



# 2024 Northwest Transportation Conference



Oregon State University  
CH2M Hill Alumni Center

## Oregon's Next Generation of Travel Planning Tools

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March 4, 2024, 3:30pm to 5:00pm

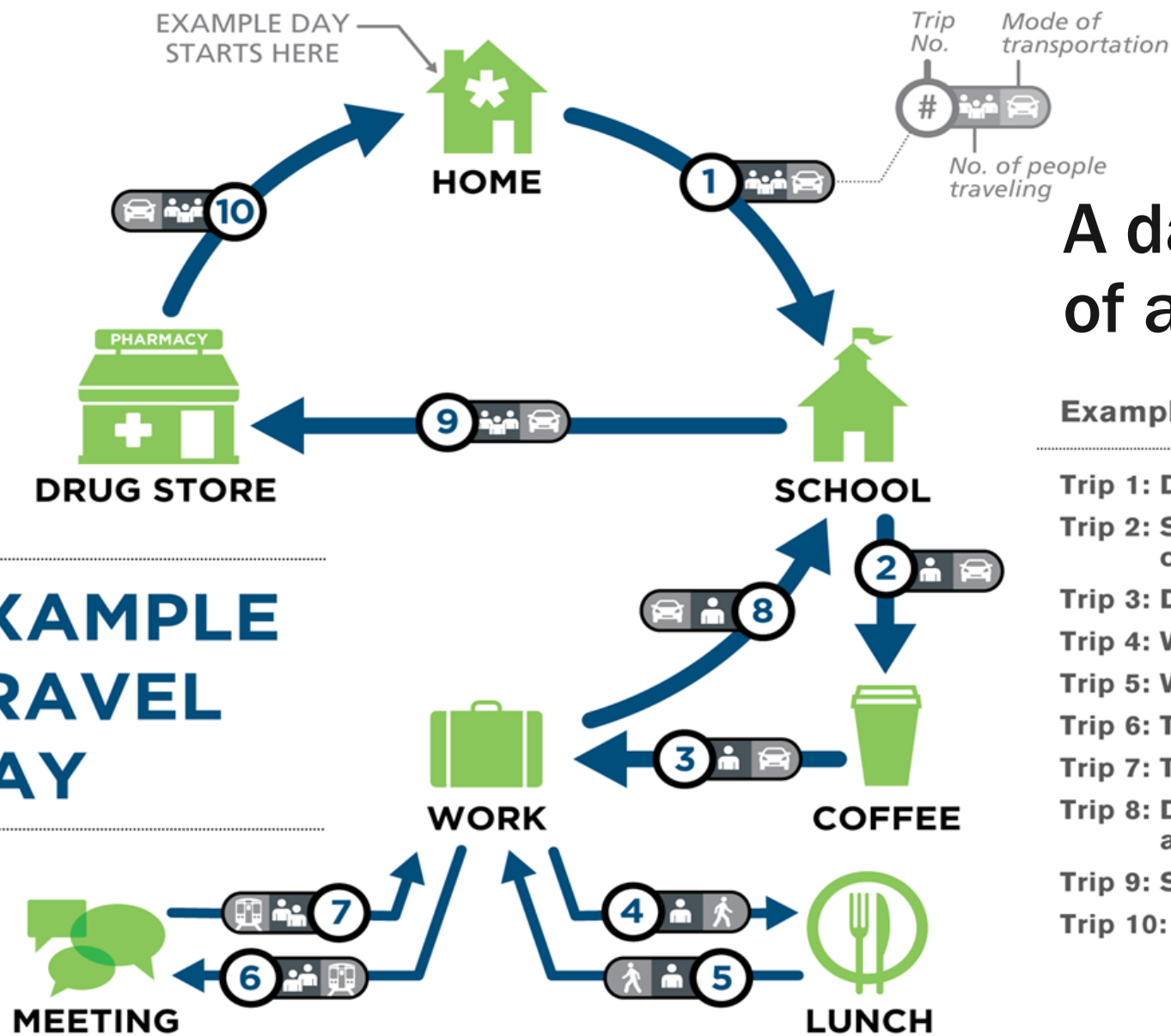


From  
1%  
To:

100%

And  
into  
the  
Future

## EXAMPLE TRAVEL DAY



## A day in the life of a participant

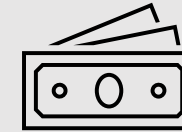
### Example Travel Day Trips

- Trip 1: Drive children to school
- Trip 2: Stop to get coffee at convenience store
- Trip 3: Drive to work
- Trip 4: Walk across street to lunch
- Trip 5: Walk back to work
- Trip 6: Take subway to a meeting
- Trip 7: Take subway back to work
- Trip 8: Drive to pick up children at school
- Trip 9: Stop at drug store
- Trip 10: Drive home


# Some Basics:

(beyond what, where, when, how, who, why)

- Pricing policies/scenarios or forecasting where having a detailed representation of different values of time is helpful,
- Equity analysis and accounting,
- Tailored (individual) programs such as; travel demand management, transit incentives, low-income toll discounts/programs, new technologies such as e-vehicles and e-bikes,
- GHG analysis and accounting,
- Improved representation of bicycling and pedestrian trip choices through the ability to represent a finer/smaller zone structure for shorter trips.

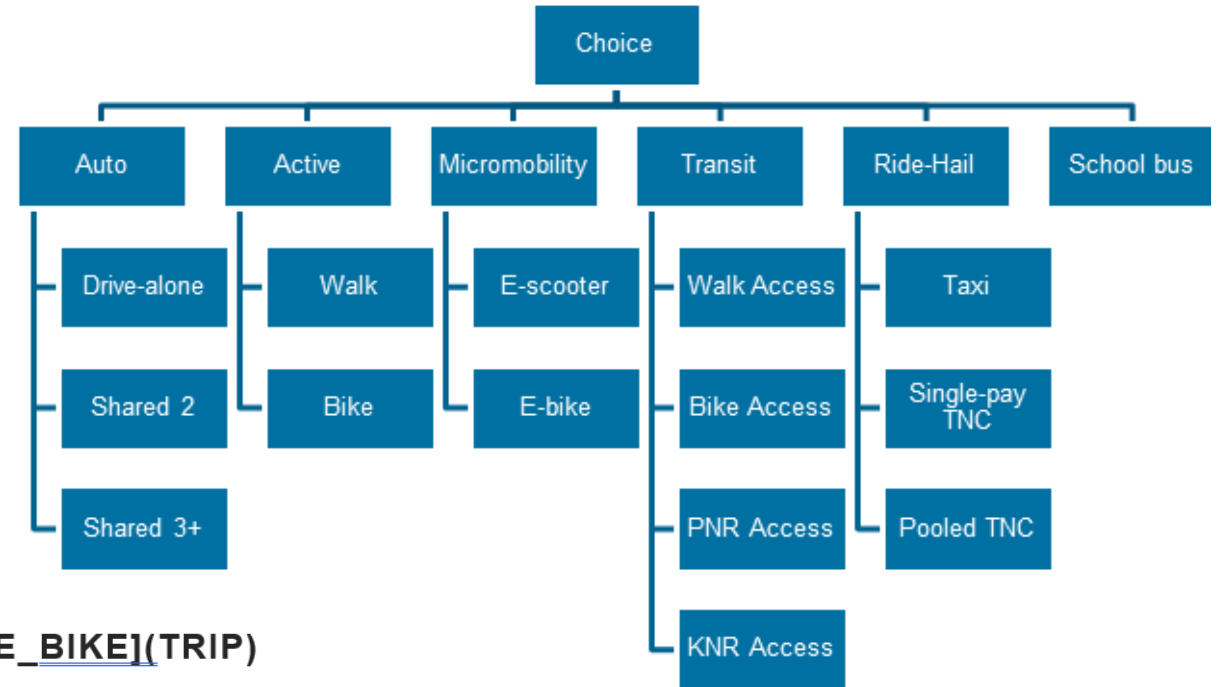


New Questions  
New Possibilities  
New Models

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# New Modes Explicitly Represented

FIGURE 14: PROPOSED MODE CHOICE STRUCTURE



## 5.7 [MODE](TRIP)

Programmer: Show for proxy trip [survey](#)

How did **<you/Name>** travel on this trip?

