Wasco County Public Transportation Advisory Committee

Agenda

Monday, January 8, 2024
The Dalles Transit Center, 802 Chenowith Loop, The Dalles
Remote Option via Zoom: https://us06web.zoom.us/j/87352952389
Or call 719-359-4580, Meeting ID: 873 5295 2389
10:00 – 11:00 AM

Topic	Time	Item
Call to Order and Introductions	10:00	
Minutes Approval *October 2023*	10:05	Approval
Committee Member Application	10:07	Recommendation
Grant Applications	10:10	Recommendation
Staff Updates • The Link • Travel Trainer	10:15	Information/ Discussion
STIF Plan Implementation	10:25	Information/ Discussion
Final Climate Action Plan Report *Guest Christoph Zurcher*	10:30	Information/ Discussion
New Business/ Good of the Order	10:55	
Set Next Meeting and Adjourn	11:00	

The meeting location is accessible to persons with disabilities. If you have a disability that requires any special materials, services or assistance, please contact us at 541-296-2266 (TTY 711) at least 48 hours before the meeting.

WASCO COUNTY PUBLIC TRANSPORTATION ADVISORY COMMITTEE
MONDAY, October 9, 2023 at 10:00 am
MCEDD CONFERENCE ROOM & ZOOM TELECONFERENCE

COMMITTEE MEMBERS: Louise Sargent (Chair), Jesus Mendoza, Thomas Tramontina, Rita Rathkey, Lee Bryant

***STAFF*:** Jessica Metta (MCEDD Executive Director), Jill Brandt (Administrative Assistant), Sara Crook (Travel Trainer)

Guests: Jovi Arellano (ODOT)

CALL TO ORDER/INTRODUCTIONS

Louise Sargent called the meeting to order at 10:00 am. A quorum was present.

MINUTES

Louise asked for any questions, comments, or edits on the minutes from the July 10, 2023 meeting. *There were none.*
Thomas Tramontina moved to approve the minutes as presented; Rita Rathkey seconded the motion. All voted in favor and the motion passed.

COMMITTEE VACANCIES: STRATEGY DEVELOPMENT

Jessica asked the committee for their thoughts on possible candidates for the vacancies representing South Wasco County and the Latino/a/Hispanic community. Louise suggested Tom McDowell who lives in Wamic, and she promised to send the phone number to Jessica after the meeting. Rita asked if the person should be someone who uses public transportation. Jessica said that this person will represent the interests of South Wasco County and the Hispanic Community. She added that there is a new South Wasco newspaper that we will advertise in to get the word out. Rita suggested Celeste at The Next Door, who speaks Spanish and recently moved to The Dalles. Jesus knew her and offered to reach out to her. Sara and Louise both agreed that having someone who works at The Next Door will have good access to the needs of our local Hispanic community.

NET-ZERO TRANSIT REPORT

The full report was included in the packet. Jesus gave a short summary of this study that The Link participated in. The stated goals are to reduce emissions by 45% by 2030, 70% by 2040, and 90% by 2050. Information was gathered for this report from July 1, 2020 through June 30, 2021. Jesus explained the different categories. This report supports The Link's strategy to transition to hybrid and electric vehicles. Jesus gave the group an update on where he was at in the process of purchasing an electric bus. Current waiting time is 6-9 months. Jesus will be meeting with Hire Electric to explore the cost for the infrastructure that will need to be installed to run the electric bus.

> *Discussion: Tom asked how long it would take to charge a vehicle. Jesus explained that Level 1 chargers take 0-2 hours, Level 2 chargers take from 6 to 18 hours and Level 3 chargers are designed for overnight use. Tom asked if multiple charging stations would be needed, and Jesus replied yes. He added that the high cost of electric vehicles means that the current plan is to purchase one vehicle.*

Jessica noted that the information from this study can be used to compare The Link's overall emissions with other rural districts. While increasing The Link's service means that we put out more emissions, it also means that individual cars won't be putting out those emissions. She further explained that state and federal funding opportunities are all focused on new electric vehicle purchases, and there is no interest in funding fleet replacements with gas vehicles. Grant funding has been increased accordingly to cover the higher costs of electric vehicles.

> *Discussion: Rita asked if electric vehicles would be used in town only because of their range limitations. Jesus responded that a fixed route will be used to test the range, and that other factors such as the weight load in the vehicle and the terrain will make a difference. He added that CAT's electric buses were tested and mostly go on the freeway. Louise voiced her support for The Link to go electric.*

Lee Bryant entered the meeting at 10:15 am.

Jesus explained that he was also looking at how these vehicles will be maintained, and that The Link will likely have to find someone in Portland for maintenance. Certification requirements for EV mechanics include a minimum of 800 square feet for room to work, and local garages can't expand their shop space.

MARKETING IDEAS FOR THE LINK

Jessica introduced the topic of seeking Committee feedback on how we are currently marketing The Link and other potential marketing ideas. Jesus summed up current marketing efforts. Radio ads are running in Spanish with plans to run them in English. Advertising is also running on social media and in the local movie theaters. Materials are posted in the bus shelters.

Sara Crook has been providing regular quarterly updates and flyers. Sara explained that marketing has settled in a cycle of seasonal outreach. Sara has developed a two-year plan for specific events for tabling based on the past two years that is focused on targeted times of the year. Flyers have been created specifically to inform students of The Link's services, and Sara has been going out to the schools personally to get the flyers posted where kids will see them.

> *Discussion: Rita commented that she loved the new wraps on the buses. There were no other ideas offered.*

STAFF UPDATES

The Link

Jesus informed the group that The Link has applied for more COVID grant funding that will cover the operations cost to add one more daily Hood River shuttle run. He is still examining whether this will be better to run for the morning commute or the evening commute between The Dalles and Hood River. The Link has also received an award of $80,000 to support transportation to and from Native American in-lieu sites along the river for one or two days per week.

> *Discussion: Louise asked how Native American involvement in the system was tracked. Jesus added that active shuttles are tracked, and when we have the Native American shuttle route stops*

added to the system, the tracking will automatically assume that riders getting on and off at these stops are Native Americans. Currently there is only Dial-a- Ride service to the in-lieu sites.

Jessica explained that this service will be designed with and for the tribes. This funding has come out of Kathy Fitzpatrick's work to provide Native Americans transit to vaccination sites during COVID. The service was really appreciated and has made the community aware of the value of transportation services.

Jesus continued with his report on The Link operations over the past quarter. The vehicle wraps project has been completed, except for buses 23 and 26 which are scheduled for replacement in the next year. Staff are finishing up with the annual inspections. Work continues to secure the next electric or hybrid purchase. The vehicle maintenance software has been upgraded from Auto Wolf to Driveroo, which allows drivers to log the pre-shift vehicle inspections on tablets, replacing the paper logs. He summarized facilities and bus shelters updates from the written report. Service hours have been increased as per the Transit Development Plan's recommendation. The Link hired new staff: Bob Fisher, Nichole Rodriguez and Jeff Oldfield. Jeff has been working weekends covering both the Dial-a-Ride and Hood River services. The Link staff have been offered a four-day work week option with the longer shifts.

Jesus reported ridership information over the past quarter, which saw an increase. There were 12,328 miles added with the The Dalles/ Hood River service route beginning on July 1. Sundays averaged 10 persons per day on the Dial-a-Ride and Hood River shuttle. An extra red route was added to eliminate the time gap during the driver's lunch, reducing the midday wait time for clients.

Discussion: Rita asked if miles were calculated per passenger, and Jesus answered yes.

Jessica reported on highlights of Kathy Fitzpatrick's regional Mobility Management work over the past quarter. Kathy coordinated a workshop for the leadership personnel at all five Gorge transit provider agencies. Transit consultants were brought in to show how to coordinate schedules better. Awards were received for both the Gorge Regional Transit Strategy and for Sara's Transit Connect program.

Travel Trainer

Sara Crook said the Gorge Transit Connect Program partners with social service organizations and provides resources. The partners determine who in their programs qualifies for Gorge passes in Hood River and Wasco Counties. She recruited Lucius, the new supervisor who runs the drop-in youth center, into the Gorge Transit Connect program.

Outreach has continued at schools, at community events such as the Latino Festival, Native Americans health fairs over the past summer and now back to school events. Sara distributed passes to students in schools and at the youth drop-in site. She also attended the Veterans' Stand Down event, where she conducted outreach to veterans and gave out some free passes.

The final version of our travel training videos library is now posted on the Gorge Translink website, under the Travel Training tab. Sara put the webpage up onscreen. She noted that there are both English and Spanish translations. The videos show kids how to ride on the bus, how to ride on the bus with bikes, and more. Sara explained that she is now incorporating playing the videos into her

outreach booth, after she had huge interest at the Hood River High School event when she tried out using her laptop to show the videos.

Discussion: Lee asked if the driver would assist older people who ride to put their bike on. Sara explained that riders are supposed to be able to load by themselves, so no. Jovi complimented Sara on the films.

STIF PLAN IMPLEMENTATION

Jesus reported that the deviated fixed routes have adopted the expanded hours and stops recommended in the Transit Development Plan. The Transit Development Plan calls for South County routes with a Monday-Tuesday or Tuesday-Wednesday split to accommodate overnight trips for riders to have services. The Link has not been able to fully staff the South County service with the driver shortage, and the service may not be able to run over the winter. Dial-a-Ride has been expanded to 7pm, but there has been pushback from the drivers for the change to 8pm.

Discussion: Jill asked how long it took for riders to become aware of the increased hours. Jesus explained that the numbers from the past quarter showed that there was a two-week delay from when the hours changed until people started riding. Lee asked if there was advertising at the theater. Jesus confirmed there is. Louise suggested that Sara put up her "Need a ride?" posters up at the courthouse, for when people have their license suspended. Sara agreed.

Jesus added that he was working with Kathy to find people who want to participate in vanpools. He has been holding off on installing the reader boards on the buses because of the cost. The next projects earmarked for funding are the Ecolane software upgrade which will allow riders to book their own rides and the bus shelters installation and bike racks at each shelter.

Current advertising with the movie theaters has been purchased for a full year. There are plenty of brochures with The Link's information. Gorge Pass marketing continues through Gorge Transit Connect with our partners purchasing passes at half price, making the program sustainable for the long term. The Link continues to provide free rides for high school students.

NEW BUSINESS/ GOOD OF THE ORDER

Rita asked for some clarification on where the line is for assistance to riders that have mobility management issues. How much can we help people, and when can we not help them anymore? At what point do we refuse service for dial a ride? Jesus explained that The Link will provide door to door assistance with Dial-a-Ride passengers. If a Dial-a-Ride passenger needs to have an assistant, that person can ride for free. If we know that a rider needs assistance, dispatch will ask a family member or DHS to be there when the bus shows up. He added that MATS (Mount Adams Transportation in Klickitat County) does door through door, with drivers going into the house to assist riders to get out and onto the bus, and at the end of ride taking the passengers inside to their appointment.

SET NEXT MEETING AND ADJOURN

The next meeting was set for January 8th, to be held in the MCEDD conference room at 10am.

Louise Sargent adjourned the meeting at 11:00 am.

Respectfully submitted by Jill Brandt, Administrative Assistant

To: Wasco County Public Transportation Advisory Committee
From: MCEDD Staff
Date: January 2, 2024
Re: Committee Member Application

Since the October PTAC meeting, we received an application from Celeste Peralta for the seat representing the Latino/a/Hispanic community and from Melissa Napoli for the seat representing South Wasco County. Since these two seats had been long vacant, staff went ahead and forwarded them to the Wasco County Board of County Commissioners for appointment.

Since the October meeting, Kris Boler asked not to renew her appointment to the Committee and staff recruited someone to fill the vacancy that could represent the disabled community. The application received from Chris Howell is included in your packet. Staff requests a decision to potentially recommend Chris' appointment by the Wasco County Board of County Commissioners.

INFORMATION AND QUALIFICATION FORM

Public Transportation Advisory Committee

VOLUNTEER POSITIONS
WASCO COUNTY, OREGON

BACKGROUND

The **Public Transportation Advisory Committee** (PTAC) is an essential component of a successful Transportation Program. The purpose of the committee is to represent the people who are served by the Special Transportation Fund Program. The advisory committee considers how transportation funds should be spent and provides the governing body with information about their community's special transportation needs, particularly related to how projects will benefit seniors and persons with disabilities. The Public Transportation Advisory Committee reviews grant applications requests and updates on the required Human Service Transportation Coordination Plan.

The **PTAC** also assists the Commissioners in tasks and duties supporting local and regional transportation services funded through the State Transportation Service Providers by:

- Reviewing and advising staff on updates to the Local Transportation Plan.
- Reviewing all proposed projects and funding levels for the STIF Plan that funds transit services.
- Reviewing and providing feedback on proposed programs, service changes, policy changes and other transit investments.
- If requested, and in the manner directed by the Commissioners, reviewing and advising staff on the methodology for distribution of Program monies allocated to Wasco County.
- Review of Transportation Discretionary applications upon request.

APPLICATION

Provide personal qualifications for this specific volunteer position.
Supplementary information may be attached. Do not provide confidential information.

Name: Christopher Howell

Address: [redacted], The Dalles

Phone (home)_____ Phone (work) 971.703.3992

E-mail address: christopher.j.howell@odhs.oregon.gov

Signature: Christopher Howell

Date: 12/11/2023 Number of years as a Wasco County resident: 8

Your objectives/goals? Desired contributions and accomplishments? Contribute to decision making on how transportation funding will be used to address the needs of people who experience barriers to employment or disabilities.

Education (school, college, training, apprenticeships, degrees, etc.)

University of Houston, B.S. Psych. Date(s): 5/2003

_____ Date(s): _____

_____ Date(s): _____

_____ Date(s): _____

Experience (work, volunteering, leadership roles, achievements etc.)

- Developmental Disabilities Service Coordinator - MCCFL Date(s): 10/2015 - 7/2020
- Vocational Rehabilitation Counselor ODHS Date(s): 7/2020 - present

General Comments/Additional Relevant Information

Send completed form to:

Wasco County
511 Washington Street, Suite 101
The Dalles OR 97058
(541) 506-2520
(541) 506-2551 (fax)

To: Wasco County Public Transportation Advisory Committee
From: MCEDD Staff
Date: January 3, 2024
Re: Grant Applications

Overview
The 2024-2026 Discretionary Mid-Cycle Grant Solicitation will open January 4, 2024 and close March 12, 2024. Funding is available for capital, operations, and planning projects. Pending approval by the Federal Transit Administration, the grant agreement period for planning and operations projects is from October 1, 2024, to September 30, 2026, and the grant agreement period for capital projects is October 1, 2024, to September 30, 2028. Grant programs include the following:

- Statewide Transportation Planning Grant Program (Federal Transit Administration (FTA) Section 5304)
- Mass Transit Vehicle Replacement
- Enhanced Mobility of Seniors and Individuals with Disabilities (FTA Section 5310)
- Bus and Bus Facilities (FTA Section 5339)
- Surface Transportation Block Grant Bus Replacement

In prior rounds, we have received Enhanced Mobility of Seniors and Individuals with Disabilities (FTA Section 5310) grants to launch/ expand our bus routes in The Dalles, and Bus and Bus Facilities (FTA Section 5339) grants to replace vehicles and purchase bus shelters and poles. The last round of 5310 funding passed through Wasco County instead of directly to MCEDD to save us costs on required match rates (there is a difference in match rates between "purchased services" and "operations").

For operations projects, funding to maintain The Dalles routes is a high priority. The STIF Plan funds we receive will not stretch as far as they can if we must use them to fully fund The Dalles routes.

For capital projects, our current thinking on priorities for vehicle and facility needs are:

1. Secure funding for a zero-emission project for "related infrastructure" allowing us to purchase and install charging equipment to make the fleet transition possible.
2. Replace two vans that have exceeded their useful life. We would evaluate the vehicle options that are currently available and utilize Fleet Transition Plan to make procurement decisions.
3. Procure reader boards for all vehicles.

We have no priorities right now for planning projects.

As additional information, relevant pages from the adopted Transit Development Plan are attached.

Request
Recommend funding priorities for these grant opportunities.

Next Steps
Once the full application details are released, MCEDD staff will work to determine the best grants for the funding priorities given our needs, differing match rates, and competitiveness of our applications. We will also determine if the applicant should be MCEDD or Wasco County. If Wasco County, we will inform them of the PTAC's feedback when we request their assistance. Grants would be submitted by March 12.

FUTURE SERVICE OPPORTUNITIES AND SERVICE PLAN

Future routing service opportunities are identified by timeframe. The prioritization of these opportunities considered several factors, including evaluation results, funding availability, and other factors influencing decision-making, including other services and capital purchases.

Table 2 shows recommendations for short-term, mid-term, and long-term implementation of the recommended service opportunities.

- **Short-term (0–5 years) plan** includes items that are low cost to implement, have high ridership potential, and improve connectivity to other providers. No new buses are needed for these opportunities.
- **Medium-term (5–15 years) plan** includes items that are low-to-medium cost and improve travel time, connectivity, and access. Some of these opportunities require purchasing additional buses.
- **Long-term (15+ years) plan** includes items that are medium-to-high cost to implement, have moderate to higher ridership potential, increase connectivity, and increase service availability and frequency.

The intent of these implementation tiers is to provide a plan for implementing service opportunities that considers the complexity and capital requirements. The **unconstrained** column in the table outlines additional opportunities The LINK could implement if and when additional funding becomes available.

