Presentation on Course Outline of MSc (Eng) in Transport Planning & Engineering under University of Leeds (UK)

Presented by
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Course Outline

- **Course Name:** MSc(Eng) in Transport Planning & Engineering
- **Name of the University**: University of Leeds (UK)
- **Funded By:** Human Resource Development and Capacity Enhancement Project, Central Training Unit, LGED HQ, Dhaka
- **Course Start Date:** 10 January 2021
- **Course Duration**: 12 Months (Full Time)
- **Entry Requirement**: A bachelor Degree
- **Language Requirement**: IELTS 6.5 overall, with no less than 6.0 in any component

Name of Modules

Module ID	Module Name	credits
TRAN5015M	Shaping Future Transport Systems	15 credits
TRAN5020M	Principles of Transport Modelling	15 credits
TRAN5032M	Transport Data Collection and Analysis	15 credits
TRAN5072M	Principles of Transport Engineering	15 credits
TRAN5191M	System Dynamics: Modelling Policy	15 credits
TRAN5241M	Road Geometry and Infrastructure	15 credits
TRAN5291M	Traffic Network Modelling	15 credits
TRAN5912M	Transport Integrated Project	15 credits
TRAN5911M	Transport Dissertation	60 credits

Module TRAN5015M
Shaping Future Transport Systems

- This module helps to gain an appreciation of the grand challenges facing the transport sector but also future opportunities in transport sector.
- Under this module, the presenter studied on the trends in demand for passenger travel in UK for three different transports i.e. road, railway and air and found that the demand for private vehicles is increasing whereas the demand for public transport is decreasing over the 20 years period. Due to increasing passenger demand, the possible challenges for the urban area congestions, lack of parking space, impact on environment, longer travel time, shortage public transport. To decrease these challenges from transport network, expanded public transport network and more frequent and reliable public transport services will be the best solution.

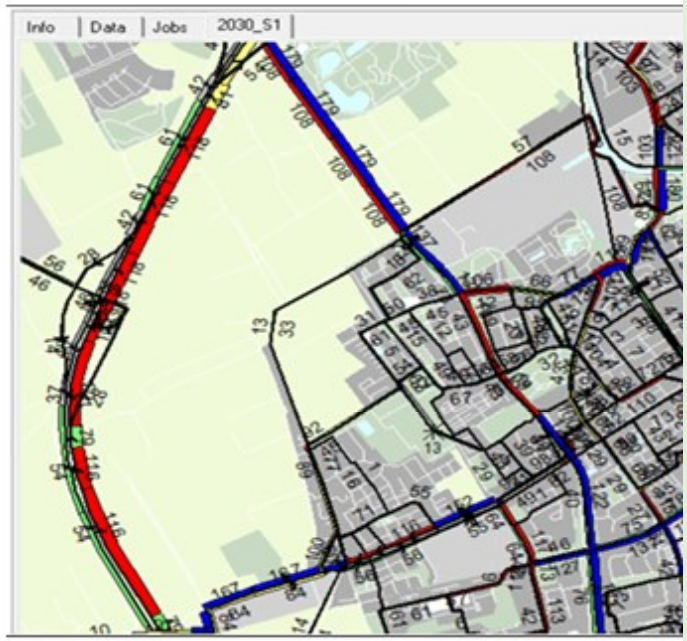
- Another study of this presenter under this module is on benefits of walking for commuting in urban area. Walking helps to decrease the demand of vehicles which results in decreasing congestion. Eventually a great improvement of environment, physical and mental health, family and social life and growth of economy can be obtained.
- The study also suggests some engineering measures to encourage people to change their mode of travelling from cars to walking. Walking in urban areas can be increased by taking measures that comfort and motivate pedestrians to walk.
    - Separating pedestrians from other traffic
    - Reducing vehicle speed
    - Removing obstacles between pedestrian and vehicles
    - Safe road intersection for pedestrians

Module TRAN5020M
Principle of Transport Modelling

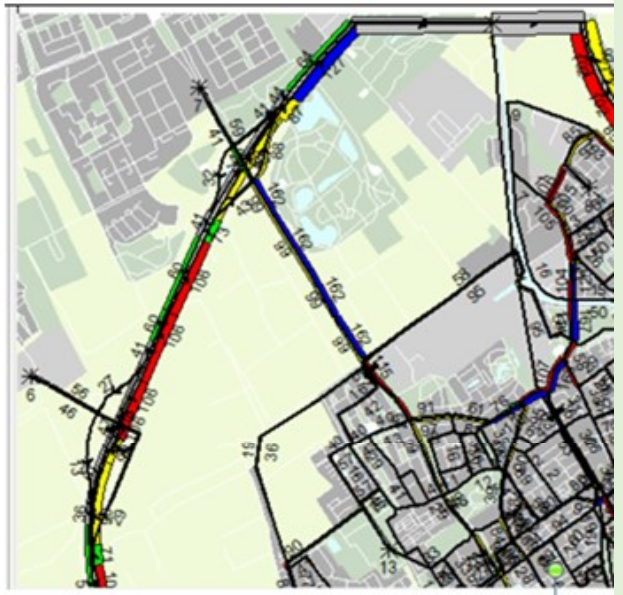
- This module provides the basic concept of transport modelling. The key mathematical modelling techniques of each of four stages of transport modelling (Trip Generation, Trip Distribution, Modal Split and traffic assignment) are introduced in this module.

- A four stage modelling of traffic in Delft road network is analyzed using OmniTRANS Modelling Software to compare traffic volume for two scenarios.

