



Park-and-Ride Demand Model Update

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Outline

- Introduction
- Model Structure
- Spreadsheet Tool
- Overview



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Introduction of the Project

Purpose

- Study of current park-and-ride market and system
- Create a standalone demand forecasting tool

Use

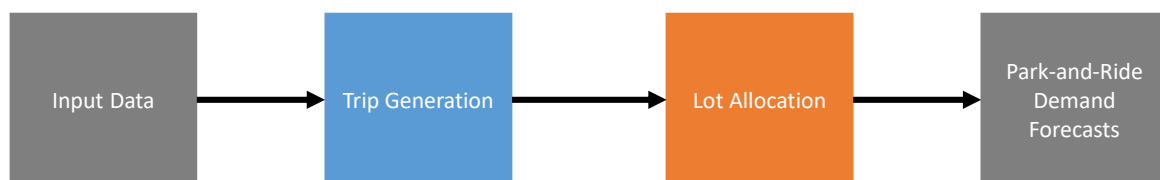
To forecast the number of parking spaces required for proposed lots



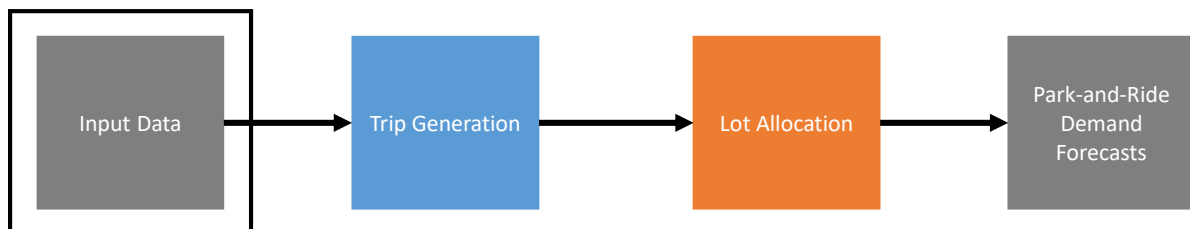
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Model Structure