Table 2: Recommended Service Opportunities

Route	Short-Term	Medium-Term	Long-Term	Unconstrained
Red Line	Convert the Red Line from a loop to an out-and-back line and add stops	--	Adjust route to serve future development near the Port	--
Blue Line	Add stops and reduce Blue Line frequency to allocate time to Red Line. Revise Blue Line for future development at the same time as converting the Red Line.	--	--	Add a clockwise version of the Blue Line
Downtown The Dalles Express Route	--	--	--	Create new out-and-back route in The Dalles (via 6th Street and 7th Street)
Service Enhancements in The Dalles	Provide dial-a-ride service on Sundays		--	Extend service hours in The Dalles. Provide weekend service in The Dalles.
Hood River	Extend The Dalles – Hood River service to connect to CGCC	--	--	Increase service frequency between The Dalles and Hood River

Route	Short-Term	Medium-Term	Long-Term	Unconstrained
South County – Maupin	Expand South County route to Maupin, operating 2 days/week; 2 trips/day	--	--	--
South County – Madras	--	Create route to Madras, operating 2 days/week; 2 trips/day	--	Increase service frequency to more days per week
South County – Warm Springs Reservation, Madras, Shaniko, Antelope	--	Provide service 2 days/month; 2 trips/day	--	Increase frequency of service to more days per month
Information and Technology	Provide real-time vehicle arrival information	Monitor the reliability of real-time vehicle arrival software and trip planning software. Monitor and consider implementing emerging technologies.		--
Education and Marketing	Provide continued education and marketing; update LINK branding on buses, stops and signs. Provide information about where the service goes, how to ride the bus/use stops, and how to pay fares.			--
Capital Plan	Add bus shelters and route information to bus stops Replace vehicles at the end of service life	Purchase new buses Electrify vehicle fleet	Purchase new buses Add a second transit center in Downtown The Dalles	--

Short-Term Service Plans

Short-term service plans include service opportunities that could be implemented within the next five years. Under the fiscally constrained scenario, The LINK cannot make changes that increase service costs in the short-term unless they receive discretionary STIF or FLAP funding for service to extend/expand South County. Within the Dalles, the recommended Blue Line and Red Line changes reallocate existing resources and provide minimal increases to dial-a-ride service, staying within existing funding sources.

Update Existing Routes in The Dalles

Existing routes within The Dalles can be modified to better serve existing travel patterns and identified needs. Generally, these route modifications provide additional connections to/from employment and residential areas. Recommended updates to the deviated-fixed route services are shown in Figure 3[1] on page 15 and described below.

[1] The grey circles show a ¼-mile walking-distance radius around potential transit stop locations. Transit stops along the deviated fixed-route lines are needed every ¼ – ½ mile. Stop locations shown in the map are approximate and need to be further refined to confirm that there is available space for transit stop amenities and there is a safe place for a bus to stop.

To: Wasco County Public Transportation Advisory Committee
From: MCEDD Staff
Date: January 2, 2024
Re: Staff Reports

Grants:

- The two CARES 5311(f) Federal Grant to support one (1) additional service hour on The Dalles/Hood River, Monday-Friday route and the shuttle to the Native American in-lieu sites were approved but we have not yet seen a contract. We have had informal meetings with some of the proposed Advisory Committee members for the Daily Needs Shuttle, but we are waiting to schedule a formal launch meeting until we receive the contract from ODOT.
- We received the annual contribution from the City of The Dalles and are working on our request for next fiscal year's funding.

Vehicles:

- The Link completed the vehicle annual inspections and the annual Winter tire rotation.
- We are continuing to try to work with ODOT on implementing the grant we have to purchase a hybrid or fully electric vehicle.

Facilities:

- We continue the process to install bus shelters in The Dalles. Applications have been submitted to the City and County. The application for installation at 5th and Court has been approved, but we are waiting for the license agreement from City of The Dalles. Foley Lakes and One Community Health permit applications are on hold pending updated site maps/engineering documents.
- Mid-Columbia Community Action Council expressed interest in a shelter for the Gloria Center. We will be siting our fourth and final shelter there.

Marketing/Outreach

- The Link participated in the The Dalles' Starlight Parade with decorated bus, distributed safety items, and promotional material. The event was one of our favorite outreach activities this December. (Picture at right)
- Jesus participated in an interview with Radio Tierra to promote The Link services and enhance outreach to the Latino population.
- We purchased Ad space in the South Wasco Times to increase South County shuttle awareness.

Staff: The Link added three new drivers. We are happy to welcome Tim Curran as part-time Driver, Carmen Walker as full-time Driver, and Allan San Juan as a full-time position performing both Bus Driver and Dispatcher/ Scheduler duties.

Committee: We provided an orientation for new member Celeste Peralta and recruited applications from Melissa Napoli and Chris Howell.

Gorge Translink Alliance

MCEDD's Mobility Manager Kathy Fitzpatrick coordinates the Alliance which seeks to enhance regional connectivity and develop a seamless network of transportation services in the five-county region. These providers include Mt Adams Transportation Service (Klickitat County), Skamania County Transit, Columbia Area Transit (CAT), the Link (Wasco County), and Sherman County Community Transit.

Implementation of the Gorge Regional Transit Strategy

MCEDD received grants from ODOT and WSDOT to put the Gorge Regional Transit Strategy's recommendations into action. Kathy will lead this project, which will focus on the prioritized operational strategies and will also engage both policy makers and the Gorge community in outreach activities, culminating in a large community event. The Gorge TransLink Alliance will focus on operational strategies in 2024, with the goal of improving coordination of the regional transit system. The second goal of the project is to continue to build community and policymaker support for public transportation by demonstrating the importance of this regional system with data and with the stories of the many riders for whom transit is a lifeline.

Vanpool Programs

Both Columbia Area Transit and The Link Public Transit have budgeted funds to subsidize vanpools in Hood River and Wasco Counties. Vanpools are especially important in rural regions, where many communities are located long distances from the major job centers. If you know of an employer that might be interested in exploring a subsidized vanpool program for their employees, please contact Kathy at kathy@mcedd.org.

MCEDD Travel Training Program

MCEDD Travel Trainer Sara Crook manages the Gorge Transit Connect program, the Go Vets Columbia Gorge program, and is available to assist individuals with their travel training needs in Wasco and Hood River Counties.

The Gorge Transit Connect program welcomed the Columbia Gorge Food Bank as an official community partner this quarter! We are working with the main distribution center on Klindt Drive to provide transportation resources and fare assistance for clients in need.

Native American Transit Project: MCEDD recently received an ODOT Innovative Mobility Grant for a project that provides Gorge Passes and travel training services to the Native Americans living in the Columbia Gorge. Sara is accompanying partners that work one on one with residents the in-lieu and Treaty Access Fishing sites to bring passes and travel training education directly to the residents of these communities.

Veterans' Services: Sara and Kathy assisted with the planning for the Wasco County Veterans' Stand Down, the first in the region in 6 years. Sara spent the day working with Veterans to understand their transportation needs and distributed the 12-month universal fare Gorge Passes to Veterans who were interested in using the regional transit system.

Our spot at the Stand Down event in October.

To: Wasco County Public Transportation Advisory Committee
From: MCEDD Staff
Date: January 2, 2024
Re: STIF Plan Implementation

The Wasco County FY24 and 25 Statewide Transportation Improvement Fund (STIF) Plan was developed with more projects than could be funded in case revenues trended much higher than anticipated. Unfortunately, they are trending lower than expected instead. Staff are prioritizing preserving service and eliminating or reducing other categories. The following table shows the differences between the original and revised budget for Committee discussion and feedback.

Project Name	Project Description	Original Budget	Revised Budget
Routes & Connections			
Deviated Fixed Route	Continues to operate Deviated Fixed Route in The Dalles. Year 1 is match for the existing grant. Year 2 assumes no grant received, covers weekday and Saturday service.	$ 690,120	$ 388,816
South County Service	Service to South County twice per day, two times per week.	$ 144,000	$ 72,000
Weekday Dial-a-Ride	Dial-a-ride service from 7:30am to 4:30pm. (This is the historic STF grant project.)	$ 156,940	$ 156,940
Weekend Dial-a-Ride	Dial-a-ride service from 9am to 4pm on Saturday and Sunday.	$ 140,000	$ 140,000
Expanded Hours for Employment Transportation	Dial-a-ride service from 6am to 8pm on weekdays. Only supports time outside of 7:30am to 4:30pm.	$ 175,000	$ 175,000
The Dalles-Hood River Service	Provides 20% match needed for service between Hood River and The Dalles. Four times per day on weekdays and three times per day on Sat/ Sun.	$ 39,811	$ 39,811
Vanpooling Subsidy	Subsidizes two vanpools to support transportation beyond what The Link can easily provide.	$ 24,000	$ 12,000
Fleet and Technology			
Hybrid Bus (12/2)	Provides grant match to purchase hybrid vehicles. Assumes some cost increases.	$ 93,800	$ 18,800
Readerboards	Adds readerboards to the sides of all existing buses with bilingual messaging. This project would only be funded if STIF estimates come in higher.	$ 36,000	$ -
Ecolane Upgrade #1	One-time fee for Ecolane mobile app (self booking, self vehicle tracking) and annual fee for one year.	$ 42,000	$ 1,500

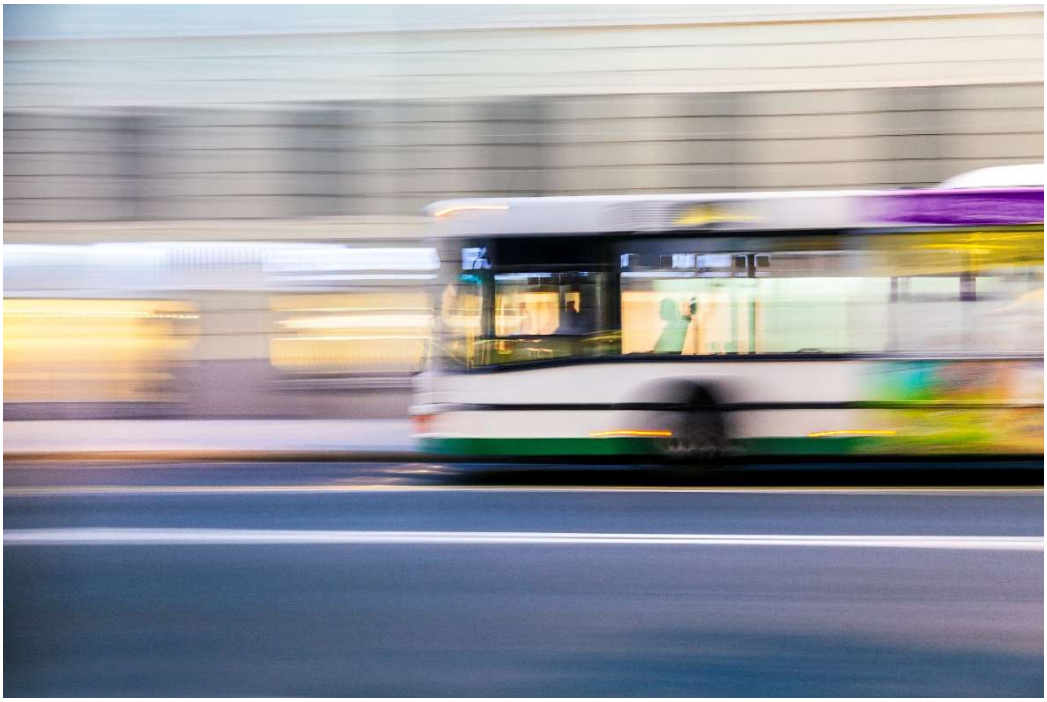
Ecolane upgrade #2	One-time fee for Ecolane improvements (pre/post inspections, customer service tracking, robocalls) and annual fee for one year.	$ 61,000	$ -
Facilities & Bus Shelters			
Bus Shelters	Grant match to purchase/ install bus shelters.	$ 20,000	$ -
Bike Racks	Purchases bike racks to install at all shelters.	$ 4,000	$ 4,000
Administrative Support			
Grant Match Reserve	Creation of a general grant match reserve fund that could be used as needed to match grants for capital or operations. Any additional STIF funds would be placed here.	$ 10,000	$ -
Administrative Support	General planning and grant management support at 10% of total.	$ 91,500	$ 91,500
Marketing			
General Marketing	Billboards, brochures, print media, radio, movie theaters and other marketing costs to promote The Link in general	$ 10,000	$ 4,000
Gorge Pass Marketing	Marketing specific to the Gorge Pass used as grant match.	$ 16,000	$ 16,000
Free Fares for Low-Income	Provides free dial-a-ride tickets and Gorge Passes for low-income residents, distributed through the Gorge Transit Connect program.	$ 27,750	$ 27,750
Spanish Language Outreach	Spanish-langauge advertising/ marketing materials and cultural-sensitivity training.	$ 10,000	$ 10,000
High School (9-12) Promotional	Free rides for high-school students at 1% of total. Outreach materials for high school students.	$ 19,400	$ 19,400
Planning & Mobility Management			
Mobility Management	Staff support to update the coordinated plan, set up vanpools, outreach to older adults, exploring other services to improve transit for seniors, disabled, low-income, Native American and Limited English Proficiency populations.	$ 20,000	$ 20,000
Travel Trainer	Staff support to provide training on how to use the transit system and promote The Link at public events.	$ 102,015	$ 102,015
	PLAN TOTAL	**$ 1,933,336**	**$ 1,299,532**
	Dec. 2023 estimate for total plan funding		**$ 1,297,492**

To: Wasco County Public Transportation Advisory Committee
From: MCEDD Staff
Date: January 2, 2024
Re: Final Climate Action Plan Report

At the October PTAC meeting, we presented The Link's Greenhouse Gas Inventory report and discussed our participation in a pilot project funded by ODOT to help create a climate action plan for The Link. The final plan is now complete and is included in the packet. Please read at least the Executive Summary prior to the meeting. We will be joined by guest Christoph Zurcher who helped develop the report. Christoph will present the report at the meeting and answer any questions.

Climate Action Plan

The LINK Public Transit



October 20, 2023

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Acronyms and Abbreviations

APTA	American Public Transportation Association
CAP	Climate Action Plan
CO_2e	carbon dioxide equivalent
EO	Executive Order
EV	electric vehicle
FTA	Federal Transit Administration
FY	fiscal year
GHG	greenhouse gas
MCEDD	Mid-Columbia Economic Development District
MT	metric ton
ODOT	Oregon Department of Transportation
TDP	Transit Development Plan
The LINK	The LINK Transit Agency
ZEFTP	Zero Emissions Fleet Transition Plan

Executive Summary

The LINK Transit Agency (The LINK) developed this Climate Action Plan (CAP) as a part of the Oregon Department of Transportation (ODOT) Net-Zero Emissions Pilot.

To understand the most significant greenhouse gas (GHG) emissions sources and develop an emissions baseline, The LINK completed a GHG emissions inventory for fiscal year 2021 (FY2021) as outlined in Section 3. The inventory highlighted that fleet combustion of gasoline, and the associated upstream energy emissions, make up the largest source of emissions (87%). Employee commuting and supply chain account for the next largest categories at 6% and 5% of emissions, respectively. Electricity emissions account for only 1% of the baseline inventory, but this is an important emissions source to monitor as electricity demand from electric vehicles (EVs) grows. The goals outlined in this CAP address the most impactful emissions sources and align with the strategic goals of The LINK/Mid-Columbia Economic Development District (MCEDD) Transit Development Plan (TDP) (Section 4).

Section 5 outlines four primary goals, each with specific emissions reduction targets, strategies, and action items to align with Oregon Executive Order 20-04 (EO 20-04).[1] Table 1 shows the emissions reduction targets for each goal.

Table 1. Emissions Reduction Goals, Targets, and Recommendations Summary

Emissions Source	Baseline Inventory (MT CO_2e)	Goal	Recommended Actions	Estimated Reduction vs. Baseline by 2035	Estimated Reduction vs. Baseline by 2050
Fleet	271	Transition fleet to cleaner fuel sources	• Transition urban fleet to EVs and rural fleet to EVs/green hydrogen • Establish Integrated Fleet Agreement with Gorge TransLink Alliance	55%	100%
Electricity	2	Transition to renewable energy sources	• Evaluate feasibility and cost of purchasing renewable energy from the utility • Establish and implement plan for phasing in renewable energy • Evaluate the feasibility and cost of onsite solar options and install where feasible	40%	60%
Employee commuting and business travel	20	Reduce employee commuting and business travel emissions	• Educate employees on availability of low-carbon transportation options and incentives • Establish and enforce a remote work policy	10%	45%
Supply chain	17	Reduce supply chain emissions[2]	• Establish and implement a sustainable procurement policy • Track supplier performance	3%	5%
Total	**310**			**49%**	**91%**

CO_2e = carbon dioxide equivalent
MT = metric ton

[1] "Directing State Agencies to Take Actions to Reduce and Regulate Greenhouse Gas Emissions." Executive Order No. 20-04. https://www.oregon.gov/gov/eo/eo_20-04.pdf.

[2] Supply chain emissions refer to emissions associated with purchased goods and services.

The LINK has the potential to reduce emissions 49% by 2035 and 91% by 2050. As services expand and ridership increases, The LINK can further contribute to meeting EO 20-04 statewide goals to reduce GHG emissions to (1) 45% below 1990 levels by 2035, and (2) 80% below 1990 levels by 2050[3] by enabling transportation mode shift from more carbon-intensive transportation options in its service area. These reductions are also aligned with the Federal Transit Administration (FTA) Zero Emissions Fleet Transition Plan (ZEFTP) requirements.

This report provides the following inputs for sections of the ZEFTP including:

- Long-term fleet management plan – **Appendix C**, the Fleet Transition Plan, shows the long-term fleet replacement schedule that integrates the transition to zero-emissions vehicles.
- Availability of resources to meet costs –**Appendix D**, Funding Opportunities, provides funding opportunities available to the agency.
- Evaluation of existing and future facilities – Section 6, Strategies and Actions, provides infrastructure needs.
- Impact of transition on current workforce – Section 6, Strategies and Actions, provides training needs for staff. However, more details would need to be developed for the ZEFTP.

The following sections are not addressed by this report:

- Policy and legislation impacting relevant technologies.
- Partnership with utility or alternative fuel provider.

These ambitious targets are attainable over the next 10+ years if alternative vehicle technologies and availability continue to improve. The strategies in Section 6 are phased to address implementation challenges, such as technology readiness and funding sources, presented in Section 7. Each strategy has actions with metrics for tracking progress, a timeline, responsible staff, and support needs.

Fleet transition and emissions reduction are complex undertakings that depend upon technological advances, funding, and organizational change from business as usual. This document is an initial introduction to the emissions reduction process, next steps, and challenges.

1. Introduction

This CAP is intended to guide The LINK in how to reduce GHG emissions associated with its local transit system. The goals established for emissions reductions were developed in collaboration with support from ODOT as part of a series of Net Zero workshops. They account for The LINK's unique operating structure, Reporting Year 2021 Emissions Inventory, and existing TDP goals.

