

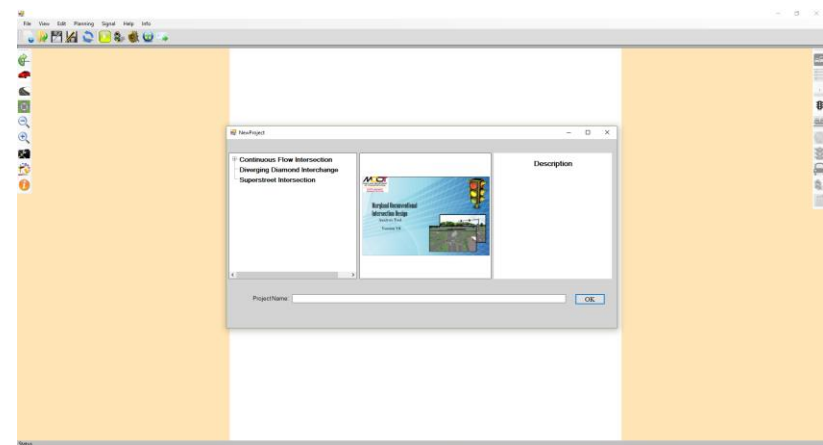


MUID

Maryland Unconventional Intersection/Interchange Design
Analysis Tool

INTRODUCTION

- ✿ **M**aryland **U**nconventional **I**ntersection/Interchange **D**esign (**MUID**) Analysis Tool
- ✿ Developed by University of Maryland, College Park and MDOT SHA
- ✿ A tool to conduct a capacity/queuing analysis as well as signal optimization for continuous flow intersection (CFI), diverging diamond interchange (DDI), and superstreet intersection (signalized RCUT)



MODULES

✿ Planning Evaluation Module

- Queue length
- Queue/link length ratio
- Average delay
- Critical lane volumes

✿ Signal Optimization Module

- Offset
- Cycle length
- Green split
- Average delay

✿ Output Module

- Shows input parameters, planning evaluation results and signal optimization results

PLANNING EVALUATION MODULE

✿ Planning Evaluation Procedure

Identifying all factors contributing to the total delay and queue, including external factors such as demand, and internal factors such as intersection geometric features



Generating a comprehensive data set with all identified factors for simulating analysis



- Build simulation models using VISSIM and Calibrate VISSIM parameters with field data
- Random sampling of different demand scenarios

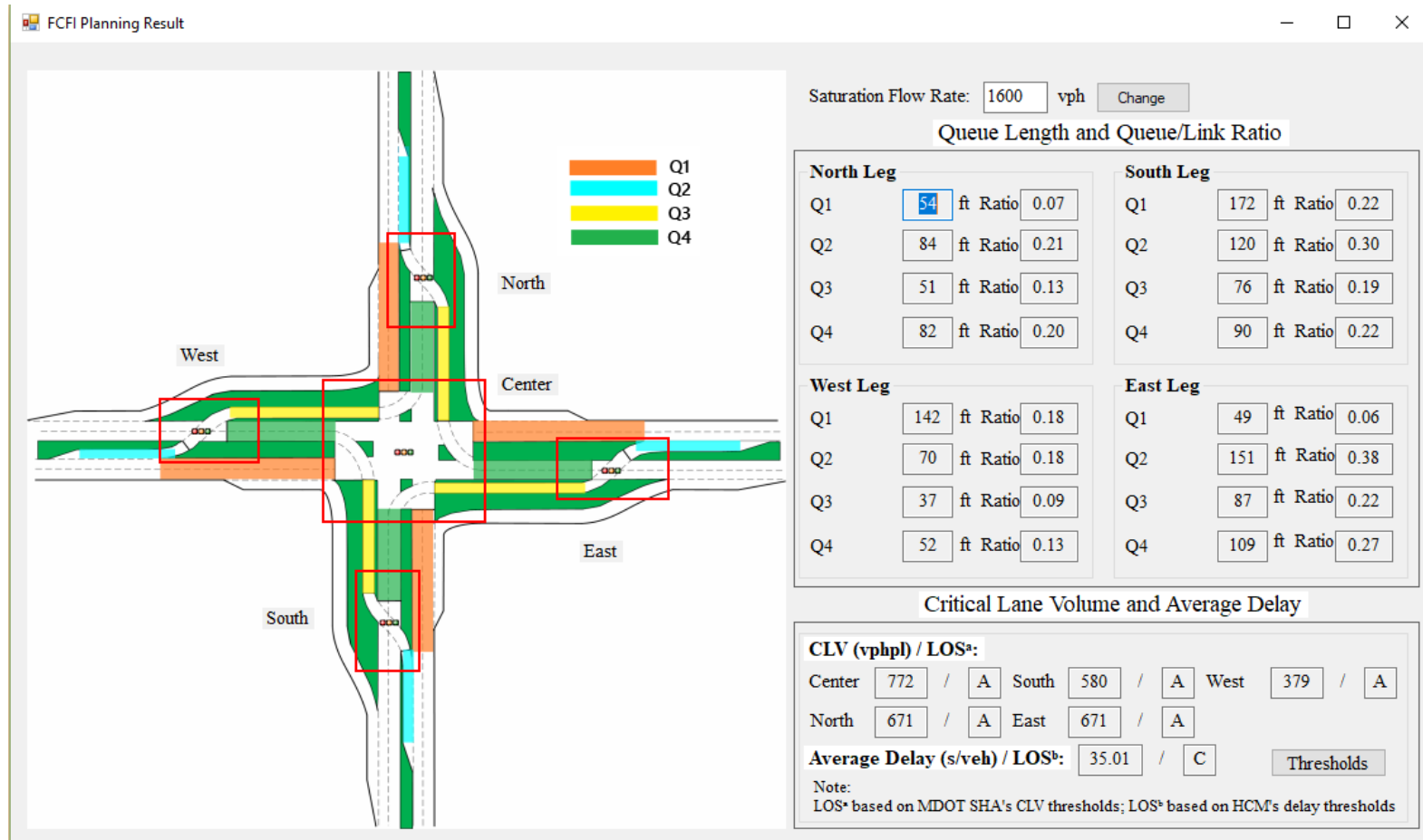
Deriving the quantitative relationships between performance measures and contributing factors



