Mountain Line

Sustainability Plan

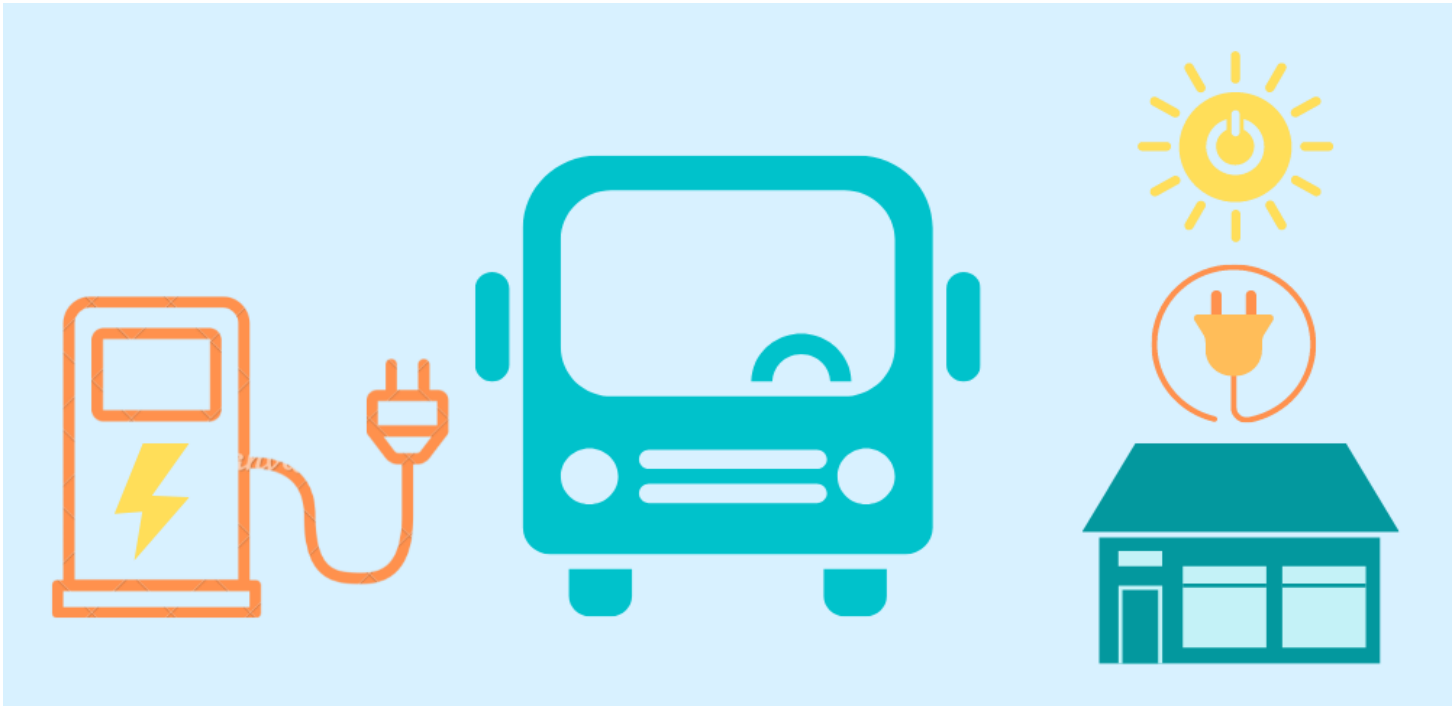


TABLE OF CONTENTS

List of Figures and Tables

Introduction

On April 22, 2021, President Biden announced an ambitious goal: for the United States to achieve a 50-52 percent reduction from 2005 levels in economy-wide net greenhouse gas (GHG) pollution by 2030. On June 15, 2021, the Federal Transit Administration (FTA) launched the Sustainable Transit for a Healthy Planet Challenge to encourage transit agencies to build on progress already made and to further reduce GHG emissions from public transportation in support of President Biden's GHG reduction goal.

Transportation is a major source of GHG emissions in the United States, accounting for 29 percent of 2019 GHG emissions (EPA's U.S. Greenhouse Gas Emissions and Sinks: 1990-2019). Public transportation plays a vital role in reducing a community's transportation GHG emissions through transportation and land use efficiencies.