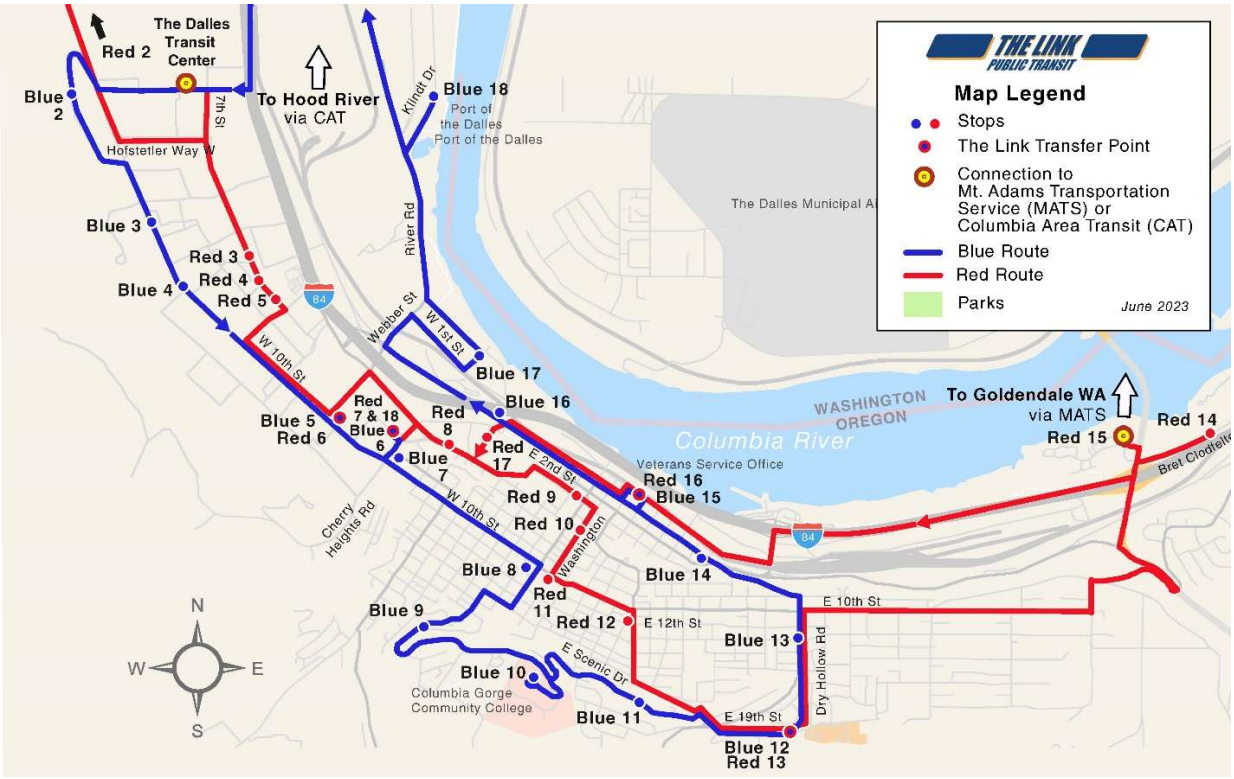
The emissions inventory and associated emissions reductions goals focus on the agency's operational Scope 1, 2, and 3 emissions. **Appendix B** contains more information on public transportation's key role in reducing regional emissions outside of these operational emissions.

[3] *Reducing Greenhouse Gas Emissions*. https://www.oregon.gov/energy/energy-oregon/Pages/Greenhouse-Gases.aspx.

2. Agency Overview

The LINK is one of five rural public transportation agencies that make up the Gorge TransLink Alliance, which collectively provides transportation services throughout the Mid-Columbia River Gorge. The Gorge TransLink Alliance was officially formalized under MCEDD in 2010 by the governing board of each transit agency. The LINK is overseen and operated by MCEDD, which was launched in 1970 to coordinate and collaborate on economic development needs in the Gorge. The LINK provides service in Wasco County. Figure 1 shows the deviated fixed route included in this service area.

Figure 1. The LINK Deviated Fixed Route Map



The LINK offers door-to-door service to riders within the City of The Dalles and surrounding communities. Routes include popular destinations within the City of The Dalles and offer a "deviated fixed route service," which allows riders to schedule "off route" drop-offs or pick-ups within a 1/4 mile of the fixed route. Other features include Dial-a-Ride, a door-to-door service that can be scheduled in advance and free rides for high school students. All The LINK transit services are accessible, and all buses have wheelchair lifts.

The LINK has 17 employees and operates 13 vehicles, including 10 transit buses and 3 vans.[4] In FY2021, The LINK provided 14,091 unlinked passenger trips (defined as number of passengers who board public transportation vehicles) and supplied 116,401 vehicle revenue miles.[5] The LINK's operating expenses for

[4] The LINK Fleet Inventory.

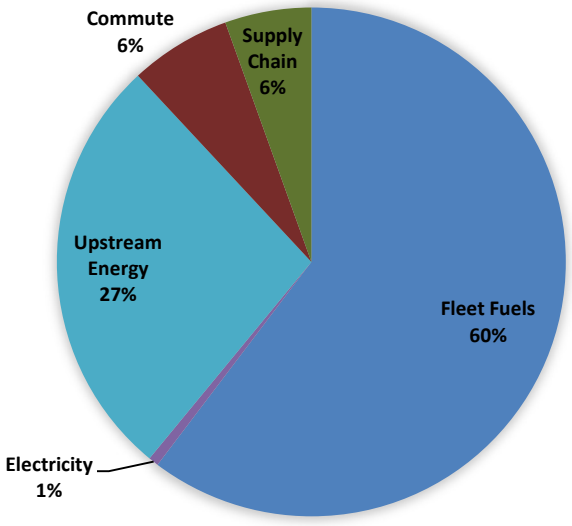
[5] The Federal Transit Administration defines vehicle revenue miles as the miles that vehicles are scheduled to or actually travel while in revenue service. Vehicle revenue miles include layover / recovery time and exclude deadhead, operator training, vehicle maintenance testing, and other non-revenue uses of vehicles.

FY2021 totaled $953,411. Everyday operations are overseen by the Transportation Operations Manager for MCEDD.

3. Emissions Inventory

The 2021 emissions inventory for The LINK serves as a basis to understand the sources of the organization's GHG emissions (**Appendix E)**. To form this baseline, Scope 1, 2, and 3 emissions were measured for FY2021 (July 1, 2020, to June 30, 2021).[6] Figure 2 depicts emissions by source. The largest source of emissions was fleet fuels (60%), followed by upstream energy production (27%), employee commute (6%), and supply chain – purchased goods and services (6%). Within the supply chain – purchased goods and services category, vehicle repair made up the largest portion (38%), followed by building maintenance and repair (36%), office supplies (18%), building services (7%), and computers (1%). Other smaller sources of emissions included building energy from refrigerants, electricity, business travel, and solid waste (all together represent about 1% of total emissions).

Figure 2. The LINK FY2021 Operational Emissions, by Emissions Sources[7]



3.1 Intensity Metrics

As public service providers, transit agencies must be responsive to the communities they serve and may make frequent changes to their operations in response to demand. As demand or population fluctuates, agencies may expand or alter fixed routes, remove underused routes, and add new routes or services. These changes in service or ridership may lead to increases in a single transit agency's operational emission, while helping to reduce local transport-related emissions in the region overall by enabling mode shifting to less carbon-intensive transportation options in the community.

To better understand service productivity, fleet vehicle efficiency, and overall operational efficiency as route mileage, ridership, and population served change over time, metrics that compare emissions from transit operations against relevant service indicators for transit agencies are tracked alongside absolute emissions. Table 2 includes performance metrics that communicate The LINK's GHG emissions per revenue miles traveled, passenger served, and service area population. These were developed in line

[6] **Scope 1:** All direct GHGs from equipment and facilities, including those from fossil fuel combustion and process emissions. **Scope 2:** Indirect GHG emissions from electricity purchased. **Scope 3:** All other indirect emissions sources that result from The LINK's activities but occur from sources owned or controlled by another entity, including business travel, embodied emissions in material goods purchased and services contracted by an organization, upstream emissions from energy production (vehicle fuels and electricity), and emissions associated with employee commuting.

[7] The following emissions sources contributed less than 1%: refrigerants, business travel, and solid waste.

with guidance from American Public Transportation Association (APTA).[8] Avoided or displaced emissions, which are an estimate of the regional emissions benefits associated with mode shifts from personal vehicles or higher-emitting transportation options to transit, are not incorporated (**Appendix B** contains more detail).

Table 2. Intensity Metrics for The LINK, FY2021

Metric Unit	FY2021 Value	Metric Description
MT CO_2e / thousand vehicle revenue miles	2.4	Measures vehicle efficiency, service productivity, and operational efficiency and will reflect efforts to purchase lower-emissions vehicles or fuels and increases in ridership. *All Scope 1, 2, and Scope 3: Upstream fuel and energy emissions are included in this metric.*
MT CO_2e /thousand unlinked passenger trips	19.5	
MT CO_2e / thousand people in service population	12.4	Measures operational efficiency and reflects emissions reduction initiatives across all scopes and changes in regional population. *All Scope 1, 2, and 3 emissions are included in this metric.*

CO_2e = carbon dioxide equivalent
MT = metric ton

4. Past and Current Initiatives

The LINK's TDP established five goals and developed a needs assessment to improve transit across Wasco County:[9]

Goal 1: Customer-Focused Services - Provide services that are safe, attractive, and convenient for all riders.

- Improve safety through transit facility design such as facility lighting.
- Focus on service to places that are important to the community such as health centers, training and education facilities, and stores.

Goal 2: Accessibility and Connectivity – Improve access and connections within and outside the county.

- Facilitate first and last-mile connections to transit stops.
- Align decisions regarding future transit service and coordinated transportation improvements with Wasco County Human Services Public Transportation Coordinated Plan and the Gorge Regional Transit Strategy.

Goal 3: Coordination - Collaborate with public and private partners to maximize services.

- Participate in the review of land use proposals with the potential to impact transit service or use.
- Coordinate with local jurisdictions on transit improvements that expand efficiency and reach of transit.

[8] *Quantifying Greenhouse Gas Emissions from Transit*. https://www.apta.com/wp-content/uploads/Standards_Documents/APTA-SUDS-CC-RP-001-09_Rev-1.pdf.

[9] *Wasco County Transit Development Plan*. https://www.mcedd.org/wp-content/uploads/2022/06/23021_TDP_Final.pdf.

- Explore and develop connections between transit and other potential transportation services.

Goal 4: Health- Foster public health by increasing use of active travel and improving access to healthy places.

- Support safe and complete walking and biking connections to transit stops.
- Integrate transit into emergency response planning to bolster resiliency of communities in Wasco.

Goal 5: Sustainability - Foster environmental, economic, and fiscal sustainability through transit investments.

- Reduce single-occupancy vehicle trips to increase energy conservation.
- Increase transit use to conserve land that would have been used for roads and parking.
- Use transit to protect and regulate access to recreational areas that are overused.
- Promote transit as an economic development tool in tourism and community revitalization.

The needs assessment from the TDP identified the following topics:

- Adding more north–south connections, converting routes from loops to out-and-back lines, and adding or shifting a route to serve clockwise travel could improve the efficiency of passengers' trips.
- Continue replacing vehicles as they reach the end of their useful service life and consider cleaner fuel sources, such as electricity, for future vehicle purchases and facilities.
- Increase education and marketing for transit, and update tools and technology (e.g., establish trip-planning tools and more fare payment options for users).

The TDP and CAP are complementary and achievement of either supports the achievement of both. TDP Goals 1, 2, and 3 are designed to increase ridership and in turn reduce personal VMT and GHG emissions, in direct alignment with the CAP. TDP Goal 4 is supported by CAP goals of expanding access to transit, which including lowering GHG emissions and other air pollutants in the local community, allowing for better public health and improved mobility and access to neighborhoods for riders, regardless of age, income, and ability. TDP Goal 5 is supported by CAP goals for reducing emissions from fleet fuel, supply chain, community, and energy use.

Resources should be focused where achievement of both TDP and CAP goals can occur.

5. Emissions Reduction Goals and Targets

Four emissions reductions goals were designed to reduce the most impactful emissions sources at The LINK. The targets were developed based on the current emissions reduction actions available for each of the focus areas identified by the GHG inventory report. Table 3 summarizes the quantitative targets for each high impact emissions source. Each goal has an emissions source that serves as the focus area for emissions reductions. For example, Goal 1 focuses on reducing fleet emissions. The target is to reduce fleet emissions by 55% by 2035 from baseline of 271 metric tons (MT) of carbon dioxide equivalent (CO_2e) and 100% by 2050 from the same baseline.

Table 3. Emissions Reduction Goals and Targets

Goal	Emissions Source and Rationale	Baseline Emissions (MT CO_2e)	2035 Emissions Reduction Target	2050 Emissions Rection Target
1. Transition to zero-emissions fleet	**Fleet emissions** Fleet fuels and the associated upstream energy production comprise 87% of baseline emissions. The LINK TDP identifies the need to update the fleet to cleaner fuels. Replacing old vehicles with cleaner fuel vehicles will simultaneously upgrade the fleet and decarbonize it. In accordance with the suggested Fleet Transition Plan (**Appendix C**), gasoline fuel could phase out and green hydrogen could phase in starting around 2032. By 2040, the fleet could be fully powered by items such as green hydrogen funding, vehicle availability and fueling infrastructure. Industry experts agree that HFC buses have superior performance compared to BEBs in terms of range, refueling, and operation in cold weather. The Department of Energy has set the production price of green hydrogen to be $1 per kilogram by 2031, and because of HFC buses' performance and increasing affordability of green hydrogen, experts are expecting HFC bus adoption to strongly take off in the next 5 to 7 years. For The LINK, HFC buses are the most viable option for zero-emissions vehicles because their long-range routes and rural service locations limit BEB options.	271	55%	100%
2. Transition to renewable energy sources	**Electricity use emissions** Less than 1% of The LINK's FY2021 GHG emissions comes from energy use, but there is potential for this to increase significantly with operational expansion and electric vehicle adoption. This target is based on a phased-in approach to renewable energy procurement and Oregon's Renewable Portfolio Standard that requires that 50% of the electricity Oregonians use come from renewable resources by 2040.[10]	2	40%	60%
3. Reduce employee commuting and business travel emissions	**Employee commuting and business travel emissions** In 2021, The LINK's staff commuted an average of 10 miles each way to work, with 84% of trips using single-occupancy vehicles, 14% using non-fossil fuel modes, 1% using the bus/public transit, and less than 1% carpooling. The emissions reduction targets incorporate the operational feasibility of remote work and low-carbon transportation.	20	10%	45%
4. Reduce supply chain emissions	**Supply chain emissions** Six percent of The LINK's baseline emissions come from purchased goods and services. Thirty-eight percent of these emissions were attributed to vehicle repair and 36% to building maintenance and repair. The emissions reduction targets incorporate the technological feasibility of low-carbon alternatives in the current supply chain.	17	4%	5%
		310	**49%**	**88%**

BEB = battery electric bus
HFC = hydrogen fuel cell

[10] *Renewable Portfolio Standard.* https://www.oregon.gov/energy/energy-oregon/pages/renewable-portfolio-standard.aspx.

6. Strategies and Actions

This section identifies strategies and actions The LINK may take to achieve the goal and targets identified in Section 5. These strategies are proposed to allow for a phased implementation approach and to leverage existing resources. For each action, the staff responsible for implementing the action, metrics to measure progress, and targeted timeframe for completing the action are identified.

Timeframes are proposed based on priority focus areas. It is important to note the long lead time associated with many strategies. Steady progress toward these longer-term strategies will allow The LINK to capitalize on opportunities, such as the availability of alternative fuel vehicles, when they arise. **Appendix A** contains additional information pertaining to each goal. Tables 4.1a through 4.4b show the strategies and actions for the four goals.

In accordance with APTA, the main source of transit agency emissions reductions is avoided emissions versus personal vehicle use. Emissions are avoided because of mode shifting from more carbon-intensive private transportation to public transit and when transit enables denser land use patterns that promote shorter trips, walking and cycling, and reduced car use. These GHG emissions reductions are most appropriately quantified at the regional level. **Appendix B** details the connection between increasing transit ridership and the overall reduction in community emissions. This report does not include an option to calculate community emissions. However, The LINK should work to increase ridership to produce a net reduction in community emissions, even with the associated increase in emissions from the increased ridership and Vehicle Revenue Miles needed to provide increased transit service.

6.1 Goal 1: Transition to Zero-Emissions Fleet

Table 4-1a. Strategies and Actions: Goal 1 – Strategy 1: Transition Urban Fleet to Electric Vehicles

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Perform feasibility assessment for transitioning to EV buses, while ensuring service needs are still met. This includes: • Evaluating charging options, range, durability, power delivery needs and infrastructure, and telematics systems. Feasibility assessments of EV charger installation should include climate/temperature considerations, particularly nighttime temperature differences in the winter • Confirming operational requirements for maintaining service levels during fleet transition • Assessing supplier availability and options • Planning for proper maintenance and training needs	Feasibility assessment complete (Y/N)	Initial assessment: 2024-2025 Revisit in 2030, 2035, and 2040	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Develop a plan to transition to EVs, including: *Vehicles* • Obtain and deploy the vehicles for which The LINK already has funding • Work with ODOT to expand price agreement for EV vehicles • Secure ongoing funding for new vehicles through ODOT and/or grant funding (**Appendix D** contains information on funding opportunities) • Map out specific vehicle transition timeline and options (**Appendix C**)	Transition plan developed (Y/N)	2024-2025	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Infrastructure • Evaluate existing electricity providers to determine whether utility contracts need to be revised and/or facility upgrades are required • Determine feasibility and necessity of providing onsite power • Determine permitting requirements, space, and funding needs			
Implement fleet transition *Vehicles* • Transition vehicles per the Fleet Transition Plan, and update the plan as service needs, funding, or technology may change *Infrastructure* • Implement necessary changes with power provider to enhance energy supply for EV charging • Install onsite EV charger if deemed necessary *Staff Training* • Train staff on how to charge vehicles, particularly during cold weather. EV charging software that comes with larger charging systems should be used to help optimize charging to 80% until an hour or so before use when it fully charges automatically to 100% • Train staff on how to maintain alternative fuel vehicles. For EVs in particular, proper battery maintenance must be followed in addition to brake, tire, and fluid checks	Fleet transition in progress (Y/N)	2025-2050	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Evaluate the need and, as appropriate, plan and budget for a maintenance/operations/administration facility that accommodates zero-emission technologies	As needed	2025-2030	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant

Table 4.1b. Strategies and Actions: Goal 1 – Strategy 2: Transition Rural Fleet to EV/Green Hydrogen

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Collaborate and discuss lessons learned, in concert with ODOT, with other regional agencies and technology hubs such as the Pacific Northwest Hydrogen Hub	Regional coordination for mutual benefit, as needed	2028-2030	**Responsible Staff:** MCEDD Executive Director **Support:** The LINK Transit Operations Director
Conduct a feasibility assessment on EV and green hydrogen fueling options in rural service areas, building off EV feasibility assessment in Strategy 1 Note: It is anticipated that the Pacific Northwest Hydrogen Hub would enable expansion of hydrogen fueling infrastructure within approximately 5 years. Emissions inventory projections assume low emission hydrogen fuel production to prevent increases in upstream energy emissions[11]	Feasibility assessment complete (Y/N)	2028 - 2030	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant

[11] IEA - *Hydrogen*. https://www.iea.org/energy-system/low-emission-fuels/hydrogen.

