East West University

Department of Civil Engineering

Performance Evaluation and Capacity Enhancement of Existing T-junction

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Our
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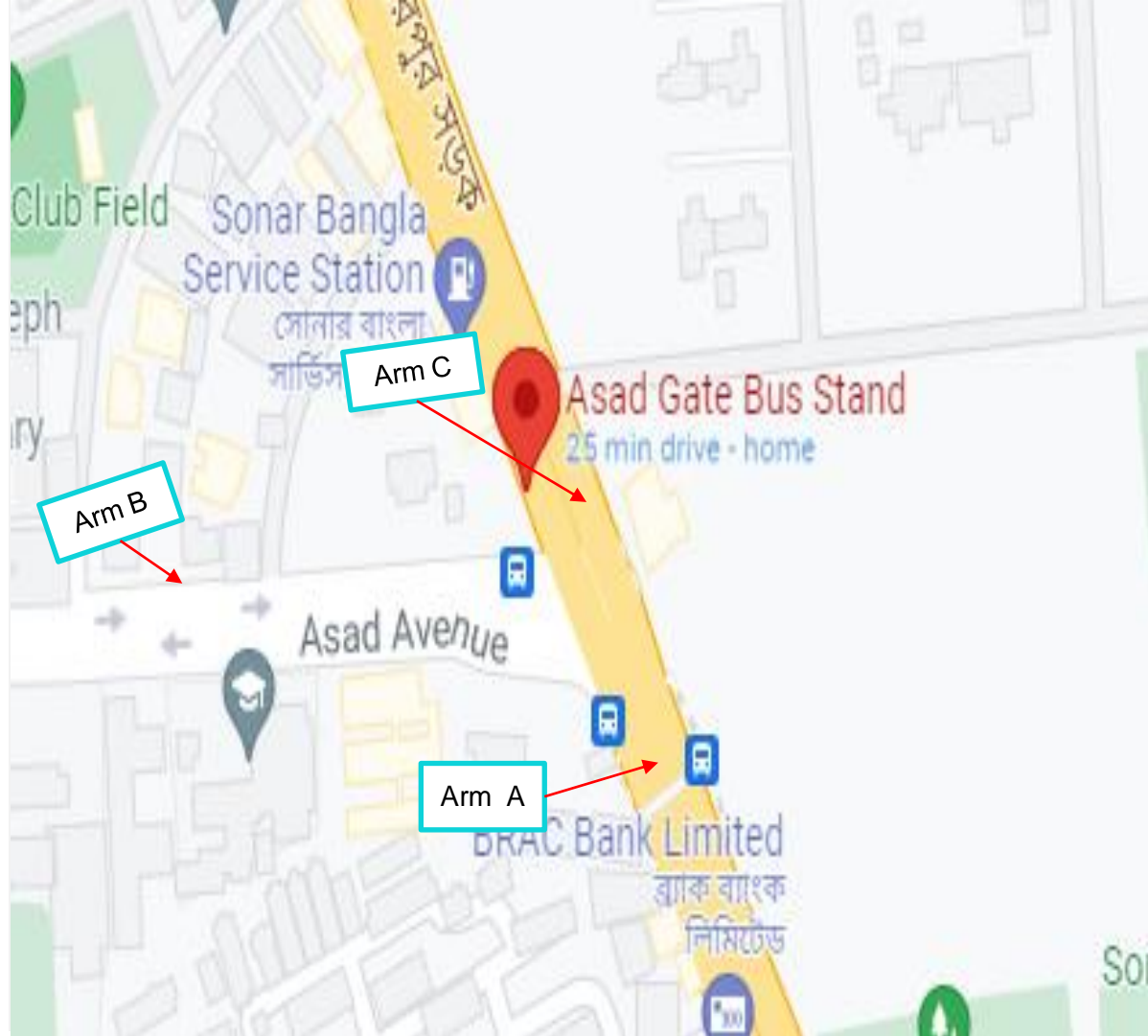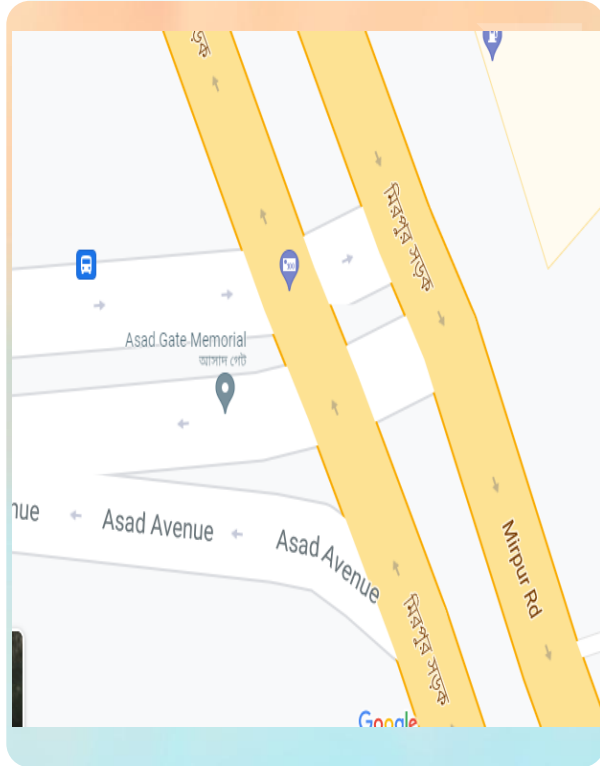
Introduction

