are decisions about transportation made?

The Ohio legislature adopts a Transportation Budget every two years.

ODOT's Transportation Review Advisory Council (TRAC) makes specific project funding allocations every year.

MPOs often engage in grant-making cycles that take place throughout the year.

Cities and counties have yearly capital budgets and are constantly thinking about new roadways, bicycle paths and pedestrian thoroughfares.

It pays to be regularly engaged in both local and statewide planning conversations.

Where are decisions about transportation made?

Congress and the federal agencies operate out of Washington, D.C.

ODOT has offices in Columbus and in **12 districts** throughout Ohio.²

Local decisions happen at county offices and at city halls.

² See chart and ODOT map on the next page.

ODOT District Offices

District 1 - Lima

District 2 - Bowling Green

District 3 - Ashland

District 4 - Akron

District 5 - Jacksonstown

District 6 - Delaware

District 7 - Sidney

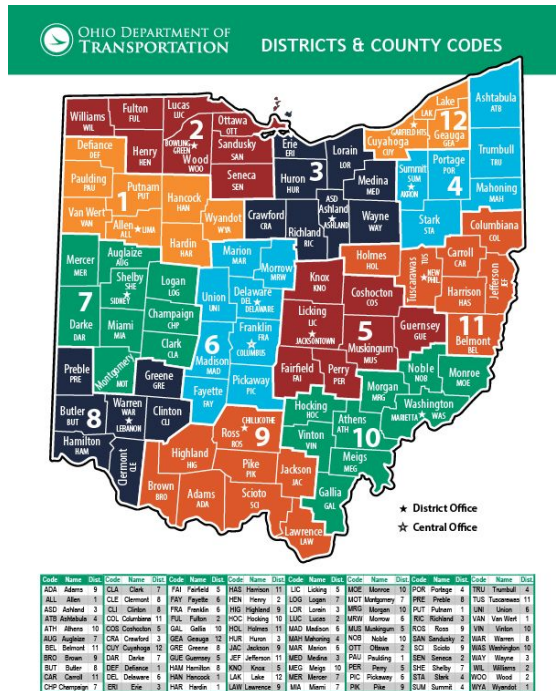
District 8 - Lebanon

District 9 - Chillicothe

District 10 - Marietta

District 11 - New Philadelphia

District 12 - Cleveland



Map courtesy of the Ohio Department of Transportation.

There are also **17 MPOs** that oversee regional transportation planning around the major metropolitan areas in Ohio.³ Federal law requires urban areas with populations above 50,000 to organize MPOs in order to be eligible for federal transportation planning funds.

Ohio MPOs

Akron Metropolitan Area Transportation Study (AMATS) - Akron
Stark County Area Transportation Study (SCATS) - Canton
Ohio Kentucky Indiana Regional Council of Governments (OKI) - Cincinnati
Northeast Ohio Area Coordinating Agency (NOACA) - Cleveland
Mid-Ohio Regional Planning Commission (MORPC) - Columbus
Miami Valley Regional Planning Commission (MVRPC) - Dayton
KYOVA Interstate Planning Commission (KYOVA) - Huntington, WV
Lima-Allen County Regional Planning Commission (LACRPC) - Lima
Richland County Regional Planning Commission (RCRPC) - Mansfield
Licking County Area Transportation Study (LCATS) - Newark
Wood-Washington-Wirt Interstate Planning Commission (WWW) - Parkersburg, WV
Erie Regional Planning Commission (ERPC) - Sandusky
Clark Co.-Springfield Transportation Coordinating Committee (CCSTCC) - Springfield
Brooke Hancock Jefferson Metropolitan Planning Commission (BHJ) - Steubenville
Toledo Metropolitan Area Council of Governments (TMACOG) - Toledo
Belmont-Ohio-Marshall Transportation Study (BELOMAR) - Wheeling, WV
Eastgate Regional Council of Governments (EASTGATE) - Youngstown

³ See http://www.dot.state.oh.us/Divisions/Planning/SPR/StatewidePlanning/Pages/MPO_Planning.aspx.

Why are certain decisions about transportation made?

