

# NW Transportation Conference

## Climate-Friendly & Equitable Communities (CFEC) Vehicle Miles Traveled (VMT)

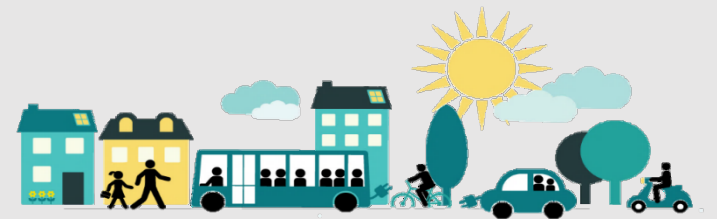
Zachary Horowitz

March 4, 2024

# Presentation Outline

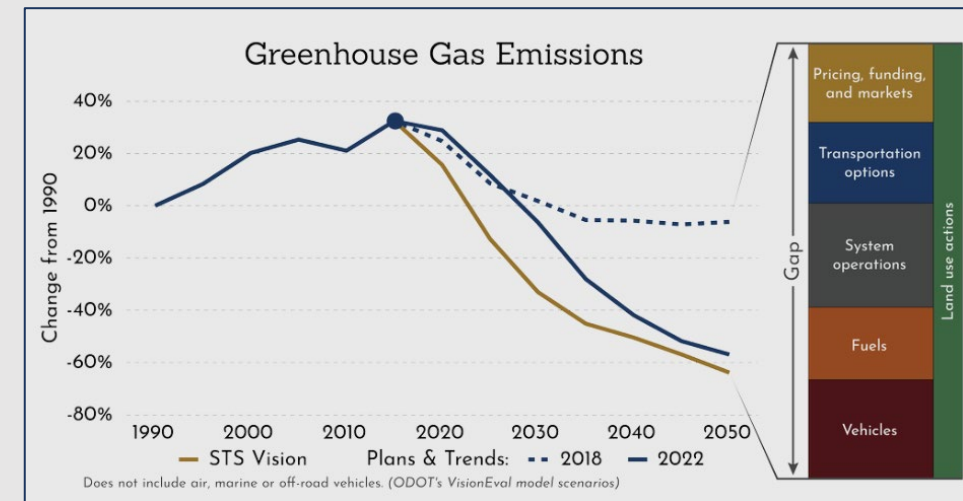
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- A brief history of greenhouse gas planning in Oregon
- Statewide policy to local plans - how did we get to Vehicle Miles Traveled (VMT) as a performance measure?
- Implementation within Transportation System Plans (TSP)
- Calculating VMT



