The Executive Network of Seattle

Highways and Transportation
Separating Myth from Reality

by

Jim Hom
Chairman, Eastside Transportation Association

February 20, 2006
Basics

Highways of Statewide Significance (HSS) are the backbone of our transportation system.

WSDOT owns, designs, builds, operates & maintains our HSS.

Highways are corridors, transit is a mode of travel – they are not in conflict.
The Questions

Why do Americans travel?
How do Americans travel?
How does density affect travel?
How is transit performing?
Will our regional plan reduce congestion?
What’s happening to air quality?
Why is there a focus on the work trip?
How important is working at home?

In other words, know your customer
Data Sources

USDOT, National Household Travel Survey, 2001 (a 22,000 household sample)
Census Bureau, 2000 Census
FHWA, Highway Statistics
PSRC, Destination 2030 (adopted Metropolitan Transportation Plan), 2004 Review
National Transit Database
EPA
APTA (American Public Transit Association)
U.S. AVERAGE MODE OF TRAVEL

- Cars, Trucks, Vans: 86%
- Walk: 9%
- Transit: 1%
- School Bus: 2%
- Other: 2%

Source: NHTS 2001
Trend of Commute Mode

<table>
<thead>
<tr>
<th>Year</th>
<th>Work at Home</th>
<th>Other Means</th>
<th>Walked</th>
<th>Public Transit</th>
<th>Carpoiled</th>
<th>Drive Alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>2.3%</td>
<td>1.6%</td>
<td>5.6%</td>
<td>6.4%</td>
<td>19.7%</td>
<td>64.4%</td>
</tr>
<tr>
<td>1990</td>
<td>3.0%</td>
<td>1.3%</td>
<td>3.9%</td>
<td>5.3%</td>
<td>13.4%</td>
<td>73.2%</td>
</tr>
<tr>
<td>2000</td>
<td>3.3%</td>
<td>1.2%</td>
<td>2.9%</td>
<td>4.7%</td>
<td>12.2%</td>
<td>75.7%</td>
</tr>
</tbody>
</table>

SOURCE: Census/FHWA. 2103/DATA/CENSUS/COMMUTE MODE 80 TO 2000
U.S. AVERAGE TRIP PURPOSE

Source: NHTS 2001

- Family/Personal: 44% (Includes Shopping)
- Work: 15%
- Social/Recreational: 27%
- Work Related: 3%
- School/Church: 10%
- Other: 1%
Mode Share vs. Density
(National, Urban, without New York area)

#2103 05 Aug 04 H://2103/Data/National/Mode Share by Density.xls - National Urban w/o NY
U.S. Transit Ridership Compared to Urban Population

Source: APTA, Census Bureau, and TDA
GROWTH COMPARISON: Vehicle-Miles Traveled (VMT) & Emissions (U.S.)

Data Sources: EPA "Trends", FHWA
Percent Working at Home (West Coast)

Density, persons per square mile

- Almost Daily
- Never
- Sometimes

20-Feb-2006
REGIONAL
Transit’s Successes

Elderly and Handicapped
Downtown Seattle
University District
Downtown Bellevue
City of Seattle Dominates Transit Trips

2020 Transit Trips

- Seattle-Seattle: 67%
- Suburb-Suburb: 14%
- Seattle-Suburbs: 19%

2020 All Person-Trips

- Suburb-Suburb: 76%
- Seattle-Seattle: 15%
- Seattle-Suburbs: 9%
Another Success: Vanpools
Percent of Daily Person-Trips by Transit
(Central Puget Sound)

(Source: PSRC)
Seattle Urbanized Area Growth, 1982-2002

- Pop'n: 45%
- Land Area: 38%
- VMT: 82%
- Lane Miles: 28%
Seattle Urbanized Area Growth Per Square Mile, 1982-2002

- Pop'n: 5%
- VMT: 32%
- Lane Miles: -7%
DAILY HOURS OF DELAY
(PSRC Metropolitan Transportation Plan)

Daily Hours

- 50,000
- 100,000
- 150,000
- 200,000
- 250,000
- 300,000

2000: 130,176
2030 Adopted Plan: 274,404

+111%

Source, PSRC, Destination 2030 (2004 Review)
PUGET SOUND PUBLIC INVESTMENT
SHARE THROUGH 2030 (Capital + O&M)

Source: PSRC, 2004 Review
PUGET SOUND PUBLIC INVESTMENT THROUGH 2030 (COMPAARED TO MARKET SHARE)

