



# Modelling Autonomous Vehicles in Calgary's Regional Transportation Model

Edmonton 2018 CITE Annual Conference



# A Possible Future?

Minority Report (2002)



# Another Possible Future?

Wally (2008)



# The Regional Transportation Model Contains Real Science

## Model is Based on Travel Observations

- Survey All Day Travel of 20,000 Calgarians
- When, Where and How they travel
- Individual Personal & Household Characteristics  
Occupation, Age, Income, Kids, Home Location... and more

## Travel Choices are compared with known Travel Options

Single Occupant Vehicle  
High Occupant Vehicle  
Transit  
Walk  
Bike



# The Regional Transportation Model Contains Real Science

Using this data we can establish how...

1. the qualities of the individual and,
2. the qualities of the travel options

....influence the travel behavior/choice

This is the science of **Econometrics** and is implemented in our model as a **logit choice model**

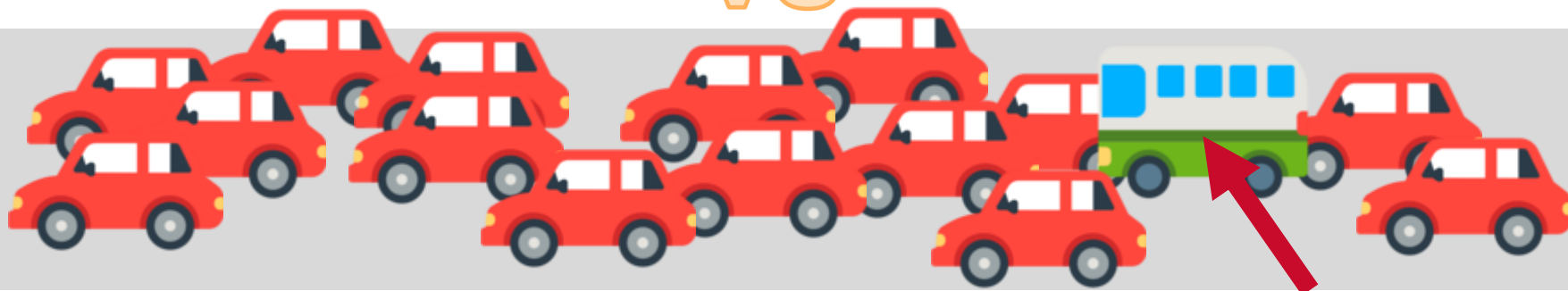
This process quantifies the influence of travel time on mode choice

# Travel Time Influence on Mode Choice

Time Spent  
Driving a Car  
Irritability

VS

Time Spent  
Riding on Transit  
Irritability



**NETFLIX**

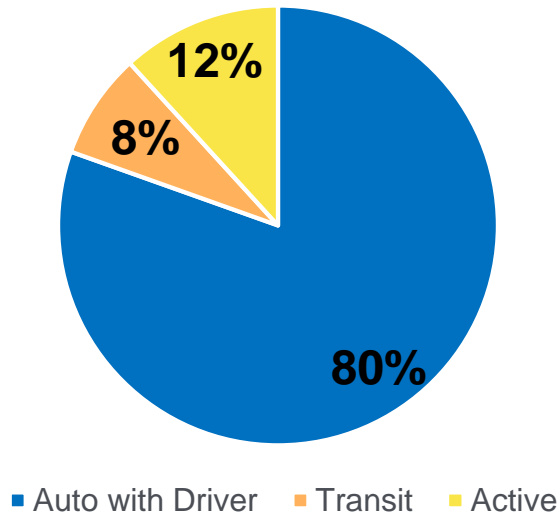
Example:  
1 hour driving car during rush hour?  
vs.  
1 hour riding a bus in rush hour?

# Autonomous Vehicle Scenario Assumptions

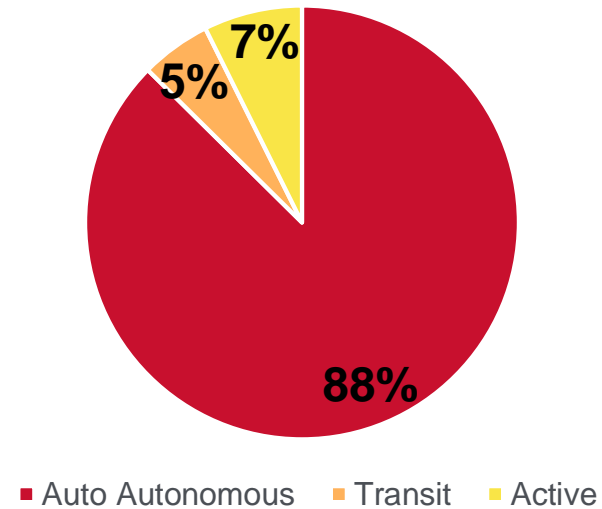
1. Time spent riding in an autonomous vehicle is nicer than time spent driving in a vehicle. “The Irritability Factor”. So let’s say it’s like riding transit.
2. All Vehicles are autonomous
3. Autonomous vehicles will drive home empty if cost is less than parking cost.
4. Lane capacity is higher because autonomous vehicles drive closer together. (We assumed 25% higher)