A road junction is a location where vehicular traffic going in different direction can proceed in a controlled manner designed to minimize accidents. In some cases vehicles can change between different roads or directions of travel.

Objective of the Study

▪ To measure the current performance of the junction.
▪ To review the future scenario of the junction performance.
▪ To propose a solution for the existing junction for the development of the junction performance.

Performance Parameter

- **Junction delay**
- **LOS (Level of Service)**
- **RFC (Ratio of Flow to capacity) data.**
- **Queue length**

#3

PICADY

- **PICADY(Priority Intersection Capacity and Delay) is a micro simulation software tool, we are using the software to measure the junction parameters for this Asad Gate T-Junction.**
- **The reason for using the software is that this software is user-friendly.**
- **It was very easy to get the trail version. Since we didn't have the budget to purchase software.**
- **PICADY is basically junction9 software which belongs to TRL company.**

PICADY MODEL

#4
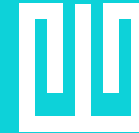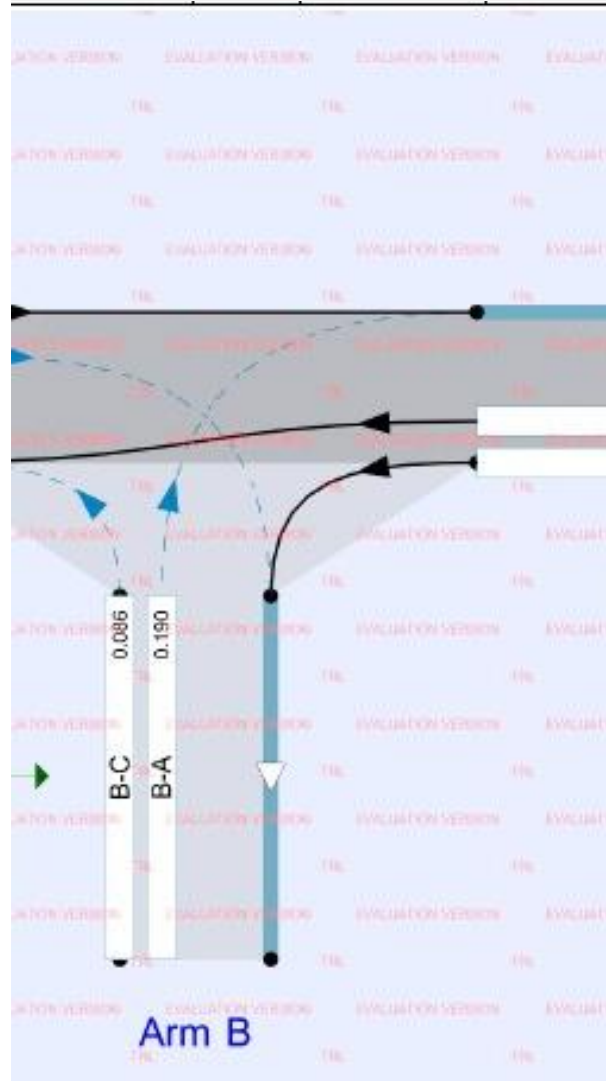
Data Collection