Select all that apply.

- Walk (or jog/wheelchair)
- Household vehicle (or motorcycle)
- Other vehicle (e.g., friend's car, rental, work car)
- Bus, shuttle, paratransit, or vanpool
- Bicycle or e-bicycle
- Micromobility (e.g., scooter, moped, skateboard)
- Uber/Lyft, taxi, or car service
- Medical transportation service
- Rail (e.g., train, streetcar, MAX)
- Other

## 5.23 [MODE\_BIKE](TRIP)

Logic: if mode or transit\_access or transit\_egress = bicycle

Programmers: Show for proxy trip [survey](#)

What bicycle did **<you/Name>** use on this trip?

Select all that apply.

- Standard bicycle (my household's)
- Electric bicycle (my household's)
- Cargo bicycle (standard or electric)
- Borrowed bicycle (e.g., a friend's)
- Bike-share - standard bicycle
- Bike-share - electric bicycle
- Other rented bicycle

## 6.4 [TELECOMMUTE\_TIME](DAY)

Logic: if *employment = full/part/self/volunteer*

How much time did **<you/name>** spend working at home or teleworking (from anywhere) for pay on **<traveldate>**?

Please estimate for all time teleworked (both during & outside regular business hours).

*Programmer: Selection is in 15-minute increments from 0 up to 10+ hours*

## 7.8 [REMOTE\_WORK\_FREQ](PERSON)

Logic: if *employed full/part/self/volunteer*

How often **<do you/does name>** typically work from home or telework (instead of going to work that day)?

- 6-7 days a week
- 5 days a week
- 4 days a week
- 3 days a week
- 2 days a week
- 1 day a week
- 1-3 days a month
- Less than monthly
- None

### *Telecommute Frequency Model*

Number of <u>Models</u> :	1
Decision-Making <u>Unit</u> :	Persons
Model <u>Form</u> :	Multinomial Logit
<u>Alternatives</u> :	Four (No telecommute/Telecommute less than one day per week, telecommute 1 day per week, telecommute 2 days per week, telecommute 3 days per week, telecommute 4 or more days per week)

The telecommute frequency model predicts, for each worker in the household with a regular out-of-home workplace, whether they participate in a telecommute program. The definition of telecommuting in the ActivitySim model is where a worker has a regular out-of-home workplace but works from home for one or more weekdays rather than commutes to work. The alternatives in the model include no telecommuting or telecommutes less than one day per week, telecommutes one day per week, telecommutes 2 days per week, telecommutes 3 days per week, or telecommutes 4 or more days per week.

Explanatory variables to be tested include:

- Household variables (Household income, number of adults, presence of children, autos owned)
- Person variables (work status, school status, industry of worker)
- Distance to work
- Expected parking cost at work

# Parking Details and Constraints Added

## 5.12 [PARK\_LOCATION](TRIP)

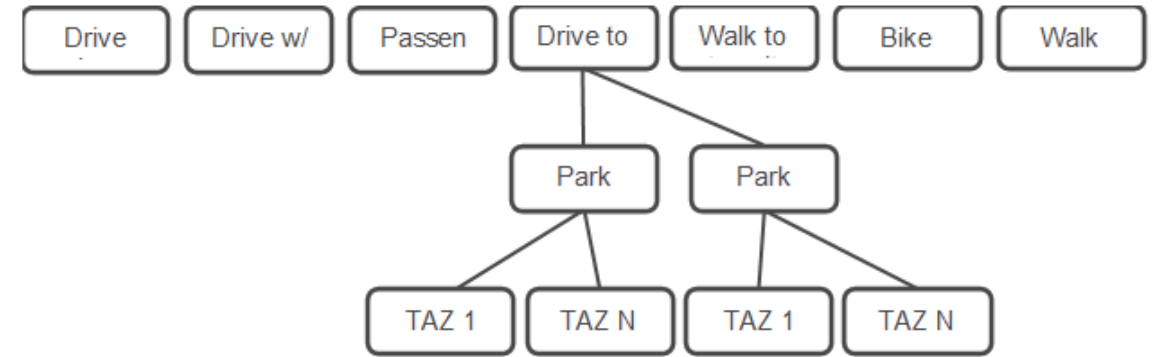
Logic: if *mode* or transit\_access or transit\_egress = HH vehicle or other vehicle

Programmer: Do not ask for proxy trip survey.