Traffic Congestion in Scenario S1 in the year 203



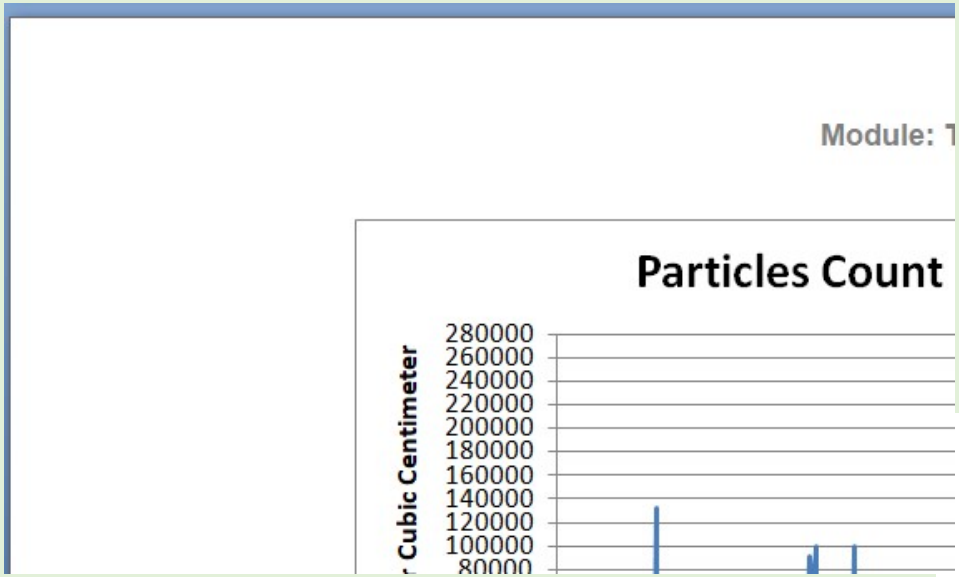
Traffic Congestion in Scenario S2 in the year 2030

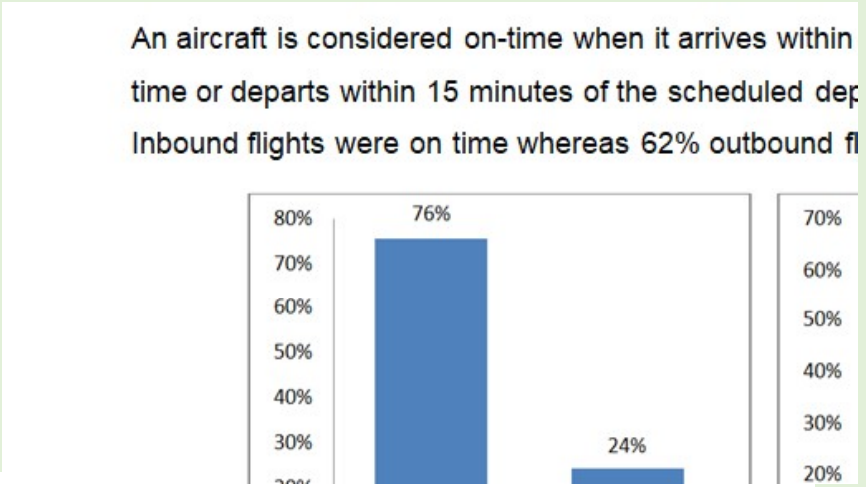


Module TRAN5032M
Transport Data Collection and Analysis

Data collection techniques and statistical analysis of the data related to transport system are thought in this module.

A group work is done for preparing different data collection forms and collecting data from recorded videos of road, rail and air transport. Statistical analysis, interpretation and visualization are done for these data.





Module TRAN5072M
Principles Transport Engineering

This module provides an overview of transport engineering aspects.

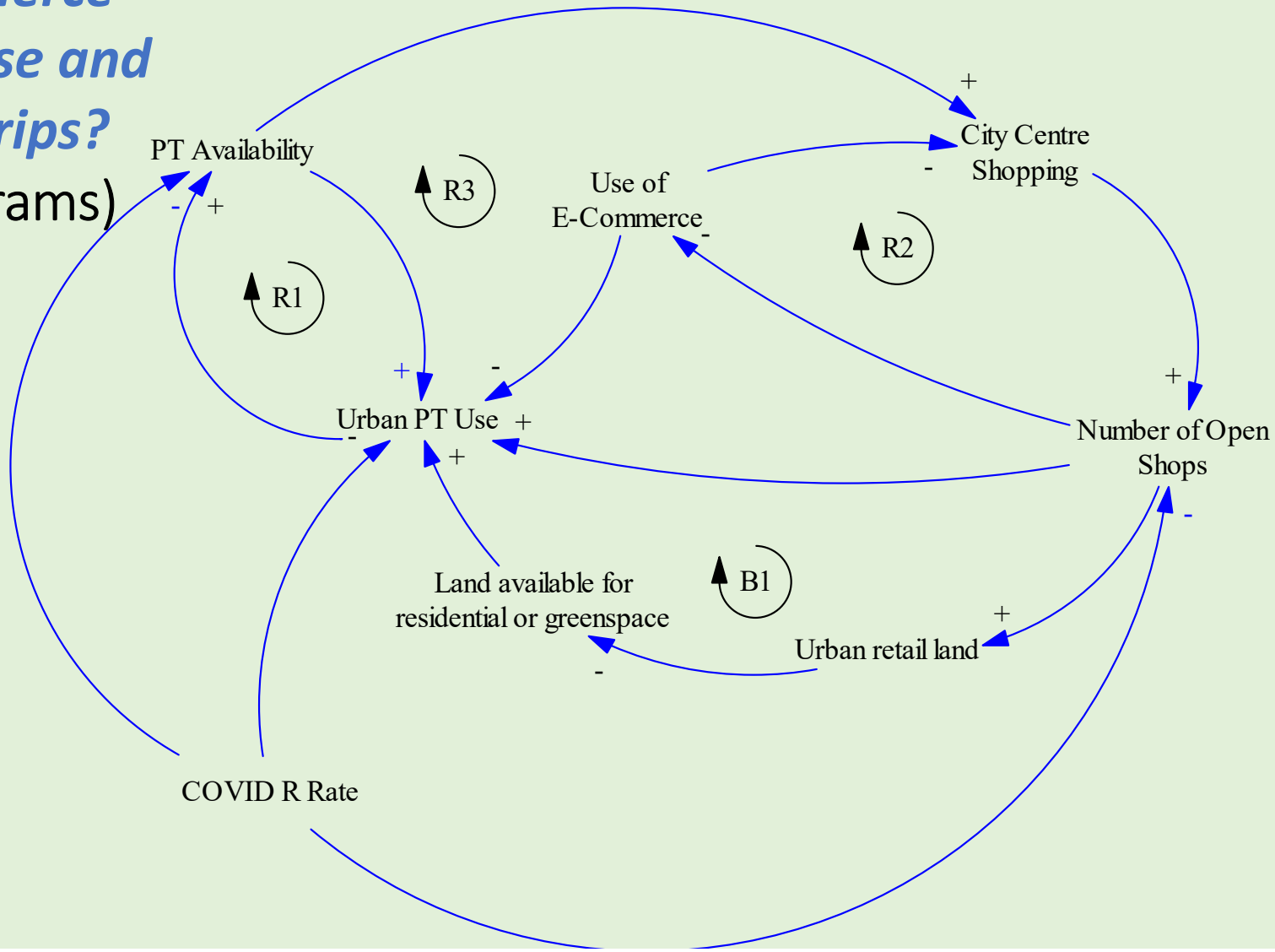
- Highway design standards. DMRB CD 109
- Highway capacity.
- Principles of junction design.
- Principles of route location.
- Principles of horizontal and vertical alignment.
- Principles of pavement design.
- Principles of railway track design.
- Environmental impacts (inc pollution, severance and noise).
- Design of public transport infrastructure.