▪ **Number of field visit: two days.**

▪ **Initial survey done on 10 February 2021**

▪ **Major data collection 17 February 2021.**

▪ **First step was to collecting the geometric data.**

▪ **Geometric data such as lane width, visibility.**

▪ **Data collection time starts from early morning at 7 AM and ends at 9 PM**

▪ **We have taken data for total 11 time periods.**
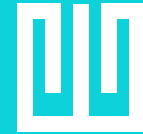
Asad Gate T-Junction

Data Collection

- We have taken the data for 15 minute time slots for each individual time period.
- Then we have collected traffic data for video survey.
- Visibility of major arm from minor arm was measured through google map.
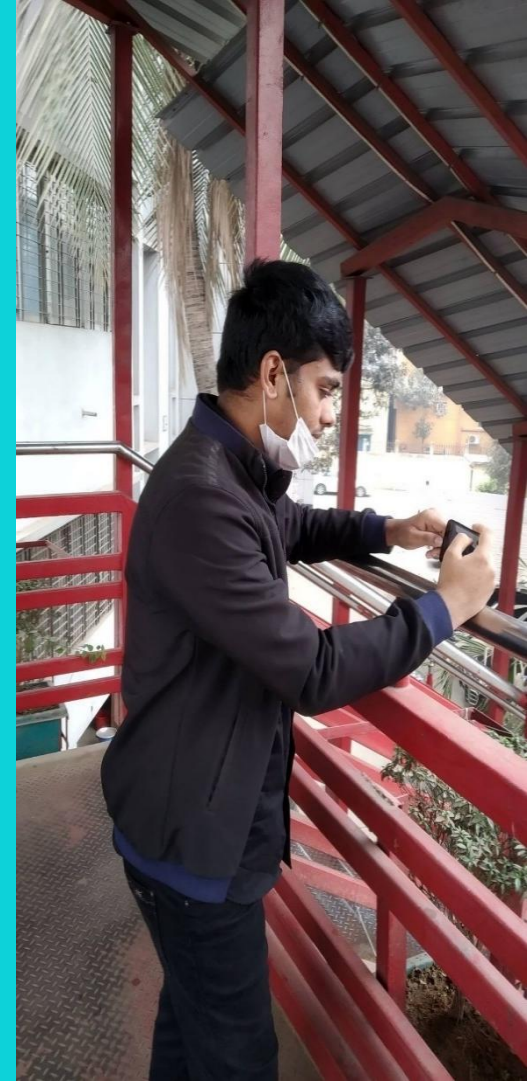
Types of Traffic Counts

Manual traffic counting in progress.

Automatic counting station secured and operated by solar power.

A weigh –in-motion speed and axle detection pad.

Typical installation of inductive loops.

