



**AUP I49/GEOG I49 SPRING TERM, 1994**

Tues./Thurs. 2-3:30, Perloff I243C

**Jonathan Richmond**

office: Perloff Hall I203A, 825-4676, e-mail: richmond@pacel.gsaup.ucla.edu

### **Course Summary**

Just about anything of a geographical nature is related to transportation. The form and organization of both settlements and the production of goods is intimately and intricately linked to the ability to move people and commodities across space. This course will focus on the relationship between transportation innovation and urban function and form.

Because history is so important to explaining what exists today, a particular emphasis will be placed at the start of the course on tracing the forces which transformed traditional activity centers — whose size was constrained by the daily distance which could be covered on foot — to the modern city of the automobile. The development of rail transit and of automobile-based personal mobility will be given particular attention.

A critical review will be provided of transportation/land-use models, with a case-study of the Los Angeles – Long Beach Blue Line rail system. Several classes will be devoted to the debate between rail and road based planning for modern urban mobility, asking whether our concept of a utopian city is also an autopian one and what the implications of this are for good design. The role of transportation in making available opportunities for those of low-income will get particular consideration.

A case study of the evolution and form of AMTRAK and of the potential for high-speed rail will also be included, asking how such services relate to patterns of interaction between U. S. cities.

### **Prerequisites**

There are no prerequisites for this course, which is open to all UCLA undergraduates.

# Transportation Geography

## Course Assignments and Evaluation

Writing assignments will be in the form of discursive essays rather than research papers and will encourage students to critically analyze a series of problems. The emphasis will be more on learning to critically analyze material than on assembling a large number of references or facts. The aim should be to produce something which is tightly organized, yet flowing, a “thought piece” which requires less time in the library than a “paper” but which does require you to have thoroughly understood what you have read and to provide a thread of logic to keep the reader on track from beginning to end. While the formal referencing systems of “papers” are not required, you must attribute any idea which is not your own. You may discuss what you are writing about with other members of the class provided you write the essay by yourself and attribute any material someone else has provided.

Perhaps the most important thing to bear in mind is that there is generally no “right or wrong” answer. You can generally be most successful by considering views you find hard to accept along with those which seem to make more sense, and to question the assumptions of both. By exposing assumptions, you might change your mind. While I will try to represent both sides of arguments in class, I will not try to disguise my own views. You should not feel obliged to agree with me, and I will in fact particularly appreciate well-presented dissenting views from which I can learn.

There will be five essay assignments during the term, but the course grade will depend on performance in only the best four of these essays. It is therefore acceptable to miss out one assignment. Given this flexibility you should please note that late assignments will not be accepted except in cases of personal emergency. As an additional option, you may write one of the essays on a course-related subject of your own choice. If you decide to do this, please get approval for the subject before beginning work and note that it may be handed in at any time up until the due date of the fifth assignment.

Students can expect to be called on to orally present their essays in class. Grades will be adjusted to reflect in-class participation.

## Readings

To promote a lively environment in class, students will be expected to have read and be prepared to critically discuss readings in class. We will be using many sources. The only definite recommendation for purchase, however, is Brodsky's *LA Freeway*. A textbook — *The Geography of Urban Transportation* edited by Susan Hanson — has also been ordered, but it will only be lightly used in the course so only buy it if you are really interested. A reader will be made available based on the material listed below. Copies of my dissertation, *Transport of Delight — The Mythical Conception of Rail Transit in Los Angeles*, will also be available at cost to anyone interested.

## Plan of Course

Please note that each of the sections outlined below may involve several class meetings. Recommended readings will be announced for subsequent sessions during each class. Please note, also, that we may not be able to cover all the topics below in the time available. Regular announcements will be made on the topics for the next few weeks ahead.

## Introduction

Colin Clark's essay from the 1950s may not reflect the experience of the recent past, but its message still stands. The existence of a city creates a demand for transport. And, just as an absence of transport can be "the real limiting factor" to growth, transportation innovations do much more than satisfy an existing demand: they feed back to shape the urban form which created the demand in the first place. "Transport has indeed done its work all too well. The final result, if we go on the way we are now going, will be an ugly and planless dispersal of population spreading almost uniformly over a whole industrial zone." We have here a great irony: while transportation is frequently referred to as a "derived demand" — of no utility except to serve some other demand reached by means of transportation — it can potently set the pattern of activities which call for its existence in the first place. The question we need to ask is: "Do we really want this demand-servicing-other-demands to shape our cities and how we lead our lives?"

James Vance provides a useful characterization of "Measures of Transportation."

