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# Introduction leads to why this model

## Problem Statement

## Why this model helps at all?

* Goal simulate an urban environment in which Owner Agents (O.agents) must manage their infrastructure assets to maximize their utility function.
  + Different O.agents have different utility functions based on the asset type and business model.
* Explore how different operational and maintenance decisions can effect asset use patterns, asset life-cycle cost, and network performance.

### Questions to be answered

## Others for now

### Other papers or projects similar

### Literature Review

#### Papers By Topic

##### ABM and Hybrid Models

##### [DropBox\PhD\Papers](https://www.dropbox.com/sh/sa5lb2bxzjkyymf/AAAwn3quLdFmQ_idEi6LXq0Ea?dl=0)..

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# Virtual Network

## Description of virtual network

## Why SUMO

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## Components

### Physical layout – OSM

### Roadway parameterization

#### Names; lane width, max speed; permissions; etc…

#### Show Dataframe

### O agent HQ locations

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# Network Demand – Users; Routes; Behavior; Etc…

## Description\_of\_Network\_Demand

## Calibrators

### Data sources

#### Specific roadway flow counts

#### Vehicle type distribution

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## Routes

### Heuristics

#### Try without and see if we can go for a longer

## Dynamic User Assignment

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# Infrastructure Asset Own Agent

## Description of Owner Agent Purpose Capabilities

## Operation Research Scheduling Decision Module

### Description of how the schedule will be made inputs outputs

#### Scenarios to run

##### Objective Function

##### Constraints

##### metrics

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## Virtual Network Modification Module Python Code

### Description of how O agent interacts with V network

### True to constraints of OR Schedule

#### Physical Representation of workforce enforces logic controls

##### Work crews like buses with special stops

#### TRAci Python SUMO Interface

##### Link back to net work parameters

### O agent collects simulation network run data for OR module

#### Frequency and Accuracy of update based on agent characteristics

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