Transit agencies are increasingly taking actions to reduce their own carbon emissions to further the GHG emission reduction benefits associated with public transportation. FTA's Sustainable Transit for a Healthy Planet Challenge encourages transit agencies to take bold actions and investments to cut GHG emissions. The challenge calls on transit agencies to develop sustainable strategies with measurable goals to achieve GHG emission targets. Mountain Line has signed on to this challenge and has prepared its first Sustainability Plan

The purpose of this plan is to provide a high-level overview of sustainability at Mountain Line, including both current conditions and future projections. The first section of the plan provides an agency overview including information on bus services, energy usage, water usage, and current sustainable initiatives. The next section of the plan outlines two of Mountain Line's Plans: Zero Emission Bus Transition (ZEB) Plan and the 2020 – 2025 Mountain Line Strategic Plan, and how each of the plans prepare Mountain Line to become more sustainable. Next, is the Goals section which outlines four goals, along with strategies and actions to achieve these goals. The concluding section provides an overview of current Mountain Line projects which follow the goals outlined in this plan.

Agency Overview

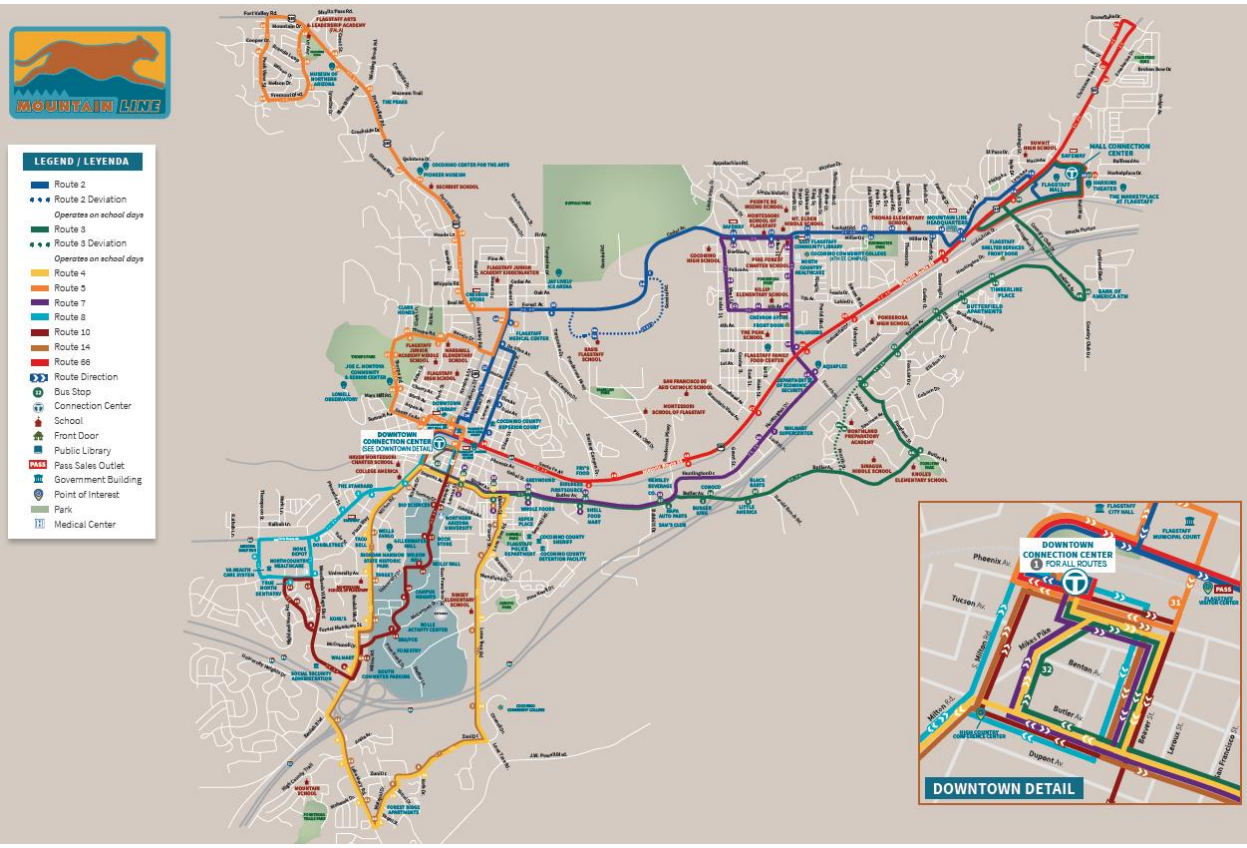
Northern Arizona Intergovernmental Public Transportation Authority (NAIPTA), doing business as Mountain Line, is an intergovernmental organization whose member agencies include Coconino County, the City of Flagstaff, Northern Arizona University (NAU), and Coconino Community College. Mountain Line formed in 2001 to provide public transportation services and has been operating public transit in the greater Flagstaff area for 20 years. Mountain Line is funded by a locally dedicated transit tax which was increased and renewed by the voters in 2008 and 2016, respectively. Mountain Line's mission is "Getting you where you want to go."

