

# Congestion and Its Discontents

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- Congestion reduction the central focus of transportation policy since World War II.
  - Epitomized in the philosophy of “predict and provide”
- Questions now arising about the suitability of congestion reduction as a policy objective.

# Outline

- Historical development of predict & provide philosophy
- Limitations of congestion reduction as an objective
- Alternative perspectives on congestion
  - Psychology
  - Smart growth (access vs. mobility)
  - Social capital
  - Transaction costs
  - Congestion as an institutional problem
- Conclusions

# Early U.S. History

- US rejected “internal improvements” program in early 19<sup>th</sup> C – National Road
- Rail system development
  - States played dominant role
  - Strong reliance on incentivizing the private sector
    - Land grants

# Federal Highway Policy

## 1<sup>st</sup> Generation

- U.S. Primary System  
1916 – Present
  - Focus: rural integration
  - Built out through late 1920s
  - Facilities owned by the states
  - Federal role – funding (50%); expertise
  - Not focused on congestion
- Key issues
  - Local v long distance
  - Impact of WWI
- Deficiencies (1930s)
  - Congestion in/around metro areas
    - Strip development / lack of access control
  - Unsafe geometry
    - Vertical / horizontal alignments insufficient for increasing vehicle speeds

# Interstate Planning (1930s)

- Urban / metro system vs. national
  - BPR [now FHWA] favored metropolitan system
    - Addressed congestion and land use
  - FDR / Congress favored national system
    - Fascination with German autobahns (primarily rural)
    - FDR – budget concerns
    - Congress – concern over expanding federal role, “regionalism”
- Result – “Interstate” system
  - Designed to serve long-distance traffic
  - Used mostly by local traffic

# 1956 – Interstate Highway System

- 40,000 mi when authorized in 1944
- 37,681 mi designated in 1947
  - 34,700 mi rural routes
  - 2882 mi urban extensions
  - 2317 mi for beltways
- All limited access divided alignment with high design speed
- 44,000 in 1956 act
  - Highway Trust Fund – 90% of “cost to complete”
- Planning philosophy – “predict & provide”
  - 20-year traffic forecast
  - Avoid “mistakes” of primary system
    - Pavement with service life but obsolete due to speed and volume increases

# 4-Step Planning Process

- [0] Predict land use 20 years into future
- 1. Predict trips generated by land use
- 2. Predict trip origins (“trip distribution”)
- 3. Predict split among modes (modal split)
- 4. Predict trip assignments to specific facilities (“traffic assignment”)
- [5] Provide facilities to meet predicted demand

# Design Philosophy

- High speed design (65 mph) in urban
  - Long acceleration/deceleration lanes
  - Interchange separations of 3-4 mi
- Valuable for long trips
- Less valuable for short trips...
  - ... most traffic in urban areas (90% +/-)
  - ... especially in congestion

# Result: Relief but also Substantial Congestion

- Traffic exceeded forecasts
- Response → provide more capacity
  - System length fixed in law – not # lanes
  - Federal share 90% interstate
  - 0% - 50% for non-interstate
- Impact – disproportionately in poor/minority communities
  - Removing “decadent” areas of high crime, vandalism, disease that contributed little to tax base
  - Save CBD shopping / office activity

# Freeway Revolt

- Landmark legislation
  - National Historic Preservation Act ('66)
  - National Environmental Policy Act ('70)
  - Clean Air Act Amendments of 1970
- Challenged Predict and Provide philosophy
- Required examination of all reasonable alternatives, including
  - Transportation Demand Management
  - Transportation operations (ITS)

# Limitations of Congestion Reduction as an Objective

- Congestion not entirely a bad thing
  - Chernobyl has no congestion
  - Congestion a sign of vitality
    - Wm Whyte's (*The Organization Man*) on pedestrian behavior
- People choose to live/work and experience congestion
  - So benefits must outweigh costs
- Engineering efficiency vs. individual choices
  - Purpose of travel
    - Travel as utilitarian – for access alone
    - Travel as instrumental – an end in itself
- People willing to pay to avoid congestion
  - E.g., HOT lanes

# Limitations of Congestion Reduction as an Objective (2)

- Congestion reduction as political gambit
  - Supports large projects, capital intensive projects that won't ultimately solve problems
  - “Public choice” view of political power as a means to accumulate advantage
    - Rent seeking, political patronage
- Works for the opposition, too
  - “Can't build our way out of congestion.”
  - Induced demand
  - Congestion as a lever to change travel behavior

# Alternative Perspective: Psychology/Psychiatry

- Freud's *Civilization and Its Discontents* (1930)
  - Social harmony is not an outgrowth of man's natural instincts.
  - Man motivated by powerful primal instincts (sexual)
  - Man's dissatisfaction, aggression, hostility and violence arise from conflict between basic instincts and social mores.
  - Road rage as a manifestation of these conflicts?
- Kohut's "psychology of the self" (1971)
  - Seeking shared experiences as a source of self-esteem
- Does congestion ...
  - Excite/exacerbate basic primal instincts?
  - Impede incipient desires for social harmony?