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Develop a plan to transition to EV and/or (HFCV in rural areas Confirm infrastructure availability before planning and budgeting for vehicle procurement *Infrastructure* • Implement necessary changes with power provider to enhance energy supply for EV charging • Install onsite EV charger if deemed necessary • Determine green hydrogen fueling station availability in concert with Pacific Northwest Hydrogen Hub *Vehicles* • Secure ongoing funding for new vehicles through ODOT and/or grant funding (**Appendix D** contains information on information on funding opportunities) • Work with ODOT to expand price agreement for HFCVs • Secure ongoing funding for new vehicles through ODOT and/or grant funding • Map out specific vehicle transition timeline and options (**Appendix C**)	Transition plan developed (Y/N)	2030-2032	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Implement fleet transition, including integrating EVs and green hydrogen fuel cell vehicles into fleet when green hydrogen stations and vehicles are available regionally *Infrastructure* • Secure access to green hydrogen fueling station ○ Note: permitting and installation of green hydrogen stations is expected to take 2 years at a minimum *Vehicles* • Transition vehicles per Fleet Transition Plan (**Appendix C**), and update the plan as service needs, funding, or technology may change *Staff Training* • Train staff on how to fuel and maintain the vehicles, as well as health and safety considerations for using HFCVs	Transition implemented (Y/N)	2033-2050	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant

HFCV = hydrogen fuel cell vehicle

Table 4.1c. Strategies and Actions: Goal 1 – Strategy 3: Accelerate the Adoption of Cleaner Fleets by Establishing an Integrated Fleet Agreement with Gorge TransLink Alliance

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Identify alignment opportunities with the Gorge TransLink Alliance to accelerate transition to EV and HFC vehicles through economies of scale in procurement and maintenance that comes with a shared fleet.	Discussed with Gorge TransLink Alliance (Y/N)	2024-2026	**Responsible Staff:** MCEDD Executive Director **Support:** The LINK Transit Operations Director
Define common objectives for accelerating the transition to cleaner fuel sources by using joint resources to increase purchasing power, access to maintenance facilities, route alignment, and beyond	Common objectives identified with Gorge TransLink Alliance (Y/N)	2024-2026	**Responsible Staff:** MCEDD Executive Director **Support:** The LINK Transit Operations Director

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Sign fleet agreement	Fleet agreement signed (Y/N)	2024-2026	**Responsible Staff:** MCEDD Executive Director **Support:** The LINK Transit Operations Director

6.2 Goal 2: Transition to Renewable Energy Sources

Table 4.2a. Strategies and Actions: Goal 2 – Strategy 1: Develop and Implement a Renewable Energy Transition Plan

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Evaluate the feasibility and cost of transitioning to renewable energy provided by the utility when the electrical load increases as part of the Fleet Transition Plan	Feasibility assessed (Y/N)	2024	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Identify funding needs and availability (**Appendix D** contains information on funding opportunities)	Amount of funding available ($)	2024	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Establish a plan for phasing in renewable energy Gradually phasing in renewable energy to 50% by 2050 aligns to Oregon's Renewable Portfolio Standard	Plan outlines path for percent increase in reliance on renewable energy	2024	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Implement plan	Renewable energy used (%)	2025-2050	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant

Table 4.2b. Strategies and Actions: Goal 2 – Strategy 2: Evaluate the Feasibility and Cost of Onsite Solar Options

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Evaluate feasibility of installing an onsite solar system	Feasibility assessed (Y/N)	2024	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Identify funding needs and availability (**Appendix D**)	Amount of funding available ($)	2024	**Responsible Staff:** The LINK Transit Operations Director

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
			Support: Consultant
Establish a plan for implementation, including permitting	Plan outlines path for % increase in reliance on renewable energy	2024-2025	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant
Install onsite solar as feasible	Reduction of electric utility bill to minimum service connection only (Y/N)	2024-2050	**Responsible Staff:** The LINK Transit Operations Director **Support:** Consultant

6.3 Goal 3: Reduce Employee Commuting and Business Travel Emissions

Table 4.3a. Strategies and Actions: Goal 3 – Strategy 1: Encourage Staff to Choose Low-Carbon Transportation for their Commute

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Educate employees on the benefits and availability of low-carbon transportation options, including carpooling with coworkers	Educational materials distributed (Y/N)	2023-2028	**Responsible Staff:** The LINK Transit Operations Director **Support:** To be identified
Offer vouchers for employees to use transit service	Vouchers provided (Y/N)	2024-2028	**Responsible Staff:** The LINK Transit Operations Director **Support:** To be identified
Offer incentives for low-carbon commuting (e.g., carpooling)	Incentives provided (Y/N)	2023-2028	**Responsible Staff:** The LINK Transit Operations Director **Support:** To be identified
Provide an option for employees to use agency-owned zero-emissions vehicles for commuting or business travel	Zero-emission vehicles provided (Y/N)	2026-2028	**Responsible Staff:** The LINK Transit Operations Director **Support:** To be identified

Table 4.3b. Strategies and Actions: Goal 3 – Strategy 2: Reduce Unnecessary Commuting and Business Travel by Encouraging Teleworking

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Establish and enforce a remote work policy	Policy established (Y/N)	2023-2024	**Responsible Staff:** The LINK Transit Operations Director
Educate employees on policy	Educational materials distributed (Y/N)	2024-2025	**Responsible Staff:** The LINK Transit Operations Director

6.4 Goal 4: Reduce Supply Chain Emissions

Table 4.4a. Strategies and Actions: Goal 4 – Strategy 1: Establish and Implement a Low-carbon Procurement Policy

Actions	Metric to Track Progress	Timeframe	Responsible and Supporting Staff
Establish a low-carbon procurement policy that includes: • Requesting Environmental Product Declarations from suppliers to assess emission reduction opportunities in the supply chain • Prioritizing goods and service providers that use low/no carbon fuels and materials • Assessing what is bought at scale and low-carbon alternatives are available for those goods/services (e.g., used buses, lower-carbon materials for construction, less carbon-intensive maintenance, and repair options)	Policy established (Y/N)	2024	**Responsible Staff:** The LINK Transit Operations Director **Support:** ODOT Climate Office
Train employees on how and why to implement the policy	Policy implemented (Y/N)	2024-2025	**Responsible Staff:** The LINK Transit Operations Director

Table 4.4b. Strategies and Actions: Goal 4 – Strategy 2: Track Supplier Performance

Actions	Metric to Track Progress	Timeframe	Responsible Staff and Support Needs
Monitor supplier compliance with low-carbon procurement policy	Percentage of suppliers in compliance	2025-2050	**Responsible Staff:** The LINK Transit Operations Director
Assess opportunities for emissions reductions in the supply chain, such as purchasing tires made with low-carbon materials or contracting with firms with low-carbon construction practices	Engage with suppliers on emissions reduction (Y/N)	2025-2050	**Responsible Staff:** The LINK Transit Operations Director

7. Implementation and Monitoring

The strategies and actions can be used to track progress and implementation of emission reduction goals. Milestones and due dates should be regularly monitored and evaluated to maintain progress toward the 2035 and 2050 targets. Given the long lead times involved with deployment of newer

technologies and other shifts to "business as usual," delays on one task can delay subsequent tasks and every effort should be made to make and keep to realistic, achievable timelines.

7.1 Implementation Considerations

Challenges to implementing the strategies for emission reduction include market availability, technological feasibility, financial feasibility, and operational feasibility. Table 5 shows that while fleet and energy transition are the most difficult to implement, their contribution toward emissions reduction is high.

Table 5. Implementation Difficulty, Cost, and Emissions Reduction Potential by Goal

Goal	Implementation Difficulty	Cost[12]	Emissions Reduction Potential
1. Transition to zero-emissions fleet	High. A comprehensive planning process is necessary to avoid service disruption while undergoing this fundamental change to operations.	High	High
2. Transition to renewable energy sources	Medium. Technicians will need to be leveraged to plan and implement the switch to renewable energy.	Medium	Low/ Medium
3. Reduce employee commuting and business travel emissions	Low. Programs to reduce emissions from commuting and travel can be implemented with relatively limited resources.	Low	Low
4. Reduce supply chain emissions	Medium. Working with suppliers and choosing low-carbon alternatives in the supply chain is an ongoing effort that requires external coordination.	Medium	Low

Table 6 outlines known issues and suggestions on how to address them. As technologies and funding evolve, these challenges are expected to lessen. However, proper foresight into potential issues will help maintain service levels and prevent unforeseen costs.

Table 6. Challenges and Recommendations for Implementation

Challenge	Recommendation
Goal 1: Transition to zero-emissions fleet	
Market availability	Plan for long lead times for vehicle purchases and limited clean fuel availability. For a fleet transition to be successful, routes will need to be optimized. A quick turnaround at the end of routes will be necessary, which relates back to maintenance feasibility requirements.
Technological feasibility	The feasibility of green hydrogen fueling will depend on proximity to green hydrogen onsite generation and storage which entails permitting challenges.
Financial feasibility	The cost to purchase new zero-emission vehicles, retrofit current vehicles, and obtain adequate infrastructure to support this transition is high, but long-term savings are expected. **Appendix D** contains information on funding opportunities.
Goal 2: Transition to renewable energy sources	
Technological feasibility	For onsite renewable energy generation, energy production feasibility will need to be assessed.
Financial feasibility	Onsite renewable energy has significant upfront costs, with long-term cost savings expected. **Appendix D** contains information on funding opportunities.

[12] Based on ODOT GHG Emissions Reduction Options Guide (**Appendix A**)

Challenge	Recommendation
Goal 3: Reduce employee commuting and business travel emissions	
Market availability	Low-carbon commuting and business travel options are available but depending on the needs of the commuter or traveler, options can be limited.
Operational feasibility	Employees that cannot do their jobs remotely will need to continue commuting. Other employees may be able to transition into a hybrid or fully remote work schedule that can reduce commute time and travel.
Goal 4: Reduce supply chain emissions	
Market availability	Market availability for low-carbon and zero-carbon goods and services is currently limited but growing. A phased-in approach is recommended.

7.2 Tracking GHG Reduction Progress

The intensity metrics presented in Section 3 will be used to track GHG emissions reduction progress. A tracking tool is included as a separate Excel file named "CAP Tracking Tool" that uses the 2021 metrics as a starting point. As actions are completed, the calculator can be updated and reductions in emissions are estimated. This tool can be used to support funding applications, and to report on implementation.

One limitation of this tool is that it is based on the 2021 GHG inventory. Technological advances, and the resulting reduction in emissions, will require an update to the GHG inventory. The inventory should be updated every 2 to 3 years and the intensity metrics adjusted in the tracking tool.

7.3 Looking Ahead

The transportation industry, and society more broadly, is going through a once-in-generation shift to new technologies and modes of operation. The political, legal, economic, sociological, technological, and environmental components of this transition are evolving, and attention must be paid to understand how these may influence each transit agency. The upstream and downstream impacts of these reduction strategies should be considered upfront through careful planning so that the transition can occur with as minimal impact on service as possible.

Making progress on the CAP will simultaneously support progress toward The LINK's existing organizational goals and vice versa. With concerted implementation of both, The LINK's operations can expand and thrive, GHG emissions can decrease, and air quality increase, all of which benefit the local community and future residents.

Appendix A: ODOT Greenhouse Gas Emissions Reduction Options Guide

Tables A-1 to A-6 summarize the relevant emissions reductions options from the Oregon Department of Transportation (ODOT) Greenhouse Gas (GHG) Emissions Reduction Options Guide. For more details on each reduction option, including agency examples, resources, and tools to get started, see the complete ODOT GHG Emissions Reduction Options Guide.[13]

The numbers in the rank from 1 (low) to 3 (high), regardless of the positive or negative outcomes. The shading represents the outcomes or benefit, as summarized follows:

- **Emissions Reduction:** green (high benefit), yellow (medium benefit), red (low benefit)
- **Overall Cost:** green (low cost), yellow (medium cost), red (high cost)
- **Overall Difficulty:** green (low difficulty), yellow (medium difficulty), red (high difficulty)

Table A-1. GHG Emissions Reduction Options Relevant to Transitioning Fleet to Cleaner Fuel Sources

Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Battery electric buses	3	2	3	Battery electric bus motors are powered by an onboard battery pack and, depending on the model, can charge as quickly as just a few minutes and go between 55 and 350+ miles between charges. This technology is best suited for non-rural routes. Charging methods include overhead pantograph charging, ground-based charging, or plug-in charging. Additional emissions reductions are possible when powered by renewable electricity. Infrastructure requirements are complex and have a high upfront cost, but significant fuel and especially maintenance savings are expected.
Diesel-electric hybrid buses	3	2	2	Hybrid buses have a diesel engine and electric motor that captures energy with regenerative braking. The range of diesel-electric buses depends on the amount of diesel fuel stored onboard (not by battery charge). Plug-in hybrids are similar to traditional diesel-electric hybrid buses, but with a larger battery that can power the bus for a certain distance. These buses are more expensive than regular diesel buses, but do not require significant infrastructure and there are operational cost savings with fuel efficiency. There are increased maintenance costs associated with these vehicles. These vehicles can run on renewable diesel to further reduce their emissions. Note: Many agencies are phasing these lower emission buses out as other zero-emissions options are being phased in.
Fuel cell electric buses powered by green hydrogen	3	3	3	Fuel cell electric buses generate onboard power from green hydrogen to recharge the batteries powering the motor. There are no route constraints due to limited range and fueling. Further emissions reductions are possible by using hydrogen using renewable energy (i.e., green hydrogen.) These are more expensive than diesel buses. Currently, green hydrogen is costly and not available in all regions.

[13] Oregon Department of Transportation. 2023. *Greenhouse Gas Emissions Reductions Options Guide*.

Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Use renewable fuels	3	2	1	Renewable diesel is chemically identical to the non-renewable counterpart (diesel), and can be used in conventional diesel buses. There are opportunities for reductions in maintenance cost as well as renewable fuel subsidized by the Oregon Clean Fuels Program.

Table A-2. GHG Emissions Reduction Options Relevant to Transitioning to Renewable Energy

Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Enter into a Power Purchase Agreement to procure renewable energy	3	2	2	A Power Purchase Agreement involves a third-party developer installing, owning, and operating an energy system and a customer contract for purchasing the electric output for a certain period. This allows customers to receive stable and relatively low-cost electricity with no upfront cost, while also allowing the owner of the system to benefit from tax credits and income from the sale of electricity.
Microgrid systems	3	2	3	Microgrids are self-sufficient, localized energy systems powered by distributed energy resources like solar panels. Microgrids have control systems that manage battery storage and energy delivery. This infrastructure and systems engineering is complex and requires significant upfront investment. Microgrids strengthen energy resilience because they can operate when the main grid is down and help reduce energy inefficiencies in transmission and distribution.
Onsite solar	3	2	2	Solar photovoltaic can be scaled to almost any size from a few kilowatts to many megawatts. Photovoltaic systems may either be ground-mounted or rooftop-installed and integrated into a building such as those for roofing shingles or parking lot shading. Installing this infrastructure is complex and requires upfront investment, but there are significant operational cost savings including community solar purchasing programs that open up alternative revenue streams.
Community solar	3	2	2	Community solar purchasing programs open up alternative revenue streams and represent one of the operational cost savings opportunities for onsite solar.
Purchase renewable energy through electric provider (e.g., utility green tariff)	3	2	2	Some utilities offer a renewable energy solution with a cleaner power mix and a "green tariff" is charged to the customer on monthly bills. This is a premium rate, thus operational costs associated with this choice will increase. Depending on the utility, there may not be options to purchase 100% green power.

Table A-3. GHG Emissions Reduction Options Relevant to Encouraging Zero-Emission Commuting and Travel

Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Encourage low-carbon modes of commuting and business travel	1	1	1	Encourage staff to choose low-carbon transportation for their commute (e.g., offer vouchers for employees to use the transit service and encourage the use of active-transportation modes like bicycling, carpooling, and walking). To reduce business travel emissions, inform and support staff on low-carbon transportation options like taking the train instead of flying, when feasible. Many low-carbon transportation options are also more economical.
Reduce unnecessary commuting and business travel	1	1	1	Encourage video conferencing and web-based meetings as an alternative to in-person meetings, where feasible. This can reduce emissions and business travel costs.

Table A-4. GHG Emissions Reduction Options Relevant to Developing and Implementing a Low-Carbon Procurement Policy

Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Low-carbon construction policy	2	2	1	A low-carbon construction policy can include specifications that construction contractors must use a certain percent of equipment that uses low/no carbon fuels, use renewable electricity on the job site (e.g., green hydrogen-powered excavators), and use recycled and/or low-carbon building materials (e.g., alternative cements and aggregates, or timber instead of steel). Policy implementation is limited to the availability of low-carbon options for construction.
Low-carbon procurement policy	2	2	1	A low-carbon procurement policy can include specifications that service providers (e.g., janitorial and landscaping) use a certain percent of equipment that uses low/no carbon fuels and use low-carbon materials. Also include specifications and/or track full lifecycle emissions from the manufacturing and use of purchased vehicles, tires, signage, and other goods. These low-carbon options are often more expensive and require time to track, thus operational costs will likely increase. Policy implementation is limited to the availability of low-carbon options.