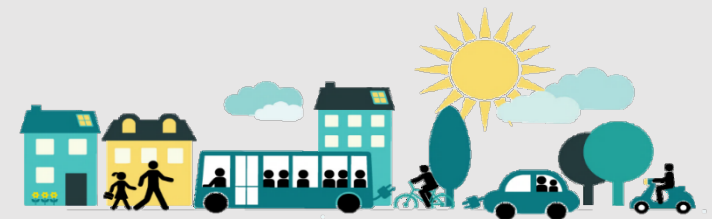
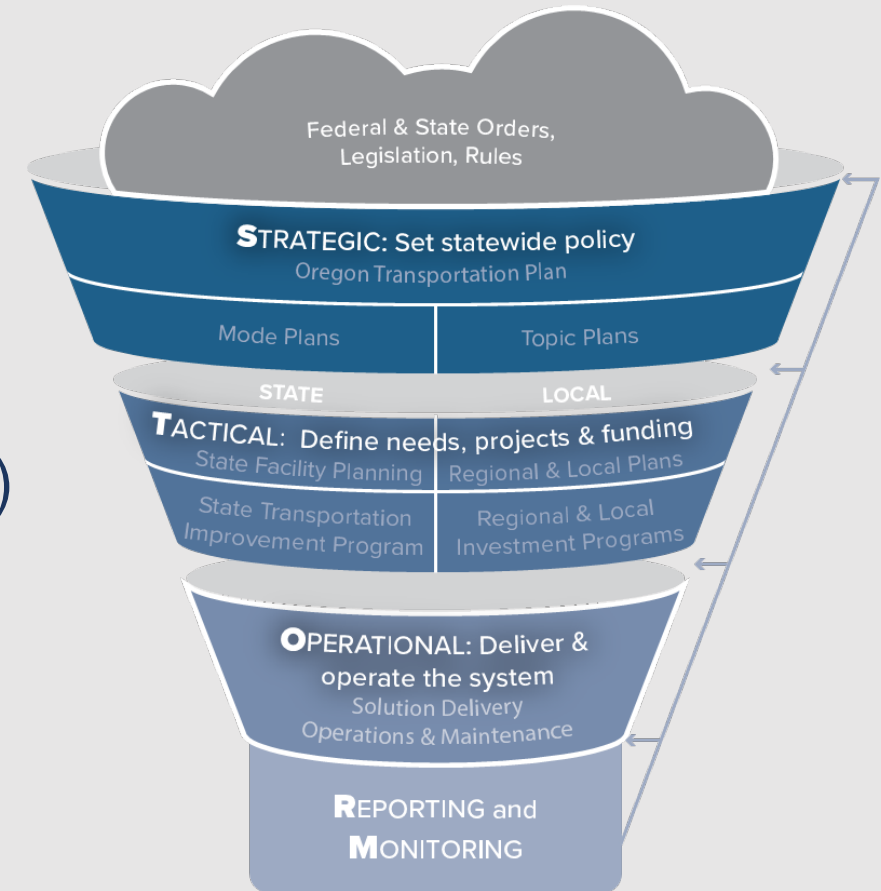
# CFEC Background

- **ORS 468A.205** was adopted by Legislature in 2007, setting a goal to reduce GHGs to 75% below 1990 levels by 2050.
- In 2011, LCDC adopted rules (OAR 660-044) that set **GHG Reduction Targets** for metropolitan areas of the state.
- **Statewide Transportation Strategy** outlined actions to meet that goal (2013)
- **Executive Order 20-04** directed ODOT and DLCD to adopt amendments to the TPR directing cities to meet GHG reduction targets through transportation plans



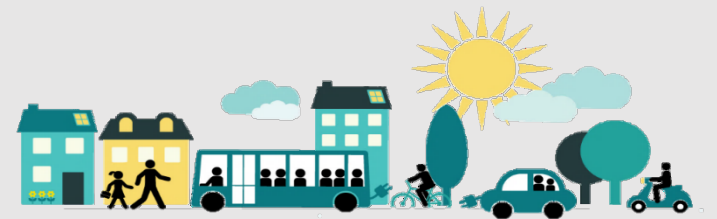
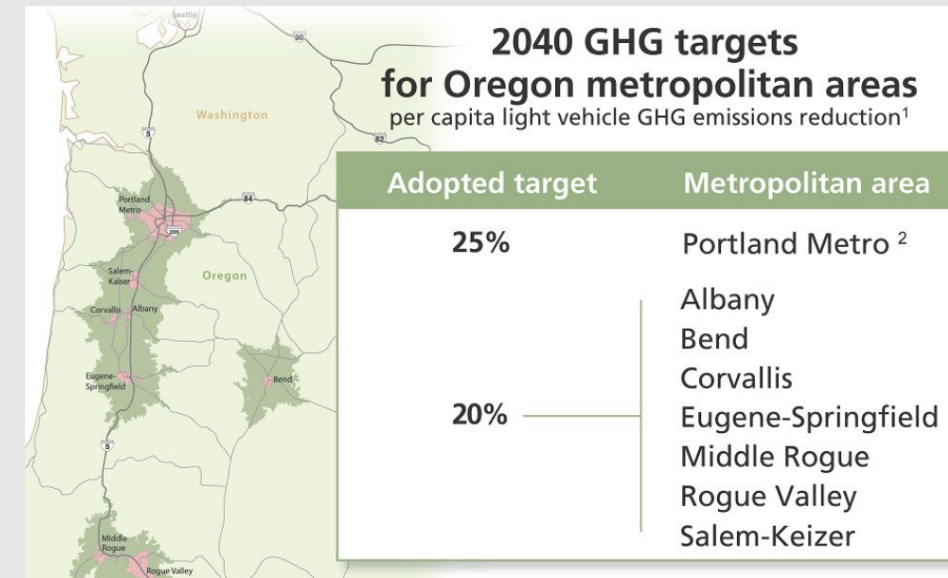
# CFEC in the Planning Process