Estimating the impact of queues on the overall intersection performance and **developing a set of statistical models** for queues length prediction at each critical location

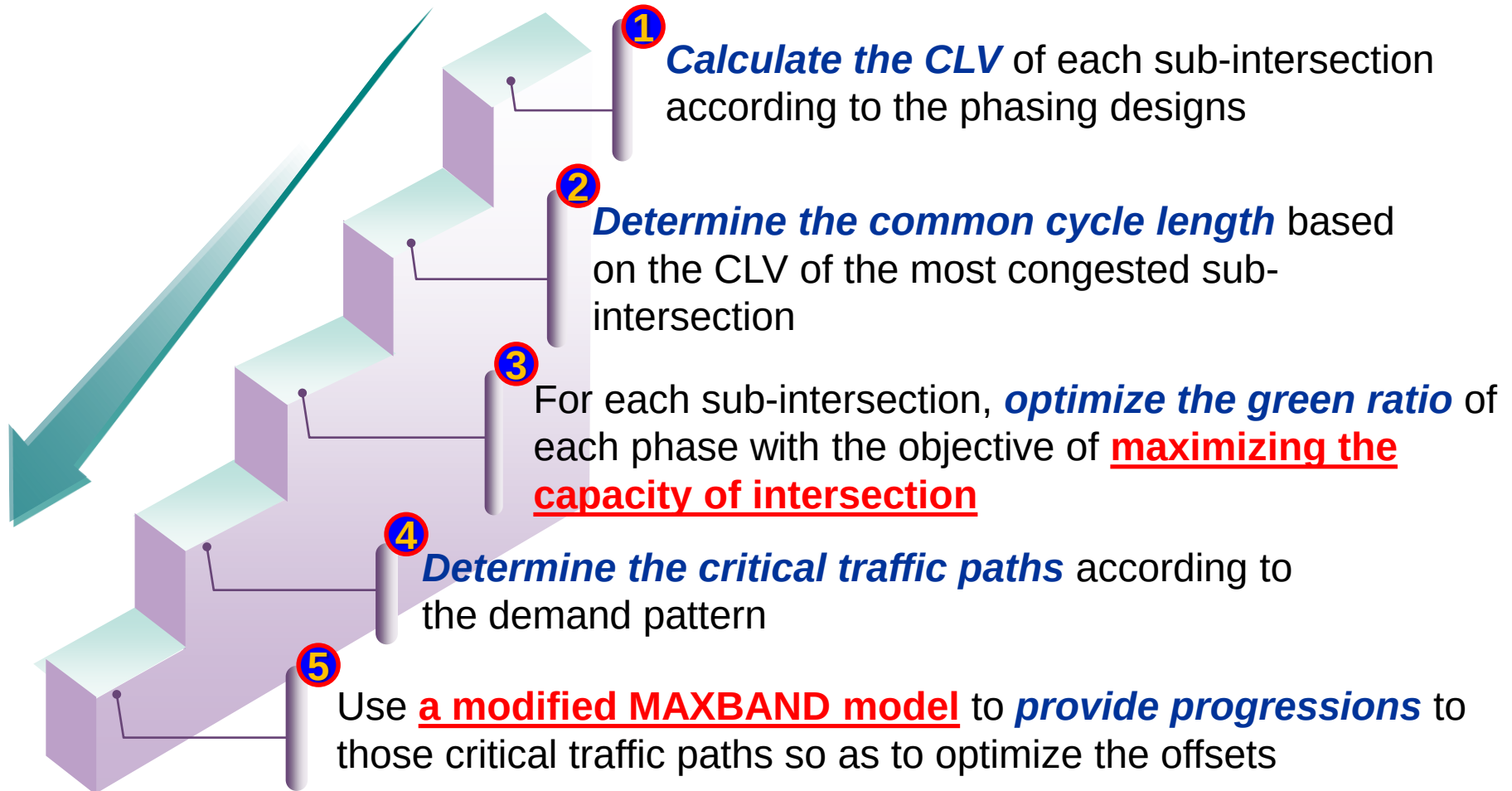
PLANNING EVALUATION MODULE

✱ Planning Evaluation Results



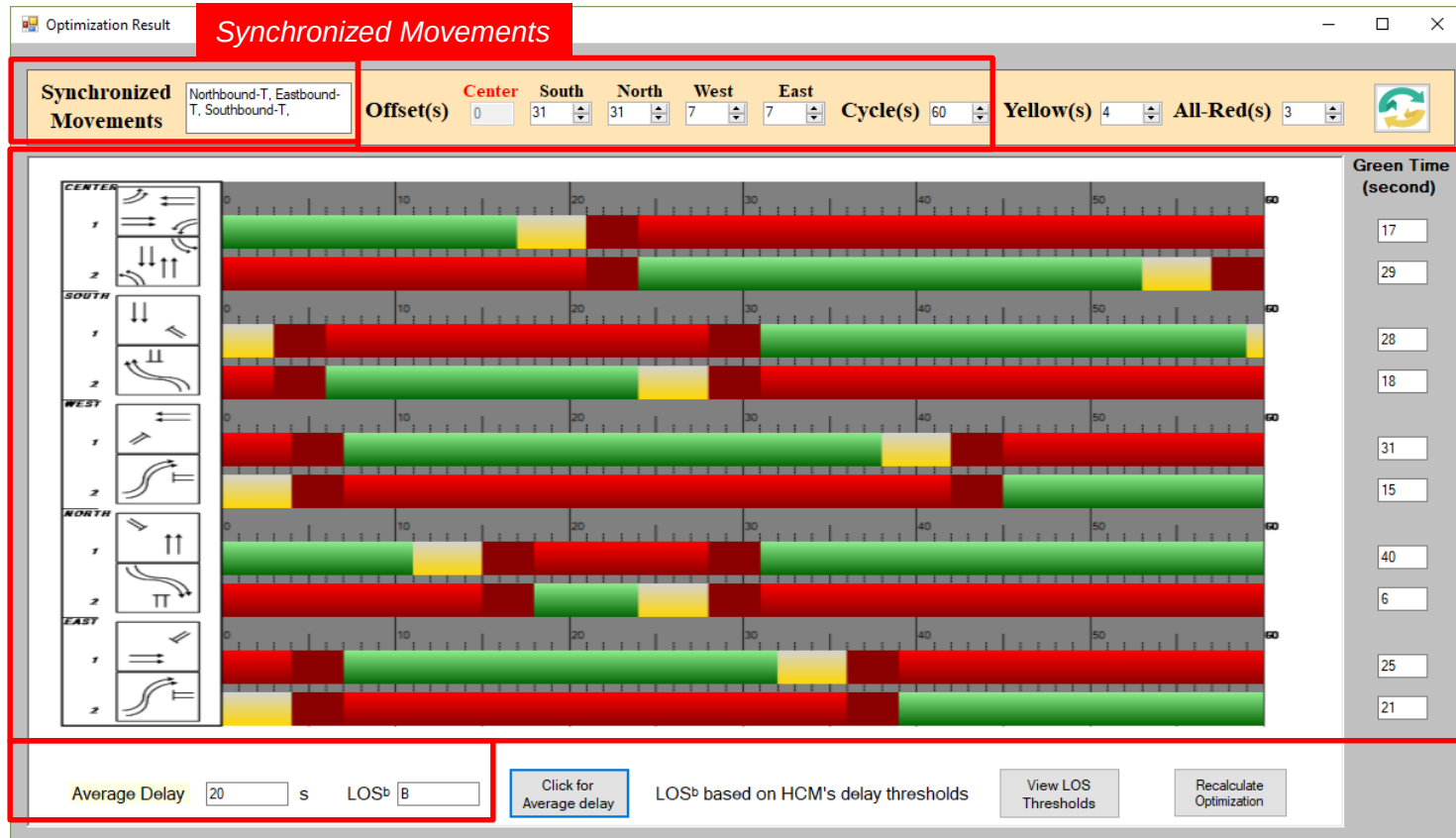
SIGNAL OPTIMIZATION MODULE

✿ Signal optimization Procedure



SIGNAL OPTIMIZATION MODULE

Signal Optimization Results



Estimated average delay with the signal optimization results