Mountain Line's boundaries coincide with the MetroPlan region, a 525 square-mile area that includes the City of Flagstaff and outlying areas. Flagstaff has a population of 71,000 people and is an important destination and regional hub in Coconino County as the only community with a population of over 10,000 people in a county covering 18,000 square miles, an area twice the size of Maryland. Flagstaff is at an elevation of 7,000 feet and experiences winter conditions, receiving on average 109 inches of snow per year, which makes it one of the top ten of snowiest cities in the U.S. Flagstaff is also home to NAU which has a current student population of 21,248.

In 2008, voters approved a sales tax increase allowing Mountain Line to adopt low and zero-emissions bus technologies as their fleet expands and is replaced. Additionally, in 2021 the Flagstaff City Council adopted the Carbon Neutrality Plan which addresses the City Council's goal of achieving community-wide carbon-neutrality by 2030.

The Mountain Line fixed route system operates 29 hybrid diesel-electric buses in peak service on nine routes and is one of the first systems in the country to be 100% low emission with hybrid electric buses, achieved in 2017. Peak hour frequencies are 8-30 minutes with 30-60-minute frequency on the weekends. Mountain Line also operates a winter seasonal service called Mountain Express, which goes to the ski report. All routes operate seven days a week and have since August 2016. Mountain Line is one of eleven systems that achieves all six of the Small Transit Intensive Cities (STIC) program measures. Before COVID-19, ridership has steadily increased 88% over ten years, with operating cost per passenger at $3.64. Additional ridership is generated from paratransit, taxi, and vanpool programs.

FIGURE 1 MOUNTAIN LINE FIXED ROUTES



Mountain Line has an Emergency Operations Center Compact Agreement with Coconino County to respond to emergencies, like the Museum Fire that burned 1,887 acres immediately north of Flagstaff in 2019. In Flagstaff we are already seeing firsthand the effects of climate change: worsening wildfires followed by flooded drainages, drought, extreme weather, and ecological shifts in our beautiful forests. Flagstaff residents value a sustainable climate pathway to protect our neighbors, the local economy from harmful climate impacts, and to create well-paying jobs as part of the climate solution.

MOUNTAIN LINE FLEET

FIXED-ROUTE

Mountain Lines fixed route service has nine routes which operate in Flagstaff city limits. Mountain Line operates 29 buses, twenty-three are 35' and six are 60' articulated buses. All Mountain Lines buses are Hybrid-Electric, the diesel engines on the hybrid buses currently emit significantly less greenhouse gas emissions than standard diesel engines, as shown in TABLE 1 below

The annual fixed-route fleet mileage in 2019 was 1,020,591 miles, of which 869,512 miles are driven annually by 35' buses and 151,079 miles are driven annually by 60' buses. The annual fixed-route fleet fuel use is 188,040 gallons of diesel, of which 156,923 gallons of diesel are consumed by 35' buses and 31,117 gallons of diesel are consumed by 60' buses.