Table A-5. GHG Emissions Reduction Options Relevant to Regional Transit Management

Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Reduce regional traffic-related emissions by increasing ridership and supporting non-driving travel options	3	2	2	Increasing transit ridership has a direct effect on reducing regional vehicle miles traveled and as a result in overall GHG Emissions. Increasing ridership is a challenge for transit agencies, and relies on thorough transit route and frequency of service planning. A fair and equitable fare structure, with a low-income fare support program also helps to increase ridership and reduce vehicle miles traveled. Close coordination with local municipalities on route structure, service levels, and optimizing transit is essential to support transit services financially and politically. Supporting local micro-mobility (such as bike/scooter share) and active-transportation programs (bike lanes and bike facilities) will also help increase transit ridership.
Bus rapid transit	3	3	3	Bus rapid transit is a high-quality, bus-based transit system that delivers fast and efficient service that may include dedicated lanes, busways, traffic signal priority, off-board fare collection, elevated platforms, and enhanced stations. This type of service can increase ridership and revenue, but significant costs and external coordination is needed to develop this.
Deviated fixed-route and demand-response models	2	2	3	A hybrid model uses both a fixed-route and demand-response model. These systems use prescheduled timetables, but may deviate from the predetermined route to go to a specific location. Flex route services work well when deviations from the fixed-route do not significantly impact regular timetables. Depending on the existing services, there is a moderate level of complexity and cost involved with implementing this.
Mobility-on-demand (MOD) service	2	3	2	MOD service refers to an integrated and connected multi-modal network with a variety of public and private travel options that serve travelers on an as-needed basis. Some pilot projects, such as those funded by the U.S. Department of Transportation MOD Sandbox Program, have been deployed across the U.S. to examine if MOD initiatives can help enhance last-mile transit connections, reduce operating costs, improve service availability, and elevate rider experiences. There is a significant level of cost and complexity involved with implementing this.
Optimize fixed-route service through strategic planning	2	2	2	Optimizing fixed-route service can reduce fuel use and increase ridership, with little upfront cost. Minimizing recovery time and dwell time, rerouting to avoid hills, storing vehicles indoors to reduce warmup/cool down time, and spacing bus stops appropriately to reduce the number of start/stops can all reduce GHG emissions.

Table A-6. Other GHG Emissions Reduction Options

Reduction Category	Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
Energy efficiency measures	Heat pumps for building heating and cooling	2	2	1	Heat pumps are an energy-efficient replacement for traditional air conditioners and heating systems. Heat pumps use electricity to transfer heat instead of generating it, making them 3 to 5 times more efficient than traditional heating and cooling systems (including boilers and furnaces). Installing heat pumps require some upfront investment, but there is an opportunity for significant operational cost savings from reduced maintenance and energy costs.
	Implement an energy management control system to support cost-effective and energy-efficient building operations	2	2	2	An energy management control system is designed to control energy consuming systems, such as the heating, ventilation, and air conditioning; lighting; and water heating systems. The systems often monitor loads, and adjust operations to optimize energy usage and respond to demand-response signals. There are upfront costs associated with installing this system, but there are also opportunities to significant reduce energy costs and reduce emissions in the long term.
	Upgrade to high-efficiency operations and maintenance equipment, where feasible	2	2	2	Upgrading to energy-efficient equipment can help reduce emissions and provide energy cost savings. The U.S. Environmental Protection Agency ensures that Energy Star products are independently certified to deliver efficiency performance and savings. Energy Star products include heat pumps, smart thermostats, computers, TVs, water heaters, commercial refrigerators, light fixtures, and more.
	Install high-speed roll-up doors for depot to optimize depot heating and cooling	1	2	1	High-speed roll-up doors are well insulated and open and close up to three times faster than conventional steel roll-up doors, minimizing the air exchange between the depot and the outside environment and resulting in decreased heating and cooling demand throughout the year. There are upfront costs associated with installing this system, but there are also opportunities to significant reduce energy costs and reduce emissions in the long term.
	Upgrade to more efficient lighting	1	2	1	LED lights use at least 75% less energy and last up to 25 times longer than incandescent lighting. This simple upgrade can significantly reduce energy costs.
Fugitive emissions	Refrigerant management program	1	1	2	A refrigerant management policy involves adhering to maintenance best practices and ensuring proper recovery, reclaiming/recycling, and destruction of refrigerants at end of life (90% of refrigerant emissions happen at end of life). Implementing this policy requires external coordination and is limited to the availability of certified contractors and programs.

Reduction Category	Reduction Option	Emissions Reduction	Overall Cost	Overall Difficulty	Definitions and Details
	Replace refrigerants with low-warming HFCs/new cooling agents/non-HFC substances	1	2	2	Alternative refrigerants with lower global warming potential include ammonia, carbon dioxide, propane, and isobutane. Using these alternative refrigerants may require changing out or retrofitting current equipment. Consider reserving this option for replacing old equipment near end of life.
Reduce waste	Encourage recycling, composting, and reuse with a waste management policy	1	1	1	A waste management policy should be established that defines best practices for reducing operational waste and reusing materials where possible. Transportation operations and maintenance activities have recycling and reuse opportunities for vehicle batteries, antifreeze, engine oils, engine lubricants, tires, signs, and more.

Appendix B: Measuring Public Transportation's Impact on Regional Emissions Reductions

Measuring an aggregate across U.S. cities, transit ridership decreases private vehicle miles traveled (VMT), transportation fuel use, and greenhouse gas (GHG) emissions by 2% -- a substantial change given that "only 4% of passenger trips are currently done by transit in U.S. metropolitan areas."[14] In addition to lower community emissions, transit allows for better public health, improved mobility, and improved access to neighborhoods for riders, regardless of age, income, and ability.

According to a study by Davis and Hale in 2007, "an estimation of U.S. public transportation's 2005 GHG impacts found a net 7 million metric tons of CO_2 (MMT CO_2) saved by public transportation through avoided personal vehicle use and congestion relief."[15] A follow-on study examined the vehicle miles avoided by non-transit riders in communities with transit, which increased transit's estimated net benefit to 37 MMT CO_2.[16] While an increase in public transportation services and ridership may lead to high emissions overall for a transit agency, the expansion of transit ensures net GHG emissions benefit for communities. As transit agencies are already working to reduce their own carbon footprints, the expansion of their services will lead to a greater overall reduction in emissions for the community as a whole.

A 2021 study from the Transit Cooperative Research Program published a formula used to determine the net GHG benefits of transit, derived from practices recommended by the American Public Transportation Association, the U.S. Environmental Protection Agency, and the GHG Protocol.[17] For their specific project, which reported on a total of 10 fuel types and direct, indirect, and upstream CO_2, methane, and nitrous oxide emissions, the following formulas were used:

- Passenger miles * mode shift factor (0.329) = avoided vehicles miles
- Avoided vehicle miles/miles per gallon (22.5) = avoided gallons of fuel

This formula allows the research findings about transit's impact on VMT in 28 communities to be applied to every transit agency in this study in a regionally specific way

- Transit multiplier = $\frac{(Transportation\ efficiency\ (VMT)+(land\ use\ efficiency\ VMT)}{(transportation\ efficiency\ VMT)}$

The same study reported that passengers saved nine MMT CO_2 of GHG emissions from "riding transit rather than using personal vehicle" in 2018. In addition to the ridership effect of transit, an increase in

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[14] *Quantifying Transit's Impact on GHG Emissions and Energy Use – The Land Use Component*. https://nap.nationalacademies.org/catalog/22203/quantifying-transits-impact-on-ghg-emissions-and-energy-use-the-land-use-component

[15] *An Update on Public Transportation's Impacts on Greenhouse Gas Emissions*. https://nap.nationalacademies.org/catalog/22203/quantifying-transits-impact-on-ghg-emissions-and-energy-use-the-land-use-component

[16] *"The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction."* https://www.apta.com/wp-content/uploads/Resources/resources/reportsandpublications/Documents/land_use.pdf

[17] *"An Update on Public Transportation's Impacts on Greenhouse Gas emissions."* https://www.trb.org/Publications/Blurbs/181941.aspx

services leads to more land use benefits of transit. The land use effect of transit refers to more compact development occurring, which can further environmental and social benefits. Such benefits include providing more walking and biking opportunities and making some car journeys shorter, leading to an aggregate 8% decrease in VMT, transportation fuel use, and transportation GHG emissions in U.S. cities. A 2010 study from the Transit Cooperative Research Program reported that adding a rail station to a neighborhood without previous rail access is associated with an 9% increase in activity density and a 2% reduction in VMT, transportation fuel use, and transportation GHG emissions.[18] It cited an analysis of the Portland Westside light-rail extension, which found a land use effect of 24% increase in densities in the corridor area between 1994 and 2011, which corresponded to a 6% household VMT reduction due to the land use effect and an additional 8% VMT reduction due to the ridership effect.

[18] "Quantifying Transit's Impact on GHG Emissions and Energy Use— The Land Use Component." https://ssti.us/wp-content/uploads/sites/1303/2015/10/tcrp_rpt_176-quatifying_transit_impact_GHG_VMT_energy-1.pdf

Appendix C: Fleet Transition Plan

Table C-1 summarizes the Fleet Transition Plan. For more details on delivery year, existing facility capacity, average vehicle age, spare ratios, and more, the Fleet Transition Plan Excel file is provided with this CAP.

Table C-1. 2023-2050 Fleet Transition Plan

In-Service Date	Useful Life (years)	Replace Year	FTA UL	FTA Replace Year	Fuel Type	No. of Vehicles	Fleet Series
2011	**14**	2025	8	2019	Gasoline	**1**	Toyota Sienna
2012	**13**	2025	8	2020	Gasoline	**1**	Toyota Sienna
2018	**10**	2028	10	2028	Gasoline	**1**	Dodge Grand Caravan
2020	**10**	2030	10	2030	Gasoline	**1**	Ford E-450
2021	**10**	2031	10	2031	Gasoline	**7**	Ford E-450
2025	**10**	2035	10	2035	Gasoline	**2**	Ford E-450
2028	**10**	2038	10	2038	EV	**1**	Ford Transit
2030	**10**	2040	10	2040	EV	**1**	Ford Transit
2031	**10**	2041	10	2041	Green hydrogen	**7**	TBD
2035	**10**	2045	10	2045	Green hydrogen	**2**	TBD
2038	**10**	2048	10	2048	Green hydrogen	**1**	TBD
2040	**10**	2050	10	2050	Green hydrogen	**1**	TBD
2041	**10**	2051	10	2051	Green hydrogen	**7**	TBD
2045	**10**	2055	10	2055	Green hydrogen	**2**	TBD
2048	**10**	2058	10	2058	Green hydrogen	**1**	TBD
2050	**10**	2060	10	2060	Green hydrogen	**1**	TBD

ADA = Americans with Disabilities Act
FTA = Federal Transit Administration
UL = Useful Life

Figure C-1 shows the future paratransit vehicle fleet makeup that is based on the fleet transition data in Table C-2.

Figure C-1. Future Vehicle Fleet Makeup

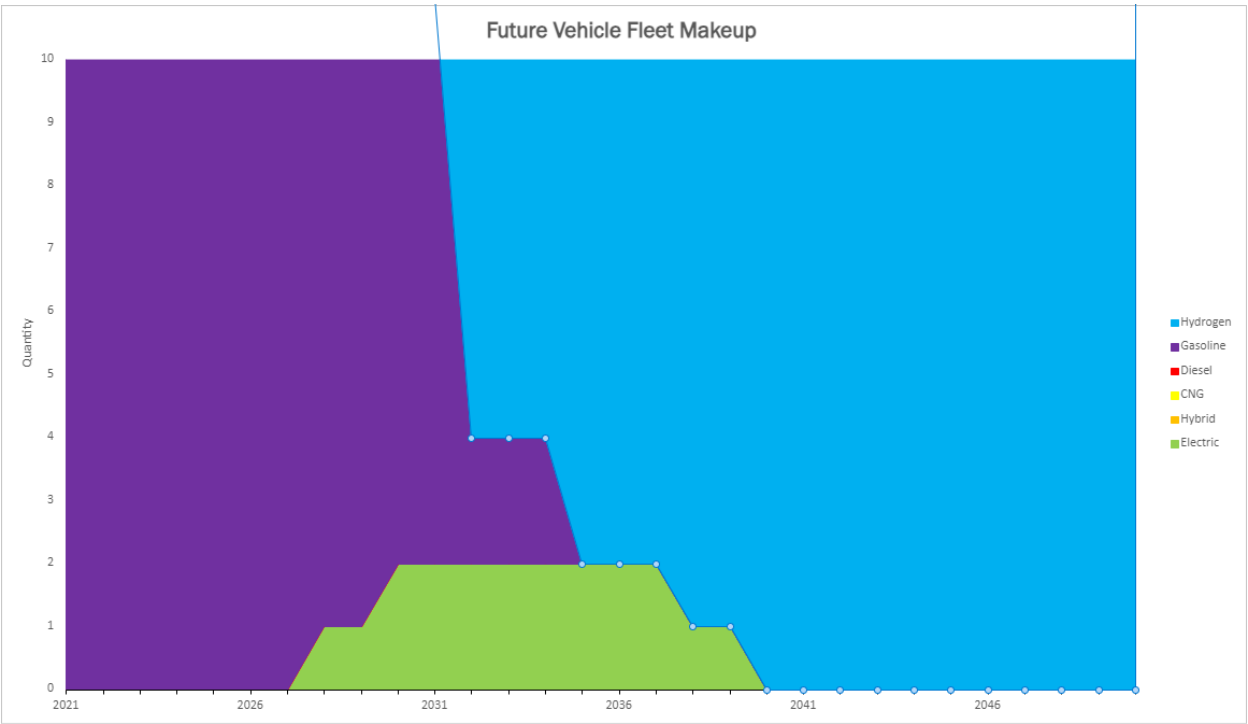


Table C-2. Future Vehicle Fleet Makeup

Date	Electric	Hybrid	CNG	Diesel	Gasoline	Green Hydrogen	TOTAL
2021					11		**11**
2022					11		**11**
2023					11		**11**
2024					11		**11**
2025					11		**11**
2026					11		**11**
2027					11		**11**
2028	1				10		**11**
2029	1				10		**11**
2030	2				9		**11**
2031	2				9		**11**
2032	2				2	7	**11**
2033	2				2	7	**11**
2034	2				2	7	**11**
2035	2					9	**11**
2036	2					9	**11**
2037	2					9	**11**

Date	Electric	Hybrid	CNG	Diesel	Gasoline	Green Hydrogen	TOTAL
2038	1					10	**11**
2039	1					10	**11**
2040						11	**11**
2041						11	**11**
2042						11	**11**
2043						11	**11**
2044						11	**11**
2045						11	**11**
2046						11	**11**
2047						11	**11**
2048						11	**11**
2049						11	**11**
2050						11	**11**

Appendix D: Funding Opportunities

See Funding Options for Decarbonization

Full document provided on following pages.

Funding Opportunities for Decarbonization

Presented by

GREENE ECONOMICS

Prepared for ODOT Transit Departments

Funding Opportunities

No.	Program Name	Projects Supported by Funding	Amount Available	Important Dates	Stipulations
1	FTA – Lo No Grant Program	Any activities related to low or no emission bus purchases, leases, facilities, or accommodation construction, or fleet operator efficiency training	$1.2 billion	Deadline April 13th (Funding will be available in 2024)	The Federal share of the cost of leasing or purchasing a transit bus is **not to exceed 85 percent** of the total transit bus cost
2	FTA – Busses and Bus Facilities	Capital projects to replace and purchase buses, vans, and related equipment, and to construct bus-related facilities, including technological changes or innovations to modify low/no emission vehicles/facilities	$470 million	Same as above	The Federal share of eligible capital costs is **80 percent** of the net capital project cost, unless the grant recipient requests a lower percentage
3	Federal DOE – GRIP	Grid Resilience & Innovation Partnership Program – supports strategies that accelerate interconnection of clean energy generation/storage	$5 billion 2022-2026	New round in 2024	None
4	Federal Investment Tax Credit	Reduces the federal income tax liability for a percentage of the cost of a solar system installed during the tax year	NA	Through 2035	Tax exempt entities are eligible to receive the ITC in the form of a direct payment
5	Federal Production Tax Credit	Tax credit for electricity generated by solar and other qualifying tech for the first 10 years of a system's operation	NA	Through 2035	**Cannot claim both the ITC and PTC** for the same property

Funding Opportunities 2

No.	Program Name	Projects Supported by Funding	Amount Available	Important Dates	Stipulations
6	FHWA – Charging & Fueling Infrastructure (CFI)	Projects that deploy EV charging and other alternative vehicle-fueling infrastructure projects in publicly accessible locations in urban and rural communities	$2.5 billion over 5 years minimum award $500k	Deadline June 13th (5-year funding program, funds available 2024)	The Federal share of a project carried out with CFI Program funds under both programs shall **not exceed 80 percent** of the total project cost
6a.	Community Program	Projects that deploy publicly accessible EV charging infrastructure, and hydrogen, propane, or natural gas fueling infrastructure in communities	$1.25 billion	Same as above	Same as above
6b.	Corridor Program	Same as above but in designated alternative fuel corridors	$1.25 billion	Same as above	Same as above
7	Federal Carbon Reduction Program	For projects involving alternative fuels, purchase of zero-emission construction vehicles, energy efficient lights along public transit routes	$1.2 Billion	Deadline November 15th, 2023	**20% match required**
8	FHWA – PROTECT Grant Program	For planning and improvement activities involving transportation resiliency including public transportation	$100k min funding per project; $300 million annual total funding	Deadline August 18th, 2023	MPOs, local govts can apply directly to FHWA. A Federal land management agency may be eligible if the **agency applies jointly with a State**.

Funding Opportunities 3

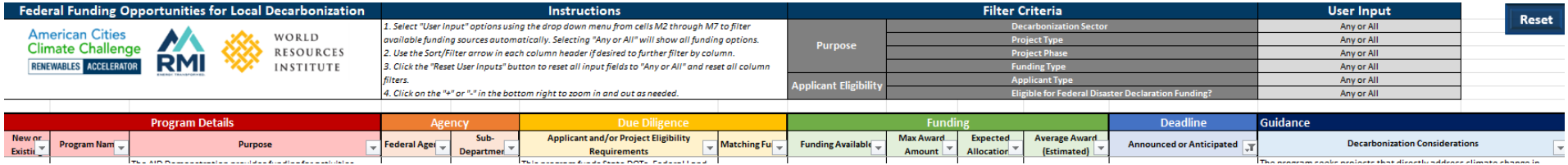
No.	Program Name	Projects Supported by Funding	Amount Available	Important Dates	Stipulations
9	OR Clean Vehicle Rebates	The electric and clean vehicle rebate programs are closed	NONE Currently	NA	**Closed to vehicles bought after May 1st, 2023**
10	OR DOE – Heat Pump Program	For eligible Regional Administrators – each will design a heat pump deployment program to best serve their community and support heat pump installation	$8.5 million	Due April 7, 2023	Eligible entities include coordinated care organizations and community action agencies + must serve at least one EJ community
11	OR DOE – Community Renewable Energy Grant	Planning/developing community renewable energy and energy resilience (priority given to projects supporting program equity goals, community energy resilience, and include energy efficiency and demand response)	$100k for planning, $1 million for development project	TBD (opens later in 2023)	Covers 50% of community renewable energy construction projects & 100% of renewable energy planning projects up to $100k. **Funding open to public bodies with emphasis on solar/battery projects to improve energy resiliency**
12	OR Solar + Storage Rebate	Rebate may cover up to 50% of the net cost of a system. The rebate is paid to the contractor and the savings are passed to the low-income service provider	Max $30k for solar system, max $15k for energy storage system	NA	Eligible entities include local govt entities such as a city, county, or school district that uses public buildings to **provide services to low- or moderate-income individuals or provide emergency shelter and/or communications in disaster situations**.