Module TRAN5191M
System Dynamics: Modelling Policy

The module provides an understanding of the structure and dynamics of complex systems in the transport sectors. VENSIM system dynamics platform is used to develop models applicable for real life policy.

How does e-commerce affect urban land use and public transport trips?

(Causal Loop Diagrams)



Module TRAN5241M
Road Geometry and Infrastructure

This module provides a basic concept of geometric design of road.

- Link design (horizontal alignment and vertical alignment of roads)
- Junction Design: priority junctions, roundabouts, Multi-level intersections, high speed weaving areas.
- Principles of traffic control
- Use of LinSig Software to design signalized roundabouts.
- Use of ARCADY Software to predict capacity of roundabout.

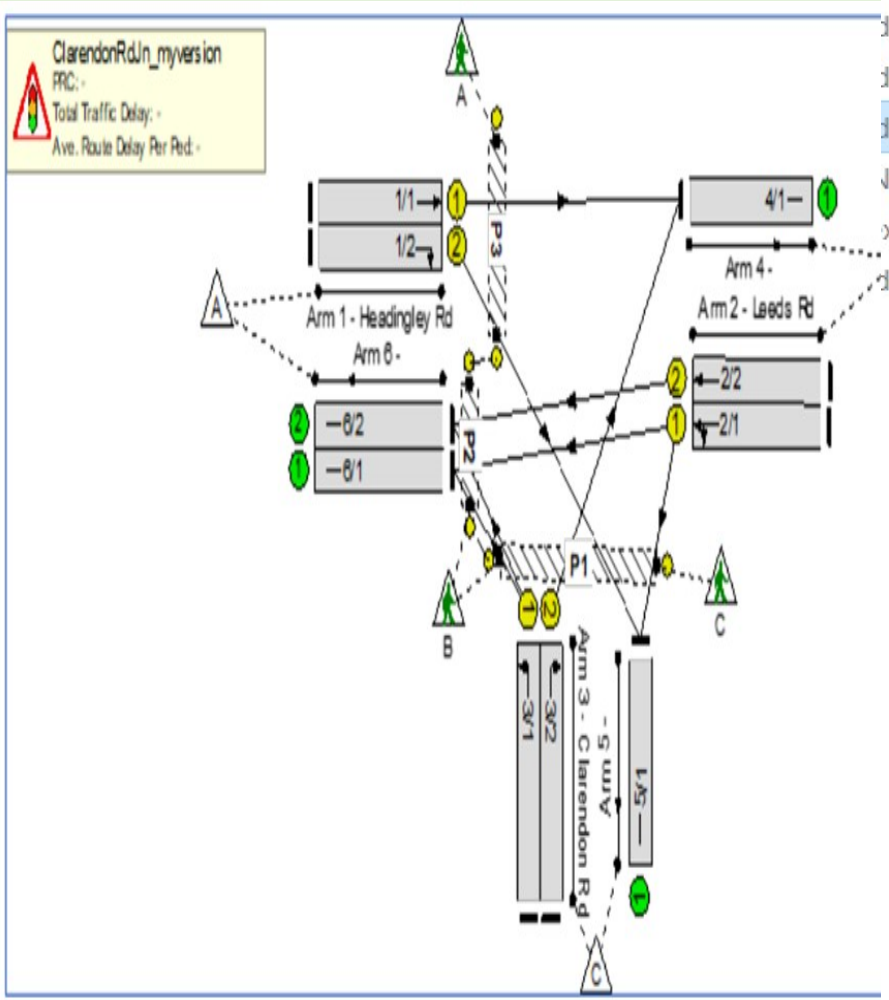
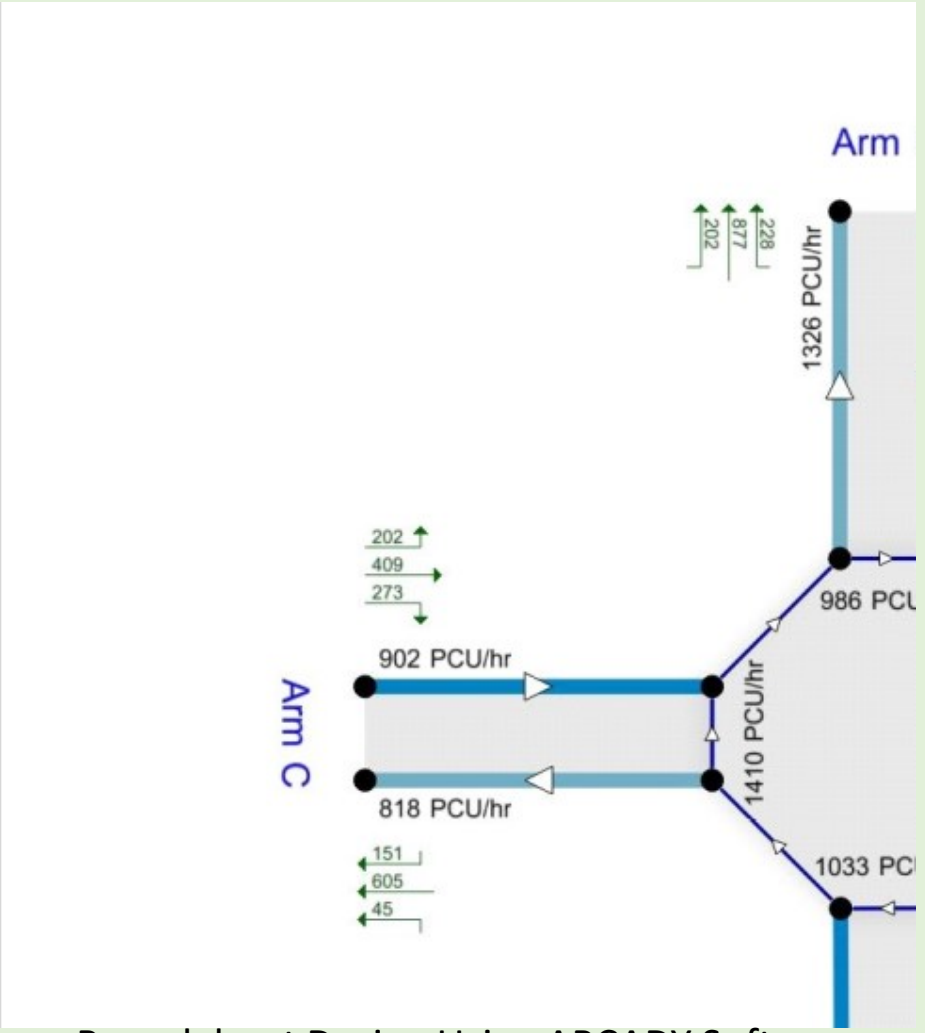