TABLE 1 FIXED ROUTE EMISSIONS OVERVIEW

Bus Type	GHG Emitted Per year (Tons)	Annual net Savings from Standard Diesel (Tons)	% Reduction from Standard Diesel (Tons)
Standard Diesel	**3,586**	**------**	**------**
Hybrid-Electric	**2,620**	**966**	**27%**
Battery Electric	**840**	**2,746**	**77%**

TABLE 2 VEHICLES MILES TRAVELED AND FUEL USE (FIXED ROUTE)

Fiscal Year	Vehicle Miles Traveled	Fuel use (Gallons)	Boardings	Passenger Miles Per Gallon
2019	**1,020,591**	**197,976**	**2,541,353**	**5.15**
2020	**902,630**	**187,692**	**2,097,814**	**4.81**

Mountain Line strives to increase ridership and promote public transit throughout Flagstaff. Between Fiscal year 2014 and 2019 Mountain Line saw an increase from about 1,800,000 riders to about 2,500,000 riders which was an increase of 39%. Mountain Line's ridership dropped with the COVID-19 pandemic, but Mountain Line has already started to recover ridership since the pandemic. In total, from the first 12 months of the pandemic (April 2020 to March 2021), ridership has seen a 33% increase in the following year (April 2021-March 2022).

FIGURE 2 MOUNTAIN LINE HYBRID ELECTRIC BUS

TABLE 3 MOUNTAIN LINE RIDERSHIP BY YEAR

Fiscal year	Fixed Route Ridership	Percent Change from 2014 Base
FY 2014	1,828,209	NA
FY 2015	1,880,043	2.83%
FY 2016	1,928,797	5.5%
FY 2017	2,077,277	13.62%
FY 2018	2,440,622	33.49%
FY 2019	2,541,353	39%

TABLE 4 RIDERSHIP RECOVERY SINCE PANDEMIC

Month	Ridership April 2020-March 2021	Ridership April 2021-March 2022	Percent Change
April	56,585	77,535	37.02%
May	63,524	61,533	-3.13%
June	71,226	63,795	-10.43%
July	72,325	66,181	-8.49%
August	89,796	103,622	15.40%
September	109,102	151,013	38.41%
October	105,610	145,254	37.54%
November	71,637	121,147	69.11%
December	59,360	82,901	39.66%
January	65,687	108,086	64.55%
February	71,400	111,732	56.49%
March	76,948	125,804	63.49%
Total	913,200	1,218,603	33.44%

Ridership data is relevant to climate action since riding transit can help to reduce total Green House Gas emissions. A significant portion of our riders are choosing transit over driving, which will further help to reduce the number of emissions in the air. Mountain line estimates that moving around 10 percent of automobile trips within the City of Flagstaff to transit results in a reduction of 110 metric tons of GHG.

FIGURE 3 IMPACT OF TRANSIT

PARATRANSIT

Mountain Line also operates a complementary paratransit service. Mountain Line's paratransit fleet has eight cutaway vans that have been in service between five and ten years. All the Paratransit vans are diesel engines.

As Mountain Line replaces paratransit vans, Mountain Line will reevaluate replacement of the paratransit vehicles with battery-electric alternatives during the next replacement cycle, which is expected to begin in approximately 2028, as it is anticipated there will be additional alternatives available with increased range that would meet service needs. Currently a one-to-one replacement of vehicles in paratransit service is not feasible with a battery-electric option.

TABLE 4 PARATRANSIT VEHICLES TRANSITION TO ELECTRIC SAVINGS

Vehicle Type	Anticipated Emission reduction with Transition	Annual GHG net saving with transition (Tons)
Paratransit	**64%**	**143.7**

TABLE 5 VEHICLES MILES TRAVELED AND FUEL USE (PARATRANSIT)

Fiscal Year	Vehicle Miles Traveled	Fuel use (Gallons)	Boardings
2019	140,218	16,564	19,765
2020	73,809	11,897	16,011

NON-REVENUE

Mountain Line maintains a fleet of thirteen vehicles for non-revenue services. This includes five driver lunch vans, four service trucks, three supervisor vehicles, and one administrative vehicle. These vehicles are currently gasoline powered.

The battery-electric vehicle market continues to evolve and improve with more offerings introduced each year, including additional options for transit and service vehicles. Mountain Line will continue to monitor the market, and as vehicles are deemed to be necessary for replacement, determine individually if there is a suitable battery-electric replacement vehicle.

