

# Exploratory Modeling for Project Evaluation

TMIP Webinar – December 7, 2021



Together all the way



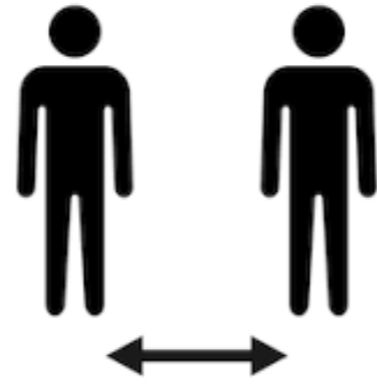
# Project 1: Analyzing the impact of COVID legacy on a grade separated LRT extension project



# SIGNIFICANT UNCERTAINTIES WITH COVID



Employment?



Willingness to share rides?



Strength of economy and discretionary spending?



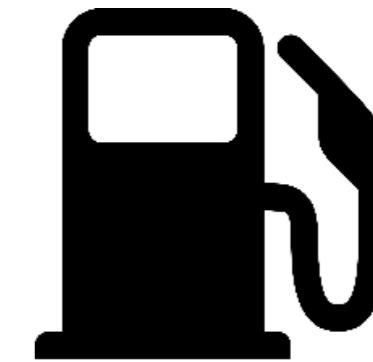
Auto ownership?



Work from home?



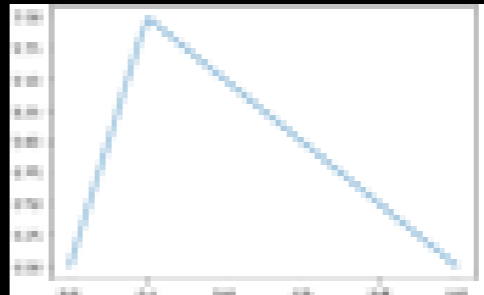
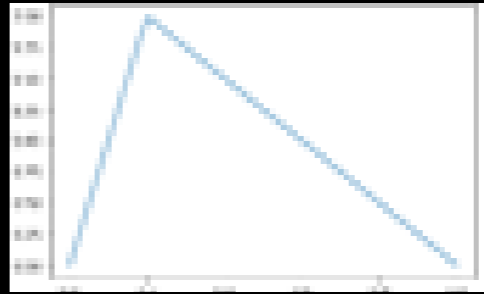
Distance learning?



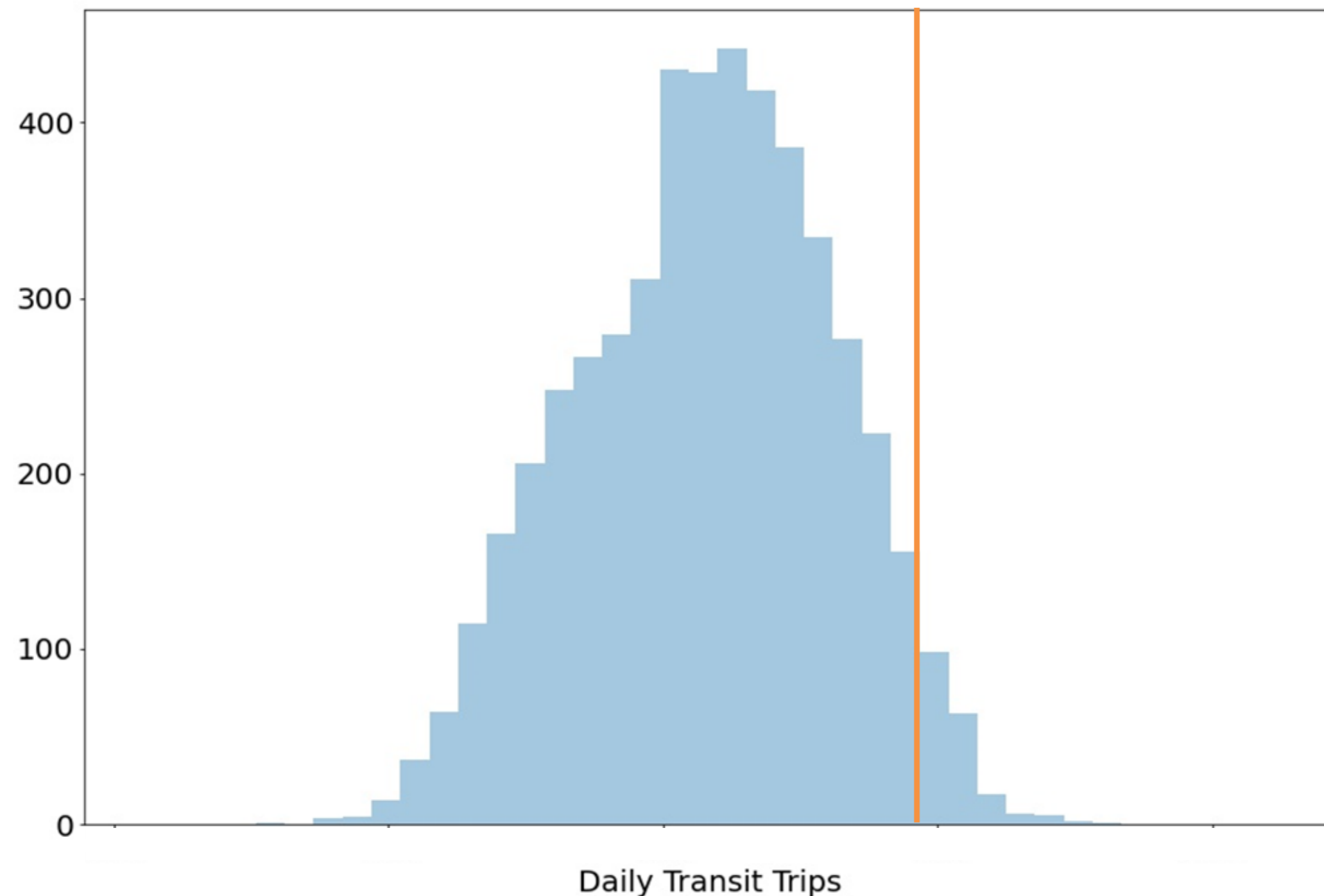
Fuel prices?