Peter Muller gives us an introduction to how transport interacts with urban form. He sees four stages: "Walking-Horsecar Era" (1800-1890); "Electric Streetcar Era" (1890-1920); "Recreational Automobile Era," (1920-1945); and the "Freeway Era" (1945- ). As we can see, technological innovation in transportation drives the creation of each new era. In fact, if we accept this argument, we can split the first era into two, for the horsecar was in itself a significant innovation which catalyzed change from the centuries-old traditional walking city.

Alan Altshuler outlines how modern problems in urban transportation have come into the public perception. "In practice public debate and mobilization have typically focused far more on proposed remedial mea-

## Readings — Introduction

ALTSHULER, ALAN A. (1979), "Central Themes;" *The Urban Transportation System: Politics and Policy Innovation*; Cambridge MA: MIT Press; 1-15;

CLARK, COLIN (1957), "Transport — Maker and Breaker of Cities;" *Town Planning Review*, Vol. xxviii, No. 1, April; 237-250;

MULLER, PETER O. (1986), "Transportation and Urban Form: Stages in the Spatial

Evolution of the American Metropolis;" Ed. Hanson, Susan, *The Geography of Urban Transportation*; New York: The Guilford Press; 24-48;

VANCE, JAMES E. JR. (1990a), "Measures of Transportation;" *Capturing the Horizon; The Historical Geography of Transportation since the Sixteenth Century*; Baltimore: The Johns Hopkins University Press; 24-32;

sure than on the problems themselves.” Too little attention has been paid to understanding the effect of the feedback loop from transportation innovation to urban form and function. Policy actions are driven by what Altshuler sees as “problems perceptions,” and the political system “seeks to accommodate new demands as they emerge by means, insofar as possible, that leave previous settlements (programs and administrative arrangements) undisturbed, that involve the least possible disruption for private enterprises, and that involve the least possible inconvenience and annoyance for individuals who have built their lives around the expectation of system stability.”

We will be studying the series of innovations which changed transportation and urban forms; and we will see that policy has done little to ask what sort of a city we actually want to live in, and what transportation such wishes might imply.

### The Need to Study History

In a book published in 1845 on *The Condition of the Working Class in England*, the author writes of Manchester that “The upper classes enjoy healthy country air and live in luxurious and comfortable dwellings which are linked to the centre of Manchester by omnibuses which run every fifteen or thirty minutes. To such an extent has the convenience of the rich been considered in the planning of Manchester that these plutocrats can travel from their houses to their places of business in the centre of town by the shortest routes, which run entirely through working-class districts, without even realizing how close they are to the misery and filth which lie on both sides of the road.”

In today’s Los Angeles similar patterns can be seen, as freeways allow commuters to cross areas of chronic poverty and deprivation without even knowing such conditions exist. History can thus be seen to repeat itself, and we can learn a great deal about patterns of today from studying their roots in the past. If we can appreciate that the freewaygoers of today are enjoying similar privileges to the “plutocrats” of the past, we can isolate the processes which lead to such impacts and in turn be taken to other questions — of privilege, of poverty, and empowerment. We will return to these issues later on when we ask if transportation is a cause of urban deprivation, or a symptom of something bigger.

### Historical Beginnings — The Traditional Town

Life for most people before the industrial revolution began and ended in one place. Communities were largely self-sufficient and their geographical boundaries were determined by walking distance. This kept most urban forms remarkable compact. There was no public transport in cities, and intercity travel was rough and restricted. As J. Joyce writes in *The Story of Passenger Transport in Britain*, travel during the Middle Ages meant that: “You could easily trip into a ditch or get stuck in the mud,

and you could easily lose your way along unmarked roads that took an indeterminate course across open and desolate countryside. And, if you were a person of rank, you might well be the victim of a cutthroat ready to relieve you of any valuables you might be carrying. Even the honest peasants were liable to throw stones at you, not from any personal motives but simply because you were a stranger, and in an age of isolation they distrusted strangers.” Chaucer’s pilgrims told their tales as a distraction from the perils and tedium of travel: “For trewely, comfort nor mirthe is none, To ryde by the waye dumb as a stone.”

The stage wagon appeared on the English scene in the sixteenth century, but its “speed touched nothing more dramatic than two miles an hour.” The next century bought the stage coach, its speed improved by the practice of changing horses at the completion of each “stage.” In many ways the start of the “Royal Mail” coach service could be said to herald the beginning of modern transportation, for it ran to a fixed and regular timetable, with an emphasis on each stop being made at a particular hour. The first mail coach ran from Bristol to London in 1784 in sixteen hours. Such transport was expensive, and the preserve of the few.

