

# Logistics of Constructing a Washington D.C.-Baltimore Rapid Transit Line

Washington Metropolitan Area Transit Authority  
Maryland Transit Administration

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# Sponsors

Washington Metropolitan Area Transit Authority (WMATA):

- ① transportation agency created by the Library of Congress
- ② operates in the District of Columbia, Maryland, and the Commonwealth of Virginia
- ③ rapid transit service (Metrorail)
- ④ bus services (Metrobus)
- ⑤ paratransit (MetroAccess)
- ⑥ currently constructing new lines in Virginia (Silver Line) and in Maryland suburbs of D.C. (Purple Line)

## Sponsors (cont.)

### Maryland Transit System (MTA Maryland):

- ① transportation agency operated by the state of Maryland
- ② operates in the Baltimore-Washington Metropolitan area
- ③ numerous bus lines
- ④ Light Rail
- ⑤ Metro Subway
- ⑥ MARC train

# Relevance

Problem area:

- D.C. and Baltimore have similar worker populations

**Table:** Workers Who Use Public Transportation

City	# of workers	# of cars, trucks, or vans
Washington, D.C.	293,532	127,494
Baltimore	269,917	186,961

- 43% of D.C. workers commute in cars, trucks, or vans
- 69% of Baltimore workers commute in cars, trucks, or vans
- it is apparent that large populations of workers of both cities rely heavily on vehicles to commute
- a subway line between the two cities would greatly reduce traffic volume, jams, and accidents
- sponsors would find this model relevant

# Problem Statement

- WMATA has no plans to expand the Metrorail system to the city and suburbs surrounding Baltimore
- MTA Maryland's Metro Subway system only operates within city limits
- residents of Greater Washington-Baltimore Metropolitan area have limited access to public transportation to travel between the two cities
- current public transportation methods:
  - AMTRAK fares too expensive for daily commute
  - MARC operates rush hours on weekdays
- both sponsors operate under two separate government agencies
- our task is to provide a model that can predict the operating capacity for a such a line based on published transportation statistics

# Deliverables: From Sponsor to Team

- ① most recent data and statistics from Maryland Department of Transportation by Oct 19, 2012
  - contingency plan: if data not received by the assigned time, we will obtain data published on the Department of Transportation website
- ② computing resources
- ③ timely responses to inquiries
- ④ small expenses relevant to work

# Deliverables: From Team to Sponsor

- ① mathematical model of traffic flow at various hours of the day (morning, noon, evening)
- ② traffic flow will model highways I-495 and I-95
- ③ analytical report on the results of traffic flow model to determine if a subway line is viable
- ④ time permitting, design of the subway line
- ⑤ R package with documentations and codes to reproduce test results
- ⑥ technical report and presentation summarizing the work done



# Gathering the Data

1

# Creating Effective Tables

# Example: Cost of Packaging

# Example: The Nuclear Mission Arms Race

# Example: Maintaining Inventory

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