1. **Manual count**
2. **Automatic count**
3. **Micro-millimetre wave Radar detectors**
4. **Weigh-in-Motion Sensor types**
5. **Video camera**

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Data Analysis

As discussed in the previous chapter, one types of data have been collected. The data has been used in modelling in PICADY. This allows to calibrate and validate the model. Also, this data is analyzed to study the traffic characteristics, composition in the study area.
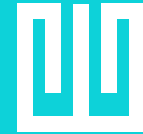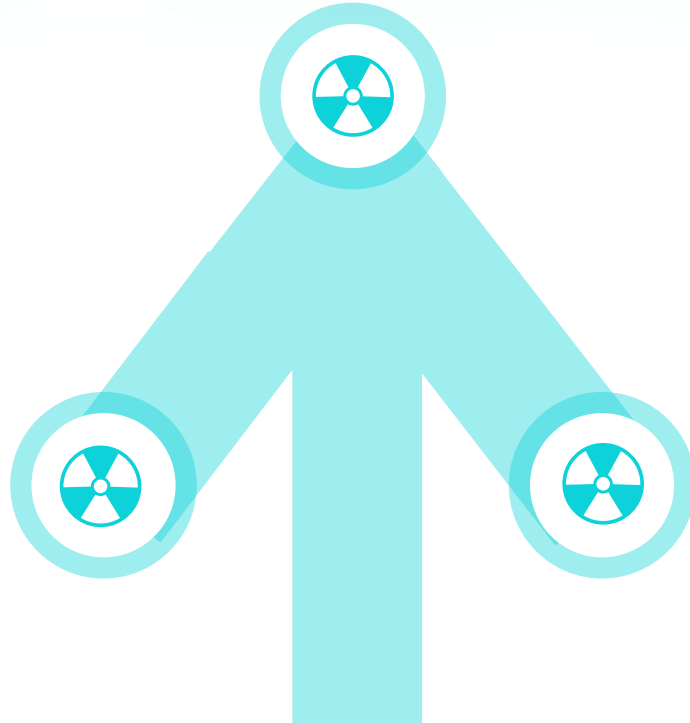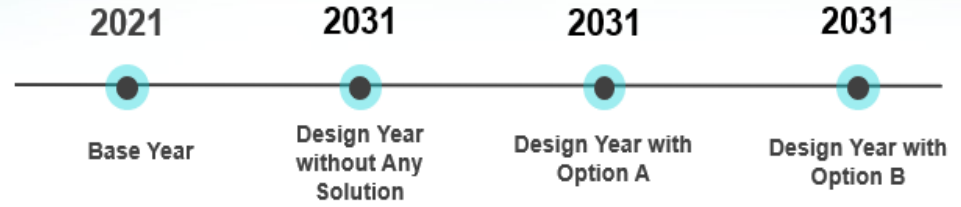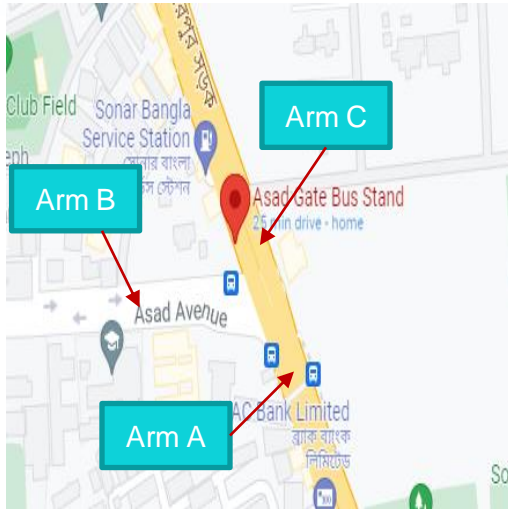

Asad Gate T-Junction

Proposals

Option A

Increasing Lane of Minor Arm

Option B

Using Iqbal Road As Alternative Way

Data Analysis (Cont.)