% OF DAILY TRIPS, 95.4%
% OF INVESTMENT, 51%

% OF DAILY TRIPS, 4.6%
% OF INVESTMENT, 49%

Source: PSRC, 2004 Review
PUBLIC INVESTMENT PER ADDED PERSON-TRIP, 2000 to 2030
(Puget Sound)

Source: PSRC, 2004 Review and TD
Travel Time Index, 20 Highest-Delay Urbanized Areas, 2002

<table>
<thead>
<tr>
<th>City</th>
<th>Index with Rail</th>
<th>Index without Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA/LB</td>
<td>1.77</td>
<td>1.77</td>
</tr>
<tr>
<td>San Francisco</td>
<td>1.55</td>
<td>1.55</td>
</tr>
<tr>
<td>Chicago</td>
<td>1.54</td>
<td>1.54</td>
</tr>
<tr>
<td>Washington DC</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Boston</td>
<td>1.45</td>
<td>1.45</td>
</tr>
<tr>
<td>Atlanta</td>
<td>1.42</td>
<td>1.42</td>
</tr>
<tr>
<td>New York</td>
<td>1.40</td>
<td>1.40</td>
</tr>
<tr>
<td>Miami</td>
<td>1.40</td>
<td>1.40</td>
</tr>
<tr>
<td>Denver</td>
<td>1.40</td>
<td>1.40</td>
</tr>
<tr>
<td>Houston</td>
<td>1.39</td>
<td>1.39</td>
</tr>
<tr>
<td>San Diego</td>
<td>1.39</td>
<td>1.39</td>
</tr>
<tr>
<td>San Jose</td>
<td>1.39</td>
<td>1.39</td>
</tr>
<tr>
<td>Riverside</td>
<td>1.39</td>
<td>1.39</td>
</tr>
<tr>
<td>Portland</td>
<td>1.38</td>
<td>1.38</td>
</tr>
<tr>
<td>Detroit</td>
<td>1.36</td>
<td>1.36</td>
</tr>
<tr>
<td>Baltimore</td>
<td>1.36</td>
<td>1.36</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>1.35</td>
<td>1.35</td>
</tr>
<tr>
<td>Phoenix</td>
<td>1.35</td>
<td>1.35</td>
</tr>
<tr>
<td>Seattle</td>
<td>1.35</td>
<td>1.35</td>
</tr>
<tr>
<td>Dallas-Ft. Worth</td>
<td>1.34</td>
<td>1.34</td>
</tr>
</tbody>
</table>

With Rail          | Without Rail in Index
I-5 is Broken and Gets Worse

(Weekday Volumes North of Jackson)

Vehicles, 2-way

2003 Actual: 165,000
MTP 2020: 257,000
True Demand 2020: 412,000
I-405 Corridor Program

THERE ARE TWO BASELINE CASES FOR COMPARISON:

2020 True Demand: this shows where travelers would be if they were not constrained by the artificial limits of roadway capacity.

2020 No Action: this assumes only continuation of existing programs and completion of those already funded (VERIFY!!)

THE SEVEN THEMES:

Theme 1 - Transportation Demand Management (TDM): reduced transit fares, parking pricing, ridesharing agreements.

Theme 2 - Transit/HOV: add 1 HOV lane in each direction on I-405, direct access ramps, arterial HOV lanes, increase transit service, moderate TDM

Theme 3 - High Capacity Transit: grade separated HCT with feeder buses, arterial HOV/ transit priority, moderate TDM

Theme 4 - Arterial Capacity: basic I-405 improvements, expand arterials (including East King County), moderate TDM

Theme 5 - General Purpose Capacity: add 2 general purpose lanes each direction on I-405, widen connecting arterials, other roadway improvements, moderate TDM

Theme 6 - Express Lanes: add 2 express lanes each direction, grade separated, widen SR 167 by 1 lane each direction, other road improvements, moderate TDM

Theme 7A - Roadway Capacity: add 2 general purpose lanes each direction on I-405, expand arterials (more than twice as much as in Theme 5), construct East King County Freeway, other roadway improvements, moderate TDM

Theme 7B - Roadway Capacity: same as Theme 7A, but omits East King County Freeway.
PERCENT OF UNMET TRUE DEMAND SERVED BY EACH THEME

(Average of Three Screenlines -- 2020, CAPACITY ADJUSTED)

Source: Derived from I-405 Corridor Program Data

20-Feb-2006
Daily Cost per Added Person Served
Average of 3 Screenlines, Capacity Adjusted Figures, 2020