INTERSECTION/INTERCHANGE DESIGNS

✿ Cover different intersection/interchange designs

- Continuous Flow Intersection
 - CFI-T
 - Partial CFI(symmetrical)
 - Partial CFI(asymmetrical)
 - Full CFI
- Diverging Diamond Interchange
- Superstreet Intersection

INPUT DEMAND

☀ User-friendly Interface

- Manually input demand or
- Generate random demand

The screenshot shows the 'EditDemand' window with a central diagram of a four-way intersection. The intersection has a central traffic light with red, yellow, and green lights. The approaches are labeled with their respective demand values in text boxes:

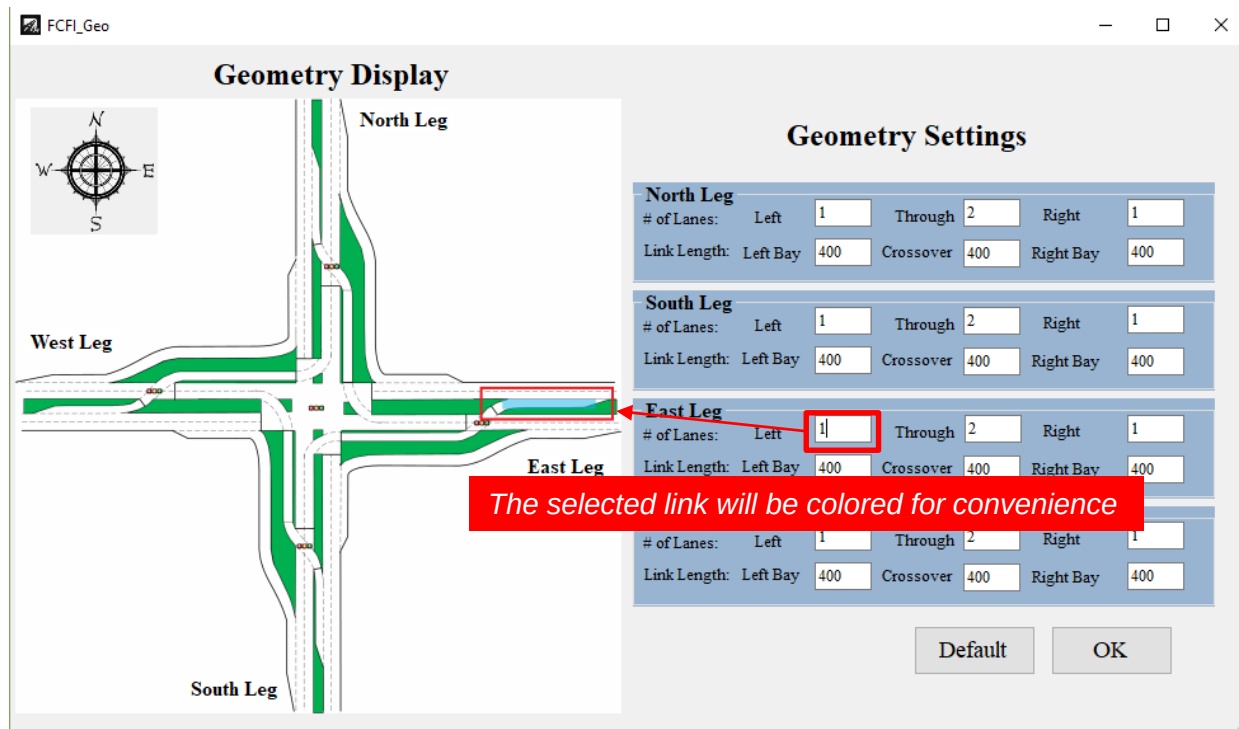
- Top Approach:** Right (164), Through (315), Left (131)
- Bottom Approach:** Left (237), Through (844), Right (335)
- Left Approach:** Left (138), Through (529), Right (291)
- Right Approach:** Right (113), Through (202), Left (308)

A compass rose is located in the upper right quadrant of the intersection diagram. At the bottom right of the window, there are two buttons: 'Random Demand' and 'OK'.