Figure : Network Layout with Pedestrian and Traffic Links (LinSig Software)



Roundabout Design Using ARCADY Software

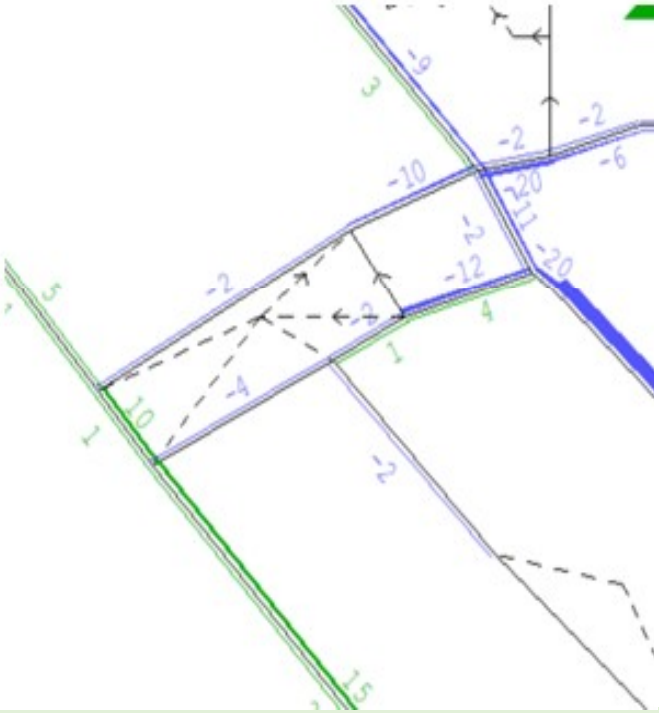
Module TRAN5291M
Traffic Network Modelling

This module provides a practical understanding of traffic assignment and simulation modeling using SATURN and DRACULA Modelling.

SATURN is a congested traffic network modelling software to represent the impacts of a realistic planning proposal.

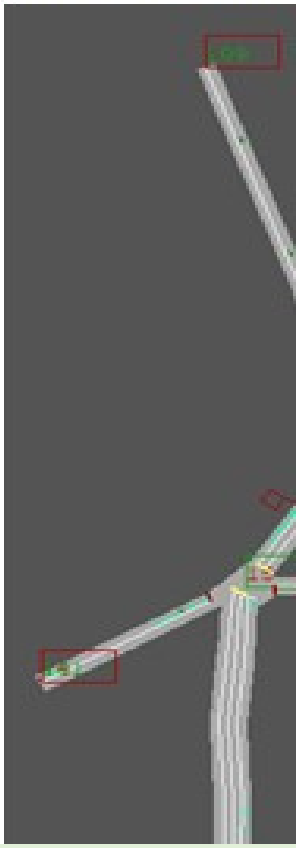
DRACULA is a micro simulating traffic network modelling software which also represent the impacts of a realistic planning proposal.

