IIT Mumbai – First and Last Leg Optimization

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Freight Flow -2

- Seller
- CFS
- Origin Port
- Destination Port
- CFS/Destination Warehouse
- Customers
Trucking Industry Level Challenges

- **Infrastructure Issues and Challenges**
  - Congestion
  - Operational inefficiencies
  - Non standard trucks
  - Under utilization of infrastructure available.
  - Supply demand mismatch

- **Institutional Issues**
  - Highly Fragmented industry
  - Manual, non-uniform or discrete processes across the industry
  - Non-availability of Quality manpower

- **Technological Issues**
  - Old technology
  - Adoption of new technologies is expensive
  - No clear Return on Investments for New Technologies
  - Manual processes leading to operational inefficiencies
Solutions and Strategies (Largely Capital intensive)

- Vehicle Size and Delivery Time Regulations
- Load Consolidation and Load Factor Efficiency (Load consolidation, or co-loading)
- Urban Distribution Centers
- Freight Villages - Different from urban distribution centers, but similar in concept. Freight villages are planned unit developments specifically designed for multi-modal freight transfer within a secured perimeter.
- Delivery Tunnels - In Helsinki, freight tunnels for underground trucking are planned
- Dedicated freight corridors – are they really helping urban areas?
Inefficiencies in the current process

- Pickup driver has to visit the terminal to collect the list of pickups
- Planning for linehaul, cross-docking, resource requirements, delivery plans etc are not possible till the goods reaches to the terminal
- There is no update on the status of delivery till the driver reports back to the terminal.
- This process is time consuming and lead to inefficiencies such as
  - missed pickups and missed appointments,
  - excessive waiting times during pickups and deliveries resulting in additional driver hours and under utilization of trucks
  - postponing pickups
  - additional kilometers operated by drivers thus additional fuel consumption and choking of traffic
  - no clue on the traffic situation on the network – no route guidance
Solution Components

- Vehicle Tracking System - Telematics
- Pickup and Delivery Management System – to plan the pickups and deliveries
- Handheld Mobile devices – Scanner, data logger etc
- Route Planner to generate optimal routes
- Central Server and communication systems
- Transportation Management System
- Platform based solution

Benefits

From Trucking companies Perspective
- Trucking company can register with minimum fee
- Trucking companies can pay as per use
- Opex and No capital investments – Transaction based
- Can withdraw when not required
- No technology skills required
- Improved visibility of shipments, high asset utilisation, less fuel costs and customer satisfaction

From Service Provider perspective
- Multiple trucking companies can be hosted on single software platform.
- Other services such as reports, performance indicators can be sold as value added services

From City/Governance perspective
- Less Pollution and congestion
- Real time and accurate data for traffic alerts
- Trustworthy and huge volume of data for / Freight Modelling/ infrastructure planning and real time decisions
Overview – An example for Auto Route Generation
Features considered

- Routes are planned for a region.
- A truck will be assigned/reserved for route
- Static route is generated by the route planner
- Dispatcher assigns new stops to the route manually as and when new orders are to be handled

Parameters for comparison

- 4 Trucks Deployed
- Total Truck KM 126

As-Is Routes
Features considered

- No region based routes
- Routes will be developed as per the order/stop locations
- Algorithm based route generation
- Optimises the number of trucks required rather than the truck-km

Parameters for comparison

| 3 Trucks Deployed | Total Truck KM 135 |
Available Data for Analysis

- Driver Data
- Equipment Data
- Order Data
- Trip Data
- Stop Data (including Stop to Stop Distance Data)

Output Expected

- Optimized Route with route parameters
Business Benefits

- Reduced P&D Costs (They represent around 30% of total cost in the case of road based movement)
- Improved Route Planning
- Effective Equipment utilization
- Effective Utilization of Drivers
Thank You
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