

# The Route Network Model

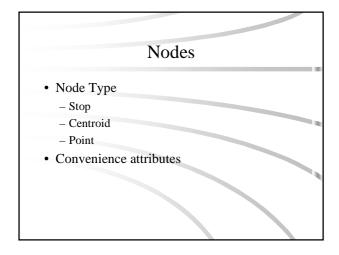
- Physical Data
- Operation related parameters
- Cost and Revenue related parameters

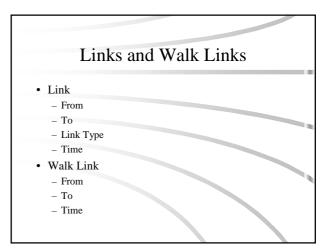


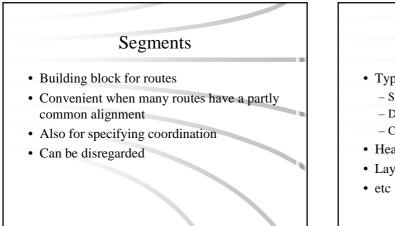
- The model works with average values for ride times, headways etc
- Reduce the size of the network description without loss of important information

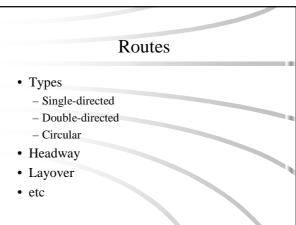
# Physical Data

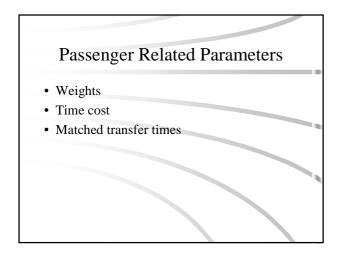
- Nodes
- Links and Walk Links
- Segments
- Routes

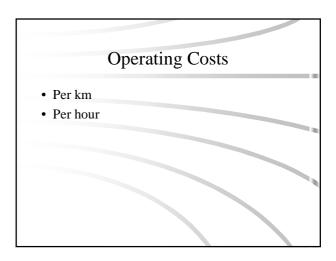


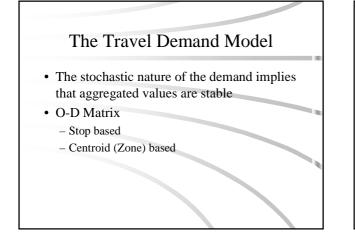












# VIPS Route Network Analysis

- Abbreviated "RNA"
- Simulation process
- Passengers seek to minimise weighted travel time



- Each passenger knows the headway and riding time to the destination for all possible routes from the origin and transfer nodes
- Each passenger has an ideal departure time, and these times are uniformly distributed over the studied time period

## **VIPS RNA Assumption Choice**

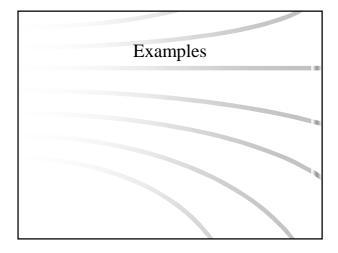
- A: Passengers know departure times ("timetable knowledge")
- B: Passengers do not know departure times

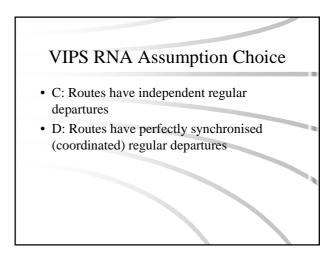
## Assumption A or B?

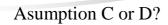
- A passengers that does not know departure times (B)
  - Always boards the next departing acceptable bus
  - If there are several boarding stops, only the one that is best on average is used

# Assumption A or B?

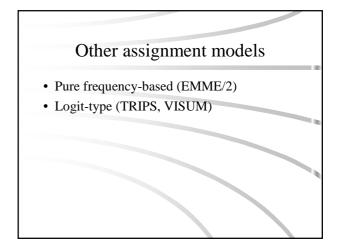
- A passengers that knows departure times (A) gets a better service
  - He/she can choose from different boarding stops at different times
  - He/she can choose to ignore a bus at the stop for a later departure of another, quicker, route

