The Greenness of a Path in Traffic

Daniel Brown, Rutgers U
Alexius Otto, CUNY Baruch
Introduction

• Vehicular pollution adversely affects public health (Annual Energy Review 2009).

• How can you travel the least polluting path when driving from a starting point to ending point in traffic?
Project Summary

- Use graph theory to identify the most green route in a path.
- Develop algorithm to measure the greenness of a path.
Greenness and Pollution

• How do we define greenness?

• Consider Greenness as minimization of the parameters that affect pollution \( P(x_n) \).

• Parameters include: travel time, lane capacity, traffic regulations, weather conditions, GPS system function.
Measuring Greenness

• $G \sqsubseteq \min P(x_n)$

• $G = k \min P(x_n)$
New Technologies

- GPS
- Communication
- Flow
Graph Theory

• Flow
• Algorithms

<table>
<thead>
<tr>
<th>Path</th>
<th>Cost (Gas)</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Green</td>
<td>$0.14</td>
<td>15 mins</td>
</tr>
<tr>
<td>2) Purple</td>
<td>$0.14</td>
<td>7 mins</td>
</tr>
<tr>
<td>3) Blue</td>
<td>$0.10</td>
<td>9 mins</td>
</tr>
</tbody>
</table>
Application

• Communication
• Independent vs. Dependent System
• Single unit vs. multiple units