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1: TDM</td>
<td>$4.55</td>
</tr>
<tr>
<td>T-2: HOV/Transit</td>
<td>$80.73</td>
</tr>
<tr>
<td>T-3: HCT</td>
<td>$51.43</td>
</tr>
<tr>
<td>T-4: Art'I Capacity</td>
<td>$22.61</td>
</tr>
<tr>
<td>T-5: I-405 Capacity</td>
<td>$5.54</td>
</tr>
<tr>
<td>T-6: I-405 Express</td>
<td>$10.98</td>
</tr>
<tr>
<td>T-7: Rdwy. Capy</td>
<td>$9.00</td>
</tr>
</tbody>
</table>
more on DENSITY
Density of Selected Urbanized Areas (2000)

- Los Angeles: 5,600 persons/sq. mile
- New York: 4,205 persons/sq. mile
- San Diego: 3,590 persons/sq. mile
- San Francisco: 3,210 persons/sq. mile
- Portland: 3,030 persons/sq. mile
- Seattle: 2,285 persons/sq. mile
- Denver: 2,275 persons/sq. mile
VEHICLE-MILES TRAVELED vs. DENSITY
(2001 NHTS)

\[ y = -0.2093x^2 + 15.963x + 9.2836 \]

\[ R^2 = 0.9924 \]
Daily Transit Trips per Sq. Mile vs. Density
(U.S. w/o NYC)

Source: NHTS 2001, and TDA Inc.
Daily Transit & Auto Trips per Sq. Mile
vs. Density
(U.S. w/o NYC)

[Bar chart showing the relationship between daily transit and auto trips per square mile and population density.]

- **Daily Person-Trips (1000's)**
  - auto
  - transit

- **Persons per sq. mile**
  - 0-100
  - 100-500
  - 500-1000
  - 1000-2000
  - 2000-4000
  - 4000-10000
  - 10000-25000
  - >25,000

- **Daily Transit Trips**
  - 0.2
  - 1.1
  - 3.2
  - 6.3
  - 12.5
  - 24.6
  - 49.2
  - 122.3

- **Auto Trips**
  - 0.00
  - 1.1
  - 3.2
  - 6.3
  - 12.5
  - 24.6
  - 49.2
  - 122.3

- **Note:** The chart includes data for U.S. without NYC.
### Density of Eastside Cities (2000)

<table>
<thead>
<tr>
<th>City</th>
<th>Density (Persons/sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirkland</td>
<td>4,220</td>
</tr>
<tr>
<td>Bellevue</td>
<td>3,564</td>
</tr>
<tr>
<td>Mercer Island</td>
<td>3,452</td>
</tr>
<tr>
<td>Renton</td>
<td>2,940</td>
</tr>
<tr>
<td>Redmond</td>
<td>2,849</td>
</tr>
<tr>
<td>Bothell</td>
<td>2,845</td>
</tr>
<tr>
<td>Sammamish</td>
<td>1,889</td>
</tr>
<tr>
<td>Newcastle</td>
<td>1,732</td>
</tr>
<tr>
<td>Woodinville</td>
<td>1,630</td>
</tr>
<tr>
<td>North Bend</td>
<td>1,612</td>
</tr>
<tr>
<td>Issaquah</td>
<td>1,331</td>
</tr>
<tr>
<td>Snoqualmie</td>
<td>317</td>
</tr>
</tbody>
</table>

**Seattle Urbanized Area Average (2,285)**

**CITY OF SEATTLE (6,700)**
Trend of Density, City of Seattle

Density of the City of Seattle has barely changed in 40 years.
GET THE PICTURE?

One success: highway air emissions
Travel behavior is hard to change
Highways largely ignored for 3 decades
Transit’s market-share in decline
By Adopted Plan:
  delay worsens
  small mode shifts
  cars, trucks and vans continue to dominate
Work trip is small part of problem
Major Projects

I-405 - 3 major projects underway

520 - 4 vs 6 vs 8 lanes still being decided
   Diverted traffic impacts I-90, I-5, I-405 & MI

Alaska Way Viaduct
   Seattle Sea Wall adds complications
   Refurb or bury?
   Why not I-5 expanded?
Changes to I-90

Sound Transit - control of center lanes
LR vs BRT (dedicated vs multiuse)
R-8a Status
MI Park & Ride expansion
Transportation Funding

Nickel Fund passed 2003

- 122 projects with schedules
- 10 year program - $4B

9.5¢ Gas Tax Increase passed 2005

- 16 year program - $8B
- More flexibility for DOT
- Gas tax initiative to repeal - 400K signatures
RTID
(Regional Transportation Investment District)

Legislation passed in 2002
3 Counties - King, Pierce, Snohomish
25 County Council Members
  1 man - 1 vote representation
7 member Executive Committee
Select the projects - Select from 7 taxes
Vote of the people
...the end