The same was true for travel within the city. As Vance tells us, hackney carriages had appeared in London by 1634, but they were expensive and “for most people living and working within the metropolises there was no alternative to daily, sometimes considerable journeys on foot.” The arrival of the omnibus in the early 19th century made travel possible for the middle classes, but it wasn’t until the late nineteenth century that public transport became an affordable possibility for those of lesser means.

The bus is named after a French hatter called Omnes whose sign read “Omnes Omnibus.” The entrepreneur Stanislas Baudry took the name “Omnibus” — “for all” in Latin — for his service which people of any class could ride, provided they could pay the fare. He began service in Nantes in 1825 and in Paris in 1828. George Shillibeer brought this service to London in 1829. American bus service began in Philadelphia and New York in 1831, in Boston in 1835 and in Baltimore in 1844.

In 1854, 20,000 people arrived each day in the City of London by bus, 15,000 by steamboat, and 6,000 by steam railroad. For these people suburbia — which at the time began only a few miles from central London — had become a reality. But 200,000 commuters still went to work by foot and their place or residence remained tied to the location of their employers.

## **The Beginnings of Mass Transportation — The Arrival of the Horsecar**

The rail-guided horsecar came to New York in 1852. Boston and Philadelphia had services by the end of the decade, while the first horsecar operation began in London in 1861.

Horsecars could transport two to four times the passengers of omnibuses, at a faster speed, and with less animals. Finally, the cost of commuting was lowered to a level which ordinary people on both sides of the Atlantic could afford. Inner suburbs expanded with the influx of blue-collar workers, displacing those of high income who moved further

out into newly-developing outer suburbs. There are interesting quotations in the Taylor article which show that the extension of horsecar lines to Roxbury prompted many of Boston's immigrant workers to move out there, while an 1866 report on New York states that "In the morning, between six and seven, and the same hours at night, the cars are filled with mechanics, laborers, clerks, factory girls, while later in the morning, and the earlier eve, our more wealthy business men favor these roads."

As Vance notes, "it was

only during a fairly short period at midcentury that the rapid transformation of the city to a modern form was accomplished," and horse cars were crucial to this process.

Look at Weightman and Humphries for a fascinating account of the beginnings of public transport in London, and at Jones for a comment on how many of today's transit operating practices began in the streetcar era.

### **The impact of new rail transit on the city.**

In 1886, Charles Van Depoele gained the right to electrify the Capital Street Railway in Montgomery, Alabama, but it was Frank Sprague — who had been an assistant to Edison — who developed the technology needed to make electric street railways a financial success. Vance (1990b) shows how Boston was "the Laboratory for Electric Traction." "Eastern Massachusetts demonstrated more graphically than anywhere else how the trolley could provide labor and working-class housing to support large industrial towns. Brockton, Salem, Lowell, Lawrence, North Andover, Haverhill, and Newburyport grew to become major American manufacturing cities in the trolley era."

Rapid expansion in streetcar lines took place in the 1890s, but as Jones shows there were already hints of the financial problems to come. The preponderance of firms were "unable to generate sufficient earnings

## **Readings — Beginnings**

- JONES, DAVID W. (1985), *Urban Transit Policy; An Economic and Political History*; Englewood Cliffs, NJ: Prentice-Hall; 28-30;
- TAYLOR, GEORGE R. (1966), "The Beginnings of Mass Transportation in Urban America;" *The Smithsonian Journal of History*, Vol. 1, Part I, Summer; 35-50; and Part II, Fall; 31-54;
- VANCE, JAMES E. JR. (1990a), "Dealing with Space within the City;" *Capturing the Horizon; The Historical Geography of Transportation since the Sixteenth Century*; Baltimore: The Johns Hopkins University Press; 351-364;
- VANCE, JAMES E. JR. (1990b), "The Rise of the Horsecar;" *The Continuing City, Urban Morphology in Western Civilization*; Baltimore: The Johns Hopkins University Press; 382-383;
- WEIGHTMAN, GAVIN AND HUMPHRIES, STEVE (1983), "The Horse and the Railway;" *The Making of Modern London 1815-1914*; London: Sidgwick & Jackson; 96-125;

to pay any return on capital invested in their common stock.”

In Southern California, Henry Huntington built the largest interurban rail network in the world. Unlike most electric rail road builders, he was well capitalized. His first line — which was also to be the last one to close and the first one to be reborn — connected downtown Los Angeles and Long Beach, starting in July, 1902. Long Beach’s population climbed from 2,200 to 18,000 in less than a decade, while Watts was transformed “into what was perhaps the first fully-fledged bedroom community in the city” (Brodsly).