Transportation decisions are often guided by established transportation policies. For example, a jurisdiction that has adopted a Complete Streets policy will work to ensure that every roadway project includes accommodations and improvements for all user modes, including pedestrians and bicyclists.

How can you affect transportation decision-making?

Most transportation decisions are made by elected and appointed officials, according to prescribed procedures and schedules. The impetus for many transportation decisions, however, often comes from public and the private sector, such as trail councils or real estate developers.

See the chapters below for more specific suggestions about how to get involved.

Sierra Club believes that the Ohio should adhere to the three Es by: (1) repairing and maintaining existing infrastructure; and (2) by investing in new multimodal transportation options. Through this *Toolkit*, we hope to encourage wise transportation decisions that will protect the environment, grow the economy, promote equity, and create more livable communities for all Ohioans.



A. Modes of Transportation



We use many different methods for moving people and goods through and throughout Ohio, including bicycles, buses, trains, cars, boats and planes. This *Toolkit* is focused primarily on ground transportation.

Historically, different modes of ground transportation were often planned for and implemented in silos - we built trails for bicycles, rails for trains and roads for cars - and often these networks functioned in isolation from one another.

The Sierra Club supports a more modern, “multimodal” approach to transportation, whereby a single trip utilizes whatever multiple modes of transportation are most efficient. Most efficient also generally means least polluting, and by connecting various car-free modes of transportation, we can make entire transportation systems more sustainable. For example, you might ride on a bicycle trail or in an on-street lane to a bus stop that is more than a mile away, place your bicycle on a bus rack, and then take the bus across town. You can traverse great distances over multiple networks without getting in a single passenger vehicle.

The following examples are part of an ever-growing list of transportation options. For example, in 2018 we have seen a proliferation of dockless urban scooter-shares that have not been without some controversy!

i. Pedestrians



The Ohio Revised Code (ORC), Chapter 4511.01(X), defines a “Pedestrian” as “*any natural person afoot*” - in other words, someone who is walking.

Pedestrian infrastructure includes sidewalks, crosswalks, walk signals, street lighting and more. Sierra Club advocates for pedestrian infrastructure that will enhance safety and improve connectivity and accessibility.

Walkable communities provide safe and efficient infrastructure for pedestrians. What make a community walkable? According to Walk Score, it includes:

- **A center:** Walkable neighborhoods have a central main street or public space.
- **People:** For businesses to flourish and for public transit to run frequently.
- **Mixed income, mixed use:** Affordable housing located near businesses.
- **Parks and public space:** Plenty of public places to gather and play.
- **Pedestrian design:** Buildings close to the street with parking in back.
- **Schools and workplaces:** Close enough for people to walk from their homes.
- **Complete streets:** Streets designed for bicyclists, pedestrians and transit.⁴

As noted by the the Columbus-area MPO, the Mid-Ohio Regional Planning Commission (MORPC), **Complete Streets** are designed to safely and comfortably accommodate all users, including but not limited to motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers and emergency responders. "All users" includes people of all ages and abilities. MORPC has made a handy [Complete Streets Toolkit](#) available to the public.

Local jurisdictions should adopt **Pedestrian and Bicycle Master Plans** to guide ongoing and future multimodal transportation planning efforts.

⁴ “What Makes A Neighborhood Walkable?” at <https://www.walkscore.com/walkable-neighborhoods.shtml>.

ii. Bicycles



The Ohio Revised Code Chapter 4511.01(G) defines “Bicycle” as *“every device, other than a device that is designed solely for use as a play vehicle by a child, that is propelled solely by human power upon which a person may ride, and that has two or more wheels, any of which is more than fourteen inches in diameter.”*

In addition to the ORC’s definition, “bicycle” can also refer to electric and hybrid two-wheeled vehicles.