According to figure 9, overall traffic has decrease
width) whereas V/C has increase in the westside roa



A SATURN Case Study on Performance of Bypass

After adding bus lane with the coc
bus lane scenario is run for five dif



Impact of Bus Lane Scheme over traffic network using DRACULA Software

Module TRAN5912M
Transport Integrated Project

This module is based on team work of multi-disciplinary project team. The team developed a project plan and followed as planed. Multi disciplinary project teams worked out to do the relevant tasks. Finally a combined project report was submitted by the team.

This module enhances a range of personal and profession skills for project planning and management.

Module TRAN5911M
Transport Dissertation

This module is related to develop and apply research and design skills in a specialist topic within the transport dicsipline.

The Problem

FASTER GROWTH OF MOTORIZATION & URBANIZATION

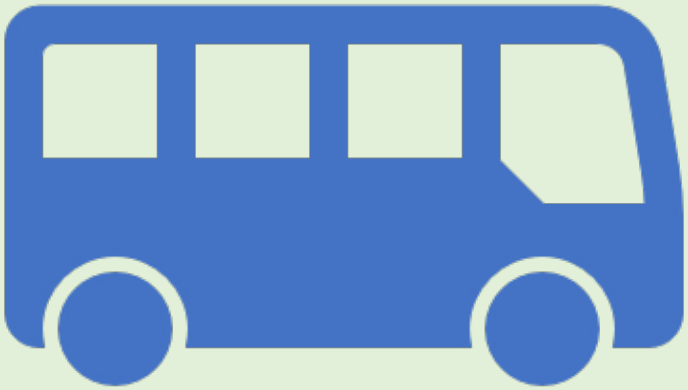
TRAFFIC CONGESTION AND GREEN HOUSE GASES

TRAFFIC CONGESTION FROM CARS

BUS TRANSPORT

TRAVEL TIME AND DELAY

Aim of the Study



The aim of the study to find out the factors that causes bus delay at bus stops particularly by understanding of bus stops operations, factors causing bus stops delays, types of bus stops delay etc.

The study is expected to provide a comprehensive understanding of following questions:

- What are the factors that influence bus stops operation and cause increasing of travel time in route and delays of bus services at bus stops?

- What are the common types delays that happen at bus stops?

- What is the procedure to calculate delays at bus stops using arriving time, dwell time and leaving time?

- Which bus stop is more efficient in terms of bus stop operations between bay style and curb side bus stops?

Methodology

Data Collection:

- Data were collected at selected two bus stops for Morning peak hour (7-10am) and evening peak hour (4-7pm) from live bus stop data available online. Arriving time and departure time are available there
- According to online bus schedule published by Metro (the transport network of WYCA), total 20 number of buses stop per hour from route 1-1B (6 nos), 6-8 (8 nos), 27 (2 nos), 28 (2 nos), 29 (2 nos).
- Number of boarding and alighting passengers are also obtained from the online bus data published by Metro.
- Due to COVID situation, manual field data collection was not allowed.

Methodology

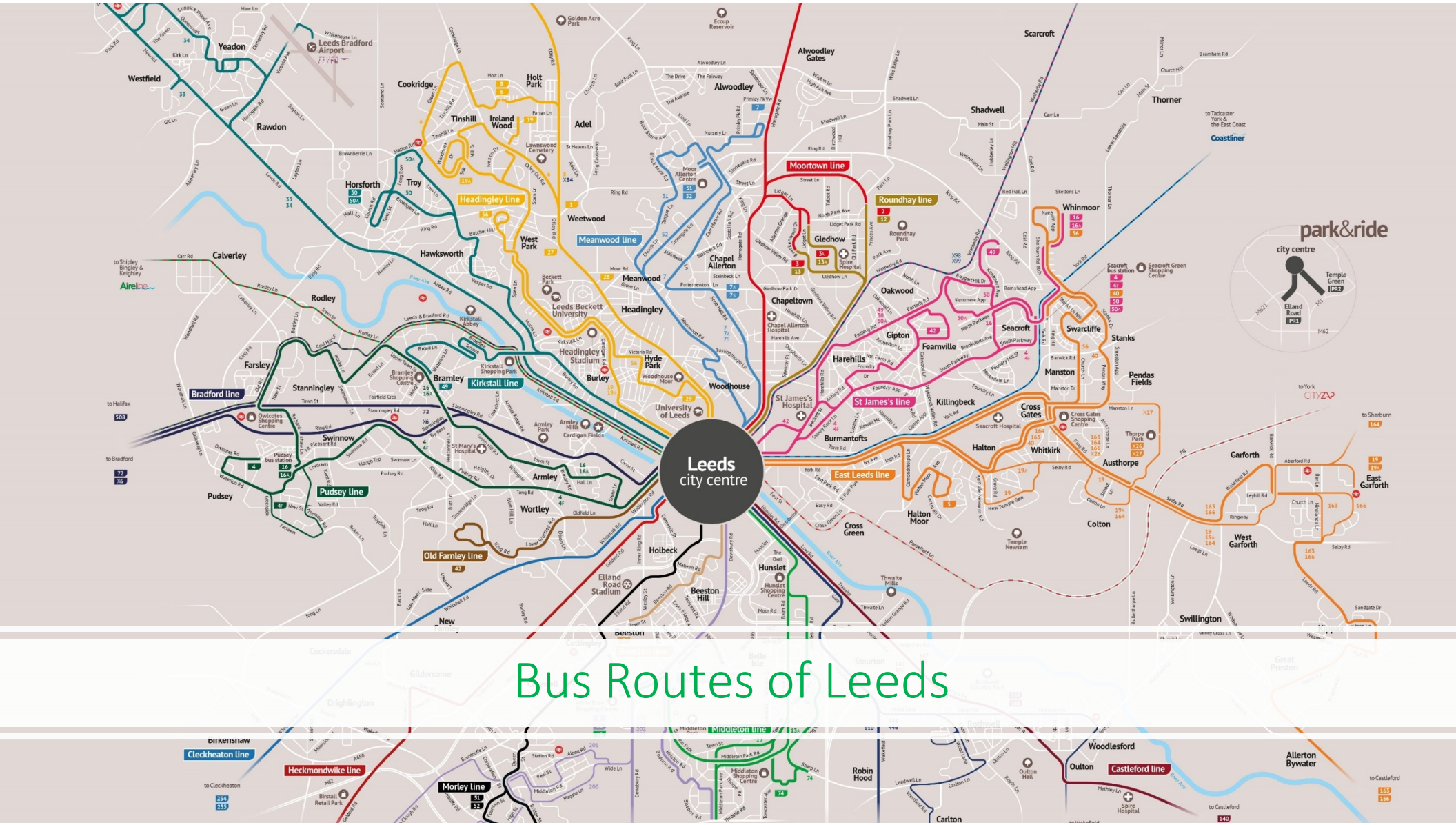
Statistical Analysis:

