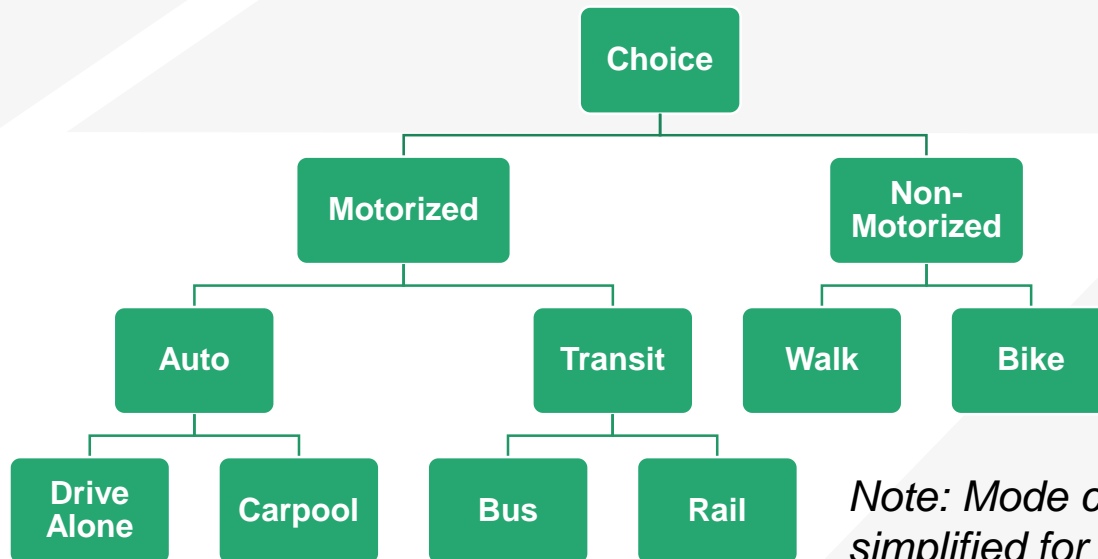


Mode Choice

Mode Choice: *What Mode?*

- Nested Logit Model
 - » Consider all modes for each zone pair

Can I get a ride?
Is it close enough to bike?
How much \$ is parking?
How about the bus?



Note: Mode choice diagram is simplified for explanatory purposes



Mode Choice

- Probability of selection any mode depends on all the available modes and relative travel times, costs, other factors

$$P_i = \frac{e^{u_i}}{\sum_j e^{u_j}} \quad (1)$$

Where:

- P_i = probability of selecting mode i
- u_i = a linear function describing the utility of mode i
- e = base of the natural logarithms

- Mode choice models use either logit models or nested logit models
 - » Nested logit models just group similar alternatives into a nest

Mode Choice Coefficients

	Federal Transit Authority Guidelines	
	Low Value	High Value
	Coefficient	
In-vehicle travel time (IVTT)	-0.03	-0.02
Initial wait	-0.09	-0.04
Second wait	-0.09	-0.04
Walk time	-0.09	-0.04
Cost ²	–	–
	Equivalent Minutes of IVTT	
Initial wait	3.00	2.00
Second wait	3.00	2.00
Walk time	3.00	2.00
	Home-Based Work Value of Time (Estimated Median Household Income)	
Low Income (\$20,000)	\$2.30	\$3.10
Middle Income (\$55,000)	\$6.60	\$8.70
High Income (\$140,000)	\$16.80	\$22.40

Mode Choice Constants

- Every alternative in the mode choice except one has a mode choice constant
- Mode choice constant reflects the travelers' perception of the mode
 - » Transit usually has a lower constant than auto
- Constants are estimated by trip purpose
 - » Home-based school trips may have a higher bike constant than the auto constant because children are more likely to bike to school

Mode Choice Modeling

- Mode choice models can be estimated or calibrated
- Estimation refers to statistical estimations of all coefficients and constants based on observed data
 - » Requires a lot of data... and patience
- Most of the models assume coefficients within the FTA range or borrow other models' coefficients
 - » Only constants are then calibrated to correctly predict the number of trips by mode

PA to OD Conversion

- Traffic assignment is done on the origin-destination trip table but all the work up to this point has been completed in production-attraction format
 - » Take PA matrix, add the inverse of the PA matrix and divide by 2 to get OD matrix

Prod	Attr	
TAZ	1	2
1	100	200
2	400	100

+

Attr	Prod	
TAZ	1	2
1	100	400
2	200	100

Divided by 2

Origin	Destination	
TAZ	1	2
1	100	300
2	300	100