Parting Thoughts

Urban Transportation Planning
MIT Course 1.252j/11.540j
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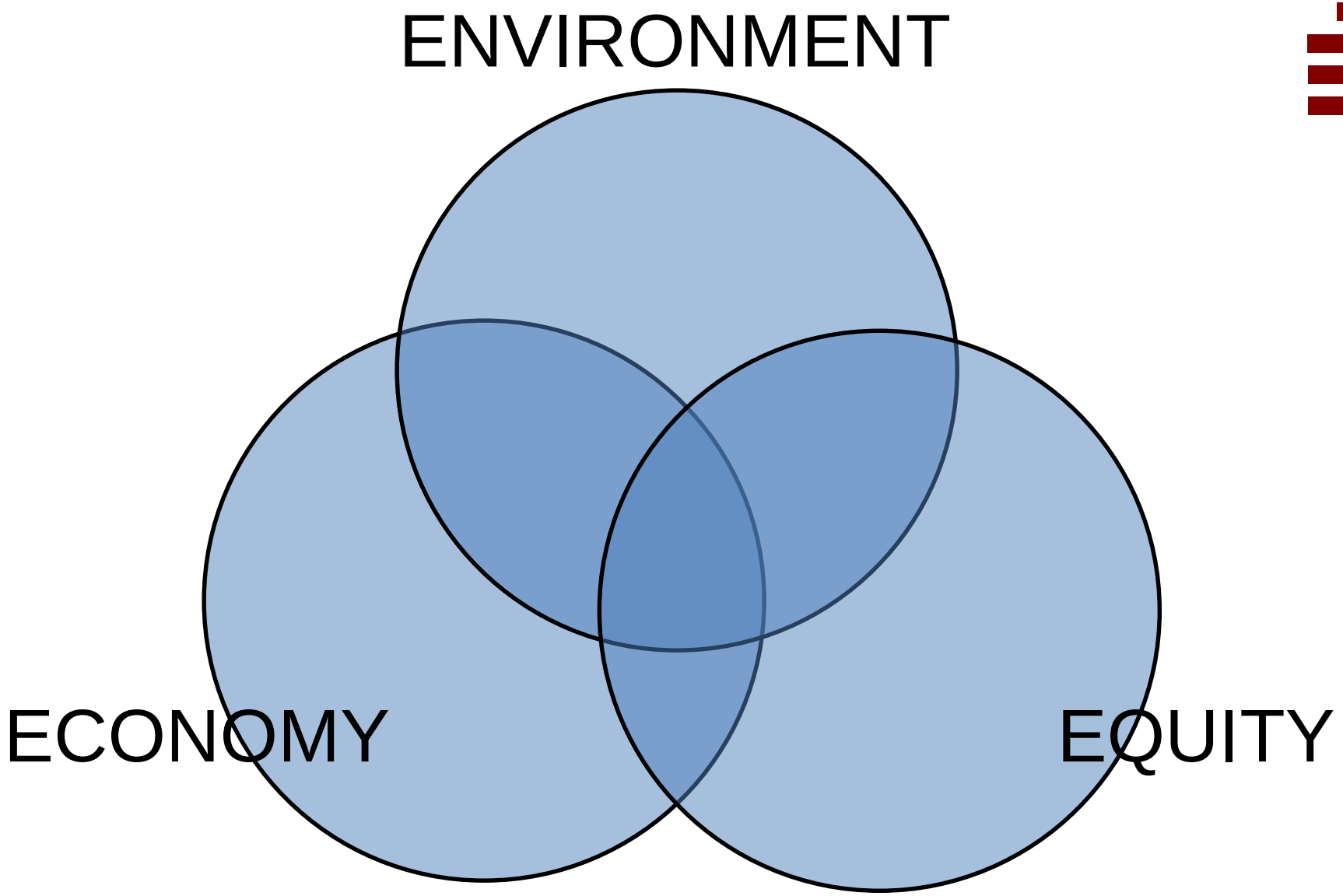
ENVIRONMENT
ECONOMY
EQUITY

Eye Of The Storm

INFRASTRUCTURE **LAND USE** **VEHICLES** **ENERGY**

1. Institutional structure
2. Lack of over-arching integration
3. Differential speed of public and private decisions
4. Ambiguity of transit, parking
5. Pattern breaks, niche markets, metamorphoses

BREAD CHEESE WINE

1. Gateway Assignment

A. Numbers matter, at least they should:

- Massachusetts Avenue carries as many people in peak buses as in autos
- Speed is important for longer trips, but 20 mph isn't so different than 50 mph as a top speed; when you look at travel time, avoiding 5 mph is the big issue.
- Pedestrians are often very important, but ignored.
- Bicycles are tiny, get a lot of attention, and complicate traffic a lot, but need safer conditions

1. Gateway Assignment (cont.)

B. Actors matter: Problems are in the eye of the beholder

- Producers and Managers of Transportation -- surrogate customers
- "users" (customers): passengers, shippers
- Abutters affected by positive and negative externalities of transportation
- Government agencies and institutions whose missions may include protecting the interests of all of the above
- Information technology might increase the effective power of bus riders
- Who you are working for matters

2. Millennium Database

A. What are the characteristics that matter in metropolitan areas, and how might they be changed over time?

3. Urban Design, Physical Characteristics Matter

A. Sullivan Square

B. Sullivan Station

C. Rutherford Avenue

D. City Square

Current National (and International) Context and Problems

1. Focus on debt and government deficit
2. Unemployment and stagnant economic growth
3. Markedly worse income distribution
4. Worsening climate change and other environmental threats

Current National (and International) Context and Problems (cont.)