TABLE 6 NON-REVENUE VEHICLES TRANSITION TO ELECTRIC SAVINGS

Vehicle Type	Anticipated Emission reduction with Transition	Annual GHG net saving with transition (Tons)
Driver Lunch vans	**82%**	**81.4**
Utility Trucks	**84%**	**21.4**
Administrative and Supervisor	**92%**	**79.6**

MOUNTAIN LINE'S KASPAR HEADQUARTERS

In addition to environmental impacts from fleet, Mountain Line also puts sustainability and energy reduction at the forefront of our facility operations.

Mountain Line's current campus, Kaspar Headquarters, includes the following facilities. Shop 0 includes office space for fleet staff, paratransit storage, and tire and part storage. Shop 1 houses Mountain Line's maintenance bays, and Shop 2 includes facility storage and houses some buses. Shop 3 is our climate-controlled bus storage, training room, and bus wash. Kaspar Headquarters also houses all the admin functions, including office space for all administrative and planning staff.

FIGURE 4 MOUNTAIN LINE HEADQUARTERS OVERVIEW

ENERGY USE

Mountain Line utilized high efficiency lighting fixtures for exterior lighting and several interior locations utilize high efficiency lighting fixtures as well motion activated lights. In addition, all lighting is run through a customizable lighting management system which decreases wasted energy. This allows Mountain Line to decrease its total energy use. In addition, Mountain Line has solar panels on top of the bus storage roof, which during a sunny month generates 3000 kWh, which is more than Mountain Line's uses. This translates into approx. $1,200 -$1,500 a month in savings and Mountain Line feeds excess electricity back to the grid.

In 2014, Shop 3, fuel island, and bus wash were built. Shop 3 is over 20,000 square feet (about four times the area of a basketball court). This space has radiant in floor heat, which maximizes heat

recovery in the building when the exhaust fans are exhausting the bad air. Heat is lost in the process but the mass of the heated concrete along with the redundant high efficiency boilers allow the building to minimize the amount of energy needed to recover the lost heat that gets passed along with the exhaust gases. All overhead doors are activated by vehicle movement to increase security, minimize heat loss and to streamline personnel time and workflow. The entry side is activated by electronic tags in the windshield which are uniquely assigned to each vehicle. The exit side is activated by the motion of the bus inching up to the door. In both cases, the doors all have a green light that activates when the door is in the completely open position to signal the operator that it is clear to proceed through. The entry and exit doors automatically close after 15 seconds, which helps reduce heat loss.

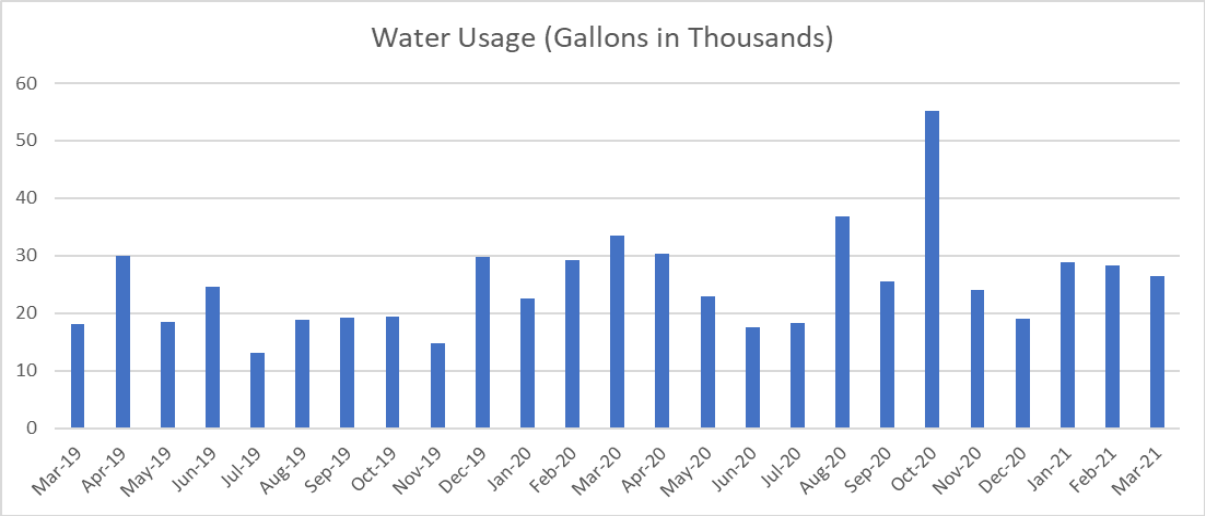
TABLE 7 MOUNTAIN LINE ENERGY USE

Fiscal year	Total Energy Use (kWh)	Solar Energy production (kWh)
FY 2019	278,900	150,000
FY 2020	265,160	150,000
FY 2021	273,340	150,000
FY 2022 (Estimated)	273,552	150,000
Total	1,090,952	600,000