INPUT GEOMETRIC CHARACTERISTICS

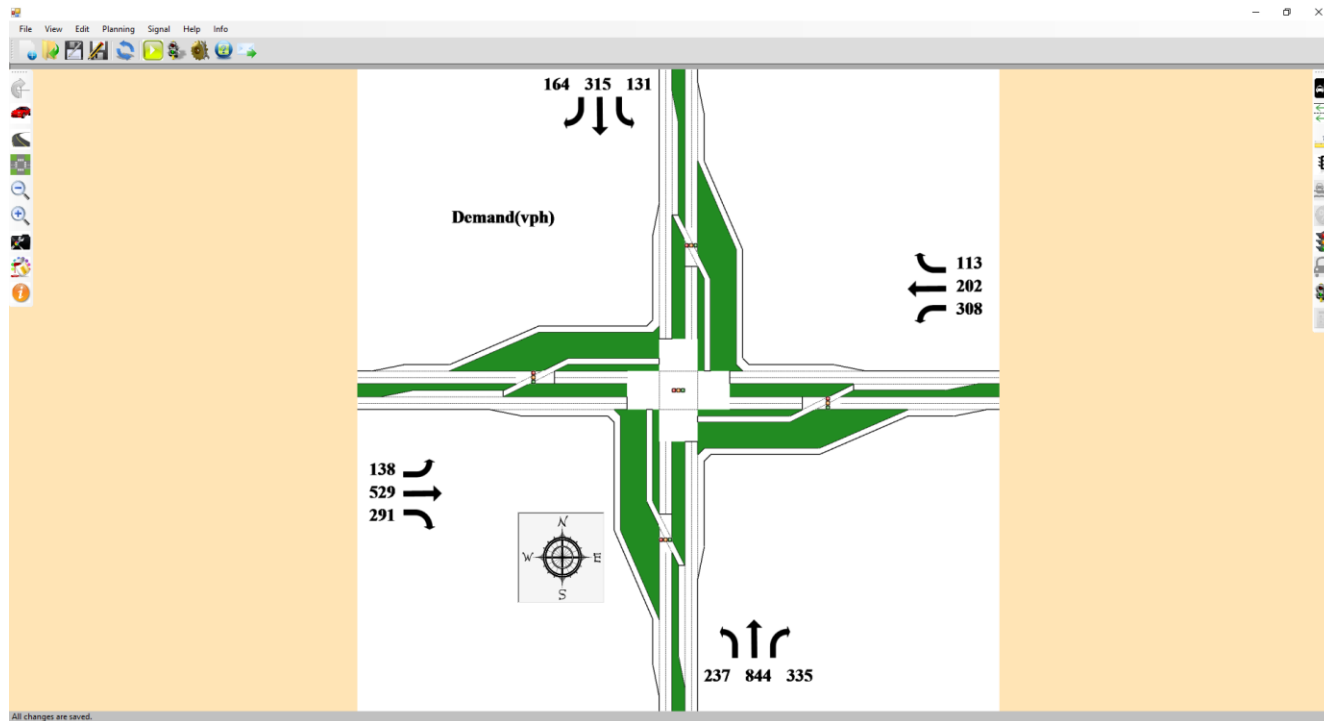
☀ User-friendly Interface

- Adopt the default geometry setting or