Where did <you/Name> park?

- Home (e.g., driveway, garage, on-street)
- Parking lot/garage
- On-street parking
- Park & Ride lot
- Didn't park (e.g., waited, drop-off, drive-thru, gas)
- Other

FIGURE 16: OREGON METRO PARK AND RIDE LOT CHOICE MODEL



## 7.13 [COMMUTE\_SUBSIDY](PERSON)

Logic: if *employed full/part/furloughed/volunteer*

Which of the following benefits does <your/name's> employer currently provide?

Select all that apply.

- Free (fully subsidized) parking at work
- Discounted (partially subsidized) parking at work
- Free (fully subsidized) transit passes or fares
- Discounted (partially subsidized) transit passes or fares
- Free/discount vanpool
- Cash or incentives for carpooling, walking, or biking to work
- Free/discount Uber, Lyft, or other smartphone-app ride service
- Free/discount shuttle service
- Free/discount bikeshare membership
- Free/discount bicycle tune-up/maintenance
- Flextime (can adjust schedule to work the same number of hours)
- Compressed work week (e.g., 10 hours over 4 days, 80 hours over 9 days)
- Stipend for working at home (e.g., internet, equipment)
- Don't know
- None of the above



# Not Everyone Bikes – New Questions to Understand biking attitudes

## 11.0 DAILY SURVEY: DAY 5

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### Bicycle-use questions

*Programmer: Asked of related adults age 18+*

#### 11.1 [BICYCLE\_USE]

The following questions will help us understand the travel options you use.

*Programmer: if rMove. Please click 'Next' to complete your daily survey.*

#### 11.2 [NUM\_BICYCLE\_ADULT](HH)

*Logic: if rMove or (rMove for Web and person 1)*

*Programmer: if household size = 1: How many adult-sized bicycles do you own?*

*Programmer: if household size > 1: How many adult-sized bicycles do you and your household members own?*

- 0 (no adult bicycles in household)
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8 or more

#### 11.3 [NUM\_BICYCLE\_CHILD](HH)

*Logic: if rMove or (rMove for Web and person 1)*

*Programmer: Ask only if there are any children age under 16 in the HH*

How many child-sized bicycles do you and your household members own?

- 0 (no child bicycles in household)
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8 or more

#### 11.4 [BICYCLE\_TYPE](HH)

*Logic: if number of adult bicycles > 0*

What types of bicycle(s) do you and your household members own?

Select all that apply.

- Standard bicycle
- Electric bicycle
- Cargo bicycle (standard or electric)
- Folding style
- Other

#### 11.12 [BIKE\_ATTITUDE](PERSON)

What is <your/name's> ability and attitude towards biking as a mode of travel?

- Not an option due to physical ability *programmer: hide if bike\_freq is 1-3 days per month or more*
- Not an option because never learned to ride *programmer: hide if bike\_freq is 1-3 days per month or more*
- Not of interest and likely never will be *programmer: hide if bike\_freq is 1-3 days per month or more*
- Would like to bike less but no other transportation options
- Happy with the amount currently biking
- Interested in finding more opportunities to bike

#### 11.13 [BIKE\_COMFORT](PERSON)

*Logic: if bike\_attitude = 'Happy with the amount currently biking' or 'Interested in finding more opportunities to bike' or 'Would like to bike less'*

*Programmer: If rMove or (rMove for Web and Person 1).*

For each of the following places you could ride a bike, please indicate whether you would be comfortable or uncomfortable biking there. Type 1-4 for each place to indicate your level of comfort.

