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 contructing new lines in Virginia (Silver Line) and in Maryland surburbs 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 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

Seven Basic Principles

1. Set the context
2. Choose effective examples and analogies
3. Choose vocabulary to suit your readers
4. Decide whether to present #s in text, tables, or figures
5. Report and interpret #s in the text
6. Specify the direction *and* size of an association between variables
7. For many #s, summarize overall pattern

Creating Effective Tables

Example: Cost of Packaging

Example: The Nuclear Mission Arms Race

Example: Maintaining Inventory