Time	Base Year	Without Solution	Increasing Lane	Iqbal Road
7.00 AM-8.00 AM	C	F	A	A
8.00 AM-9.00 AM	F	F	A	A
9.00 AM-10.00 AM	F	F	A	A
10.00 AM-11.00 AM	F	F	A	A
11.00 AM-12.00 PM	F	F	A	A
12.00 PM-1.00 PM	C	F	A	A
4.00 PM-5.00 PM	F	F	C	A
5.00 PM-6.00 PM	A	F	A	A
6.00 PM-7.00PM	A	F	A	A
7.00 PM-8.00 PM	F	F	A	A
8.00 PM-9.00 PM	F	F	A	A

Comparison of LOS

Data Analysis (Cont.)

Comparison Between Junction Delay, Design Year with and without Solution for Morning Peak
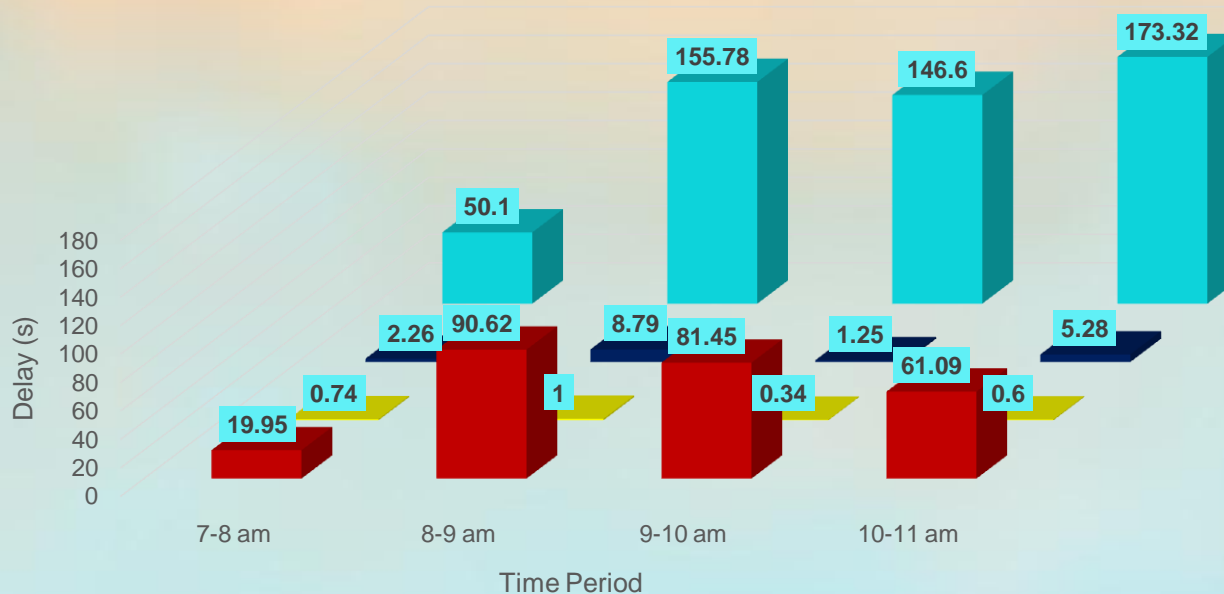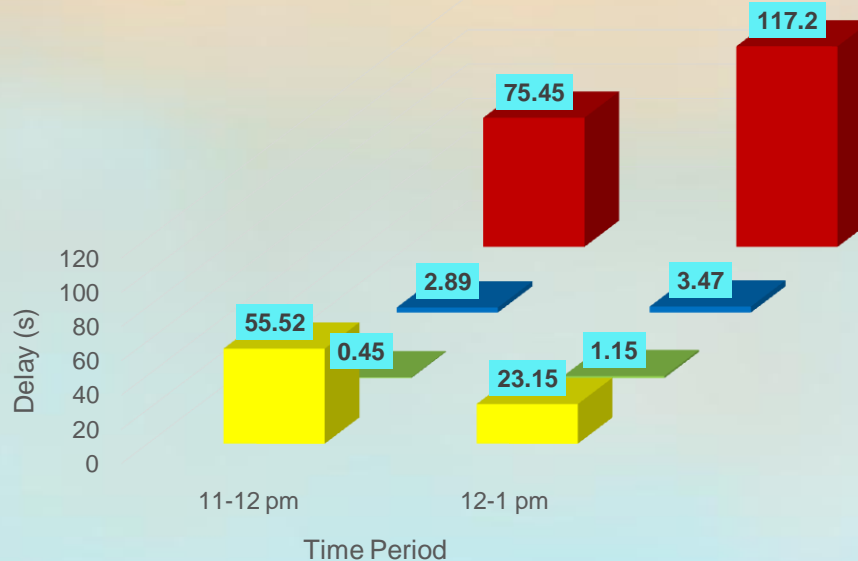
#11

