Pacific Electric Red Car on Echo Park Avenue in 1940. Pacific Electric lines ran throughout LA up through 1950s. Owner was Henry Hunington, son of Colis Huntington who was one of Big Four who brought Southern Pacific
Pacific Electric Red Car Hollywood Bowl 1942
Preview

- Tables in your paper
- Mass Transit as alternative to auto
- California’s problems in urban transportation
Integrating tables in your writing
Commuting in Urban Areas

- Last time – auto and congestion
- This time – mass transit
Alternatives to the Automobile

☐ Bus system
  ■ Cheap--uses same roadway as car
  ■ Flexible route structure
  ■ Subject to congestion, too

☐ Rail system
  ■ Separate roadway—not subject to congestion
  ■ Expensive to build (cheap to operate)
  ■ Inflexible route structure
Bay Area Rapid Transit (BART)

Walnut Creek to Embarcadero: 34 min, $4.25
San Francisco Municipal Railway (Muni)
Long Beach to LA:  55 minutes, $1.25
Southern Half of NY subway: $2.00
Washington Metro

Rockville to Metro Center: 30 min, $3.75
The Issue with Rail Transit

- Large capacity
- Rapid
- Expensive
  - High fixed cost
  - Relatively low operating cost
The Economics of Mass Transit

- High fixed cost
  - cost of construction
  - annualized

- Relatively low variable cost
  - cost per ride
  - assume constant variable cost
  - equal to marginal cost
$/year vs. riders/year

- Average total cost decreases as riders/year increase.
- Marginal cost remains constant and is lower than the average total cost.

This graph illustrates the cost behavior for different levels of ridership, showing how the average total cost decreases significantly with increased ridership, while the marginal cost remains relatively constant.
Ask students, if we build, what fare should we charge?

Should we build? Doesn’t cover costs. But what about surplus?
Ask students, if we build, what fare should we charge?
Now note that with higher demand, benefit higher than cost. But, fares won’t cover total cost.
And note that there is no fare we can charge that will cover total cost.
With even higher demand, we could charge a fare to cover average cost.

But should we? We’d be pricing off riders for whom value greater than marginal cost.
What to do?

- Charge fare equal to marginal cost and subsidize

Tough politically, because once we start subsidizing, loss incentive
Urban Transit Policy

- Cars versus mass transit
- Rail transit most likely to get people out of their cars
- How has this played out in California?
California is spending on mass transit

Table 8.3  
Net Expenditures on Mass Transit per Capita, 2002 (dollars)

<table>
<thead>
<tr>
<th></th>
<th>Total Net Expenditures</th>
<th>Fare Revenue from Public Transit</th>
<th>Subsidies to Private Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>151</td>
<td>181</td>
<td>36</td>
</tr>
<tr>
<td>US-California</td>
<td>88</td>
<td>117</td>
<td>30</td>
</tr>
<tr>
<td>Florida</td>
<td>51</td>
<td>62</td>
<td>10</td>
</tr>
<tr>
<td>Illinois</td>
<td>146</td>
<td>198</td>
<td>56</td>
</tr>
<tr>
<td>New York</td>
<td>350</td>
<td>514</td>
<td>175</td>
</tr>
<tr>
<td>Texas</td>
<td>54</td>
<td>60</td>
<td>7</td>
</tr>
</tbody>
</table>

*rounded to zero
Figure 8.2
Capital Expenditures on Mass Transit per Capita, 1977-2002

Expenditures per Capita (2002 $)

California
US-California
Figure 8.3
Current Expenditures on Mass Transit per Capita, 1977-2002

Expenditures per Capita (2002 $)

- California
- US-California

Years: 1977 to 2002
California is not spending much on highways

Table 8.12
Current and Capital Expenditures on Highways per Capita, 2002 (dollars)

<table>
<thead>
<tr>
<th>State</th>
<th>Total Expenditures</th>
<th>Current Expenditures</th>
<th>Capital Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>328</td>
<td>174</td>
<td>154</td>
</tr>
<tr>
<td>US-California</td>
<td>411</td>
<td>171</td>
<td>240</td>
</tr>
<tr>
<td>Florida</td>
<td>403</td>
<td>129</td>
<td>273</td>
</tr>
<tr>
<td>Illinois</td>
<td>451</td>
<td>180</td>
<td>271</td>
</tr>
<tr>
<td>New York</td>
<td>370</td>
<td>154</td>
<td>215</td>
</tr>
<tr>
<td>Texas</td>
<td>347</td>
<td>128</td>
<td>218</td>
</tr>
</tbody>
</table>
Figure 8.4
Capital Expenditures on Highways per Capita, 1977-2002