- Calculate distribution of arriving and leaving time for both type of stops
- Calculate bus stop capacity and load factors for both type of stops
- Derive fitting equations for dwell time and delay

Methodology

Validation

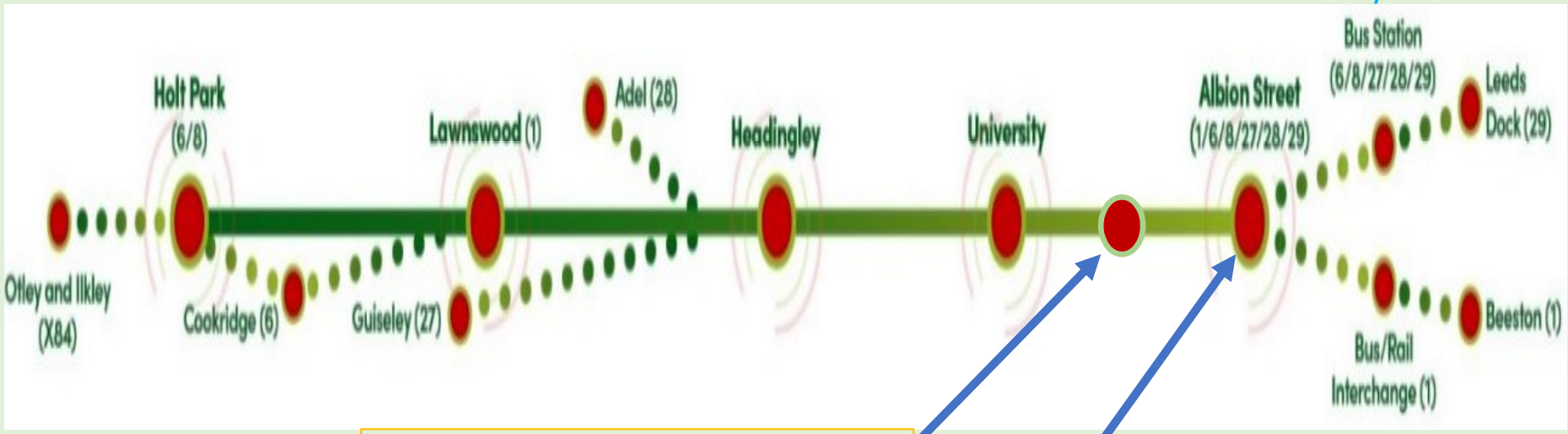
- Validation of the fitting Equations will be done through case studies for the selected routes and stops for both type of stops



Bus Routes of Leeds

Data Collection Routes and Stops

Route 1 : Beeston – Lawnswood
Route 1B : Beeston – Headingly Campus
Route 6 & 8 : Leeds Bus Station – Holt Park
Route 27 : Leeds Bus Station – Guiseley
Route 28 : Leeds Bus Station – Adel
Route 29 : Leeds Dock – University Circular



Curbside Bus Stop: Merrion B at Woodhouse Ln. (Morning Peak Hour)

Bay Type Bus Stop: Headrow L at Albion Street (Evening Peak Hour)

Factors causing delays at bus stops

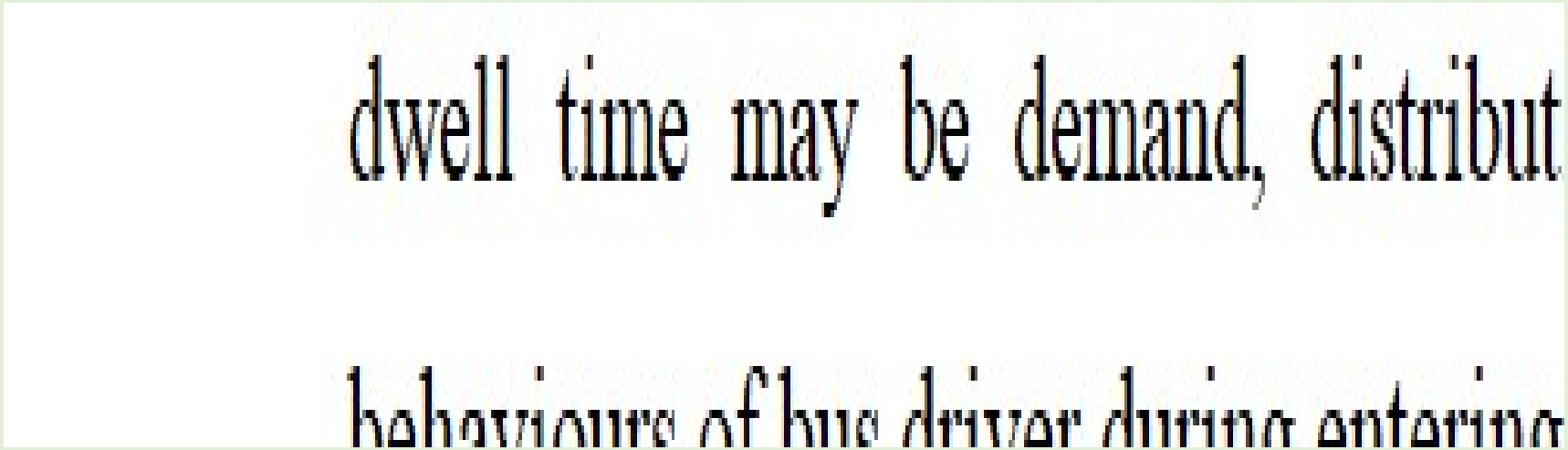
- Passengers
- Fare collection method
- Bus vehicles
- Bus stop (types, locations, length, number of berth)
- Traffic signals
- Punctuality of bus arrival