WATER

Mountain Line strives to reduce precious water resources at our facilities. Mountain Line's bus wash utilizes reclaimed water components that minimizes fresh domestic water. This was an added option to the wash system that Mountain Line chose in consideration of water use and conservation. In addition, all of Mountain Line's landscaping utilizes 100% reclaimed water which further decreases new water use. The table below shows the water usage at Kaspar Headquarters for March 2019 – March 2021.

FIGURE 5 MOUNTAIN LINE WATER USAGE



MOUNTAIN LINE SUSTAINABILITY INITIATIVES

RECYCLING PROGRAM

Mountain Line has a standard recycling program with recycling bins and cans around Mountain Line's Kaspar Headquarters. In addition, Mountain Line also repurposes old shelters until maximum use which minimizes new material being added.

REFILLABLE WATER

Mountain Line has three refillable water stations, two in the main administrative office and one in Shop 3. These refill stations allow employees to refill water bottles which minimizes trash that comes from plastic water bottles.

EMPLOYEE BUS PASSES

Mountain Line offers free bus passes to all employees. This is to promote employee riding the bus to work as well as provides the option of taking Mountain Line for daily travel needs. The program also allows passes for family members and an additional pass for a friend.

REDUCE SINGLE USE PLASTIC

In 2019, Mountain Line bought reusable plates and utensils to use for company parties or other events with food. Prior to this investment, Mountain Line would buy single use paper or plastic plates and utensils, which would end up in the landfill.

BIKE SHARE PROGRAM

As part of a wellness and sustainability initiative, Mountain Line bought three bikes, which employees can use to go to meetings, run errands, grab lunch, or for recreation. This program encourages biking instead of driving and helps minimize the number of driving trips being made and encourages employees to leave their car at home. Mountain Line has two bikes at Kaspar Headquarters and one bike at the Downtown Connection Center.

ELECTRIC CHARGING

Mountain Line has two electric vehicles charging stations at the Kaspar Headquarters for employees to use for employees who have electric vehicles. This is through a partnership with Arizona Public Service (APS), Arizona's electricity generation company.

SILVER BIKE FRIENDLY BUSINESS STATUS

Mountain Line received a silver designation as a Bike Friendly Business from Bicycle Friendly America Program in 2015 and 2019. This is due to Mountain Line's commitment to promoting bicycling at our worksite, our bike to work week challenges, bike share program, covered and secured bike parking, and bike racks on all our buses.