Huntington was a real estate developer; his system was built to open up tracts of land for development and profit. The Los Angeles metropolitan area population grew from 180,920 to 507,300 residents during the first decade of the twentieth century at a time when “the electric trolley had a virtual monopoly of interurban transport.” The trolleys traveled long distances, stimulating communities to sprout far away from the core, and setting the pattern for LA’s dispersed urban form.

### From Railway to Freeway

We turn here to the demise of the railway and the rise of the automobile, taking a case study of Los Angeles for an in depth explorations of the dynamics of technological change.

The “conspiracy theory” of Bradford Snell merits particular examination, because it is so widely believed. Snell maintained that the trolley systems of Los Angeles and other cities were eliminated through a conspiracy of “rubber interests,” to replace them first with buses and ultimately with automobiles. Such claims imply that the loss of rail lines was a function of monopolistic rather than “natural” free-market economic forces. This conclusion leads to the belief that under “natural” conditions the rail lines would have continued in use, and lends support to those who would resurrect the system today.

The alternative view is that the demise of the trolley was a function of the decline in the financial feasibility of operations, accelerated as automobile ownership grew and as rail services became decreasingly suited to meeting the population’s transportation needs. This hypothesis suggests that Huntington’s “Red Cars” became naturally extinct as they were displaced by automotive technologies which both caused changes in urban

## Readings — Rail & City

BRODSLY, DAVID (1981), *LA Freeway*; Berkeley: University of California Press; 61-80;

JONES, DAVID W. (1985), *Urban Transit Policy; An Economic and Political History*; Englewood Cliffs, NJ: Prentice-Hall; 30-34;

RICHMOND, JONATHAN E. D. (1991), *Transport of Delight: The Mythical Conception of Rail Transit in Los Angeles*; MIT, Ph.D. dissertation; 23-29;

VANCE, JAMES E. JR. (1990b); *The Continuing City, Urban Morphology in Western Civilization*; Baltimore: The Johns Hopkins University Press; Chapter 8 in general, but especially 378-407;

WEIGHTMAN, GAVIN AND HUMPHRIES, STEVE (1983), “The Making of the Suburbs,” *The Making of Modern London 1815-1914*; London: Sidgwick & Jackson; 127-147;

form, and provided services better suited to serving that new form's needs.

## Readings—Railway to Freeway

- BAIL, ELI (1984), *From Railway to Freeway, Pacific Electric and the Motor Coach*; Glendale, CA: Interurban Press; 113-142;
- BRODSLY, DAVID (1981), *LA Freeway*; Berkeley: University of California Press; 80-137; 151-160;
- FOSTER, MARK (1979), "City Planners and Urban Transportation: The American Response, 1900-1940;" *Journal of Urban History*, Vol. 5, No. 3, May; 396-465;
- GENERAL MOTORS (1974), "The Truth About 'American Ground Transport' — A Reply by General Motors;" Part 4A, Appendix to Part 4, *Hearings* before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, United States Senate; A-107 – A-127;
- HAMER, ANDREW M., (1976), "Transportation and Urban Location Behavior in Perspective;" *The Selling of Rail Rapid Transit*; Lexington MA: Lexington Books; 1-18;
- HOLT, GLEN E. (1972), "The Changing Perception of Urban Pathology: An Essay on the Development of Mass Transit in the United States;" Ed. Jackson, Kenneth T. and Schultz, Stanley K., *Cities in American History*; New York: Knopf; 324-343;
- JONES, DAVID W. (1985), *Urban Transit Policy; An Economic and Political History*; Englewood Cliffs, NJ: Prentice-Hall; 28-95;
- RICHMOND, JONATHAN E. D. (1991), "The Rise and Fall of the Pacific Electric: A Case-Study in Technological Evolution and Displacement;" *Transport of Delight: The Mythical Conception of Rail Transit in Los Angeles*; MIT, Ph.D. dissertation; 23-40;
- SCWARTZ, GARY T. (1976), "Urban Freeways and the Interstate System;" *Southern California Law Review*, Vol. 49, No. 3, March; 406-513;
- SNELL, BRADFORD C. (1974), "American Ground Transport, A Proposal for Restructuring the Automobile, Truck, Bus, and Rail Industries;" Part 4A, Appendix to Part 4, *Hearings* before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, United States Senate; A-1 – A-103;
- VANCE, JAMES E. JR. (1990a), "The Road in Transition III: The Rise to Dominance;" *Capturing the Horizon; The Historical Geography of Transportation since the Sixteenth Century*; Baltimore: The Johns Hopkins University Press; 485-528;
- WACHS, MARTIN, (1984), "Autos, Transit and the Sprawl of Los Angeles: The 1920s," *Journal of the American Planning Association*, Vol. 50, No. 4, Summer; 297-310;