Types of delays at bus stops

- Queuing delay
- Hindered delay
- Boarding and alighting delay
- Second stop delay
- Re-entry delay
- Delay due to nearby traffic signal

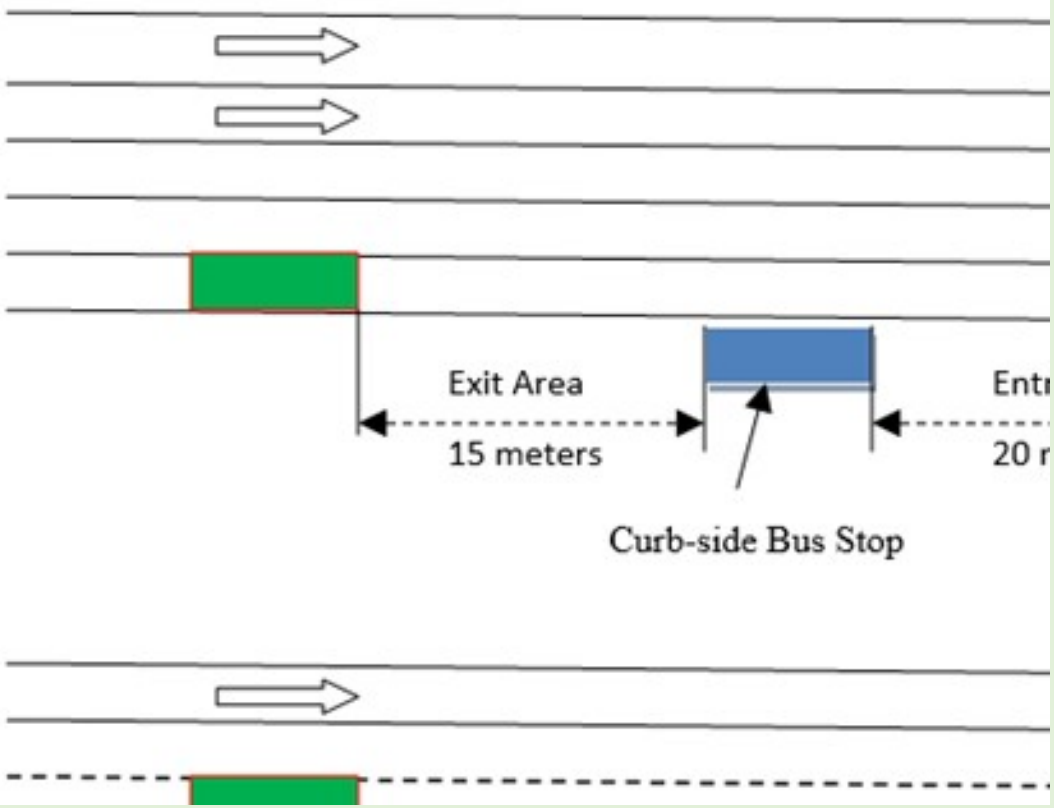
Bus Stop Operations

- Arriving (deceleration),
- Dwelling and
- Leaving (acceleration)



Where T_{a1} , T_{dw1} and Tdw1 represent estimated arriving time, dwell time and leaving time respectively.

passengers of boarding and alighting.