Data Analysis (Cont.)

Comparison Between Junction Delay, Design Year with and without Solution for Inter Peak

Data Analysis (Cont.)
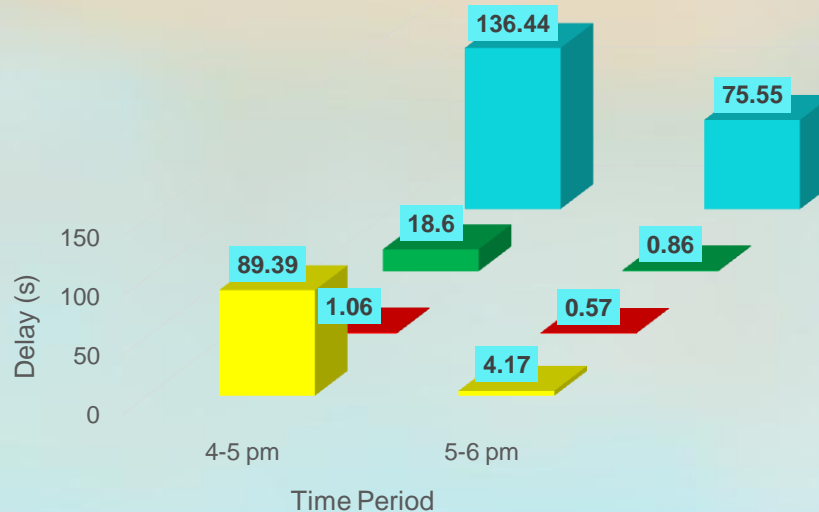