- Statewide Transportation Strategy (STS)
- Scenario Planning (OAR 660-044)
- Transportation Planning Rules (OAR 660-012)
  - Transportation System Plans
  - Climate Friendly Areas
  - Performance Standards
  - VMT analysis and reporting



# Metropolitan Greenhouse Gas (GHG) Reduction

- ODOT Climate Office models GHG through the VisionEval (formerly Greenstep) model
  - Required in Metro, Salem, and Eugene
  - Regional targets set in OAR 660-044
  - VisionEval is not the same as a travel demand model
- Ties to the TPR (OAR 660-012) via performance measures
  - Housing, employment, active transportation, transportation options, parking, etc.
  - And...VMT per capita



# Household-based (HH) VMT per capita

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- This is the key performance measure from the new TPR
- Cities and counties subject to the rules must develop CFEC-compliant TSPs that reduce HH-based light vehicle VMT per capita

$$GOAL = \text{Emission Rate} \times TARGET$$

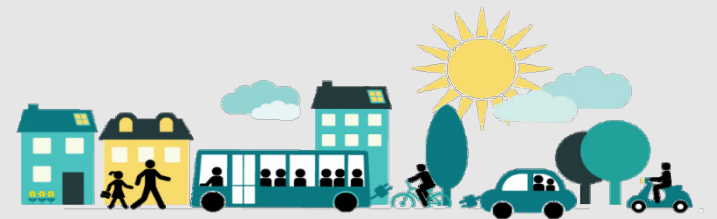
$$\frac{\text{Emissions}}{\text{Persons}} = \overset{\text{or equivalently}}{\frac{\text{Emissions}}{\text{Miles}}} \times \frac{\text{Miles}}{\text{Persons}}$$

# What About a Technology Solution?

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- Electric vehicles – what if everyone drove an EV?
  - Still need to generate and transport electricity
  - Still need to construct and develop the infrastructure
  - Still need to build EVs, maintain roadways, etc.
  - Will take a long time based on current fleet mix
- EVs + Pricing (tolls, VMT pricing, HOT lanes)
  - Effective to raise revenue, reduce congestion and manage demand
  - Not implemented yet

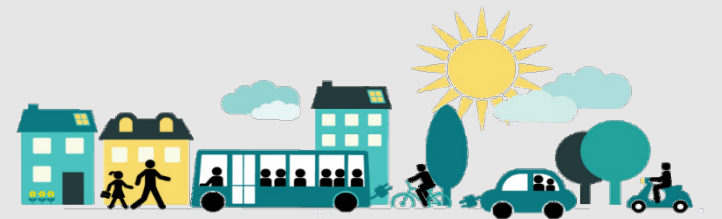
**Bottom line: Technology helps, but VMT needs to be reduced to meet statewide climate goals**



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# Calculating VMT

## What to Know

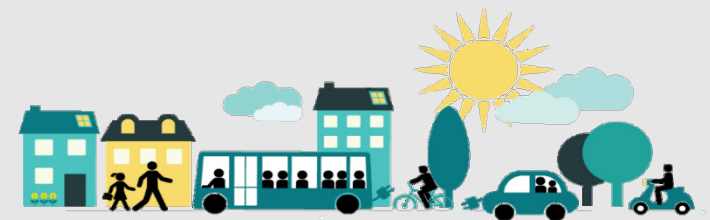




# Rule 660-012-0005(64) - VMT Definition

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“Vehicle Miles Traveled (VMT)” means all jurisdiction household-based light vehicle travel regardless of where the travel occurs.