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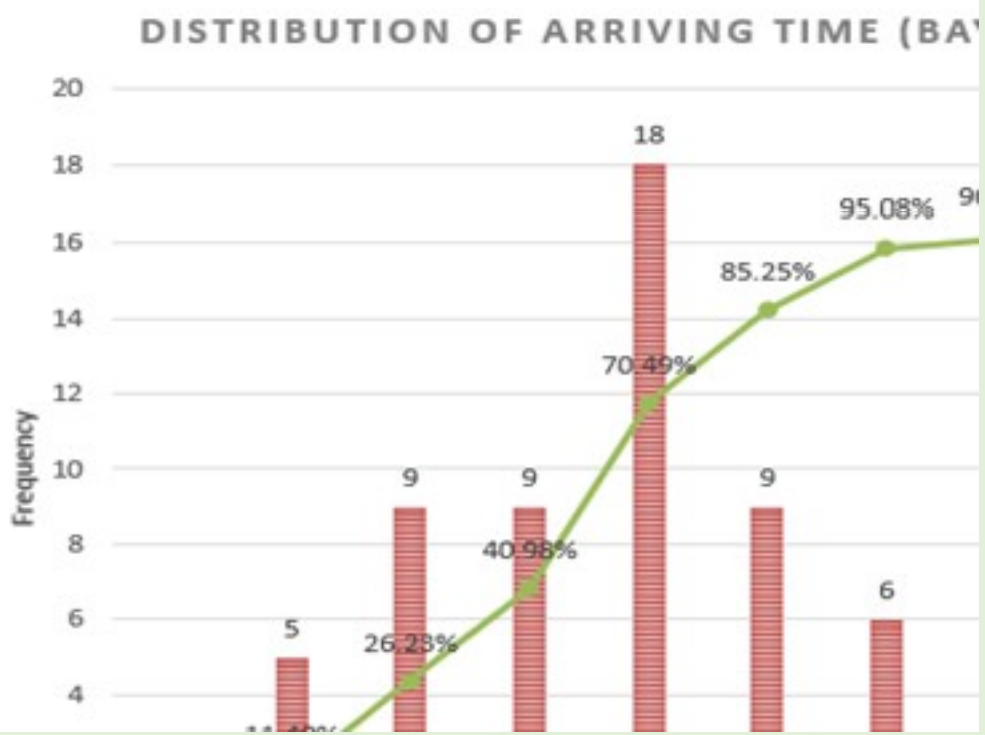
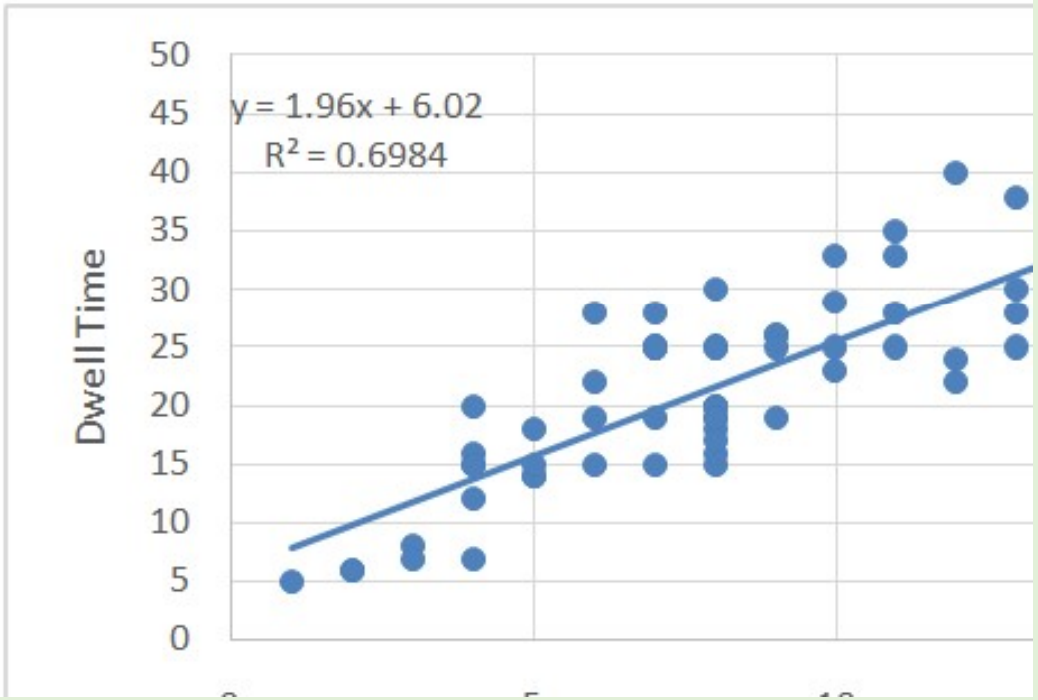
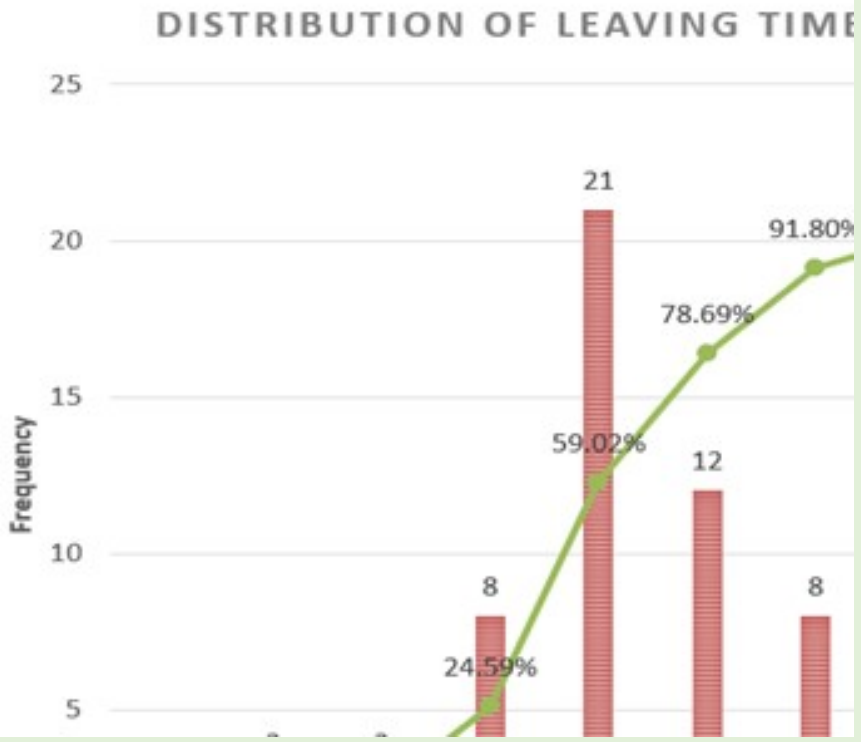

DISTRIBUTION OF ARRIVING TIME (BA
Frequency
20
18
16
14
12
10
8
6
4
18
9
9
9
6
5
26.23%
40.98%
70.49%
85.25%
95.08%

passenger volume and drivers' behaviour during arriving ar



seconds (*Figure 6*). The average and standard devi

1.7 seconds respectively.



- The study shows that delays for bay style bus stop is more than curb side bus for same number of boarding and alighting passenger.
- In terms of bus stop efficiency, curb side bus stops are better than bay style bus stops. However, bay style bus stops have less interference to traffic flow than curb side bus stops.

Thank You