5. Infrastructure maintenance, reconstruction and operations create substantial new financial needs

   - interstate facilities over 50 years old
   - growing congestion in most metro areas, simultaneously constraining goods movement
   - aging population pose ‘new’ mobility challenge
   - no culture of operation and maintenance in most public work agencies
   - Stagnant federal funding means costs are pushed “down” to states and local government

Boston is Manhattan surrounded by Phoenix

Boston is blue, with rust belt surrounding – and marbled in

Government vs, Private

GOVERNMENT / PRIVATE	Honest & competent	Honest & incompetent	Dishonest
Honest & competent			
Honest & incompetent			
Dishonest			

4. Pattern Breaks

A. The future is not always a projection of the past

B. Kierkegaard: History can only be understood looking backward, but it must be lived going forward

C. What does President-elect Trump mean for the future?

Can We Be Realistic AND Positive?

- Currently 750 million vehicles in world. By 2050, number is projected to be 2 billion. [Factor of 3]
- Is it feasible to reduce petroleum consumption per vehicle by a factor of 4? Could we really change?
- Maybe. If we can implement a 20% fuel consumption reduction in each of 6 different areas:
  - $0.86 = 0.26$
- Will require changes in technology, vehicles, system operation, and behavior. Technology is key, but not enough.

From Prof. J Heywood's address at MIT Energy Forum, May 2006

Getting to the Source of Pollution

Pollution = $\frac{pollution}{VMT} * \frac{VHT}{VMT}$

Pollution = $\frac{pollution}{VHT} * \frac{VHT}{VMT} * \frac{VMT}{vehicle} * \frac{vehicles}{population} * population$

$\frac{vehicles}{population} =$ *f*(land use, transit, income, auto industry, density, roads)

- *Externalities are external and*

- *"Culture eats policy for breakfast"*
- *Terry Stone*

Ways to Impact Energy Use: Behavior

1. Encourage less aggressive driver behavior
2. Increase vehicle occupancy on substantial fraction of trips
3. Reduce mileage driven per person per year
4. Substitute bio-mass fuels for petroleum fuels
5. Manage existing transportation system more effectively (ITS)
6. Increase public transit utilization

Adapted from Prof. J Heywood's address at MIT Energy Forum, May 2006

Ways to Impact Energy Use: Technology

1. Shift the vehicle performance/fuel economy tradeoff towards lower fuel consumption
2. Improve vehicle maintenance, lubricants, tire pressure, reduce parasitic loads
3. Lighter weight, “less big” vehicles
4. Implement more efficient engine, drivetrain, and vehicle technologies
5. Develop and implement use of hydrogen as an energy carrier with fuel cell powered vehicles
6. Use electricity with advanced battery technologies to shift part of transportation energy demand away from petroleum

Adapted from Prof. J Heywood’s address at MIT Energy Forum, May 2006

Way to impact energy use: Regional Connectivity

A. Locate jobs where there is good transit

B. Significantly increase good transit, and transit accessible locations

C. Encourage employees to use transit

D. Upgrade significantly the quality of urban spaces (people will eat more spinach if it tastes good)

From Prof. J Heywood's address at MIT Energy Forum, May 2006

“Objective” Reality

- Capital investment in the interstate has now been implemented
- Operation and maintenance is inadequate throughout the country
- Capital needs most significant in growing economies
- Time for a national pattern break?
- O&M, at 40 – 60 everywhere?
- Return to sender? Local and state flexibility?
- Metro areas more important than states – but states are written into the constitution

“Objective” Reality (cont.)

- Agency culture
- Public private partnership
- Capital investment by rational criteria
- Institutional reality
  - Construction industry
  - Vehicle procurement

“Charity Begins at Home”

1. California referenda
2. Massachusetts 1964 MBTA statue
3. London cross rail lesson
4. Toronto exercise in business
5. Political will

Conditionality

- Davis Bacon
- Environmental law
- Environmental justice
- Integrity; Trump legacy

- Boston is Manhattan surrounded by Phoenix
- Boston is blue state surrounded by rust belt
- Why should North Adams pay for Boston bus ride?

- Return to Sender, with transparent rules will build political wills, and distribute more money to rusty area
- Better for Boston than discretion and grants

And,

- More likely to be supported politically

Which should be the next priority?

1. Really complete the Green Line extension?
2. The Blue to Red connector?
3. The missing link of the Silver Line?
4. The Stuart Street subway
5. South Coast Rail
6. Grade separate Silver Line at “D” Street
7. The north to south rail track?

“Synecdoche”

“Waiting for lefty”

Self Reliance

- But national tax collection is most effective – so embrace return to sender
- Plus vehicle and signal manufacturing promotion at National level
- Large capacity increase (tunnels, subways) would benefit from national support
- Contracting out is fine with Davis Bacon

How to pay for this?

- Local and State
  - Gas tax
  - Carbon tax
  - Sales tax
  - Property tax
  - VMT tax
- Interstate Compact
  - Gasoline tax
  - Carbon tax
- National
  - Carbon tax
  - Petroleum company
  - Excise tax

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