## Mode Choice All Trips

Mode Choice Normal Scenario

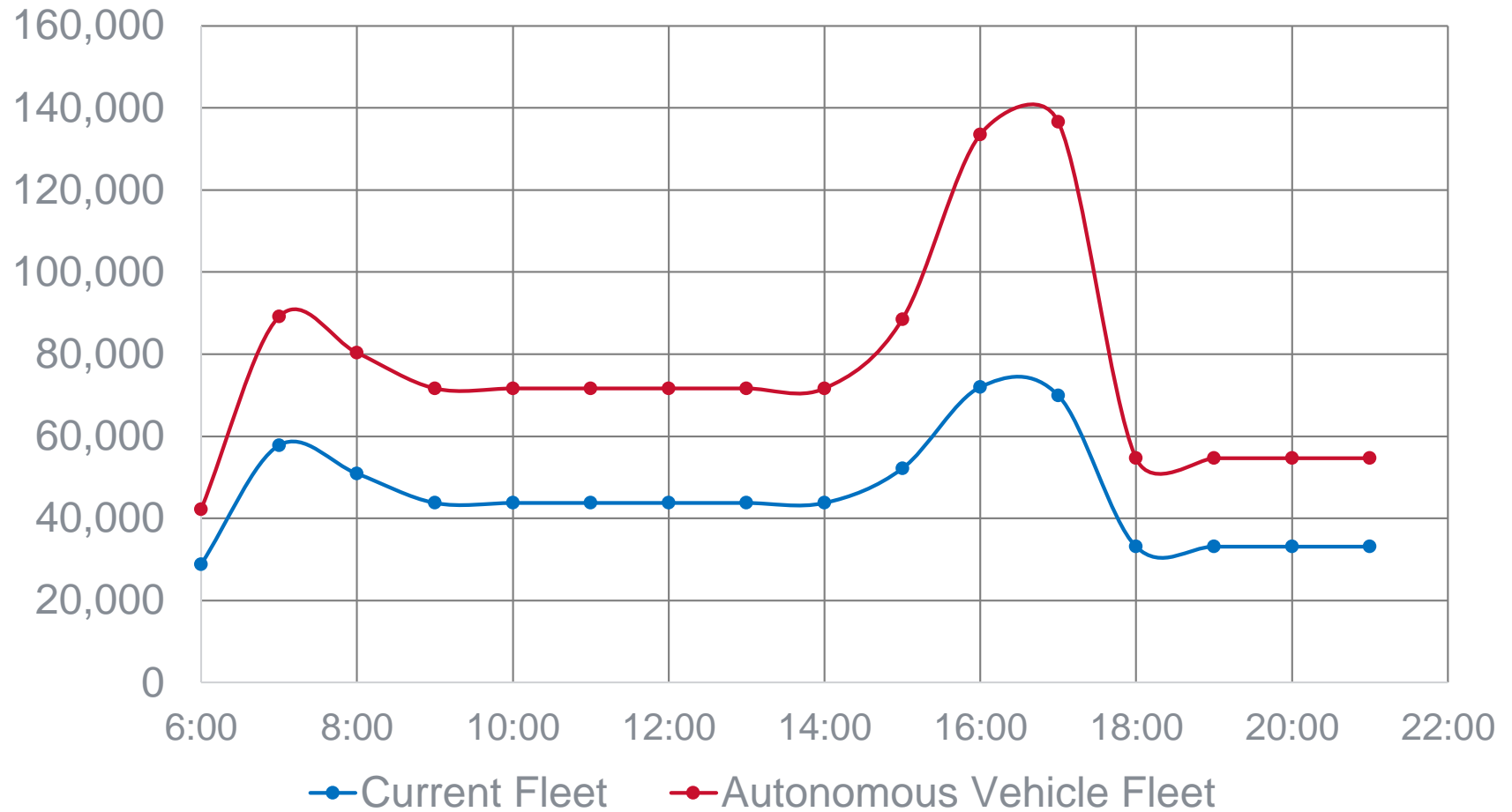


Mode Choice In Autonomous Scenario



# Vehicle Hours

Total Vehicle Hours



## Travel Behavior Changes in Autonomous Vehicle Scenario

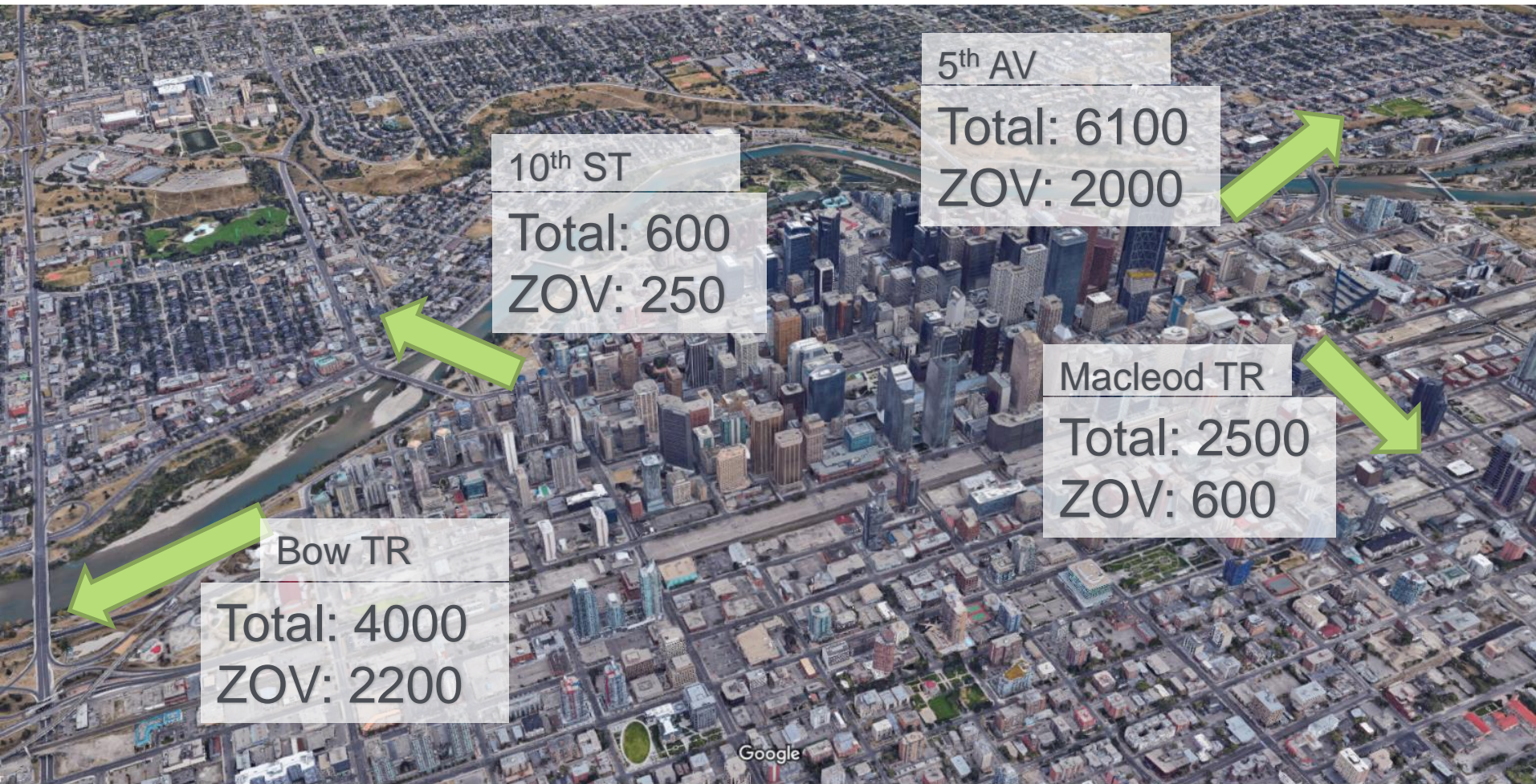
Total Daily Vehicle Hours **+67%**

Average Auto Trip Distance **+39%**

Number of Trips **+3%**

# Zero Occupancy Vehicle Volumes (AM Peak)

Google Maps



Imagery ©2018 Google, Map data ©2018 Google 100 m

## Comments on Model Results

- We made the assumption that autonomous vehicles will have the same “irritability factor” as transit but I think it could be significantly less irritating.
- ZOV results is based on status quo. These results help understand the magnitude of the incompatibility of current parking policies and the advent of autonomous vehicles.
- For Improvement: Ride sharing and taxi data please. This would help further reduce the assumptions made

## Questions