- Manually input geometric information



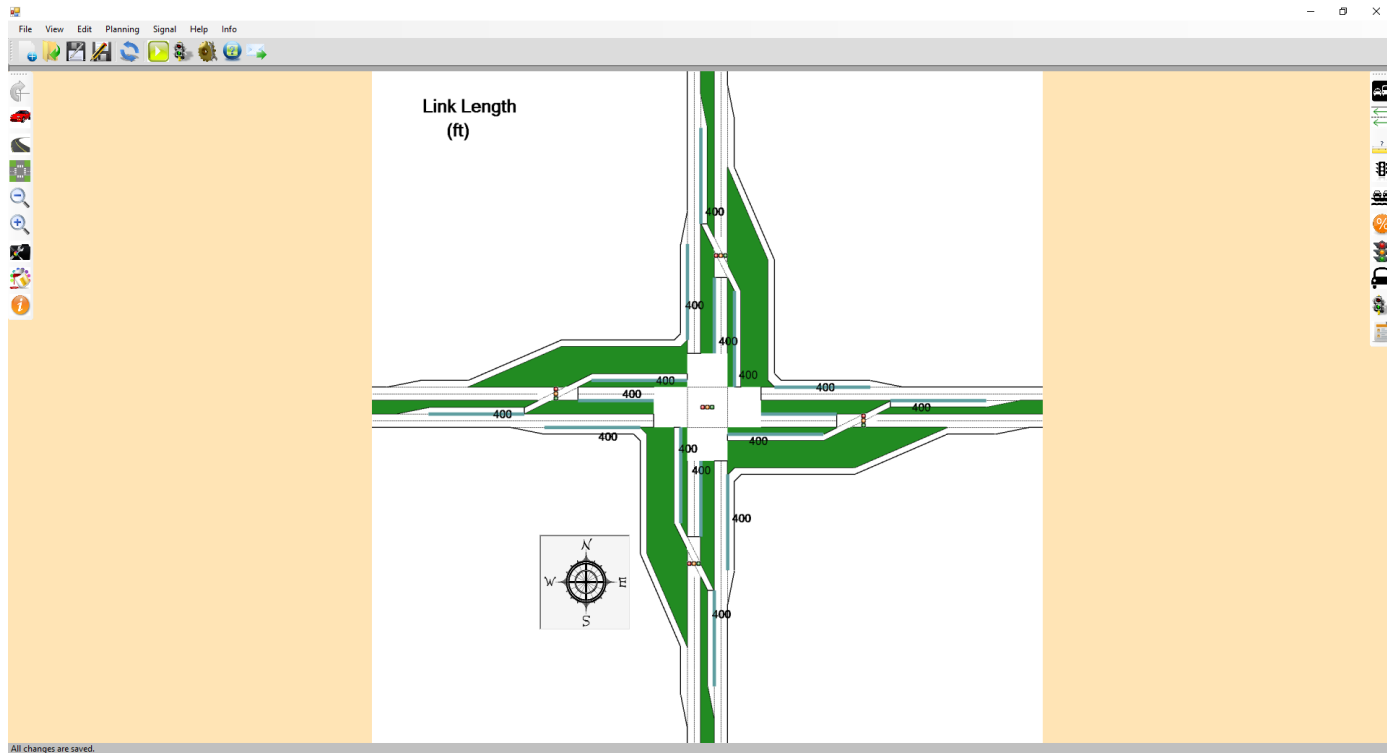
OUTPUT

☄ Show demand



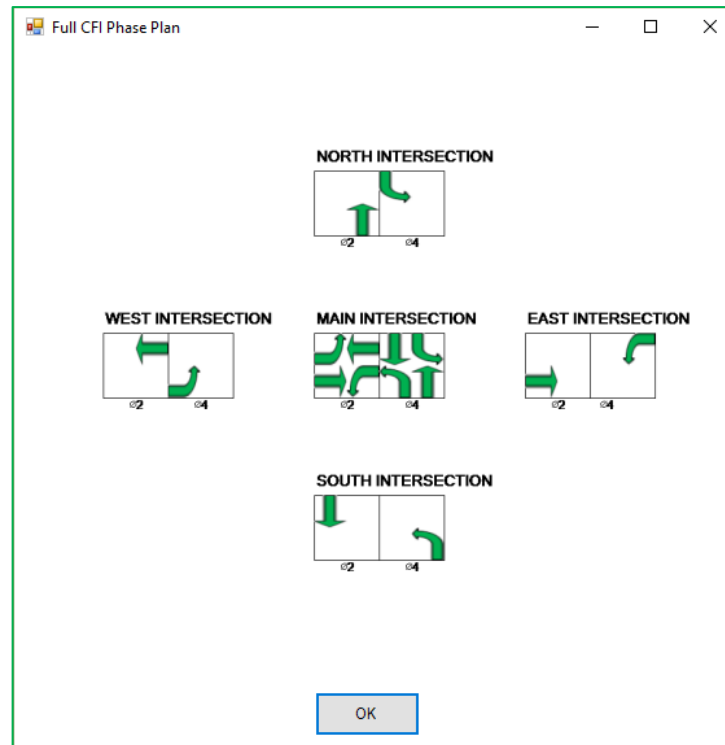
OUTPUT

☄ Show link length