We will look at how Los Angeles became an automobile city, at how the private vehicle provided access to new areas not accessible by rail and promoted infilling, at how the automobile provided new opportunities and competed with the Red Cars. As Snell put it, "In the 1930s General Motors and allied highway interests acquired the local transit companies, scrapped their pollution-free electric trains, tore down their power transmission lines, ripped up their tracks, and placed GM buses on already congested Los Angeles streets. The noisy, foul-smelling buses turned earlier patrons of the high-speed rail system away from public transport and, in effect, sold millions of private automobiles."

George Hilton sees things rather differently: "Rail passenger transportation was so inflexible that it could provide little but the trip to and from the central business district... The introduction of rubber-tired transport initiated both the decline of rail passenger transport and major revision of the urban pattern. The automobile gave Americans a lateral mobility, and an opportunity for point-to-point travel which the electric railway had denied them."

It is interesting to note the role of the bus in this, and Bail provides a valuable account. It can be argued that buses made for a financially far healthier form of investment. It can also be argued that the inauguration of "de luxe" bus lines took commuters away from the rails by providing a

higher level of service.

We will also see how the Los Angeles freeways system got underway in *A Major Street Plan for Los Angeles*, published in 1924. In this plan, congestion was seen as a function of “unscientific” street width and design, and “improper” use of existing street spaces. The plan sought to produce a “balanced scheme for handling a tremendous traffic flow” by establishing different classes of roadways for different traffic needs as a way of avoiding the “promiscuous mixture of different types of traffic,” which the authors said caused congestion. Of particular note, the plan called for roads both focusing on the central business district, and roads which linked other places, steering clear of the CBD itself. The concentration of activities was seen by the authors as a stimulus to road congestion, and limits on building heights called for to mitigate its effects. “Extended-through highways, interdistrict bypasses, boulevards and parkways all were proposed to provide programmatic support for a dispersed and multicentered urban form” (Brodsly).

Thus was the freeway concept born. We’ll begin to use Brodsly’s poetic account to appreciate how the freeway became intrinsic to Los Angeles and how it gave LA not only form, but meaning. We’ll come back to it when we look at the formation of myth in more detail later on.

## Inter-City Rail

We will break from our emphasis on within-city movement for a few sessions to look at developments in inter-city rail. In doing so, we will find parallel trends to the urban story, both in terms of displacement of technology and of resistance to that displacement.

First, we will examine the current rail passenger network of AMTRAK and ask why it takes a nationwide form. AMTRAK began life in 1970, supposedly as a “for profit” corporation. The route structure established provided an inter-connecting set of services from coast to coast, with much service operated only once a day or less. Despite efforts to improve service in the Northeast Corridor and a few other short-distance routes — efforts which have fallen short of the achievements for equivalent services in Europe and Japan — the basic pattern of long-distance service remains unchanged to this day. This seems strange, because rail services cannot compete with air over longer distances, rail’s only modern chance for survival being over the shorter routes. Why has this route pattern persisted?

Politics has doubtless had a major role to play. AMTRAK is funded by Congress, and it makes political sense to go through as many congressional districts as possible, even if it would make more transportation sense to concentrate resources where rail can do the best job. The political explanation can be taken far deeper than this, however, if we look at the sources for information members of Congress receive: information is biased, and leads members to believe rail has more advantages for their

constituents than really exists.

AMTRAK managers do not live in an information-neutral environment either. They can be seen to have adopted inherited operating procedures. Decades of neglect had left railway philosophy in another age, and the dated route structure AMTRAK took over was seen as a foundation upon which to build rather than an anachronism to be remodeled. AMTRAK's centralized organizational form, can, additionally, be seen to encourage a national network basis, rather than a series of regional systems.