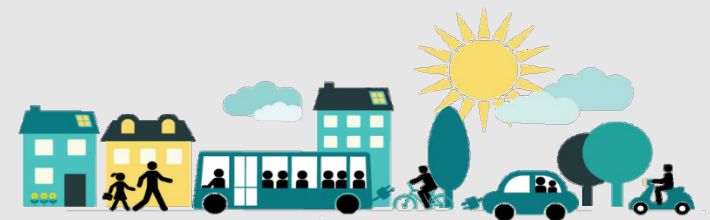


# Rule 660-012-0160 (Reducing VMT in TSPs)

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## Key Messages:

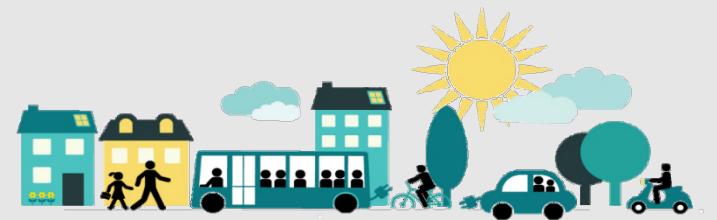
- Calculated based only on a jurisdiction's households
- Based on the TSP fiscally-constrained project list
- TSPs may only be adopted if the horizon year VMT per capita is no greater than the base year VMT per capita
- VMT is measured on a per capita basis



# VMT Calculation Process Goals

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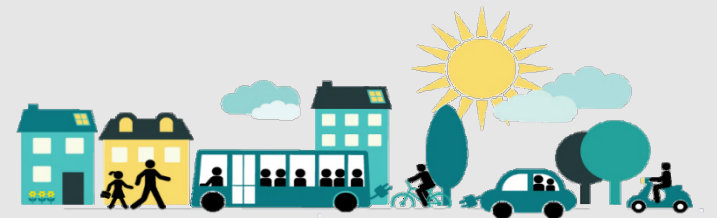
- Align with definition
- Consistent and repeatable across Oregon MPOs
- Documentable
- Supportive of GHG and VMT reporting requirements
- Incremental modifications to current modeling process
  - Demographics/households
  - Land use and employment data
- Integrate Climate Friendly Areas (CFA)
- Prepare for wider use of activity-based models



# Which VMT are we Including?

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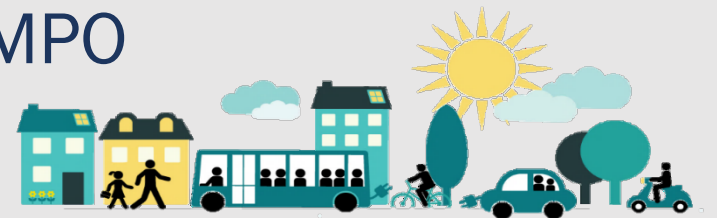
- Household-based
- Trips beginning within a TAZ in a specific jurisdiction that:
  - End in the same TAZ
  - End elsewhere in the model area
  - End elsewhere outside the model area (using SWIM)
- Non-home based (NHB) trips
  - Activity-based models (easier)
  - Trip-based models (not so easy)