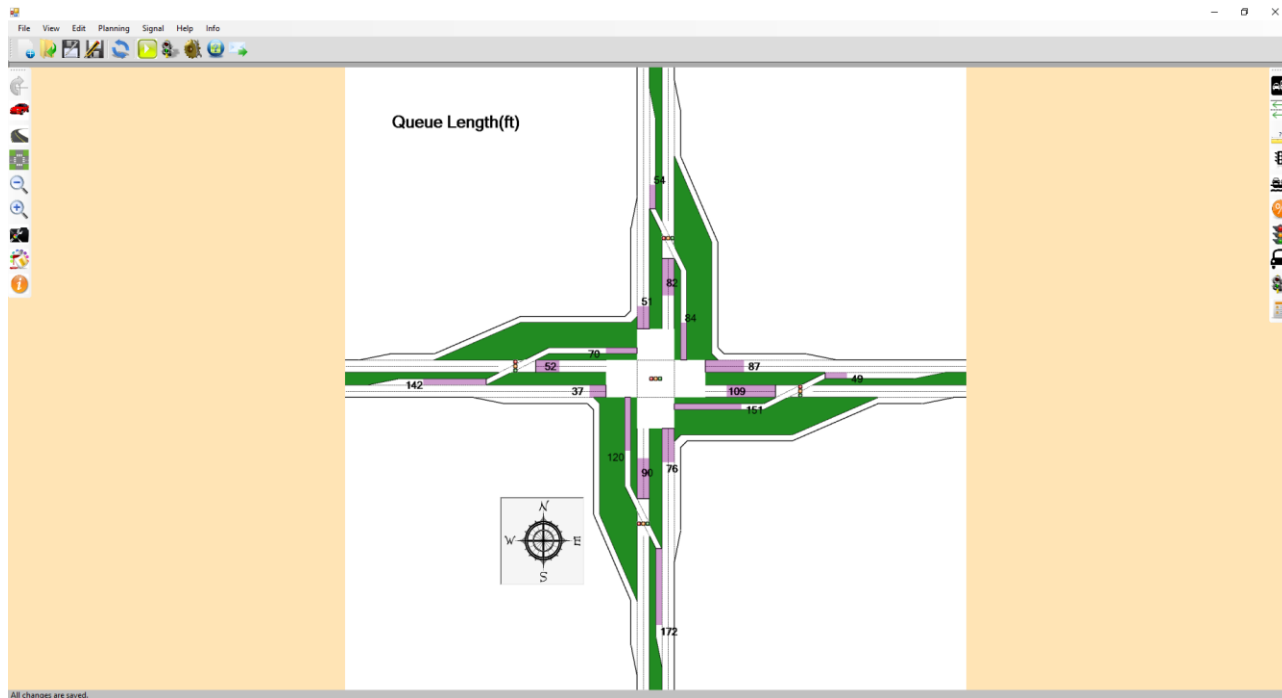
OUTPUT

☄ Show phase plan



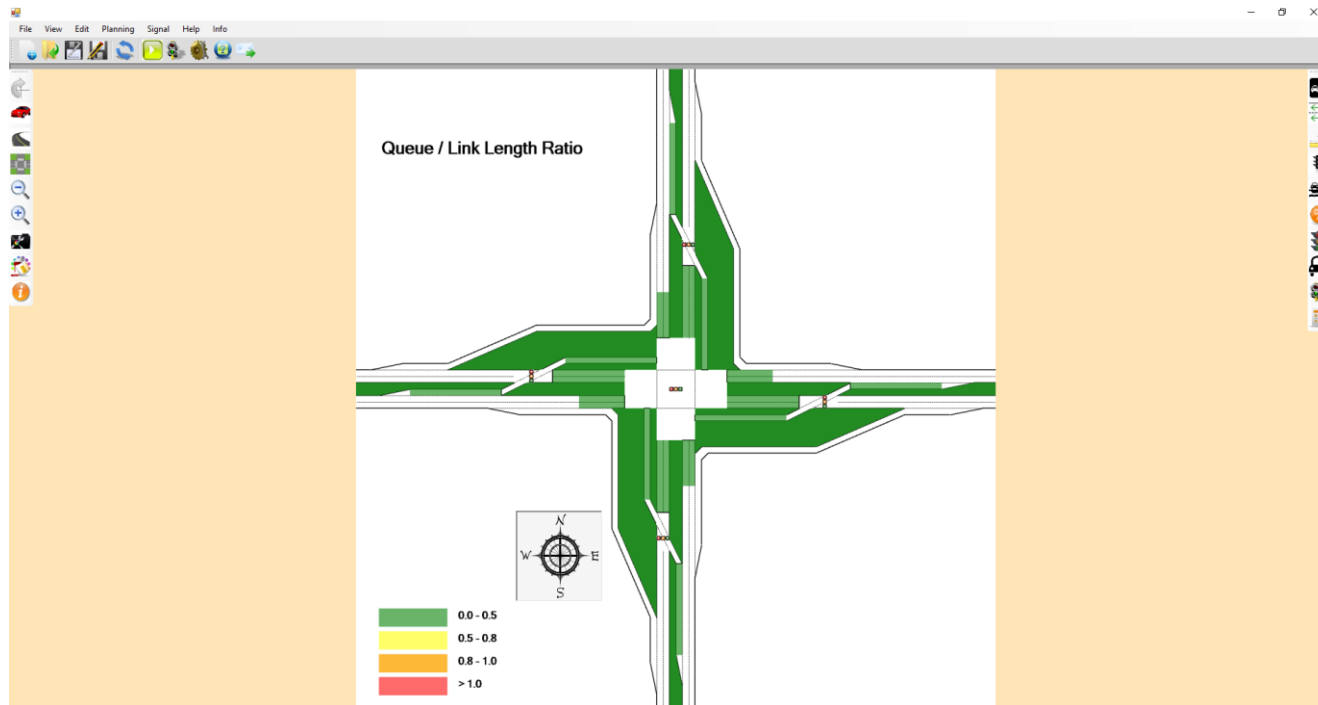
OUTPUT

☄ Show queue length