## Readings — Inter-City

BONNAFOUS, A. (1987), "The Regional Impact of the TGV;" *Transportation*, 14, 127-138;

KAMADA, M. (1980) "Achievements and Future Problems of the Shinkansen;" Ed. Straszak, A., and Tuch, R., *The Shinkansen High-Speed Rail Network of Japan: Proceedings of an IIASA Conference, June 27-30, 1977*. Oxford: Pergamon; 41-56;

RICHMOND, JONATHAN E. D. (1981), *Perpetuum Mobile: AMTRAK — The Original Sin*; MIT Masters Thesis;

RICHMOND, JONATHAN E. D. (1983a), *Testimony Before the Senate Transportation Committee*, Sacramento, May 17;

RICHMOND, JONATHAN E. D. (1983b), *Slicing The Cake — The Case for a Los Angeles – San Diego Bullet Train Service*; Tustin CA: City of Tustin;

SANUKI Y. (1980), "The Shinkansen and the Future Image of Japan;" Ed. Straszak, A., and Tuch, R., *The Shinkansen High-Speed Rail Network of Japan: Proceedings of an IIASA Conference, June 27-30, 1977*. Oxford: Pergamon; 227-251;

VANCE, JAMES E. JR. (1990a), "France Uses the Railroad for Spatial Organization;" *Capturing the Horizon; The Historical Geography of Transportation since the Sixteenth Century*; Baltimore: The Johns Hopkins University Press; 231-246;

Finally, we will step back from these explanations to look at the root cause of all these ails: a failure to examine AMTRAK's fundamental mission and ask what values it was to serve. And this, we will see, is related to our tendency to be more comfortable talking about what Wachs and Schofer refer to as "Concrete Highways" than "Abstract Values."

We will look next at efforts to establish high-speed rail systems in the US. If we look at the history of high-speed rail in France and Japan we can see how such a technology can work there. France, with a high-cost of automobile usage has remained more

dependent on public transport than the U. S. The country's centralized nature also makes a route system focused on Paris likely to succeed, while high airline fares relative to rail and competitive travel times give rail a strong market position. In Japan extraordinarily high travel densities and limited alternative travel facilities make the Shinkansen a natural success.

In the U. S. there are few markets where rail stands a chance of competing with air service, while over shorter distances the automobile is a far more potent competitor than in France or Japan. While we will see that the case for high-speed rail or Maglev might be appropriately made by casinos in Las Vegas desiring such service to add to the city's "Disneyland" effect, or by developers seeking to derive real estate profits with which to subsidize operations, there are questions as to high-speed rail's merit as a transportation provider alone. We will look at the proposal for a Los Angeles – San Diego high-speed rail service in the light of

regional patterns of travel interaction — which are largely short-distance and dispersed — and study the dissonance of such patterns from a service based on high speed but few and centralized stations.

## Thinking About the Urban Transportation Planning Process

Many texts, including the Hanson and the classic by Stopher and Meyburg talk of the urban transportation planning process as if it essentially a technical exercise. During this section, we will look at what this technical conception means, critically analyze it, and ask if there are other better approaches we could try.

Stopher and Meyburg describe the “Transportation-planning process” as a series of seven technical steps, at the core of which are a series of forecasts to estimate the future demand for transportation and determine how attractive to travelers alternative means of travel will be in providing for it.

The first step is to take an inventory of the situation prior to planning. This includes information on current transport facilities and usage and demographic data. We start off with a problem because the information being used to feed the model represents a current picture which may be undesirable for the future. Today is projected to tomorrow, even if the tomorrow we might desire is structured quite differently.

Land-use forecasts are done next. These forecasts are done separately from the transportation forecasts which are to follow. They are often politically shaped and based on assumptions which may not prove to be reliable.

“Trip generation” and “trip distribution” involve building a picture of the *total* transportation market by all modes of travel. Total travel is then divided among competing transportation modes in a “modal split” model.

The model is analogous to purchasing and serving cake. When buying, one has to decide what size of cake to get. Later, a decision has to be made on how to divide the cake. A quarter of a big cake will be more than a quarter of a small cake. So, the bigger the cake out of which a potential new mode of transportation gets a proportionate slice, the more its predicted ridership will be.

## Readings — Planning Process

LASKI, HAROLD J. (1974), “Limitations of the Expert;” *Chemtech*; April, 198-202;

PAS, ERIC I. (1986), “The Urban Transportation Planning Process;” Ed. Hanson, Susan, *The Geography of Urban Transportation*; New York: The Guilford Press, 1986; 49-70;

RICHMOND, JONATHAN E. D. (1991), “Inventing Demand for the Long Beach Line;” *Transport of Delight: The Mythical Conception of Rail Transit in Los Angeles*; MIT, Ph.D. dissertation; 81-111;

SOUTHERN CALIFORNIA ASSOCIATION

OF GOVERNMENTS (1984), *Los Angeles – Long Beach Light Rail Transit Project, Patronage Estimation and Impacts*; March;