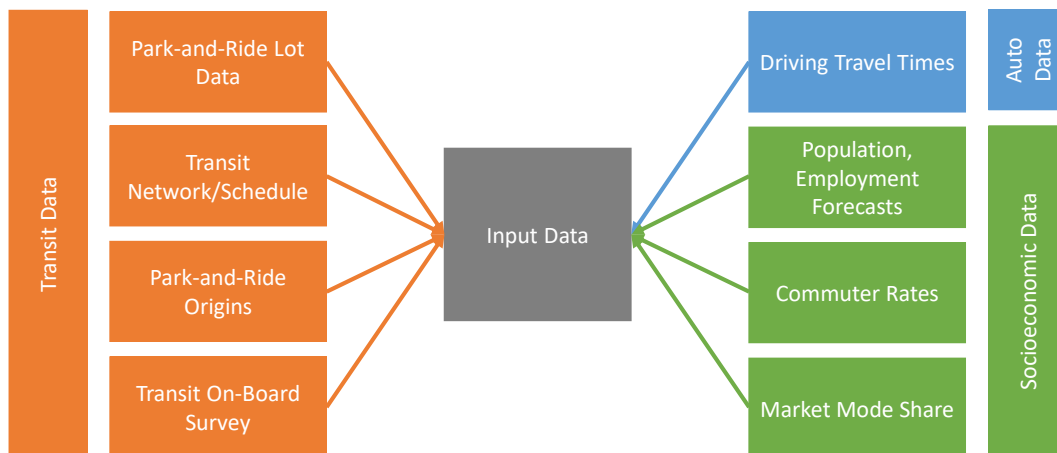


Model Structure



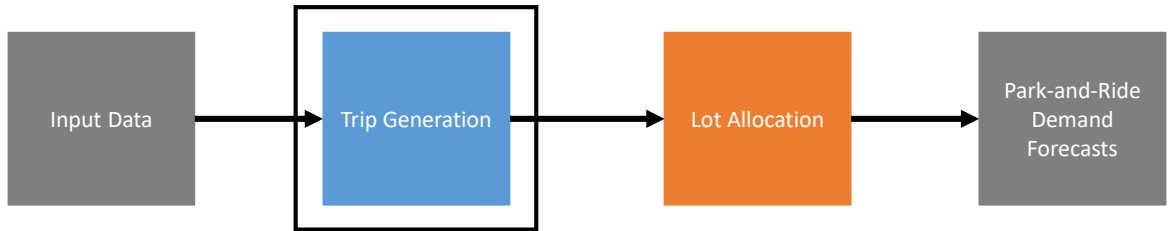
9/28/2018

Input Data



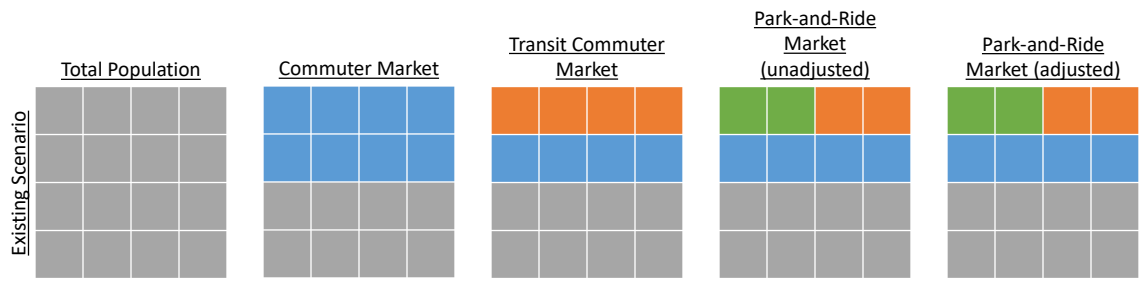
9/28/2018

Model Structure – Trip Generation

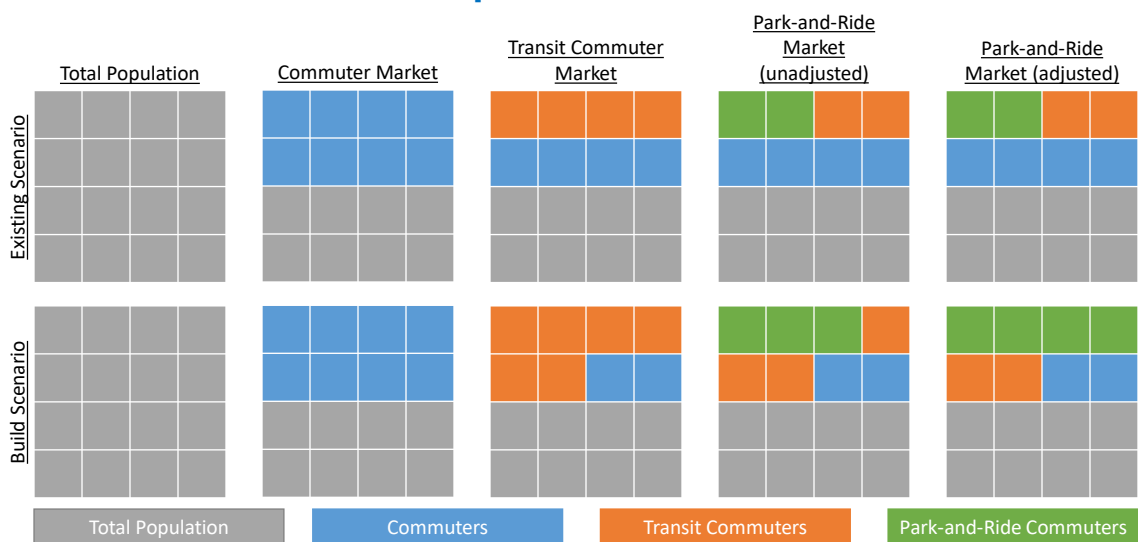


9/28/2018

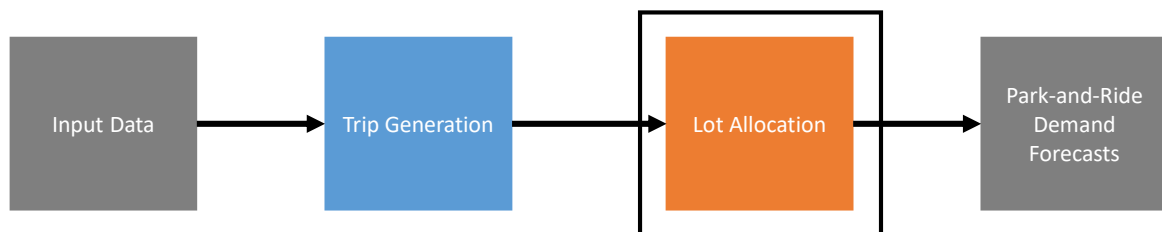
Model Structure – Trip Generation



Model Structure – Trip Generation



Model Structure – Lot Allocation

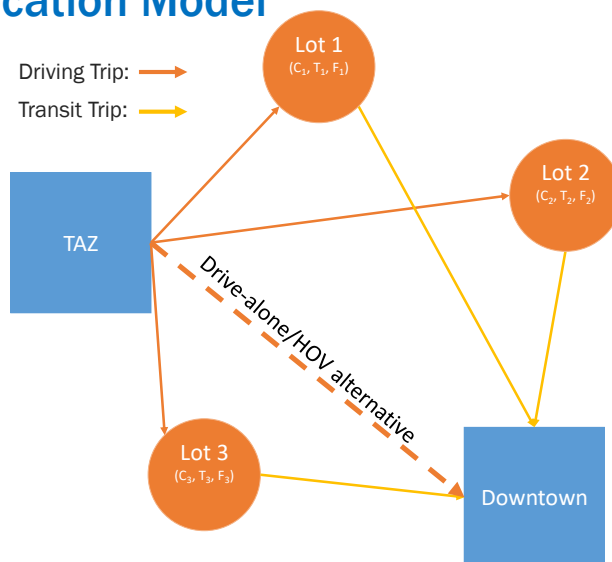


Model Structure - Lot-allocation Model

Lot attributes:

- Lot capacity
- Driving access time
- Transit travel time
- AM service frequency
- Mid-day service frequency
- Amenities
- Premium Service

Capacity Constrained Allocation



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Spreadsheet Tool

Regional Scenario Attributes		Tested Range of Values*
New Park-and-Ride?	Yes	Yes, No
Scenario Demand Year	2030	2014, 2030, 2040
Capacity Constrained Results?	Yes	Yes, No
Service Frequency Adjustment**	100%	80% - 150%
Downtown Parking Costs**	100%	50% - 400%

New Lot Attributes		Tested Range of Values*
TAZ of new lot (choose 1-3030)	1106	1 - 3030
Lot Number (value must be larger than 1000)	1002	> 1000
New lot name	63rd and Bottineau	
Congested transit travel time from park-and-ride lot to Minneapolis	24	5 - 115
Congested transit travel time from park-and-ride lot to St Paul	54	10 - 145
Capacity of park-and-ride lot	200	10 - 1585
Number of transit trips during morning (7:00AM - 9:00AM) - MPLS	12	0 - 30
Number of transit trips during morning (7:00AM - 9:00AM) - STP	12	0 - 21
Number of transit trips during mid day (11:00AM - 1:00PM) - MPLS	8	0 - 24
Number of transit trips during mid day (11:00AM - 1:00PM) - STP	8	0 - 8
Premium service available?	LRT-MPLS/STP	No, (BRT, LRT, CRT) - (MPLS, STP, MPLS/STP)
Amenity level	High	Low, Medium, High

* See documentation for using caution when using values outside the tested range of values.

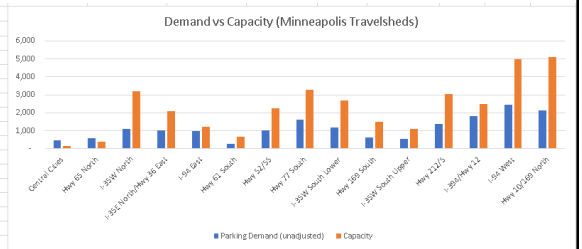
** These values should not be adjusted unless warranted by changes in conditions from existing 2014 conditions.



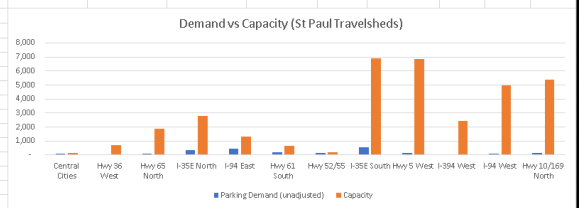
Run Scenario

Spreadsheet Tool

Minneapolis Travelsheds			
Name	Parking Demand (unadjusted)	Added Parking Demand	Capacity
Central Cities	479	-	152
Hwy 65 North	595	-	411
I-35W North	1,120	-	3,223
I-35E North/Hwy 36 East	1,028	-	2,111
I-94 East	985	-	1,213
Hwy 61 South	267	-	675
Hwy 52/55	1,044	-	2,271
Hwy 77 South	1,637	-	3,285
I-35W South Lower	1,175	-	2,703
Hwy 169 South	632	-	1,518
I-35W South Upper	558	-	1,092
Hwy 212/5	1,371	-	3,062
I-394/Hwy 12	1,805	-	2,476
I-94 West	2,442	-	4,996
Hwy 10/169 North	2,128	-	5,105



St Paul Travelsheds			
Name	Parking Demand (unadjusted)	Added Parking Demand	Capacity
Central Cities	116	-	152
Hwy 36 West	39	-	695
Hwy 65 North	104	-	1,893
I-35E North	340	-	2,766
I-94 East	447	-	1,313
Hwy 61 South	176	-	675
Hwy 52/55	138	-	202
I-35E South	566	-	6,917
Hwy 5 West	129	-	6,859
I-394 West	56	-	2,429
I-94 West	80	-	4,996
Hwy 10/169 North	154	-	5,396



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Overview

- Built a user-friendly park-and-ride demand forecasting tool
 - Data-driven trip generation
 - Locally calibrated choice model for lot allocation
 - User friendly tool built in Excel
- Computational time in Excel