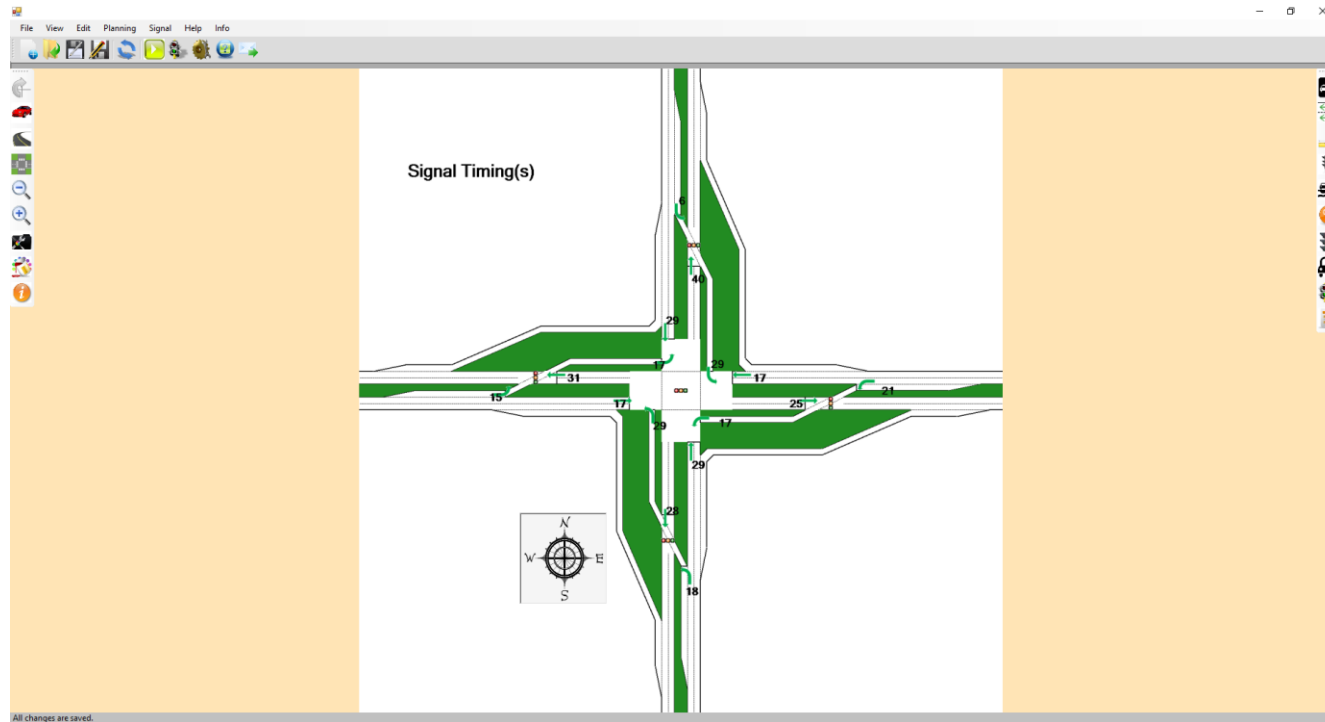
OUTPUT

☄ Show Queue/Link length ratio



OUTPUT

⚙ Show signal timing(s)



OUTPUT

- Generate a report with input and module output

