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# Mobility Allowance Shuttle Transit (MAST): an introduction and future research agenda

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# Mobility Allowance Shuttle Transit (MAST): an introduction and future research agenda

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**R. Shahin**

# Mobility Allowance Shuttle Transit (MAST)

# Introduction

## Introduction

### Research gaps

Transport agencies are seeking for ways to improve service flexibility.

- ▶ Undoubtedly, Conventional Public Transport (CPT) is cheaper than Demand Responsive Transit (DRT).
- ▶ CPT is perceived to be inconvenient by clients.
- ▶ DRT covers the disadvantages of CPT, but it comes at a price.

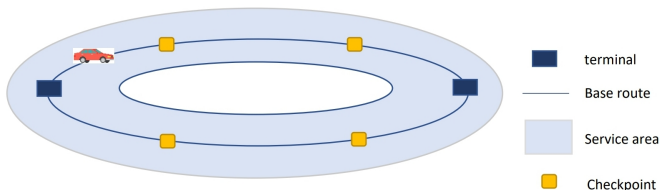
This justifies the need for Mobility Allowance Shuttle Transit (MAST), which was originally designed for a night shift.

# MAST : definition

Introduction

Research gaps

It merges the flexibility of DRT with the low cost of CPT. A shuttle would run between two terminals and in between, it must pass through some mandatory checkpoints (stops).

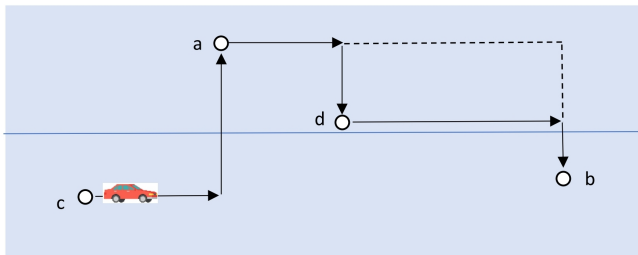


# MAST : definition

Introduction

Research gaps

The MAST system is a type of public transportation where vehicles may deviate from a fixed route to serve clients who wish to get on or off within a service area.



# Clients in the MAST

## Introduction

### Research gaps

a MAST system would respond to four different types of clients :

- ▶ PD (regular) : pick-up/drop-off at checkpoint.
- ▶ PND (hybrid) : pick-up at checkpoint, drop-off at non-checkpoint.
- ▶ NPD (hybrid) : pick-up at non-checkpoint, drop-off at checkpoint.
- ▶ NPND (random) : pick-up/drop-off at non-checkpoint.

# Research gaps

In this section, we discuss possible extension and new direction of the problem.

Introduction

Research gaps

- ▶ **Finite Capacity** : if we consider the finite capacity, we should also keep track of PD clients that are invisible in infinite capacity scenario.
- ▶ A policy is needed for ensuring seats for clients with reservation.



Mobility Allowance Shuttle Transit (MAST)



# Research gaps

Introduction

Research gaps

- ▶ **Dynamic Environment - Backtracking** : having a dynamic environment and backtracking would lead to a higher level of service.
- ▶ The MAST system was designed for the night service. Therefore having a fleet of vehicles and dynamic environment for day time is crucial.



# Research gaps

Introduction

Research gaps

- ▶ **Fleet of Vehicles - Periodicity** : another research direction could be having a fleet of vehicles running every 5 minutes for instance.



# Research gaps

Introduction

Research gaps

- ▶ **Alternative methods** : MILP is only good for small instances.
- ▶ Branch and Price is also a good extension for exact approaches.
- ▶ A meta-heuristic algorithm for bigger instances.



**Thank you for your attention.  
If you have any question...**

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