Expenditures per Capita (2002 $)

- California
- US-California

Capital spending low for many years
Change happened in 1970s

Table 8.13
Highway Capital Expenditures per Capita (2002 dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>221</td>
<td>248</td>
<td>275</td>
<td>224</td>
<td>89</td>
</tr>
<tr>
<td>US-California</td>
<td>192</td>
<td>221</td>
<td>256</td>
<td>257</td>
<td>179</td>
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<tr>
<td>Florida</td>
<td>220</td>
<td>184</td>
<td>229</td>
<td>249</td>
<td>153</td>
</tr>
<tr>
<td>Illinois</td>
<td>205</td>
<td>210</td>
<td>187</td>
<td>279</td>
<td>229</td>
</tr>
<tr>
<td>New York</td>
<td>149</td>
<td>206</td>
<td>203</td>
<td>203</td>
<td>94</td>
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<tr>
<td>Texas</td>
<td>196</td>
<td>242</td>
<td>305</td>
<td>286</td>
<td>151</td>
</tr>
</tbody>
</table>
Since 1980, highway capacity hasn’t kept up with population

<table>
<thead>
<tr>
<th></th>
<th>Lane Miles per Million People</th>
<th>Percentage Increase, 1980 to 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1980</td>
<td>2002</td>
</tr>
<tr>
<td>California</td>
<td>2,038</td>
<td>1,639</td>
</tr>
<tr>
<td>US-California</td>
<td>2,484</td>
<td>2,528</td>
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<tr>
<td>Florida</td>
<td>2,151</td>
<td>1,859</td>
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<tr>
<td>Illinois</td>
<td>1,287</td>
<td>1,955</td>
</tr>
<tr>
<td>New York</td>
<td>1,260</td>
<td>1,236</td>
</tr>
<tr>
<td>Texas</td>
<td>3,496</td>
<td>2,759</td>
</tr>
</tbody>
</table>
Highway capacity hasn’t keep up with population

Figure 8.5
Lane Miles per Capita, 1980-2002
Freeways and Other Principal Arterials

Lane Miles per Million People

- California
- US-California
Despite Mass Transit, Road Use High in California

Table 8.22
Road Congestion and Delay, 85 Urban Areas, 2002

<table>
<thead>
<tr>
<th></th>
<th>Annual Mass Transit Trips per Capita</th>
<th>Daily Vehicle Miles Traveled Per Capita</th>
<th>Lane Miles of Freeways and Arterials per Million Residents</th>
<th>Daily Vehicle Miles per Lane Mile</th>
<th>Annual Hours of Delay per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>51</td>
<td>16</td>
<td>1,388</td>
<td>11,803</td>
<td>39</td>
</tr>
<tr>
<td>US-California</td>
<td>59</td>
<td>14</td>
<td>1,327</td>
<td>10,293</td>
<td>22</td>
</tr>
<tr>
<td>Florida</td>
<td>18</td>
<td>15</td>
<td>1,584</td>
<td>9,355</td>
<td>25</td>
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<tr>
<td>Illinois</td>
<td>73</td>
<td>12</td>
<td>1,033</td>
<td>11,362</td>
<td>29</td>
</tr>
<tr>
<td>New York</td>
<td>169</td>
<td>10</td>
<td>923</td>
<td>10,544</td>
<td>27</td>
</tr>
<tr>
<td>Texas</td>
<td>24</td>
<td>17</td>
<td>1,576</td>
<td>10,582</td>
<td>30</td>
</tr>
</tbody>
</table>
Figure 8.6
Annual Hours of Delay in Largest Urban Areas, 2002

Daily Vehicle Miles Traveled per Lane Mile

Annual Hours of Delay per Capita
A Summary

- CA emphasized mass transit over highways
- Lane miles per capita fell as state grew
- Mass transit use is relatively high
- But highway use is also high
- Capacity less, but use is not
- Congested freeways
Interpretations

- Failed policy
- or, haven’t tried hard enough
Where now

- Massive infrastructure investment
  - Highways, mass transit, or both
- Or, demand management
  - Highway tolls
  - Anti-sprawl policies
- Planning better in new areas
  - Central Valley
  - Inland Empire
Next Time

☐ Racial segregation in housing
☐ Two readings from LA Times
  ■ “Family Stood Up to Restrictive Covenants”
  ■ “What It Is. (And What It Was).”

First is a story about a black family who overturned racial covenants in housing in Watts in the 1950s

Second is a story by a writer for the LA Times about growing up in South Central Los Angeles and how the area has changed.