# Which VMT are we not including?

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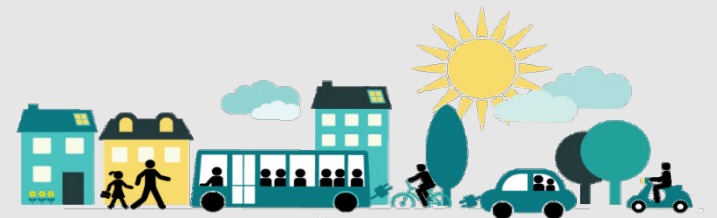
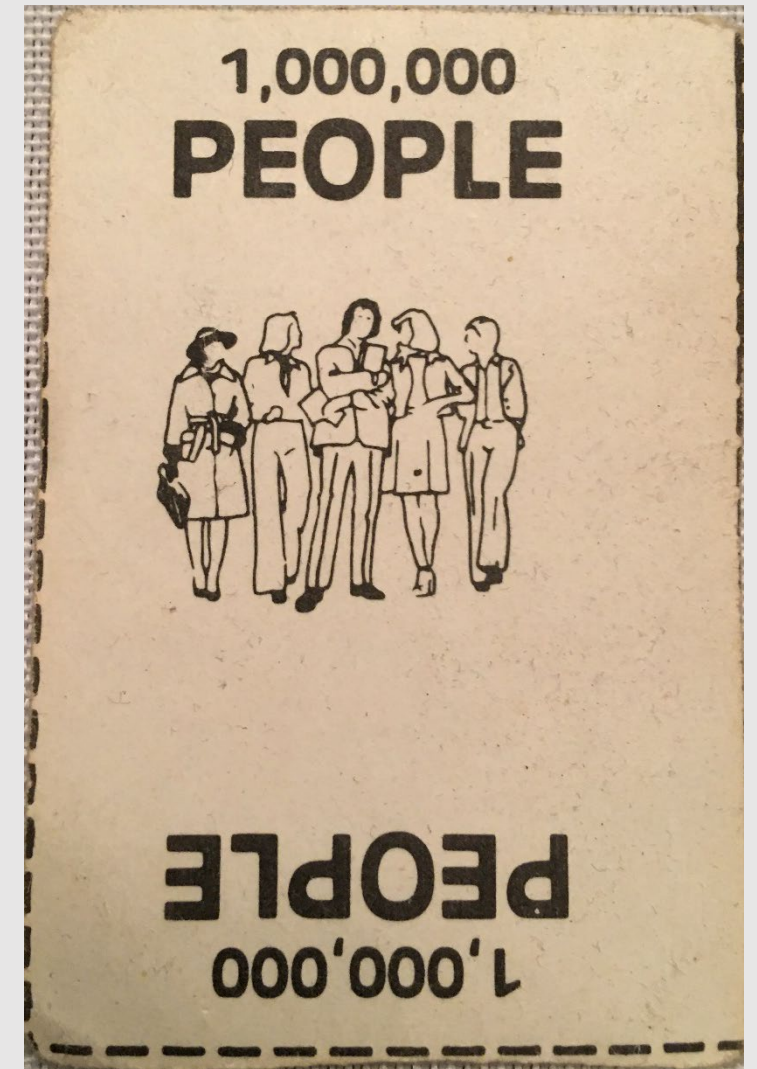
- Visitors
  - Challenge is “denominator” – the per capita component
- Commercial trips
  - Not typically household-based and align with business activity
- Future opportunities/ideas
  - Calculate VMT for visitor/commercial trips at the MPO level
  - Track and report GHG against statewide goals
  - Proportion out to individual jurisdictions in an MPO