1 = Very comfortable

2 = Somewhat comfortable

3 = Somewhat uncomfortable

4 = Very uncomfortable

A path or trail separate from the street: *Programmers: text box entry (require integer range 1-4)*

A quiet residential street: *Programmers: text box entry (require integer range 1-4)*

A quiet residential street with bicycle route markings, wide speed humps, and other things to discourage and slow down car traffic: *Programmers: text box entry (require integer range 1-4)*

A major street with four lanes and no bike lane: *Programmers: text box entry (require integer range 1-4)*

A major street with four lanes and a striped bike lane: *Programmers: text box entry (require integer range 1-4)*

A major street with four lanes and a wide bike lane physically separated from traffic by a raised curb, planters, or parked cars: *Programmers: text box entry (require integer range 1-4)*



New Questions

New Possibilities

New Models... Maybe?

# E-Commerce Research Underway

## 6.5 [SHOP\_ONLINE](DAY)

We want to know how shopping impacts travel. On **<traveldate>** , did **<you/name>** buy anything online?

- Yes
- No

## 6.6 [DELIVERY](DAY)

*if rMove or (rMove for Web and person 1)*

We want to know how delivery and household services contribute to travel.

*Programmer: Show if rMove: On **<traveldate>** , which of the following occurred?*

*Programmer: Show if rMove for Web: On **<traveldate>** , which of the following occurred for you?*

Select all that apply.

- Received packages at home (e.g., USPS, FedEx, UPS)



## 8.12 [PARTICIPATE](PERSON)

**<Are you/ls name>** willing to participate in future transportation studies?

- Yes
- No

# What if you are traveling without a destination?

## 11.8 [EXERCISE\_FREQ](PERSON)

In the last 30 days, how many days did you exercise other than biking, walking, or jogging? This includes activities like aerobics, playing sports, swimming, or working out at a gym?

- 6-7 days a week
- 5 days a week
- 4 days a week
- 3 days a week
- 2 days a week
- 1 day a week
- Less than once a week
- 0 days (have/has not done any such activities in the last 30 days)

## 11.9 [EXERCISE\_FREQ\_FOLLOWUP](PERSON)

If exercise\_freq is 1 or more days per week

How much time did <you/name> usually spend exercising on those days?

Programmer: Selection is in 15-minute increments from 0 up to 10+ hours

## 11.10 [BIKE\_PURP](PERSON)

If bike\_freq > never or less than monthly

For what reasons <have you/has name> used a bicycle in the past 30 days? Please select all that apply.

- For exercise or recreation
- To go to/from grocery/food shopping
- To go to/from other shopping (e.g., pharmacy)
- To go to/from medical appointment
- To visit friends or relatives
- To go to/from work
- For other work-related reason
- Other



# Lots of Future Possibilities

- Research proposed on understanding e-bike ownership decisions
- Future research on trip replacement with internet based options (medical, recreation...)