More and more bicycle commuters take to the streets every year, and expanding bicycle infrastructure would facilitate and encourage more commuters to forego their cars, allowing Ohioans to save money while reducing congestion, improving air quality and benefiting public health.

a. On-Street Bicycle Lanes

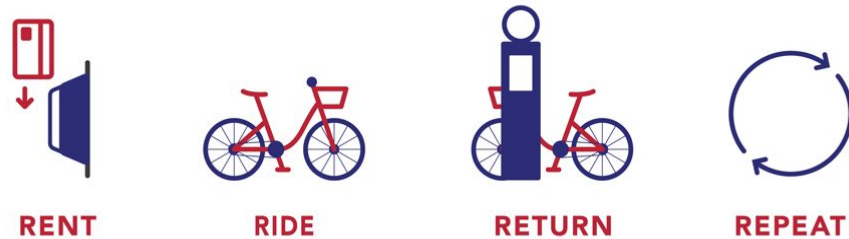
It is relatively easy to stripe a bicycle lane when building or resurfacing a roadway, provided that the roadway is wide enough to accommodate it.

b. Off-Street Trails

Off-street trails can connect pedestrian and bicycle networks while also exposing people to nature and an active lifestyle.

c. Bicycle-Sharing

A graphic from Cincinnati's Red Bike shows the simple bicycle-sharing process:



Graphic courtesy of Cincinnati's Red Bike.

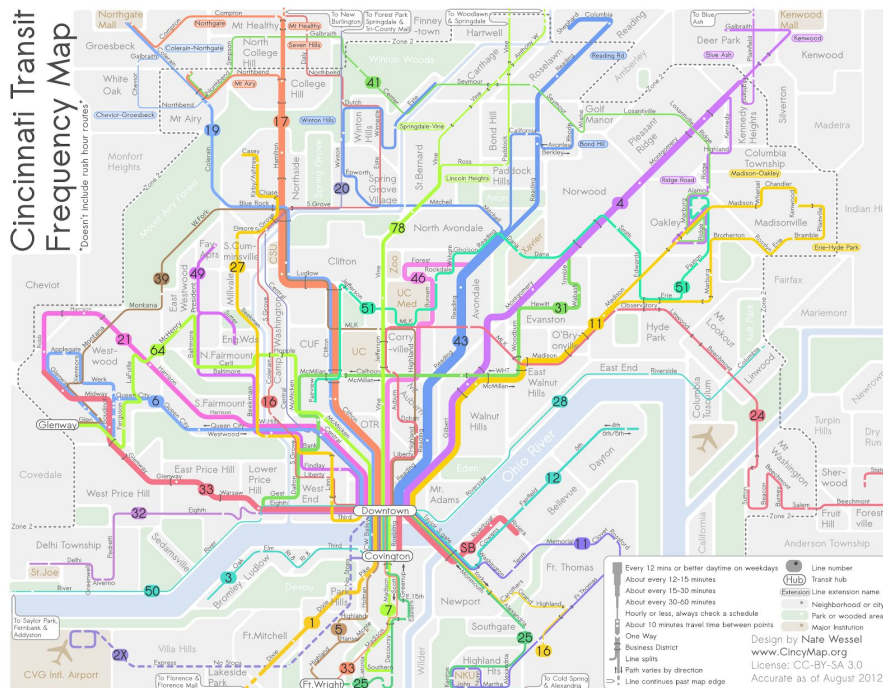
Bicycle-sharing systems give people regular opportunities to ride without having to own, store or transport any equipment.

Bicycle sharing systems have proliferated around the country and Ohio, including Cincinnati, Cleveland, Columbus and Dayton. Some memberships are transferable among different bicycle sharing systems.



iii. Buses

Transit connects people with opportunities such as education and employment. According to an ODOT study, Ohio has a rising demand “for convenient, affordable public transportation to jobs, medical appointments, shopping and recreational activities.”⁵ Transit drives economic development while improving human and environmental health; conversely, new highways create air pollution and depress local businesses by reducing accessibility.



Map courtesy of the Southwest Ohio Regional Transit Authority

In 2015, ODOT released a Transit Needs Study that illustrates our State’s transportation spending problem. The Study notes that **only 61 of Ohio’s 88 counties have transit service**.⁶ Nearly a third of Ohio’s counties have no transit services, nearly a tenth of our residents don’t have access to a car, and the transportation sector spews out approximately one quarter of our State’s air pollution.