# Population Synthesizer

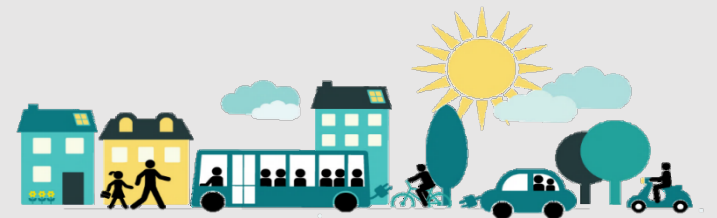
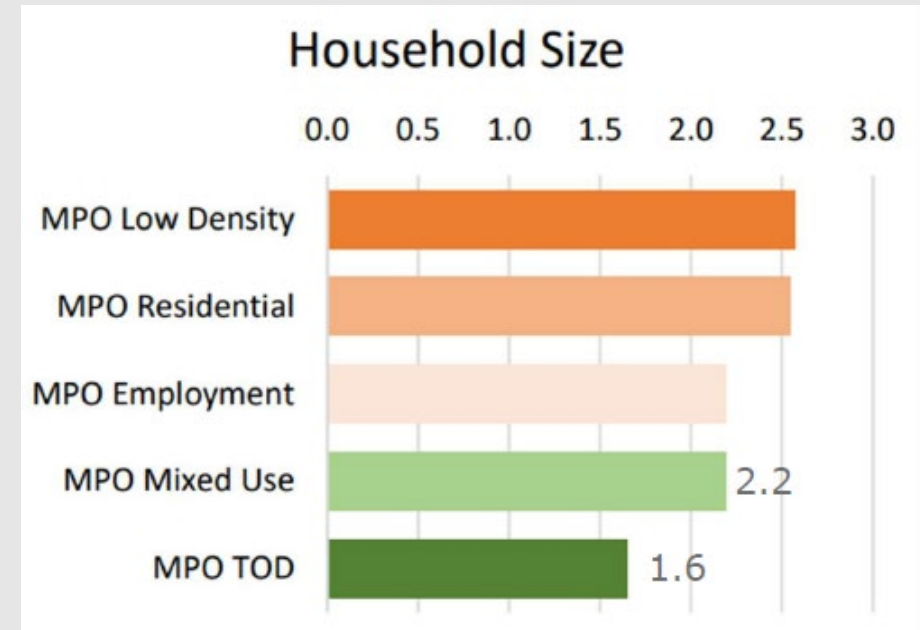
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- Already in use in activity-based model
- Can provide additional details to future demographic forecasting
- Focus on elements that drive travel decisions
  - Household size distribution (number of people in a house)
  - Percentage of single-family/multi-family homes by TAZ
- Metro has a different process based on historical approach



# TAZ Modifications that can Influence VMT

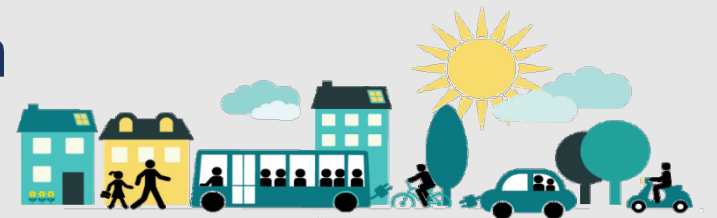
- Oregon PlaceTypes
  - Serve as part of model QA/QC process to create the
  - Opportunity to review population and employment densities
  - Review of transit availability within TAZs
- TAZ Accessibility
  - Review/modification of centroid connectors (length, location)
  - Integration of bicycle/pedestrian facility quality measures



# Non-home-based (NHB) VMT methodology

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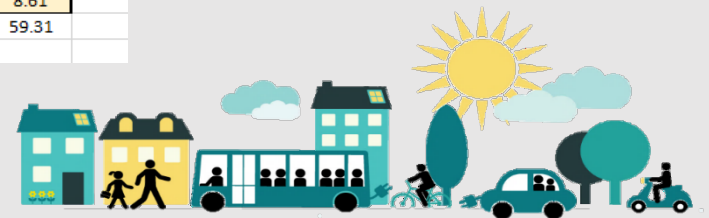
- Applies to both NHB work and NHB non-work trips
- Determine HBW and NHBW trips by TAZ via trip generation step
- Identify total percentage of HBW trips for jurisdiction by destination zone to create home-based “vector row matrix” (where trips are coming from)
- Create transpose “vector column matrix” and apply to NHBW matrix to determine destination and number of NHBW trips for each zone pair
- Create TAZ-TAZ trip length matrix for each zone pair
- Multiple NHBW trips by trip length matrix and sum
- Complete process for HBNW and NHBW trips