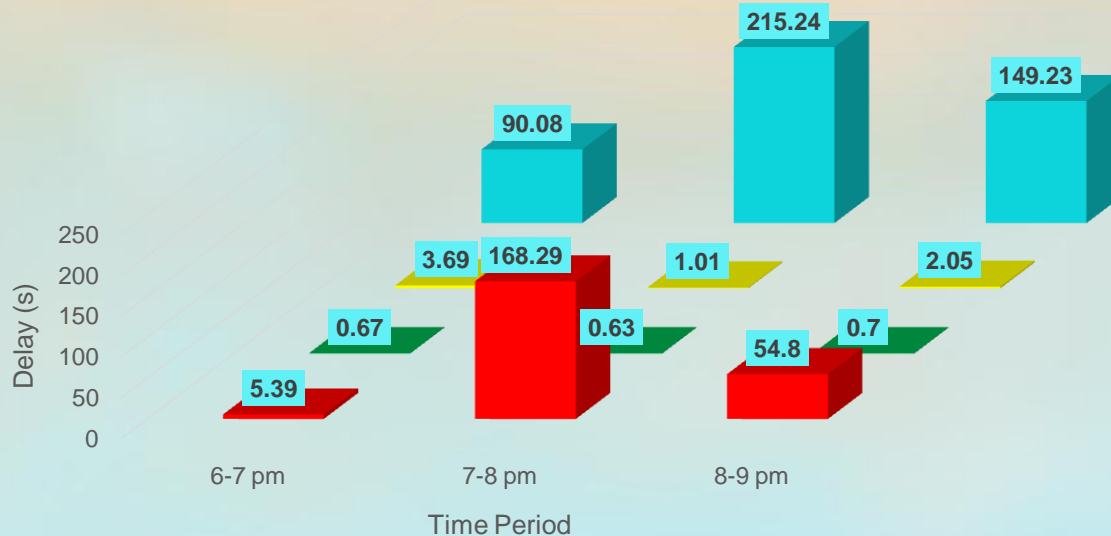
Comparison Between Junction Delay, Design Year with and without Solution for Afternoon Peak
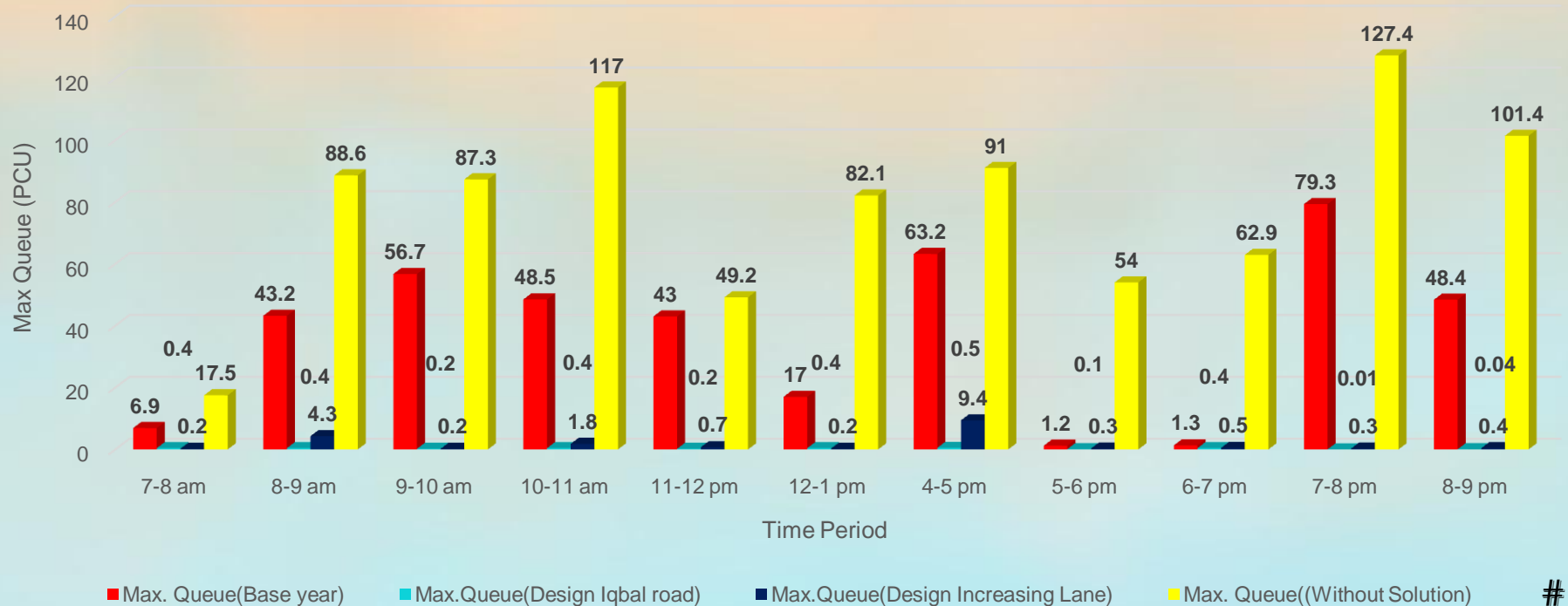
Data Analysis (Cont.)