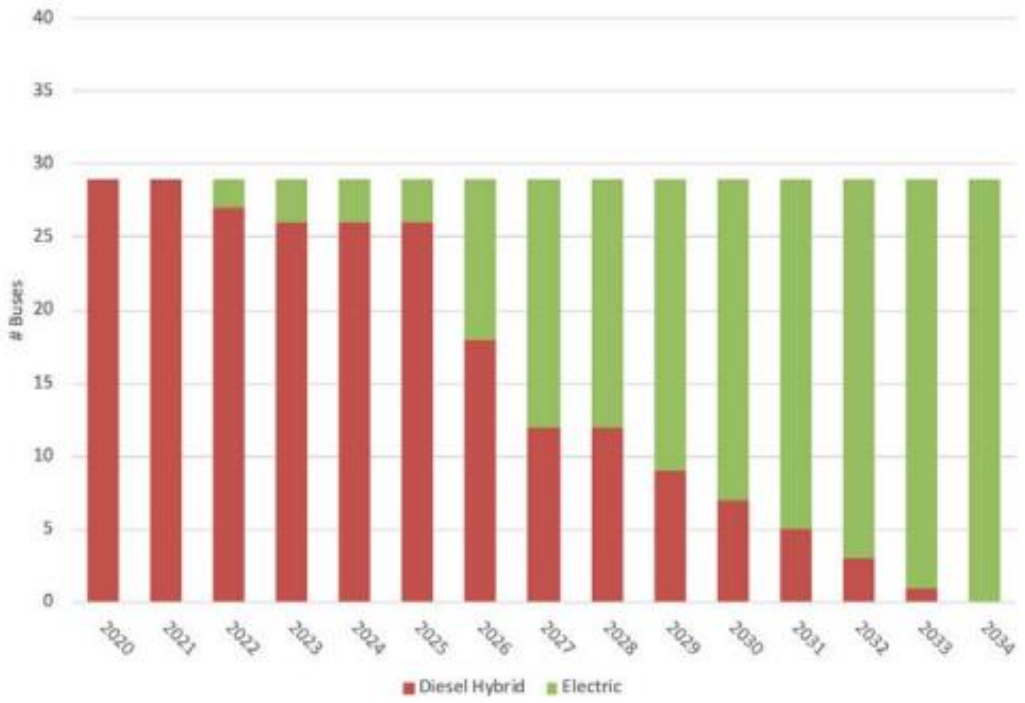
Mountain Line Plans

ZERO EMISSION BUS (ZEB) TRANSITION PLAN

In 2020, Mountain Line developed the ZEB plan with two parts. The first being a technology analysis to see which technologies would be best integrated into our current service and the second part creating

an implementation plan for integrating battery electric buses into our service. The Plan provides a template to transition to battery electric buses including the procurement process for purchasing buses, recommendations for service planning for how to organize charging, infrastructure needs to support battery electric buses, and environmental impacts of switching to zero-emission buses, and a general timeline for fleet replacement. Mountain Line anticipates transitioning its fixed-route fleet to be fully electric by 2034. By the end of the transition period, greenhouse gas emissions will be reduced by approximately 68% the equivalent of eliminating 282 passenger vehicles annually. Additionally, with electric utility provider goals to reach 100% renewable energy in the electrical grid by 2050, emission savings will only increase. The figure below depicts the annual fleet composition through 2034. This plan shows Mountain Line's commitment to sustainability and transitioning to a zero-emission Bus fleet, which will have significantly impacted on Green House Gas Emissions and Pollutants.

FIGURE 6 TRANSITION TO ELECTRIC FLEET PLAN DEPOT AND ON-ROUTE CHARGING



MOUNTAIN LINE STRATEGIC WORK PLAN

Mountain Lines Strategic Plan was developed for 2020-2025 and provides six primary goals to help guide Mountain Line. These goals are Service Excellence, Stewardship of Resources, Investing in Mountain Line Workforce, Enhanced Safety Culture, Community Engagement, Fiscal Responsibility. These first two goals heavily relate to sustainability.

Goals 1. Service Excellence

- This goal entails providing riders with a high quality of service, meeting the transit needs of the community, and making transit an attractive mode of transportation. By improving ridership experience, increasing transit access, and maintaining quality, Mountain Line

can shift trips from cars to transit. A ten percent reduction in driving to transit results in about 110 metric tons annually saved GHG emissions.

Goal 2. Stewardship of resources

- This goal entails maximizing the useful life of equipment and facilities, meeting community goals of sustainability, and ensuring Mountain Line promotes sustainability through its everyday actions

Goals and Strategies

GOAL 1. BY 2034 DECREASE TOTAL GHG EMISSIONS FROM FIXED ROUTE BUSES BY 68%

Strategy	Actions	Metric	Timeframe	Responsible Office
Fully transition Mountain Line's fixed route fleet to battery electric buses by 2034	Install battery electric charging infrastructure	Y/N install equipment	2023	Operations, Facilities, Procurement
	Implement two battery electric buses into revenue service by 2024	Y/N buses into revenue service	2024	Operations, Procurement
	Apply for grant funds for battery electric buses	Y/N Grant application is submitted	Continuous	Planning and administration
	Continue to follow the ZEB transition plan for fleet replacement	29 buses purchased	2034	Operations