# Alternative Perspective: Access vs. Mobility (Smart Growth)

- Conventional view: public policy should support mobility (maybe mobility options)
  - Income elastic
- Accessibility view: public policy should support access
  - Mobility
  - But also community design pedestrian friendly, bike friendly, mixed use, neo-traditional, new urbanist ...
  - UK – Poor access → “social exclusion” → access benchmarks/standards

# Access vs. Mobility (2)

- So access is about more than mobility
- But mobility is about more than access
- Symbolic value of the auto long recognized
  - “Compensatory device” for ego enlargement. (Mumford 1963)
  - The auto in the 1920s had a “hedonistic appeal rooted in basic human drives” (Flink 1970)

# Alternative Perspectives on Congestion: Social Capital

- Types of capital
  - Physical – equipment, buildings, facilities that support social activity
  - Financial
  - Social – rules, habits, customs, norms that govern social behavior
- Culture of driving differs from place to place – a form of social capital

# Social Capital (2)

## Key Features

- Can be eroded or influenced by public policy
  - Traditional welfare's destructive influence on families
- Can be very difficult to regenerate
  - Removing perverse incentives may not be enough
  - May be necessary to positively regenerate healthy behaviors
  - Hard to do in the context of government bureaucrats, contractors and limited government.

[Ref: Fukuyama, *Trust* (1995)]

- Implications for aggressive driving behavior?
  - Is congestion eroding social capital?
  - What will it take to regenerate it?

# Alternative Perspectives on Congestion: Transaction Costs

- Simple transactions – quantity & price of a standardized product
  - Costs – specifying the product, negotiating quantity & price
  - Examples
    - 100 cartons of 20# 8½ x 11 printer paper FOB destination

# Transaction Costs (2)

## Complex Transactions

- Involve more than price & quantity of standardized products
  - Asset specificity
    - One-of-a-kind products (e.g., s/w, bridges, toll roads, ITS equipment & services)
    - Immobility of sunk capital – can't move and redeploy a highway
  - Ongoing relationships (service, maintenance, continuity of supply chain)
    - Freight services
      - Overnight, 2-day, etc.
      - Pickup – onsite, special charges for stairs, loading dock access, after hours
      - Delivery – special charges
      - Security / damage
  - Enterprise ownership & organization
- Require active management attention – a real cost
  - Negotiating the contract
    - Information seeking and evaluation
    - Negotiation
    - Asymmetrical information
  - Monitoring and evaluation / enforcement of contracts

# Transaction Costs (3)

## Implications

- “Satisficing” vs. optimizing (Herb Simon)
- Externalities as a transaction cost problem (Buchanan & Stubblebine)
- Behavioral economics – questioning the individual as rational actor (Laplacian Demon)
- Human factors/software design – map-navigation systems
- Modal choice – what is the “cognitive load” required to evaluate mode choices

# Alternative Perspective: Congestion as an Institutional Issue

- Institutions
  - Formal – nations, states, corporations
  - Informal – habits, norms, culture
- Institutional problems
  - Jurisdictional
  - Organizational
  - Behavioral
- Jurisdictional
  - Congestion spills across boundaries
  - Requires coordination & collaboration
  - ITS can assist
- Behavioral
  - Adaptive behavior
  - Privacy
  - Aggressive driving

# Congestion as an Institutional Issue

- Non-correspondence problem
  - Formal institutions chartered in constitutions
    - Slow adaptation
  - Societal problems
    - Don't match jurisdictional boundaries
    - Evolve rapidly over time
- Policy choices
  - Adapt existing institutions
    - Compete with other missions
  - Create new institutions
    - Well focused on problems
    - Antagonistic to existing institutions
    - Proliferation of institutions over time

# Regional Operations Collaboration & Coordination (ROCC)

- A response to...
  - worsening congestion
  - capabilities of ITS
  - difficulties expanding highway capacity
- Examples
  - Transcom (NY-NJ-CT)
  - Houston TranStar
  - MTC (Bay Area)
  - AZtech (Phoenix)
- Key features
  - Form – virtual organization, corporation/non-profit, existing agency
  - Scope
    - Resource sharing (staff, funds, equipment)
    - Info sharing (construction schedules, operating status)
    - Sharing operational control

# Concluding Remarks

- Congestion perceived as the central transportation challenge of our age
- Is it the wrong problem?
  - A sign of vitality
  - A political gambit
- Is it a problem that can't be evaluated in isolation?
  - Psychology
  - Social capital
  - Access vs. mobility
  - Transaction costs
  - Institutional issue

# Concluding Remarks

## What has it to do with ITS?

- ITS as a “solution” to congestion
  - Not very likely – causes are deeper
  - May conflict with the political uses of congestion
    - To promote new projects (highway and alternative)
    - To oppose actions / projects because of congestion impacts
- ROCC in ITS
  - Valuable potential solution
  - Challenges
    - Opting out of regional operations coordination and collaboration
    - Beggar-thy-neighbor strategies – push the congestion elsewhere