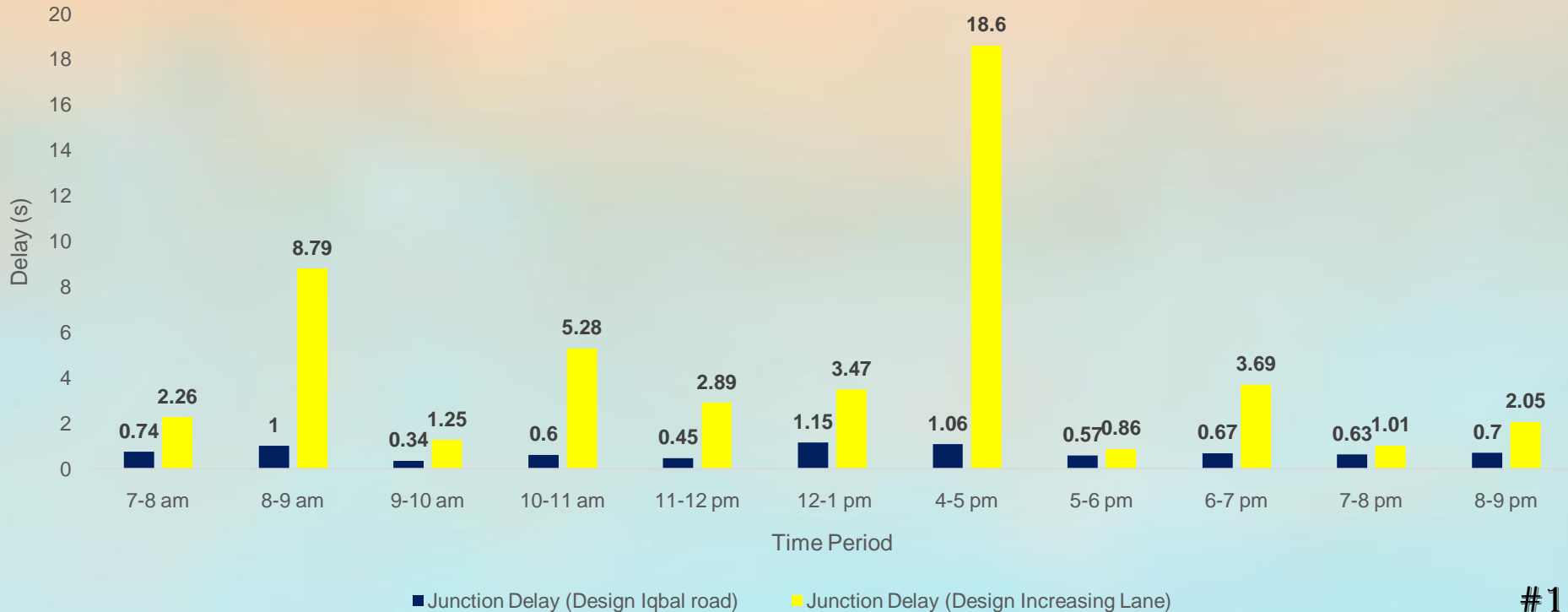Comparison Between Junction Delay, Design Year with and without Solution for Inter Off Peak

Data Analysis (Cont.)

Comparison Between Base Year, Design Year with and without Solution

Data Analysis (Cont.)

Comparison Between Solutions

■ Junction Delay (Design Iqbal road)   ■ Junction Delay (Design Increasing Lane)

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Conclusion

This Project has focused on the forced behavior of MV on the road network. Required data was collected for modeling the network to develop the model initially and the behavior was observed. The outcomes, limitations of this Project and recommendation of further study are discussed in this chapter.
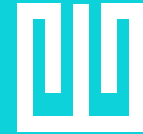
**Asad Gate
T-Junction**

Conclusions (Cont.)

- **Relatively lower right turning movement make an ideal scenario for most effective performance of junction**
- **Proposal of road widening significantly reduces traffic congestion and delay**
- **It is found that Iqbal Road system performs better when the traffic on major road from minor road was stopped.**

Thank you