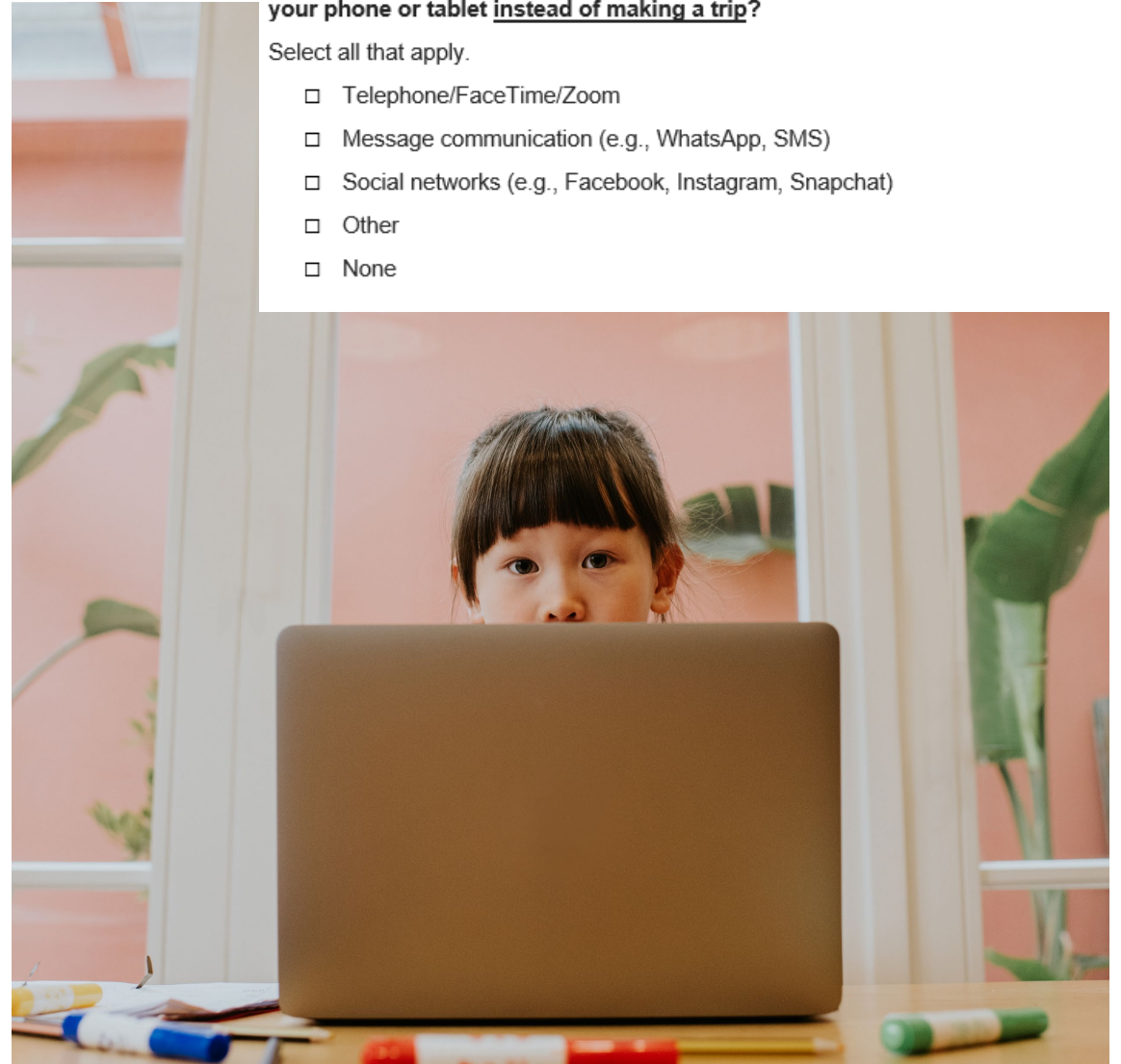


## 11.15 [ONLINE\_SOCIALIZE](PERSON)

In the past week, did you use any of the following to socialize with family or friends using your phone or tablet instead of making a trip?

Select all that apply.

- Telephone/FaceTime/Zoom
- Message communication (e.g., WhatsApp, SMS)
- Social networks (e.g., Facebook, Instagram, Snapchat)
- Other
- None



Not Exactly New Questions...

But Still:

New Possibilities

New Models



# New Vehicle Model

## 2.10 [FUEL\_TYPE](VEHICLE)

*Logic: show if number of vehicles > 0*

What type of fuel does each vehicle use?

*Programmer: Show list of all household vehicles.*

- Gas
- Hybrid (HEV)
- Plug-in hybrid (PHEV)
- Electric (EV)
- Diesel
- Flex fuel (FFV)
- Other (e.g., natural gas, bio-diesel)

Prior Survey - Fuel Type

Gas [38,147]

Diesel [2,201]

Hybrid [607]

Flex fuel [69]

OTHER, SPECIFY [58]

DON'T KNOW / REFUSED [12]



# Drivers License Input, no longer just Assumed

## 2.33 [LICENSE] (PERSON)

*Programmer: If HH size >1* Does each person drive? Please answer yes if they can drive a motor vehicle including a car, personal truck, SUV, van, or motorcycle.

*Programmer: If HH size =1* Do you drive? Please answer yes if you can drive a motor vehicle including a car, personal truck, SUV, van, or motorcycle.

We will use this information to customize which transportation questions you are asked in this study.