# COVID LEGACY UNCERTAINTY FACTORS

Factors	Range	Peak	Distribution	Correlations
Work/Learn from Home	0 – 0.25	0.1		
Commute Distance	1.00 – 1.20	1.07		WFH/LFH

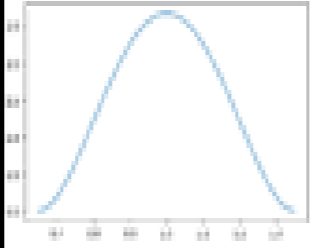
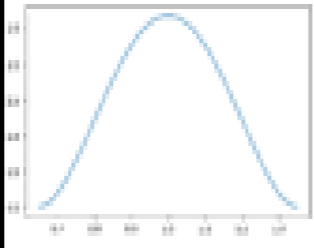
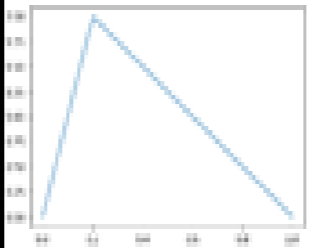
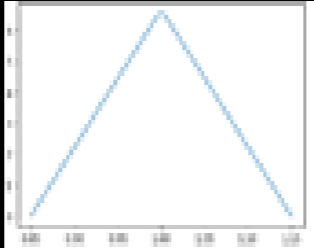
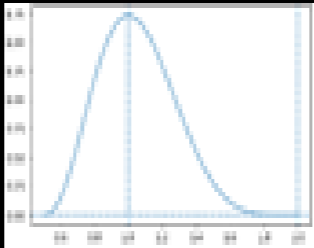
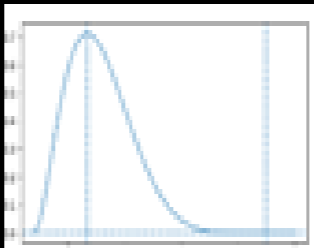
# COVID LEGACY IMPACTS ON DAILY RIDERSHIP

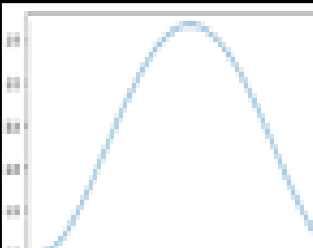
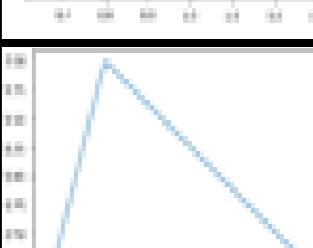

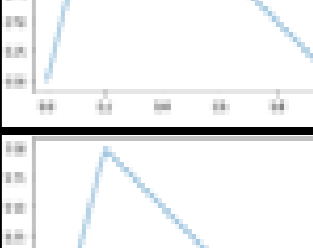


- The point estimate is around P95
- Could re-evaluate the design capacity – make design changes to limit the risk of overbuilding the system

# Project 2: Evaluating long-term uncertainty in infrastructure projects



Factor	Range	Peak	Distribution	Correlations
University Enrolment	0.65 – 1.35	1		
University Employment	0.65 – 1.35	1		enrolment
Work/Learn from Home	0 – 0.45	0.1		
Auto ownership Propensity	0.85 – 1.15	1		WFH/LFH
Vehicle operating costs	0.43-4.5	1.35		
Parking Cost Factor	0.5 – 2.00	1		
Bus Route Service	Yes, No			
Options	Option 1,2,3			

Factors	Range	Peak	Distribution
University Employment & Enrolment	0.75 – 1.25	1	
Work from Home	0 – 0.25	0.1	
Learn from Home	0 – 0.15	0.05	
Vehicle Operating Costs	0.45 - 2.0	1.35	
Road User Charges	No, 100% MSC, 50% MSC		
Corridor Development	Low, Medium, High		

# OUTSTANDING QUESTIONS

- Should factors be standardized
- How to produce BCR ranges
  - Benefit ranges
  - Combined ranges for benefits and costs
- How to use the distributions for project design
- Could exploratory modeling be used to select between project alternatives – for what projects, how



# RECOMMENDATIONS AND CONSIDERATIONS

- A model-computer setup that allows quick model runs
- Ability to automate model runs with programmatic altering of model inputs
- Storage management a concern - define required outputs at the outset of each project
- Significant work in
  - Figuring out how to translate the main uncertainties into factors in the model
  - Determining the factor ranges and distributions
- There should be some expectations about output distributions
- Expect a learning curve - it will likely take a few iterations, before satisfactory results are available

**THANK YOU!**



Together all the way