Funding Opportunities 4

No.	Program Name	Projects Supported by Funding	Amount Available	Important Dates	Stipulations
13	Federal Decarbonization Funding Tool	Depends on the program	Depends on the program	Depends on the program	Depends on the program

Federal Funding Opportunities for Local Decarbonization Tool

- Use the filters to find funding programs that fit the funding needs of a project
  - Filter by: program name, federal agency, eligibility requirements, funding available, deadline and by guidance (decarbonization and equity considerations)



Appendix E: The LINK GHG Inventory

The LINK GHG Inventory Report: GHG Inventory Report-The LINK-final.pdf

Full report included on the following pages.

Greenhouse Gas Inventory Report

The LINK Transit GHG Inventory, FY21

Oregon Department of Transportation
Net-Zero Transit Pilot Project
June 14, 2023

Acknowledgements

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Good Company (a division of Parametrix), a sustainability consulting firm based in Eugene, OR conducted this Greenhouse Gas Inventory in partnership with Jacobs Engineering. Claudia Denton and Grace Kaplowitz of Good Company provided data gathering assistance to The LINK staff and conducted all data analysis. They are the primary authors of this report.

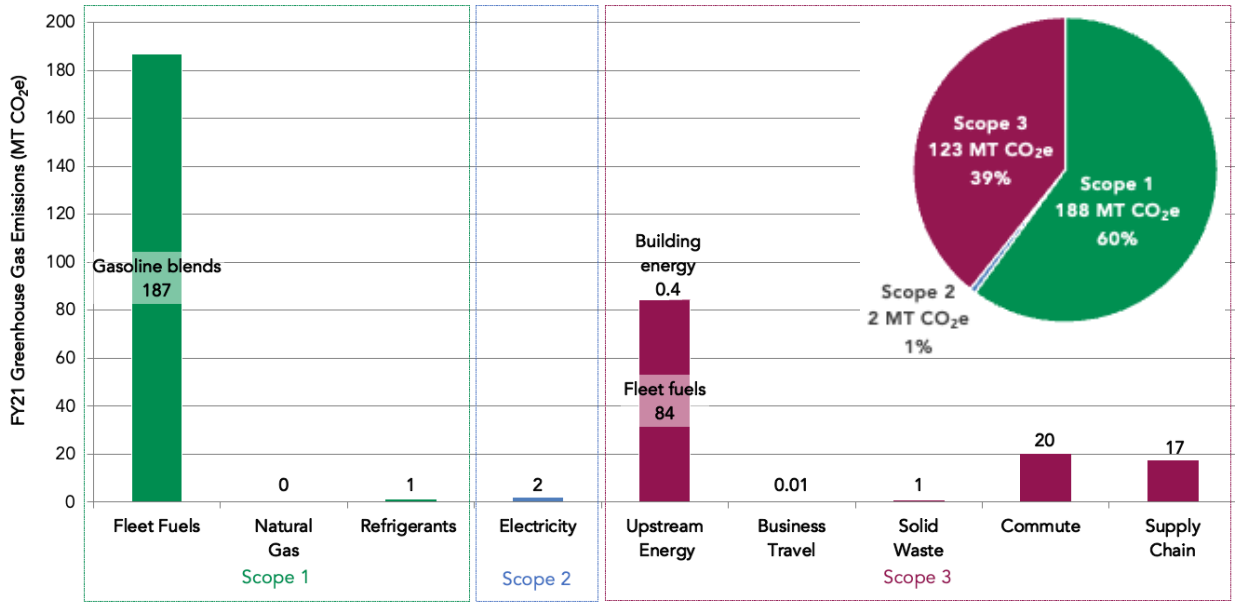
Executive summary

The LINK Public Transit is one of four transit districts participating in the Oregon Department of Transportation's (ODOT) Net-Zero Transit Pilot Project, which aims to transition operations of transit fleets to net-zero emissions. The LINK is operated by the Mid-Columbia Economic Development District (MCEDD). The LINK operates 13 vehicles along routes in The Dalles and surrounding areas. This greenhouse gas (GHG) inventory for The LINK is part of the first phase of the Net-Zero Transit Pilot. It serves as a baseline for understanding the sources of GHG emissions associated with The LINK operations in Fiscal Year 2021. The inventory will be used as a baseline and measurement tool for The LINK and ODOT in working towards the goal of reducing The LINK's emissions to zero.

In Fiscal Year 2021 (FY21: July 1, 2020 – June 30, 2021), The LINK operations generated an estimated **190 MT CO_2e** of scope 1 and 2 emissions.[1] When scope 3 emissions[2] from upstream energy, business travel, solid waste, employee commute, and the transit agency's supply chain are also included, The LINK's carbon footprint increases by an additional **123 MT CO_2e**. Thus, The LINK's is responsible for an estimated total of **312 MT CO_2e** (rounded down) for all direct and indirect activities for the fiscal year. The largest source of total emissions in FY21 was **fleet fuels (60%)**, followed by **upstream energy production (27%), employee commute (6%),** and **supply chain (6%)**. Other smaller sources of emissions included building energy from **refrigerants, electricity**, **business travel,** and **solid waste (all together representing about 1% of total emissions)**. **Figure 1** illustrates total GHG emissions (in MT CO_2e) per emission source organized by scope. Scope 1 emissions (green) are from sources that are operated by The LINK; scope 2 emissions (blue) are from electricity used by sources operated by The LINK; scope 3 emissions (magenta) are from sources outside of The LINK's operational control.

As the largest source of emissions, fleet fuel use is the best opportunity for The LINK to reduce emissions.

Figure 1: The LINK FY21 operational emissions, by scope



[1] **Scope 1:** All direct GHG emissions from equipment and facilities owned and/or operated by the agency. **Scope 2:** Indirect GHG emissions from purchased electricity.

[2] **Scope 3:** All other indirect emissions sources that result from agency activities but occur from sources owned or controlled by another company or entity. See full report for additional details.

The LINK FY21 Inventory Results Highlights:

- Fleet combustion of gasoline is by far the largest source of emissions (**187 MT CO_2e**). Fleet "tailpipe" emissions represent 98% of emissions under The LINK's direct control (scope 1 and scope 2), and 60% of total emissions (including scope 3).
- Upstream energy emissions make up the second largest source of emissions at **84 MT CO_2e** (27% of total emissions). 99% of upstream energy emissions were from fleet fuels.
- After fleet fuels and upstream energy, employee commute emissions were the third largest source at **20 MT CO_2e** (just over 6% of total emissions).
- Closely following employee commute is supply chain emissions at **17 MT CO_2e** (nearly 6% of total emissions).
- All other scope 1 and scope 2 emissions sources (natural gas, refrigerants, and electricity) all together represent less than 2% of total emissions.

Transit agencies are known to change services provided over time, such as expanding to new bus routes, removing underutilized routes, or adding additional service to popular routes. As services change, emissions will change, but in the case of transit agencies – more service activities, which may add up to more emissions, mean a greater benefit to the community. For this reason, intensity metrics are important to include and consider because they are a normalized metric that can be used to compare emissions per quantity of specific activities. This is helpful for comparing emissions over time, as services change and become more or less efficient. **Table 1** summarizes The LINK's GHG emissions intensity by Vehicle Revenue Miles (VRM), unlinked passenger trips, and service population.

Table 1: Intensity metrics for The LINK, FY21

MT CO_2e / 1,000 Vehicle Revenue Miles (VRM)	MT CO_2e / 1,000 Unlinked Passenger Trips (UPT)	MT CO_2e / 1,000 people in service population
2.7	22.2	12.4

For comparison, **Table 2** summarizes the GHG emissions intensity averages across all four agencies in the Transit Net-Zero Pilot. In contrast, The LINK operations in FY21 were below-average per VRM and UPT, but above average per people in their service population.

Table 2: Average intensity metrics across all four agencies in the ODOT Transit Net-Zero Pilot

MT CO_2e per 1,000 Vehicle Revenue Miles (VRM)	MT CO_2e per 1,000 Unlinked Passenger Trips (UPT)	MT CO_2e per 1,000 people in service population
2.2	16.3	22.4

While helpful to compare to other agencies, it is more important for an agency to compare against its own emissions and intensity metrics over time.

Note: The metrics provided above communicate the overall emissions intensity for transit services in FY21. These metrics consider total Scope 1, 2, and 3 emissions versus the relevant transit service indicator. The values for GHG intensity per VRM and UPT provided here differ from those provided in Table 2 of the CAP above, which are calculated according to APTA and TRB standards. GHG intensity metrics for VRM and UPT provided in the CAP examine a subset of Scope 1, 2, and 3 emissions related to fleet operations, as indicated in that table.

Contents

Appendices

Glossary

AR4 / AR5

Assessment Report 4/5. *See Intergovernmental Panel on Climate Change (IPCC).*

Carbon dioxide equivalent (CO_2e)

Carbon dioxide equivalent – a unit of measure. Most greenhouse gases are more potent in warming the atmosphere than carbon dioxide. In order to calculate and compare emissions easily, all gases are calculated and combined into a carbon dioxide equivalent, typically measured in metric tons (MT CO_2e).

Emissions factors

Sometimes also known as emissions intensities, an emissions factor represents the rate at which a quantity of a pollutant is released into the atmosphere, expressed as the weight of the pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of CO_2 emitted per gallon of fuel combusted).

Greenhouse gases (GHGs)

Emission of greenhouse gases are the cause of current climate change. An inventory of GHGs measures gases in units of carbon dioxide equivalent (CO_2e). A GHG inventory is also known as a carbon footprint.

Global warming potential (GWP)

This refers to the potency of GHG emissions to trap heat in the atmosphere. Carbon dioxide has a GWP of 1, and other GHG gases are more potent and expressed as a multiple of carbon dioxide. For example, methane has a GWP of 28, meaning one molecule has 28 times the effect of one molecule of carbon dioxide (IPCC AR5 values). *Note that GWP values can vary as science changes, and the GWP may have changed from IPCC's fourth Assessment Report (AR4, released 2007) to the fifth Assessment Report (AR5, released 2014).*

Intensity metrics

Intensity metrics are used to compare the intensity or scale of GHG emitting activities across inventory years and agencies of different types or sizes. These are normalized metrics that illustrate an agency's emissions relative to an operational or economic output. In this inventory, the intensity metrics used are $MTCO_2e$ per 1,000 vehicle revenue miles (VRM), per 1,000 unlinked passenger trips (UPT), and per 1,000 people in the service population of each agency.

Intergovernmental Panel on Climate Change (IPCC)

The United Nations body for assessing the science related to climate change. The IPCC prepares comprehensive reports about the state of scientific, technical and socio-economic knowledge on climate change, its impacts and future risks, and options for reducing the rate at which climate change is taking place. These reports are the international standard for measuring the global warming potential (GWP) of different greenhouse gases (GHGs), described in the Assessment Reports. *Note that GWP values can vary as science changes, and the GWP may have changed from IPCC's fourth Assessment Report (AR4, released 2007) to the fifth Assessment Report (AR5, released 2014).*

Kilowatt-hour(s) (kWh)

Kilowatt hours are a standard unit for electricity consumption, and a measure of electrical energy equivalent to a power consumption of 1,000 watts for 1 hour.

Location-based electricity emissions accounting

Refers to GHG intensity of the regional electricity grid, representing the average impacts of electricity use and efficiency efforts across the region. Contrast with Market-based Electricity Emissions Accounting. Oregon is part of the Northwest Power Pool regional electricity grid.

Market-based electricity emissions accounting

Refers to the GHG intensity of electricity contracts with local utilities. Contrast with Location-based Electricity Emissions Accounting.

Metric ton (MT)

This is a common unit by international standards (~2,200 lbs.).

NAICS

The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. Commonly used in financial reporting.

Service population

Service area population within .5 miles straight-line distance of stops. Population served by more than one stop is counted only once.

Scope (as in scope 1, scope 2, scope 3)

Scopes are one method to define the source of emissions. Scope categories distinguish between emissions that occur within a geographic boundary or with owned equipment (scope 1), from electricity generation serving the community (scope 2), and emissions that occur outside the boundary, but that are driven by activity within the boundary (scope 3).

Therm

Common reporting unit of natural gas that represents 100,000 British thermal units. A therm is roughly equivalent to 100 cubic feet of natural gas.

Refrigerant loss/fugitive refrigerants

Refrigerant gases are commonly used in refrigeration, air conditioning, and other cooling equipment and appliances. Over time, it is common for these gases to leak and escape into the atmosphere (known then as fugitive refrigerants). This loss into the atmosphere is measured and accounted for in a GHG inventory. These gases typically have very high global warming potential, causing a relatively small amount to have a significant climate impact.

Renewable energy certificates (RECs)

Renewable energy certificates are tradable, non-tangible energy certificates that represent 1 megawatt-hour of renewable energy sourced electricity that was fed and shared into the power grid. RECs are used to offset carbon and invest in renewable energy.

Unlinked Passenger Trips (UPT)

The number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination.

Vehicle Revenue Miles (VRM)

The miles that vehicles are scheduled to or actually travel while in revenue service. (Definition from ODOT "Oregon Transit Network" 2019 Report.[3])

Vehicle revenue miles include: Layover / recovery time.

Vehicle revenue miles exclude: Deadhead; Operator training; Vehicle maintenance and testing; and other non-revenue uses of vehicles.

[3] Source: https://www.oregon.gov/odot/RPTD/RPTD%20Document%20Library/Transit-Network-Report.pdf

1. Introduction

Human consumption of fossil fuels is the primary driver of planetary warming, resulting in changes to the climate that have occurred over the past few decades and accelerated in recent years.[4] Observed physical changes are already affecting Oregon's climate, including hotter temperatures, drought, wildfire smoke, and changing mountain snow.[5] The best available evidence indicates that human-caused GHGs must be reduced significantly by 2030 to avoid "severe, pervasive and irreversible impacts for people and ecosystems."[6]

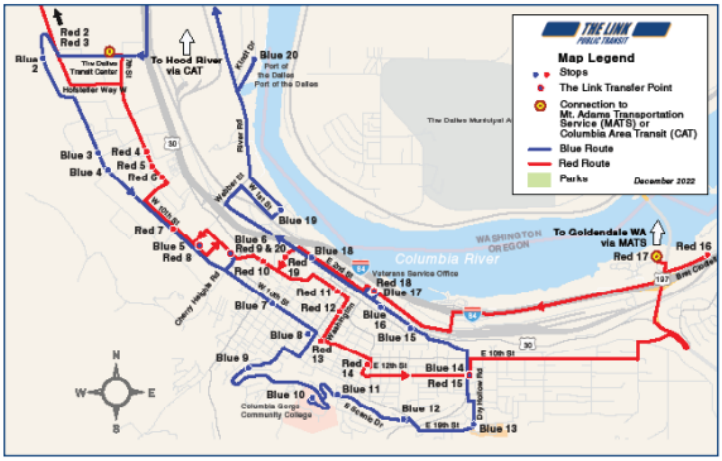
With this understanding and urgency, the Oregon Department of Transportation (ODOT) commissioned the Transit Net-Zero Project, which included completing four Oregon transit districts' operational GHG Inventories. ODOT understands that public transportation is a key piece of the puzzle to reduce fossil fuel consumption, address climate change, and mitigate a broad range of sustainability issues. By measuring the GHG emissions associated with the operation of transit districts, transportation decision-makers can understand how to reduce emissions by closely managing various sources and activities to ultimately reach the goal of net zero-emissions.

This GHG inventory report summarizes the findings for **The LINK**, one of the four transit districts participating in the Transit Net-Zero Pilot. This report quantifies the GHG emissions associated with The LINK's internal operations for **Fiscal Year 2021** (FY21: July 1, 2020 – June 30, 2021). Emissions are reported in metric tons of carbon dioxide equivalent (MT CO_2e). One MT CO_2e is equal to any one of the following:[7] 2,564 miles driven by an average passenger vehicle; 13% of one US home's energy use for a year; 46 propane cylinders used for home BBQs, or 1.2 acres of forest sequestration for 1 year.

1.1 Transit Agency Summary and Operating Structure

The LINK is one of five rural public transportation providers that make up the Gorge TransLink Alliance, which collectively provides transportation services throughout the Mid-Columbia River Gorge. The Gorge TransLink Alliance was officially formalized under the Mid-Columbia Economic Development District (MCEDD) in 2010 by the governing boards of each of the transit agencies. MCEDD oversees The LINK, which was launched in 1970 to coordinate and collaborate on economic development needs in the Gorge. The transit agency provides service throughout Wasco County. Door-to-door service is offered by The Link to riders within the City of The Dalles and surrounding communities. The geographic boundary used for this inventory includes the service area shown in **Figure 2.**

Figure 2: The LINK district boundary



The LINK has 17 employees and operates 13 vehicles, including ten transit buses and three vans. In FY21, The LINK provided 14,091 unlinked passenger trips (defined as number of passengers who board public transportation vehicles) and 116,401 vehicle revenue miles. Operating expenses for The LINK totaled $953,411 in FY21. Jesus Mendoza, the Transportation Operations Manager for MCEDD, oversees The Link's operations.

[4] Intergovernmental Panel on Climate (2014). Assessment Report 5 Synthesis Report: Climate Change 2014. http://www.ipcc.ch/report/ar5/syr/

[5] Mote, P.W., J. Abatzoglou, K.D. Dello, K. Hegewisch, and D.E. Rupp, 2019: Fourth Oregon Climate Assessment Report. Oregon Climate Change Research Institute. occri.net/ocar4.