# Non-home-based (NHB) VMT methodology

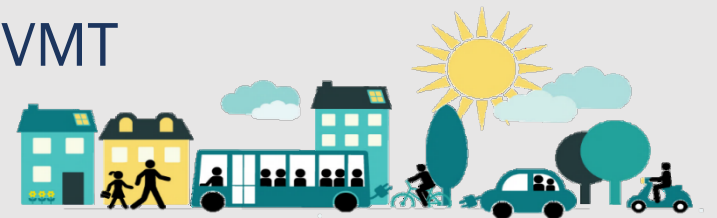
D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Assume 1,2 are Mil zones																				
From Mil																				
<b>HBW Matrix</b>																				
	1	2	3	4																
1	4	2	7	1	14															
2	6	3	5	2	16															
3	2	8	10	9	29															
4	5	4	4	7	20															
	17	17	26	19	79															
<b>Mil HB Vector</b>																				
	1	2	3	4																
	0.59	0.29	0.46	0.16																
From Mil to Z1 to Z2 to Z3 to Z4																				
Copied from below																				
<b>NHBW from Mil</b>																				
	1	2	3	4																
1	3.09	1.82	4.18	1.37	10.45															
2	3.68	2.30	4.41	1.92	12.31															
	6.76	4.12	8.59	3.29	22.76															
<b>NHBW Matrix</b>																				
	1	2	3	4																
1	3	2	5	1	11															
2	7	1	4	6	18															
3	5	3	9	1	18															
4	4	8	2	3	17															
	19	14	20	11	64															
<b>Mil HB Vector (t)</b>																				
	1	0.59																		
	2	0.29																		
	3	0.46																		
	4	0.16																		
<b>NHBW from Mil</b>																				
	1	2	3	4																
1	1.76	1.18	2.94	0.59	6.47															
2	2.06	0.29	1.18	1.76	5.29															
3	2.31	1.38	4.15	0.46	8.31															
4	0.63	1.26	0.32	0.47	2.68															
	6.76	4.12	8.59	3.29	22.76															
<b>Trip Length</b>																				
	1	2	3	4																
1	1.00	2.00	3.00	4.00	10.00															
2	2.00	1.00	4.00	3.00	10.00															
3	3.00	4.00	1.50	5.00	13.50															
4	4.00	3.00	5.00	1.50	13.50															
	10.00	10.00	13.50	13.50	47.00															
<b>VMT</b>																				
	1	2	3	4																
1	1.76	2.35	8.82	2.35	15.29															
2	4.12	0.29	4.71	5.29	14.41															
3	6.92	5.54	6.23	2.31	21.00															
4	2.53	3.79	1.58	0.71	8.61															
	15.33	11.97	21.34	10.67	59.31															



# Case Studies

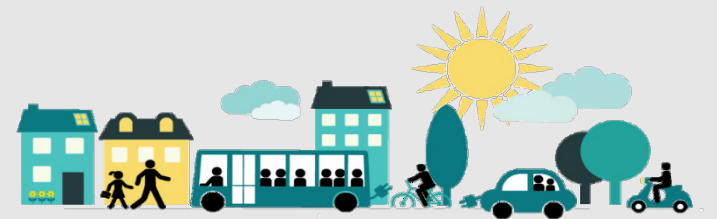
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- Milwaukie (Metro MPO)
  - Trip-based model
  - Uses existing 2040 Town Center as Climate Friendly Area (CFA)
  - More involved NHB trip calculation
  - Less opportunity (as of now) for future demographic change
- Ashland (Rogue Valley MPO)
  - Activity-based model
  - Three potential CFA candidate areas
  - Straightforward NHB, but more difficult outside model VMT
  - Working with City of Ashland on demographics



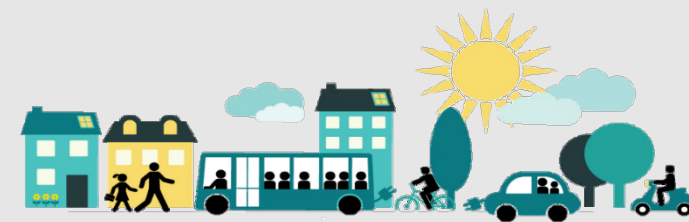
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# Discussion & Questions



# Contact Information

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