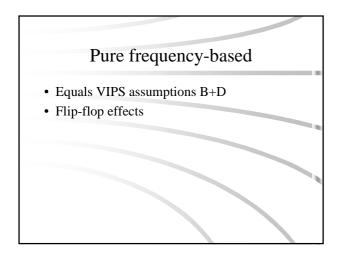






- In real life, only some routes have coordinated departures
- Assuming perfect coordination (D) is too optimistic
- VIPS allows a combination, with special coding for coordinated routes





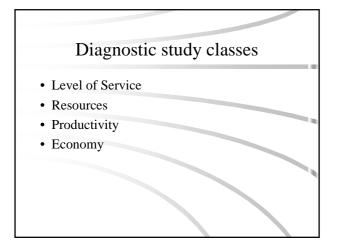
# Logit-type distribution

• Cannot distinguish between stochastic values (wait time) and fixed values (remaining travel time)

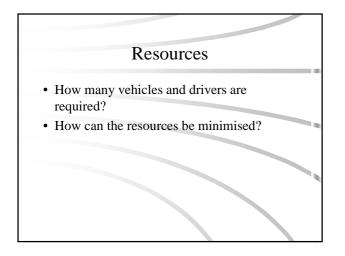
# Calibrating (tuning) the model

- Travel Time Weights
- Transfer Penalty
- Local conditions
  - Disutility factor
  - Transfer stops
  - Matched Transfers
  - Mean delay

# Evaluation of the route network Must always compare relative the base situation The modelled base replaces reality

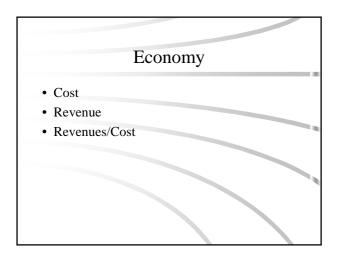


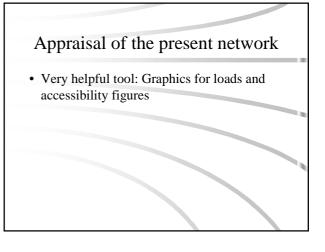
# Level of Service What is the total travel time? How many transfer have to be made? How do we get the most benefit from a small improvement? How do we get the least impact from a decrease in service?

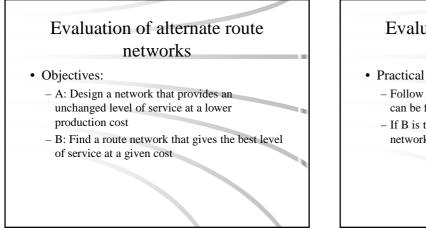


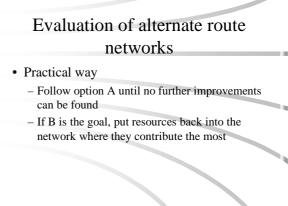
# Productivity

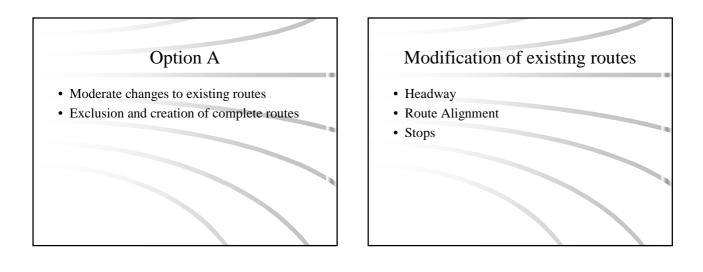
- Are the vehicles and drivers efficiently used?
- Capacity utilisation
- Cost per passenger km

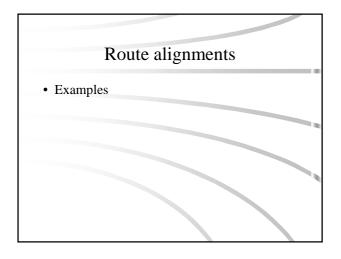


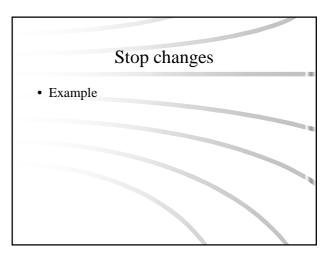












# Exclusion and creation of routes

- Choose strategy:
  - The direct trip strategy
  - The feeder strategy
- Final solution is likely to be a compromise due to local conditions