GOAL 2. INCREASE TOTAL ANNUAL RIDERSHIP TO OVER 2.5 MILLION BY 2025

Strategy	Actions	Metric	Timeframe	Responsible Office
Promote policies that will lead to an increase of ridership	Marketing programs	Number of marketing events completed	2022	Marketing and Communications
	Sign-up 3 new ecoPASS contracts with	Number of contracts	2025	Planning and Administration

	housing and employers			
	Follow the 5-Year Transit Plan and Service Excellence Goal to increase ridership	Number of new riders	Continuous	Planning and Administration

GOAL 2. BY 2030, INSTALL 4,000 SOLAR PANELS AT THE DOWNTOWN CONNECTION CENTER, CREATING 164 MEGAWATT OF ENERGY

Strategy	Actions	Metric	Timeframe	Responsible Office
Install solar panels on DCC's roof and bus shelters	Write grants for solar panels	Y/N Grant application is submitted	2022	Planning and administration
	Install solar panels after DCC is built	Y/N solar panels	2024	Facilities
	Monitor energy production	Number of watts	Continuous	Facilities

GOAL 3. MOUNTAIN LINE STRIVES TO MAINTAIN AND PROMOTE SUSTAINABLE INITIATIVES THROUGH ITS POLICIES, OPERATIONS, AND DAILY EMPLOYEE ACTIONS

Strategy	Actions	Metric	Time frame	Responsible Office
Empower employees to make sustainable choices	Educate employees on existing sustainable initiatives at Mountain Line	Number of employee orientations, Number of Internal employee communications	Continuous	Human Resources, Marketing & Communications
	Increase rides and Employee Bus Passes and Bike Program	Review employee ridership and bike log	Continuous	Human Resources

	Continue to apply for grants that implement sustainable initiatives	Y/N Grant application is submitted	Continuous	Planning and Administration

Implementing the Plan

Mountain Line's sustainability goals span every section of the organization, and all employees are responsible for helping Mountain Line achieve the goals outlined in this plan. Mountain Line strives to continue our sustainable practices and will help meet these goals through the following upcoming programs.

ELECTRIC BUS PROCUREMENT

Mountain Line received an FTA Bus and Bus Facilities grant in 2019 for $2 million to purchase two battery electric buses. Mountain Line is currently in the procurement process to purchase the two vehicles and expect them to enter revenue service in 2023. This is a crucial step to keeping us on schedule with the fleet transition laid out in the ZEB plan and will allow for expedited procurement process for electric buses.

ELECTRIC CHARGING INFRASTRUCTURE

Mountain Line received an FTA Bus and Bus Facilities grant in 2021 for $1.2 million to purchase and install electric charging at Kaspar Headquarter for our new battery electric buses. This is a vital project as without this infrastructure, Mountain Line would not have a way to charge electric buses. The new Downtown Connection Center will also include electric charging opportunities, which Mountain Line is applying for grants to accomplish this.

CAMPUS BUS STORAGE

Mountain Line is partnering with Northern Arizona University (NAU) to construct a Bus Storage Facility on NAU's campus to store Mountain Line's and NAU's buses. This new facility is essential for Mountain Line's success by decreasing deadhead (saving 23,086 miles annually) and increasing storage capacity for electric charging infrastructure at Mountain Line's existing headquarters facility. This building is anticipated to be LEED certified. This project is currently unfunded, but Mountain Line is actively applying for grants to fund this important project.

DOWNTOWN CONNECTION CENTER

Mountain Line is planning to build a new Downtown Connection Center in 2024. This building would serve as the new office space for Mountain Line staff, public facing amenities for our riders, operator break room, and main hub for all our routes. This new facility would contain the following programs to promote sustainability.

- Certified through Coconino County Sustainable Building Program
- Contain water bottle fillers
- Public and secured bike parking

- Local and low-water landscape
- Will be designed to support electric buses for on route charging
- Use locally sourced materials for construction
- Contain solar panels to provide an estimated amount of 164 Megawatts of renewable energy annually

Mountain Line is known for its broad range of innovative transit services, green practices, and visionary approach to meeting the transportation needs of the region. This plan reinforces that reputation by clearly defining the agency's sustainability goals. This is the first version of a Sustainability Plan, and it will need to respond to changing policies, goals, and conditions in the future. It will be re-evaluated for relevancy and updated as needed.