STOPHER, PETER R. AND MEYBURG, ARNIM H. (1975), “The Urban Transportation-planning Process;” *Urban Transportation Modeling and Planning*; Lexington MA: Lexington Books; 59-68;

WACHS, MARTIN (1985), “Ethical Dilemmas in Forecasting for Public Policy;” Ed. Wachs, Martin, *Ethics in Planning*; New Brunswick NJ: Center for Urban Policy Research; 246-258;

We will identify a number of problems with these procedures in general and as implemented in Los Angeles. A key problem with the method of trip generation used in Los Angeles, for example, is that trip volumes being generated for a study of the potential of a new transit system are said to be a function of private vehicle ownership alone. Areas with many cars are said to produce more trips — including potential transit trips — than those with less automobiles.

Yet, first of all, we would expect areas with lower car ownership to have a proportionately higher demand for transit, all other things being equal, because of the lack of alternatives. One would, in fact, expect a negative income effect; the demand for transit would be expected to decrease, relatively, as increasing income provides increasing opportunities to travel by car.

Secondly, we might *want* to supply areas with low car ownership with a relatively higher level of transit service, simply in order to increase transportation opportunities to those for whom they are currently denied. The formulation used, however, implicitly makes a normative statement favoring those areas which already have a high degree of transportation opportunity by showing that transit will have a higher relative demand in those better-off areas than in parts of town which are, in fact, more heavily “transit dependent.”

Another example of dangerous use of assumptions lies in the use of a gravity model from Newtonian Physics in “Trip distribution,” despite the lack of evidence that people in towns — and especially in the non-traditional Los Angeles — behave like particles in space.

By examining the assumptions for planning implied by such modeling methods, we can ask what this means about our understanding of our city. We will see that while forecasts are often of little or no validity, they can serve powerful political purposes for promoting the cause of transportation technologies which have *already* been selected on other grounds. We will be looking at how they come to be selected shortly.

## The Rail Versus Road Debate

We look here at the arguments put forward for different transportation technologies. The historical understanding of how patterns of transportation and urban form have interacted through previous eras of technological information will help us appreciate the implications of taking alternative future paths to the transportation systems and urban structures of tomorrow.

A large selection of readings is included below. Guidance will be given to steer you towards those you might find of particular interest. Alan Altshuler’s book (unfortunately out-of-print but available on reserve) contains a good introduction to many of the topics. Note in par-

ticular chapters on “Recent System and Policy Evolution;” “Politics and Innovation;” “Congestion;” “Urban Land Use and Development;” and “The Options.” My chapter in *Transport of Delight* also covers much of the ground we will be discussing. You will note that I am strongly critical of rail proposals. There are many people, however, who disagree with me. Look at the arguments on both sides, and make up your own minds. If I may subversively steer you towards my bias, however, may I particularly recommend the John Bonsall article. It describes the development of a bus system in Ottawa that has many of the advantages often attributed to rail. Reading it will help you think about what is special about rail, what

## Readings — The Rail Versus Road Debate

- ALTSHULER, ALAN A. (1979); *The Urban Transportation System: Politics and Policy Innovation*; Cambridge MA: MIT Press;
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is special about bus, and how we can effectively determine what is right for a particular urban environment.

Issues we will examine will include the following:

**Service characteristics.** We will look at the different service characteristics of road and rail transportation facilities, and how they meet the needs of alternative patterns of transportation demands. Rail services may be faster, but they tend to be organized in radial forms, and their limited ability to reach into any but the highest density residential districts requires travelers in cities such as Los Angeles to transfer vehicles more, lessening the attractiveness of the service. Buses come in smaller units and can be operated more frequently and to more destinations by a larger choice of routes. The automobile permits direct access between a myriad dispersed destinations. Should we design transportation to mimic this desirable characteristic in a dispersed environment? Or should we change the form of the city to conform with transportation technologies?

Rail is said to be more comfortable than the bus, but there is little evidence that this influences how people travel. It is also said that trains are easier and more convenient to use than trains. But is this so and need it be so?

**Cost factors.** Rail service is said to cost less to provide than bus service, partly because one driver can haul so many more passengers than a bus driver can. We will see, however, that the evidence suggests otherwise. Facilities and maintenance costs are generally substantial for rail, while staffing levels involve far more than a matter of drivers. There is also the cost of new bus services to feed rail stations to be taken into account. On certain systems, such as in San Diego, management has claimed lower operating costs for rail than for bus, but has met with disagreement from critics. The critics have contended, furthermore, that when capital costs are taken into account as well, rail is a clearly more expensive option than bus.