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www.dot.state.oh.us/Divisions/Planning/Transit/TransitNeedsStudy/Documents/OhioStatewideTransitNeedsStudyFinalReport.pdf

⁶ Id.

And Ohio sits near the bottom of a list of states ranked by transit expenditures.

The 2015 Transit Needs Study identifies a gap of more than \$192 million in capital and \$96 million in operating funds that are needed annually just to meet existing demand for public transportation services. And we desperately need to *improve* the system. For example, according to the regional Chamber of Commerce, less than 22 percent of jobs in the Greater Cincinnati region are accessible by a commute of 90 minutes or less on public transportation.⁷

The American Public Transit Association estimates that every dollar invested in transit generates 6 dollars in economic returns and helps create nearly 20 percent more jobs than equal investments in new roadways. Yet, in one year, Ohio spends nearly \$2 billion on roadway projects but only \$7 million on transit.

a. Bus Rapid Transit

Some public transit systems can impart more environmental benefits than others. Sierra Club supports the expansion of **Bus Rapid Transit (BRT)**, which focuses on circulator routes and node-to-node networks and connections, rather than traditional “hub-and-spoke” planning.



BRT utilizes many of the advantages of light rail with the cost and flexibility of bus service. BRT routes often use dedicated lanes that are complemented by signal prioritization and timing that allows for faster and more efficient travel over long distances.

⁷ See the Chamber's *Connected Region* report at <https://www.theconnectedregion.com>.

For example, the HealthLine BRT route began operating in Cleveland in 2008. The Greater Cleveland Regional Transit Authority reports that the HealthLine has “delivered more than \$6.3 billion in economic development” and was named the “Best Bus Rapid Transit in North America” by the Institute for Transportation & Development Policy.

Cleveland’s BRT route:

- Includes 9.2 miles of roadway improvements on and adjacent to Euclid Avenue.
- Offers convenient, five-minute frequency service during peak travel periods and operates 24-hours-a-day, seven-days-per-week.
- Replaced 108 bus stops with 36 conveniently spaced stations and reduced travel time from 40 minutes to 28.
- Provides stylized 63-foot hybrid-electric Rapid Transit Vehicles with five sets of doors, located on both sides of the coach.⁸

b. Paratransit

“Paratransit” is generally recognized as special transportation services for people with disabilities and is often used to supplement public transit such as bus and rail.

Paratransit services vary, from defined-route taxi or shuttle pick ups to “fully demand responsive transport,” which offers on-demand door-to-door service.

Paratransit services are offered by public transit agencies, nonprofit groups and for-profit operators.

⁸ See <http://www.riderta.com/healthline/about>.

iv. Rail



Sierra Club supports the expansion of light, passenger and commuter rail in Ohio. New services should utilize existing infrastructure where possible and should not damage the environment or affect the health of disadvantaged communities.

a. High-Speed Rail

High-speed rail is a type of rail transport that operates significantly faster than traditional rail traffic. While there is no single standard that applies worldwide, new lines in excess of 160 miles per hour and existing lines in excess of 120 miles per hour are widely considered to be high-speed.

b. Commuter and Light Rail

Commuter rail, also called suburban rail, is a passenger rail transport service that primarily operates between an urban core and the middle to outer suburbs and commuter towns or other locations that draw large numbers of commuters.

c. Streetcars



Streetcars (or “trolleys”) are rail vehicles that are powered by electricity, usually from an overhead wire but sometimes from an in-ground connection. Streetcars run on fixed local routes.

v. Automobiles

Ohio, like much of the country, has long had a fascination with the automobile. Unfortunately, single-passenger, gas-powered vehicles contribute an unreasonable amount of air pollution and climate change inducing emissions. Fortunately, there are recent trends in the automotive industry that make some cars less problematic. Similarly, drivers can adopt behaviors to reduce the impact of their car-centric lifestyles.

a. Fuel Efficiency

The Sierra Club has worked for decades to improve the fuel efficiency of cars and trucks. Around the country, Sierra Club members have pushed Congress, the president, and states to adopt strong vehicle efficiency and emissions standards. Most recently the Obama administration finalized passenger vehicle standards that will double the efficiency of our cars and trucks by 2025. Higher fuel efficiency means less oil burned, less harm to our climate, less air pollution, and more savings for consumers.