- Yes, drives
- No, does not drive

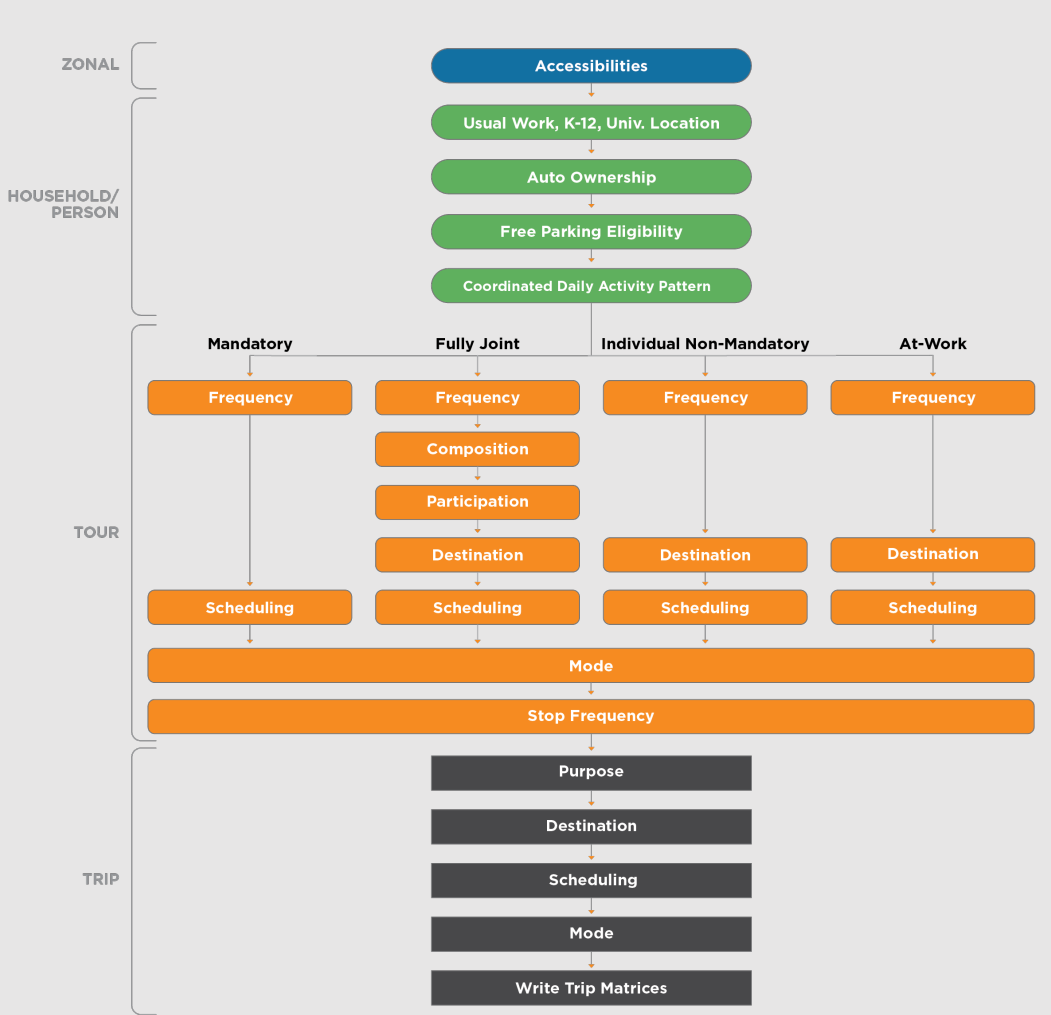




# Powered by the Nation

# ActivitySim

An open platform for activity-based travel modeling





# 14 Strong and Growing

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- ODOT's \$35,000/yr is now getting multiplied up by 13 other ActivitySim partners (and growing, now internationally).
- The 9<sup>th</sup> year of ActivitySim has a working budget of \$490k (35k x 14). Plus partner development contributions outside of the partnership





## More Info:

<https://activitysim.github.io/>

<https://activitysim.github.io/activitysim/v1.2.0/>

<https://github.com/ActivitySim/activitysim>

# ActivitySim

An open platform for activity-based travel modeling

## Questions?

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