[6] Intergovernmental Panel on Climate (2014). Assessment Report 5 Synthesis Report: Climate Change 2014 – Headline Statements. http://www.ipcc.ch/report/ar5/syr/

[7] Calculated using EPA's GHG Equivalencies Calculator

1.2 GHG Emitting Activities

The inventory includes all available emission sources for The LINK's operations and facilities following standard GHG inventory protocols.[8] These longstanding and internationally agreed-upon protocols define emissions as either direct (owned) or indirect (shared). This inventory captures both direct and indirect emissions associated with The LINK's operations for which data was available.

Direct emissions are from sources owned and/or controlled by a particular organization. Transit agencies are in direct control of selecting vehicle and equipment types and the related efficiency and fuel types used by the vehicles and equipment. Indirect emissions occur because of the organization's actions, but sources of indirect emissions are controlled by a separate entity. Organizations can influence these emissions through their purchasing power. To distinguish direct from indirect emissions sources, three "scopes" are defined for GHG accounting and reporting.[9] **Figure 3** illustrates the three scopes of emissions.[10]

- Scope 1: All direct GHGs from equipment and facilities operated by an organization. Emissions include those from fossil fuel combustion and process emissions.
- Scope 2: Indirect GHG emissions from electricity purchased for operational needs.
- Scope 3: All other indirect emissions sources that result from an organization's activities but occur from sources owned or controlled by another company or entity, including business travel, embodied emissions in material goods purchased and services contracted by an organization, upstream emissions from energy production (vehicle fuels, electricity, natural gas), and emissions associated with employee commute behavior.

Figure 3: Greenhouse gases and reporting scopes

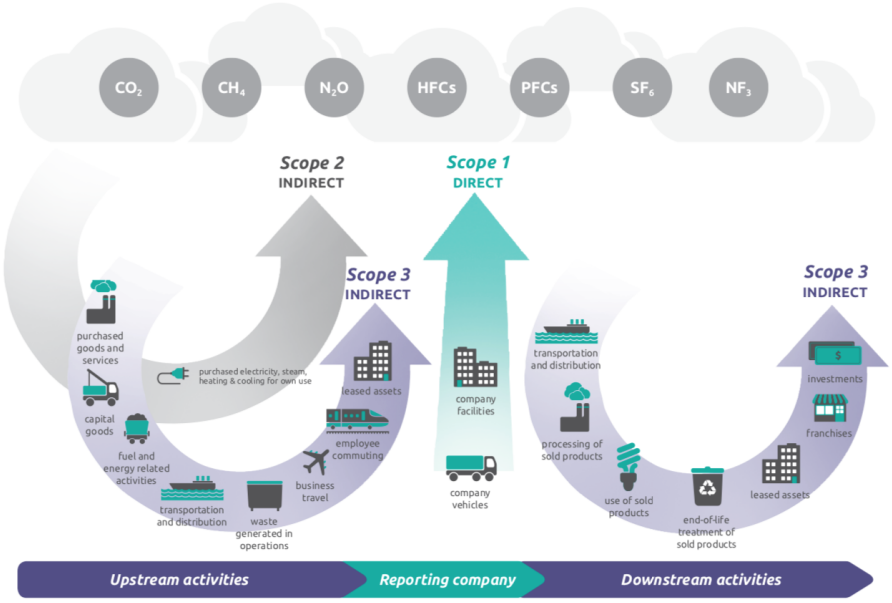


Figure 3 illustrates the GHGs measured in the inventory. The inventory includes the "Kyoto gases": carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), nitrogen trifluoride (NF_3) and hydrofluorocarbons (HFCs). **The LINK** does not use PFCs, NF_3 or SF_6; therefore, those gases are not included. In general, direct and indirect CO_2-equivalent (CO_2e) emissions consist of CO_2 from the combustion of fossil fuels (e.g., diesel, gasoline, and natural gas). All operational GHG emissions presented in this report are represented in metric tons of carbon dioxide equivalent (MT CO_2e). The GHG calculations use the global warming potentials (GWP) as defined in the International Panel on Climate Change's 5th Assessment Report (IPCC AR5).

[8] Including The Climate Registry's Local Government Operations Protocol (TCO LGO), Greenhouse Gas Protocol's Scope 2 Guidance, and GHGP's Corporate Value Chain (Scope 3) Standard.

[9] Source: WRI/WBSCD Greenhouse Gas Protocol, Corporate Accounting & Reporting Standard (Revised Edition), Chapter 4.

[10] Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard (PDF), page 5.

2. Methodology

2.1 Protocol & Boundaries

The methodology used for this inventory follows the **Greenhouse Gas Protocol's (GHG Protocol)** ***Corporate Standard*** for Corporate Accounting and Reporting of GHG emissions inventories, which is supplemented with GHG Protocol's *Scope 2 Guidance*. The inventory also follows the *Corporate Value Chain Standard* for scope 3 supply chain emissions. The first step of any GHG inventory is setting an appropriate boundary. The boundary includes defining the timespan, control approach, emissions sources, and gases covered in the inventory. This GHG inventory quantifies the GHG emissions associated with internal operations for FY21 (July 1, 2020 – June 30, 2021) using the operational control approach. Under the operational control approach, an organization accounts for all the GHG emissions over which it has operational control. This does not include GHG emissions from operations in which an organization owns an interest but does not have operational control.[11] This inventory includes the following emissions sources: fleet fuel use, building natural gas, other fossil fuels, and fugitive refrigerants for scope 1; building electricity for scope 2; and employee commute, solid waste disposal, business travel, supply chain from purchased goods/contracting services, and upstream fuel production for scope 3 (see **Table 3** for details). This inventory considers all seven recognized GHGs – carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3) as applicable. All gases are reported in terms of carbon dioxide equivalent (CO_2e), or the amount of carbon dioxide it would take to create the same warming effect.

2.2 Emissions Sources

Data for this inventory was provided by the transit agency staff. **Table 3** outlines each of the emissions sources included in the inventory.

Table 3: Description of ODOT Net-Zero Transit Agency GHG Inventory Emissions Sources

SCOPE	EMISSIONS SOURCE	EMISSIONS SOURCE DESCRIPTION
Scope 1 (Direct Emissions)	Fleet Fuels	Fleet fuels includes all combustion fossil fuels used in mobile equipment which emit GHGs. Emissions accounted for here represent scope 1 "tailpipe" emissions only, per GHG reporting standards. Upstream emissions from the extraction, processing, production, and transportation of fuels and energy to the point of purchase are included in scope 3 upstream energy production.
	Building Natural Gas	As applicable, emissions from natural gas come from the combustion process used to heat the space for buildings and water.
	Other Stationary Energy	Small quantities of other stationary combusted fuels, such as propane or diesel, are included in this category. While part of the data collection process, none of the agencies in this project reported any other stationary energy activities (e.g., diesel generator use).
	Fugitive Refrigerants	Refrigerant gases are used in heating, ventilation, and air conditioning (including vehicle AC systems), and can escape into the atmosphere. Refrigerants are powerful global warming gases. Therefore, relatively small losses have a large climate impact. While transportation refrigerant loss was largely known, no data was found or reported for building refrigerant loss and was therefore estimated for all agencies.
Scope 2	Building Electricity	The combustion of fossil fuels to generate electricity in building facilities is a source of operational GHG emissions. Emissions in this category can be reduced by purchased renewable energy credits (RECs) when calculating electricity emissions using market-based accounting methodology. None of the agencies in this project purchased RECs in FY21.

[11] Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard (PDF), page 29.

SCOPE	EMISSIONS SOURCE	EMISSIONS SOURCE DESCRIPTION
Scope 3 (Indirect Emissions)	Employee Commute	Employee commute patterns, dependent on frequency and mode, contribute to the overall indirect operational emissions.
	Solid Waste Disposal	Disposal of waste into landfills produce methane, of which a fraction leaks out into the atmosphere, having a negative climate impact.
	Business Travel	This category accounts for GHG emissions associated with business travel that is not conducted using an agency's owned vehicle fleet.
	Supply Chain: Purchased Goods and Services	This category provides an estimate of the embodied GHG emissions in the manufacture, processing, and transportation of select goods and services. Specifically, this inventory accounts for purchase of building services, vehicle repair, nonresidential maintenance and repair, computers, office supplies, and asphalt, as applicable.
	Upstream Energy Production	Providing a more comprehensive view of fuel and energy emissions, these emissions represent the upstream GHG impacts generated during raw material extraction, energy use during production, and transportation for vehicle and building energy products.

2.3 Emissions Factors

EPA Hub for 2021 (released April 2022) emissions factors were used for most sources to calculate emissions for this inventory. When factors were not available via EPA Hub, other sources were used. **Table 4** lists all emissions factors used for this GHG inventory by emissions source. Note that AR5 GWP are used when possible (released 2014), instead of IPCC AR4 GWP values (released 2007).

Table 4: ODOT Net-Zero Operational GHG Inventory emission factors by emissions source

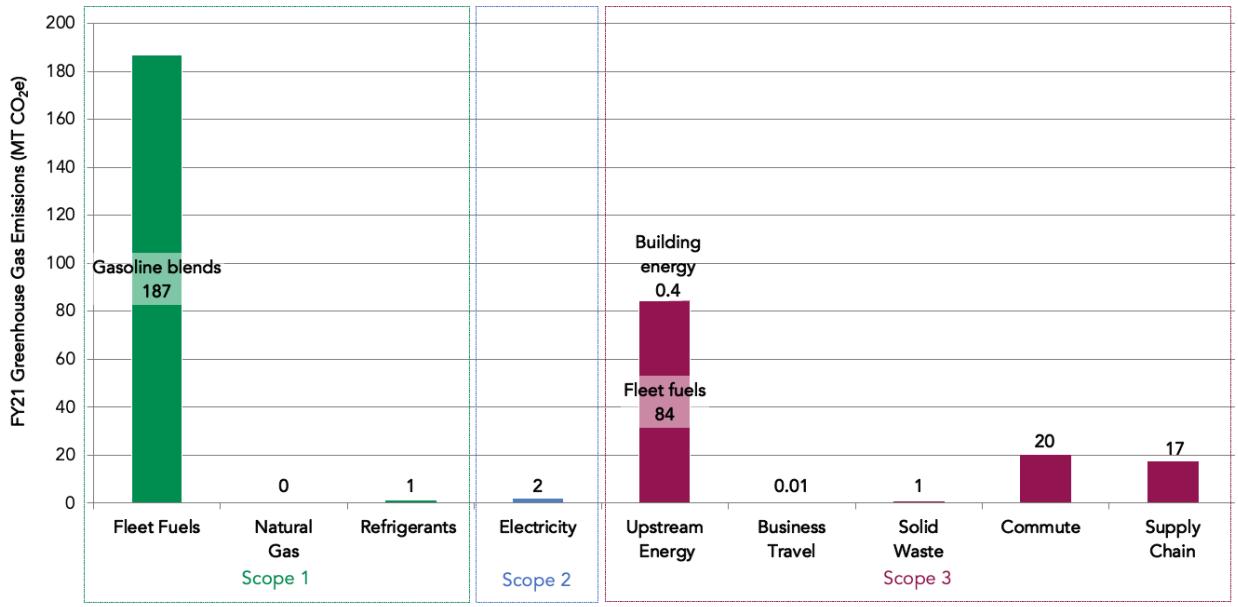
Emissions Source	Emission Factors
Fleet Fuels	EPA Hub, 2022, Table 2
Building Natural Gas	EPA Hub, 2022, Table 1
Fugitive Refrigerants	EPA Hub, 2022, Table 11 for known refrigerant loss, with Accounting Tool to Support Federal Reporting of Hydrofluorocarbon Emissions for estimating building refrigerant loss
Building Electricity – Market-based accounting	Oregon DEQ 2021 GHG Emissions from Electricity Use
Building Electricity – Location-based accounting	EPA Hub, 2022, Table 6 / eGRID 2021
Upstream Energy Production	eGRID (Electricity T&D Loss), Oregon DEQ Clean Fuels Program Updated Electricity Carbon Intensity Values for 2021 (Electricity Fuel Production), Oregon DEQ Clean Fuels Pathway (diesel and gasoline blend production), GREET model (natural gas production and distribution)
Business Travel	EPA Hub, 2022, Table 10
Solid Waste Disposal	EPA Hub, 2022, Table 9, modified to reflect IPCC AR5 GWP value for methane
Employee Commute	EPA Hub, 2022, Table 10
Purchased Goods and Services	EPA Supply Chain GHG Emission Factors for US Commodities and Industries v1.1.1, 2018 Detail Commodity Table, Supply Chain Factors with Margins, modified to reflect IPCC AR5 GWP value for methane and nitrous oxide

3. Results

3.1 FY21 GHG Inventory Summary

The following sections provide the findings and notable details from The LINK's FY21 GHG Inventory. **Figure 4** shows organization wide GHG emissions in MT CO_2e for FY21 by emissions category. Emissions from sources for which The LINK has the greatest control (scope 1 and scope 2) total **190 MT CO_2e**. Scope 3 emissions from mission critical sources, but for which The LINK has less control, total **123 MT CO_2e**. **Combined emissions from all three scopes total 312 MT CO_2e** (rounded down).

Figure 4: The LINK's FY21 operational emissions, by scope (same as executive summary figure 1)



The LINK FY21 Inventory Results Highlights:

- Fleet combustion of gasoline is by far the largest source of emissions (**187 MT CO_2e**). Fleet "tailpipe" emissions represent 98% of emissions under The LINK's direct control (Scope 1 and Scope 2), and 60% of total emissions (including Scope 3).
- Upstream energy emissions make up the second largest source of emissions at **84 MT CO_2e** (27% of total emissions). 99% of upstream energy emissions were from fleet fuels.
- After fleet fuels and upstream energy, employee commute emissions were the third largest source at **20 MT CO_2e** (just over 6% of total emissions).
- Closely following employee commute is supply chain emissions at **17 MT CO_2e** (nearly 6% of total emissions).
- All other Scope 1 and Scope 2 emissions sources (natural gas, refrigerants, and electricity) all together represent less than 2% of total emissions.

Figure 5: The LINK emissions by scope

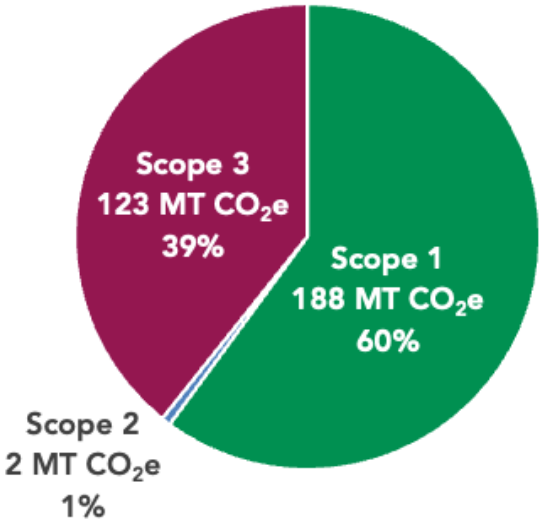
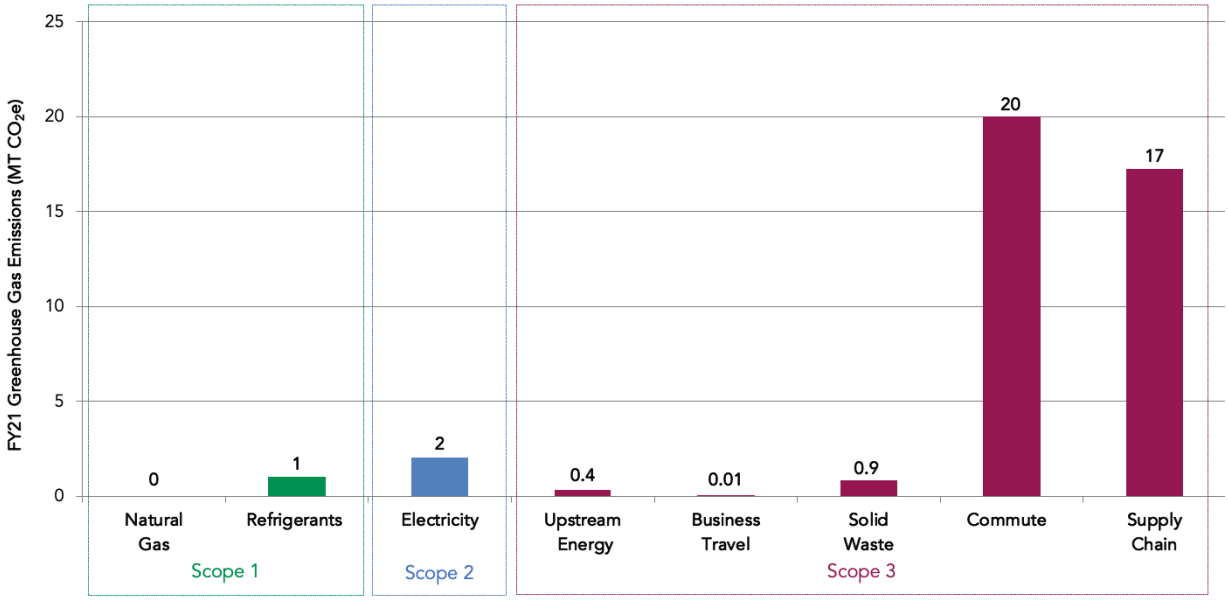


Figure 6 illustrates all The LINK emissions that are not directly tied to fuel use, excluding both fleet fuels (or "tailpipe" emissions) and upstream fuel emissions (which are directly dependent on the quantity and type of fuel used). Because these are the largest sources of emissions, omitting them in this graphic better demonstrates the scale of all other emissions sources.

Figure 6: The LINK FY21 operational emissions, excluding fleet fuels and upstream energy emissions from the consumption of fleet fuels to demonstrate scale of other emissions sources

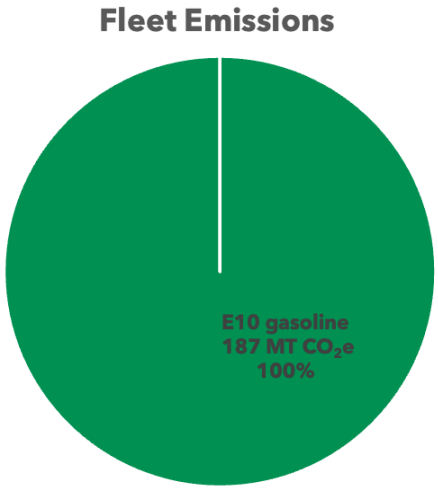


Fleet Fuels

In FY21, The LINK's fleet was comprised entirely of gasoline buses and vans that consumed 22,923 gallons of standard E10 gasoline (90% gasoline, 10% ethanol). No B5 diesel was consumed by The LINK's fleet in FY21. Emitting **187 MT CO_2e**, combusted mobile fuel accounts for 98% of owned (scope 1 and 2) emissions. In FY21, The LINK's fleet included 10 buses and 3 vans.