Passenger vehicle standards: Passenger cars and trucks are the largest source of oil consumption in the United States. Thankfully, historic standards will ensure that these cars and trucks use less gas, or no gas at all, in the years to come. Current standards will require automakers to significantly reduce carbon pollution from their vehicles, equivalent to an average of 54.5 mpg by 2025.

Heavy-duty truck standards: Freight trucks are one of the fastest-growing sources of oil use and carbon emissions in the United States. These vehicles move 70 percent of U.S. freight, consuming nearly 2.5 million barrels of oil per day and producing nearly half a billion tons of carbon pollution a year.

Corporate Average Fuel Economy (CAFE) standards are set by the federal government. CAFE was enacted by Congress in 1975 and is intended to increase the fuel economy of cars and light trucks steadily over time.

b. Hybrid Vehicles

Hybrid vehicles use a combination of internal combustion engines and electric batteries.

c. Electric Vehicles

Automobiles, above all else, represent America's addiction to dirty oil. Plug-in electric vehicles (EVs), which require no gasoline and emit no pollution from their tailpipes, present a critical opportunity to slash pollution, reduce our dependence on oil, create American jobs, and improve national security. To drive this change, the Sierra Club has a national campaign to promote electric vehicles.



Each year, American passenger cars and trucks burn 121 billion gallons of gasoline and spew upwards of 3 trillion pounds of carbon pollution into the air. These emissions are from both the vehicle tailpipes and the "upstream" emissions from extracting, refining, and transporting the oil to our vehicles. Our dangerous dependence on oil has resulted in catastrophes like the BP spill in the Gulf of Mexico, and every day, we send more than \$500 million abroad to pay for oil, increasing our national debt and dependence on many nations hostile to our policies.

A fully electric vehicle uses electricity to power a battery. This means no gasoline, no dirty oil changes, and no internal combustion engine. Most new fully electric vehicles can drive 70-100 miles on one charge. Plug-in hybrid electric vehicles run on electricity for a certain number of miles, and as their battery runs out of charge, a gasoline powered engine or generator kicks in.

Most EVs are charged at home overnight. Using a 220-volt outlet and charging unit, installed by an electrician, a plug-in hybrid recharges in about 100 minutes, and a pure electric vehicle in three to eight hours. A regular 120-volt wall outlet will significantly increase charging times, but is likely sufficient for plug-in hybrids and for fully electric vehicles for some people.

- Check out the [EV Guide home page](#) and [‘pick-a-plug-in’ quiz](#) to find which model works best for you, information on which EVs and incentives are available in your state, and the fueling costs and emissions you’ll avoid in your part of the country.

d. Carpooling

Carpooling reduces fuel consumption by cutting down on vehicle trips and VMT.

e. Ride-Sharing

Ride-sharing services allow users to drive automobiles when necessary without having to deal with storage or maintenance.

f. Compressed Natural Gas

Compressed natural gas (CNG) has been touted as a cleaner alternative to gasoline, but it is still a fossil fuel and a significant contributor to climate change. EVs are better than CNG vehicles.

g. Diesel

“Clean diesel” is a unicorn.

B. Passenger Vehicles v. Freight

Transportation infrastructure supports not just passenger services, but also commercial movement of goods, which significantly contributes to GHG emissions. Freight truck and air transport emissions contribute to 28 percent of transportation's GHG emissions.

Increasing rail infrastructure will help divert truck and car traffic to rail, and reduce the heavy burden of truck traffic on congested highways that impacts communities near freight centers.

Electrifying rail systems will increase the energy efficiency of freight and passenger rail (including high speed), and displace the emissions to an ever-more renewable grid.

Freight railroads, especially electrified, are preferred over highway or air freight to save energy and land, and to cut noise and pollutant emissions. Amtrak and high speed intercity rail which afford comparable city center to city center access times, or which offer comparable overnight convenience, are preferred to air travel because they save energy, use less land, cut noise and pollutant emissions, and allow some airports to be closed. Therefore, new or improved rail facilities, and electronic communications, are preferred to new or expanded airports.