Automatic Guided Vehicle-Decision Support Tool

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AGV-DST: Objectives

- Developed an Automatic Guided Vehicle Decision Support Tool
  - Assist users in rough-cut calculation of minimum and expected number of vehicles.
  - Spreads awareness about AGV's by providing a user friendly tool for the teaching community.

Models for Vehicle Requirement Analysis

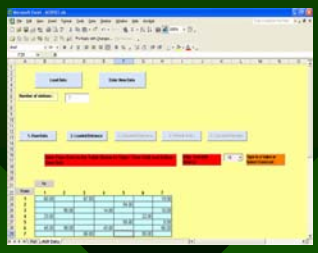
- Maxwell – Muckstadt Model:
  - Net Flow Concept
  - Solve Transportation Model
  - Minimum Number of Vehicles
- Egbelu Model:
  - A Group of models: Model 4 is of interest
  - The number of unloaded trips from one station to another based on FCFS dispatching
  - Expected Number of Vehicles

AGV-DST: Introduction to the Tool

- Uses Maxwell-Muckstadt and Egbelu Models
  - to find the minimum and expected number of vehicles.
- Provides quick and easy rough-cut analysis for number of vehicles.
- Excel-based interface for user-friendliness.
- Extensively tested at both Virginia Tech and Texas A & M University.

AGV-DST: Inputs

- Inputs:
  - Inter-station flow data
  - Shift Length



AGV-DST: Inputs

- Inputs:
  - Inter-station distance data (Loaded travel)
  - Inter-station distance data (Unloaded travel)

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AGV-DST: Inputs

- Inputs:
  - Pickup / Deposit time, Minutes available / hour
  - Vehicle Speed, Desired Vehicle Utilization
  - Congestion delay factor, loaded travel delay factor (optional)

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AGV-DST: Outputs

- Outputs
- Summary Results:
  - Expected number of vehicles (Egbelu Model)
  - Minimum number of vehicles (Maxwell-Muckstadt model)

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AGV-DST: Outputs

- Detailed Results:
  - Travel Times
  - Efficiency
  - Sensitivity to Travel Factors
- Save Results

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AGV-DST: Prerequisites and Initial Setup (see Training Manual)

- Excel 95 or higher.
- Macros should be enabled in Excel.
- Solver Add-in should be installed.
- Add-ins and Templates should have 'trusted' access.
- Sometimes, when running for the first time, rechecking of Solver Add-in in Add-ins Menu is necessary.

Go to AGV-DST

Feedback

Feedback can be sent via email: agv@vt.edu.