As the largest source of emissions, fleet fuel use is the best opportunity for The LINK to reduce emissions.

Figure 7: The LINK FY21 fleet fuel emissions by fuel type



Natural Gas

Natural gas is not used in the The LINK facilities.

Refrigerants

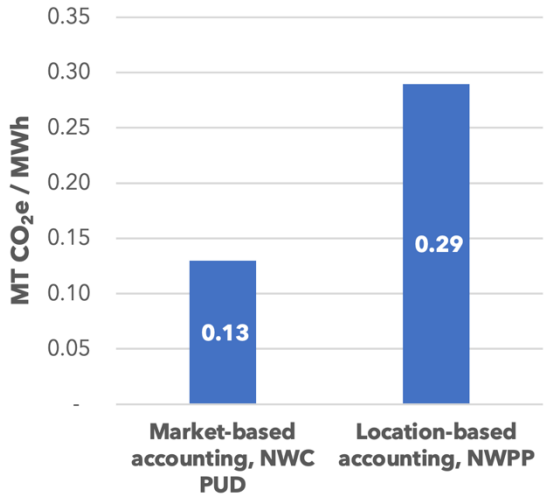
The LINK confirmed no refrigerant was purchased for fleet vehicles (transit buses and vans) in FY21. Building refrigerant use was estimated to be **1 MT CO_2e**, assuming typical office conditions with R410a.

Electricity

The LINK's administrative and operations facility consumed 15,525 kWh of electricity in FY21, emitting **2 MT CO_2e** using market-based accounting. Market-based accounting includes emissions from electricity purchased from Northern Wasco County People's Utility District (PUD), The LINK's electric utility provider. Market-based accounting is preferred when combined with goal setting and climate action.

Using location-based (uses regional electric grid average emissions factors) accounting, The LINK's facilities emitted **4 MT CO_2e** in FY21. The location-based and market-based numbers are different, as shown in **Figure 8**, because Northwest Power Pool's regional emissions factors are greater than Northern Wasco County PUD's. Northern Wasco PUD operates two small "fish-friendly" hydroelectric power plants on the Columbia River, leading to its lower GHG intensity.

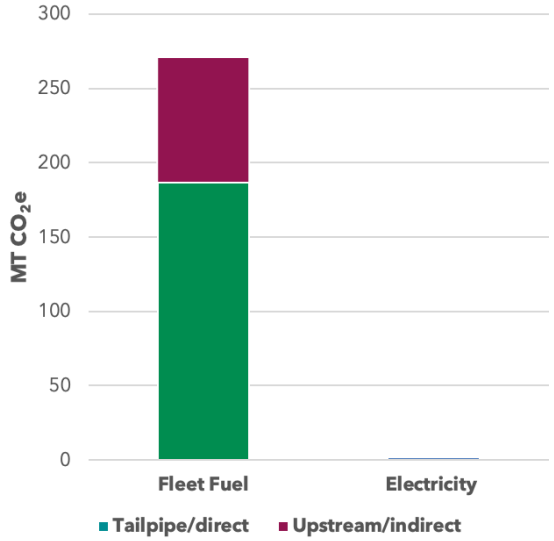
Figure 8: Comparison of market-based and location-based electricity accounting emissions factors



Upstream Energy

Emissions associated with extracting, refining, processing, transporting, and/or distributing all vehicle fuels and building energy are calculated in addition to direct emissions. Depending on the fuel, upstream emissions account for approximately 10-35% of total fuel emissions. *The LINK's upstream energy emissions are largely from fleet fuel emissions; if The LINK was to reduce fleet fuel use or fuel-switch, upstream energy emissions would correspondingly change (depending on specific fuel). Note that in **Figure 9** below, the upstream emissions for electricity are so minimal that they are not visible on the graph.*

Figure 9: Comparison of direct emissions for energy and upstream energy



Business Travel

Staff traveled 31 miles in FY21 using employee-owned vehicles on behalf of The LINK, emitting **0.01 MT CO_2e**. No other business travel occurred.

Solid Waste

In FY21, The LINK disposed of 35 cubic yards of solid waste, emitting **less than 1 MT CO_2e (0.9).**

Employee Commute

The LINK's staff commuted an average of ten miles each way to work, with 84% of trips using single occupancy vehicles, 14% using non-fossil fuel modes, 1% using the bus/public transit, and less than 1% carpooling. **20 MT CO_2e** was emitted from employee commute travel.

Supply Chain

Emissions from purchased goods and services are included in the GHG inventory, including expenditures for: new vehicles, building services, vehicle and building maintenance and repair, computers, and office supplies. The LINK supply chain emissions from these specific categories totaled **17 MT CO_2e**.

Overall, emissions from supply chain purchased goods and services totaled approximately 6% of total emissions.

The following NAICS codes/purchasing categories were used to define what goods and services fell into each category:

336111: Automobiles – this category includes truck and bus bodies and cabs and automobile bodies.

561700: Building and dwelling services – this category includes services such as: (1) exterminating and pest control services; (2) janitorial services; (3) landscaping services; (4) carpet and upholstery cleaning services; or (5) other services to buildings and dwellings.

811000: Automotive repair and maintenance – this category includes all costs related to vehicle repair and maintenance.

230301: Nonresidential maintenance and repair – this category includes nonresidential building repair and maintenance.

334111: Computers – this category includes electronics, computers, and communication equipment.

339940: Office supplies (not paper) – this category includes office supplies such as: pens, pencils, markers, pencil sharpeners, staplers, stamps, stamp pads, and inked ribbons.

As shown in **Figure 10**, the majority of The LINK's supply chain emissions are associated with the purchase of vehicle repair (7 MT CO_2e) and building maintenance and repair (6 MT CO2e), followed by office supplies (3 MT CO_2e), building services (1 MT CO_2e), and computers (0.3 MT CO_2e).

Figure 10: Supply chain emissions per purchasing category

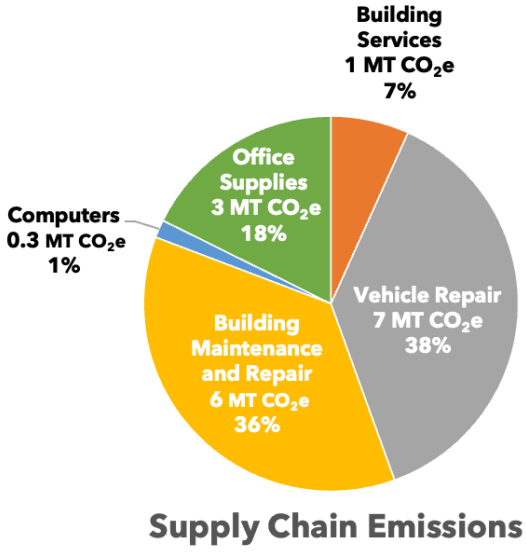
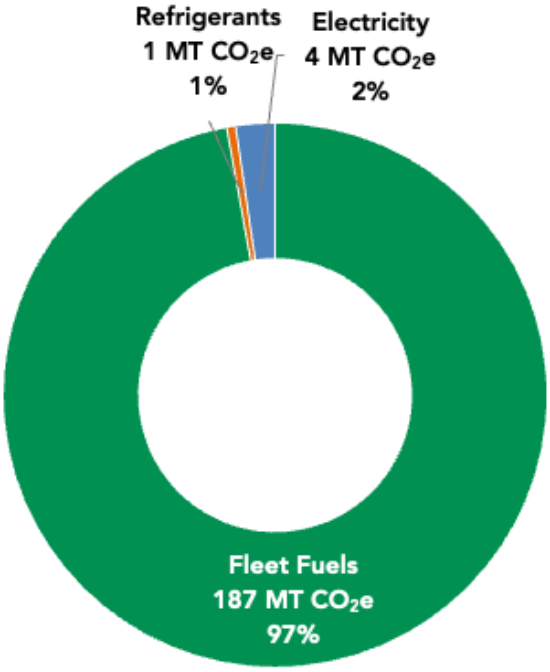


Table 5: Emissions per purchasing category

Purchasing Category	MT CO_2e
New Vehicles	0
Building Services	1
Vehicle Repair	7
Building Maintenance and Repair	6
Computers	0.3
Office Supplies	3

3.2 GHG Emissions by Scope

Figure 11: Scope 1 and 2 GHG emissions



Scope 1 and 2 Emissions

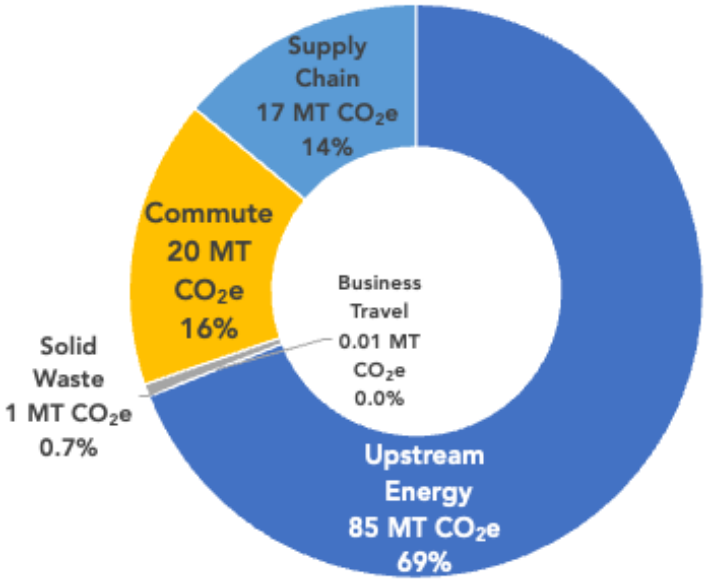
Scope 1 and 2 emissions are from sources owned or controlled by an organization. The LINK's scope 1 and 2 emissions sources include fleet fuels (gasoline), refrigerants in vehicles and buildings, and electricity use. Scope 1 and 2 emissions totaled **190 MT CO_2e in FY21, or 61% of total emissions**. Fleet fuels are by far the largest source of scope 1 and 2 emissions, representing 98% of these direct emissions.

Fleet fuels are the largest source of emissions for all the transit agencies participating in the ODOT Net-Zero Pilot. Other common scope 1 and 2 emissions sources, such as natural gas in buildings and stationary fuel combustion, were not applicable for The LINK.

Scope 3 Emissions

Scope 3 emissions (indirect emissions) occur because of the organization's actions but are controlled by a separate entity. Organizations can influence these emissions through their purchasing decisions and policies. The LINK's sources of scope 3 emissions include upstream energy from the production and distribution of fuels and electricity, employee commute, supply chain, solid waste, and business travel. The LINK's FY21 scope 3 emissions total **123 MT CO_2e, or 39% of total emissions**. These sources are significant yet can be challenging to mitigate. Upstream energy is the largest source of GHG emissions accounting for 69% of total scope 3 emissions.

Figure 12: Scope 3 GHG emissions



3.3 Intensity Metrics

Transit agencies are known to change services provided over time, such as expanding to new bus routes, removing underutilized routes, or adding additional service to popular routes. As services change, emissions will change, but in the case of transit agencies – more service activities, which may add up to more emissions, mean a greater benefit to the community. For this reason, intensity metrics are important to include and consider because they are a normalized metric that can be used to compare emissions per quantity of specific activities. This is helpful for comparing emissions over time, as services change and become more or less efficient. **Table 6** summarizes The LINK's GHG emissions intensity by Vehicle Revenue Miles (VRM), unlinked passenger trips, and service population.

Table 6: Intensity metrics for The LINK, FY21 (same as executive summary table 1)

MT CO_2e / 1,000 Vehicle Revenue Miles (VRM)	MT CO_2e / 1,000 Unlinked Passenger Trips (UPT)	MT CO_2e / 1,000 people in service population
2.7	22.2	12.4

For comparison, **Table 7**Table 2 summarizes the GHG emissions intensity averages across all four agencies in the Transit Net-Zero Pilot. In contrast, The LINK operations in FY21 were below-average per VRM and UPT, but above average per people in their service population.

Table 7: Average intensity metrics across all four agencies in the ODOT Transit Net-Zero Pilot (same as executive summary table 2)

MT CO_2e per 1,000 Vehicle Revenue Miles (VRM)	MT CO_2e per 1,000 Unlinked Passenger Trips (UPT)	MT CO_2e per 1,000 people in service population
2.2	16.3	22.4

While helpful to compare to other agencies, it is more important for an agency to compare against its own emissions and intensity metrics over time.

Appendix A. Agency Data

Data for FY21 was collected for each of the identified emissions sources. **Table 8** below outlines the emissions sources data was collected for and the availability and granularity of data received. **Table 8** differs from **Table 3** (pgs. 5-6 of the report) in that it describes the specific data sources and level of confidence for each data source The LINK provided.

Special thank you to Jesus Mendoza and Keli Lafrenz from MCEDD for collecting data for this inventory.

Table 8: The LINK data sources, quality, and availability

SCOPE	EMISSIONS SOURCE	EMISSIONS SOURCE DESCRIPTION
Scope 1 (Direct Emissions)	Fleet Fuels	The LINK provided total gallons of fuel purchased in FY21. Combustion fuel data was provided by The LINK and split by fuel type. In FY21, The LINK's vehicle fleet used only standard E10 gasoline (90% gasoline, 10% ethanol). High confidence data. No other forms of fuel usage were identified.
	Building Natural Gas	The LINK operations in the MCEDD building does not use natural gas. No offsets were purchased in FY21. High confidence data.
	Fugitive Refrigerants	The LINK staff reviewed maintenance records for FY21 and found that no refrigerants were used in the vehicle fleet in FY21. High confidence data. Building refrigerant loss and emissions were also estimated using square footage and facility activity use (office). Medium confidence data.
Scope 2	Building Electricity	The LINK provided utility bills showing total kWh of electricity use for FY21 from the utility that services their facility, Northern Wasco County People's Utility District (PUD). Building electricity emissions were downscaled for The LINK based on the portion of the bills that is charged to them/used by The LINK operations. This was reported by The LINK staff to be 25% of total electricity usage. No RECs/renewable energy purchases were made in FY21. High confidence data. Following Greenhouse Gas Protocol's Scope 2 Guidance, emissions from electricity were calculated using both market-based and location-based methodologies for all electric utility providers.[12]

[12] In 2015, the World Resource Institute and World Business Council for Sustainable Development released the Scope 2 Guidance (2015), an amendment to the GHG Protocol Corporate Standard. The Climate Registry also follows this updated guidance which requires dual reporting.

- Location-based method (or regional grid) multiplies an organization's electricity use by the average emissions intensity of a specific regional electricity grid that is published by the Environmental Protection Agency. For The LINK's service area the regional grid is the Northwest Power Pool (or NWPP).
- Market-based method (or utility-specific) represents emissions from the electricity procurement contracts that an organization has purposefully chosen. For many, market-based contracts are predominately represented by average retail emissions factors for local electric utility(s). For The LINK's service area, local utilities include Northern Wasco County People's Utility District (PUD).

The Scope 2 Guidance recommends using the Market-based method for goal-setting.

SCOPE	EMISSIONS SOURCE	EMISSIONS SOURCE DESCRIPTION
Scope 3 (Indirect Emissions)	Employee Commute	Commute surveys were distributed and completed by 25 MCEDD employees (MCEDD employs 17 staff to operate The LINK. Commute survey information collected data on number of days a week each employee commutes, how many one-way miles traveled from home to work (distance calculated via Google Maps), and the percentage breakdown of average mode of transportation (gasoline powered car; light truck; motorcycle; electric car; hybrid car; walk, bike, scoot, etc.; public transit; telecommute; or carpool or vanpool with # of occupants). Medium confidence data.
	Solid Waste Disposal	This category includes landfilled solid waste from The LINK operations. Solid waste volumes were estimated using container volumes in gallons and pick up frequency reported on service vendor invoices. Estimated gallons were converted to cubic yards. Medium confidence data.
	Business Travel	The LINK provided the total number of business travel miles (via personal vehicles) for FY21. No air travel was conducted in FY21. Medium confidence data.
	Purchased Construction Goods / Contracting Services (Supply Chain)	Financial data including dollars spent on the following categories was collected and provided by The LINK staff: new vehicles, building services, vehicle repair and maintenance, building repair and maintenance, computers, and office supplies. Some data was specific to The LINK operations, while other data had to be split from MCEDD financial reports. Medium confidence data. This analysis estimated the upstream GHG emissions generated by raw material extraction, production, and transportation of goods and services up to the point of product purchase.
	Upstream Energy	Upstream emissions were calculated based on total fleet fuels and electricity purchased by The LINK for FY21. High confidence data.

Appendix B. Data Checklist

Scope	Emissions Source	Data Needs
1	Fleet Fuels	Fuels use by fuel blend and vehicle service type (e.g. revenue vehicles, paratransit, other vehicle types). Report in unit common to fuel (gallons, cubic feet, kWh).
1	Building Natural Gas	Natural gas use by facility. Report in available units (e.g. therms, cubic feet, MMBTU). Report offsets as applicable, e.g. NW Natural SmartEnergy participation.
1	Other Fossil Fuels	Fuel use by fuel type and facility (diesel generator). Report in gallons.
1	Fugitive Refrigerants	Loss by refrigerant type, weight and end use. Buildings and fleet.
2	Building Electricity	Electricity use (kWh, etc.) by facility. *Split from vehicle electricity (if applicable).*
3	Employee Commute	Average employee commute distance, annual commute days, mode(s) of travel, and average fuel economy for passenger vehicles.
3	Solid Waste Disposal	Short-tons of mixed solid waste disposal and destination landfill. (Note that destination landfill was not used as methodology updated).
3	Business Travel	Passenger-miles or dollars spent on vehicle and air travel.
3	Purchased construction goods / contracting services	Dollars ($) spent during inventory year on specific purchasing categories (note that this data request changed as the project progressed).
3	Upstream Energy	No additional data collection needs.
Other	Context and Intensity Metrics	Number of full-time employees, facility square footage, vehicle-miles traveled (National Transit Database reporting), revenue-miles traveled (National Transit Database), passenger-miles as available.