**Environmental issues.** Rail systems are often claimed to have the potential to alleviate congestion, but rarely have the level of service needed to make a noticeable dent. Congestion is also a more complex matter than simply allocating vehicles from one system to another. As Mel Webber has said — paraphrasing Parkinson's Law — "Traffic Expands to Fill the Space Available." If some vehicles are attracted from highways to rail facilities and road speeds become temporarily faster, this will attract more road vehicles, increasing congestion again.

Questions of energy use and pollution characteristics are also far from simple to assess. If people need to get access to rail stations by automobile or bus, for example, the energy and pollutant effects of that transportation must also be taken into account. Very little analysis has been of sufficient sophistication to reflect factors such as these, and part of our task will be to ask how we can encourage the conduct of better analysis in the future.

**Land use.** Rail is often said to foster desirable development patterns, but while advocates frequently cite the example of Toronto to demonstrate rail's successful influence, others would disagree. "Many policy-makers have been misled by this widely-publicized overstatement" say Knight and Trygg. And, while Bob Cervero has been substantially more optimistic about the development potential of light rail than most, he stresses the need for additional actions to promote such development and adds that "the current auto-highway system seems to firmly rooted that any major structural changes in urban form seem unlikely."

We should also study what Alan Altshuler has to say on the matter: "As density increases within any area, the transit share tends also to increase, but so does the absolute level of highway traffic demand per unit of road capacity." If new developments are induced, a certain proportion of trips will be served by the new transit system, but there will also be new trips generated by people who choose to gain access to the development *by automobile*, resulting in *a worsening of highway congestion*. "By comparison, land use dispersal has the opposite effects; transit shares decline, but so does the absolute level of highway traffic demand per unit of road capacity."

Once again simple statements can be misleading. Even if rail does induce development, is that the sort of development we want for our city and what feedback effects will there be on the transportation system as a whole? The unfortunate reality is that most participants in debates over the virtues of one technology versus another stick to the simplest claims of what a technology can or cannot do. Our task will be to ask how to deepen inquiry to look at the systems questions so frequently ignored and to see that to ask what kind of transportation we want we have to ask what kind of a city we want to live in.

### The Formation of Myth

If we accept that rail offers few benefits and at high cost (not everyone does accept this, of course), why is it so popular? We will examine a theory of myth which tries to explain this phenomenon.

We start with the premise that our natural response is to reject complexity and ambiguity: we organize information instead so as to provide simple and coherent understandings. These provide for a "common sense" basis of action which eschews analytical processes but allows us to function fluently, efficiently, and untroubled by uncertainty.

How are these simplified understandings reached? We will study how imagery, symbolism and metaphorical conceptions shape understandings, and create myths of simplicity, power and appeal — however absurd they may seem to the outsider looking in.

Here are some examples of the material we will be studying.

**Metonymy.** Metonymy is a **symbolic** function which happens when one thing is allowed to stand for another. The relationships are rooted in

cultural understandings. We generally identify a person by their face. So, if we are shown a photo of someone's face, we are likely to say "that's so-and-so." The face stands for the person.

## Readings — A Theory of Myth

### A. Theory

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The most common form of metonymy is where a part stands for a whole, and there are intriguing examples of where metonymic understandings appear to influence our conceptions of physical space and transportation across it. It is common to represent a total trip by the time spent on just the main vehicle, for example. "People, say out in Thousand Oaks or Agoura or Westlake Village could get into downtown Los Angeles in 15 minutes on a very high-speed train," one person told me. But what about the time getting to and from stations? Because the train trip is taken to represent the total trip, this tends to get ignored in imagining the ideal system. When the system turns up, however, people are made to realize that the journey involves more than just the

time on the train, and that influences whether they decide to use the new service. This is a disturbing dissonance, and we should ask what we can do about it.

There is much **imagery** associated with alternative transportation systems, and such simplifications color our views. Trains are seen to be fast, buses slow; trains appear to be clean, and buses dirty (but do they have to be?). Freeways, once carrying images of *freedom* now draw up images of nightmare congestion and despair.

Trains are seen to be more efficient because there is only one driver up front. As a *Los Angeles Times* article reported "One of the arguments made most often for the rail line is that it will be cheaper to operate because a single driver on a train can carry up to five times as many passengers as a bus." This simple image of virtuosity is easy to understand and attractive. It is more available to the average decision maker than the convoluted financial analyses which might paint a more accurate picture. What imagery does, in essence, is to anchor what Steinbruner calls "inferential logic." It forms a compelling inferential mechanism because it

is rooted in feelings, because it provides a compelling alternative to what we might more traditionally define as “logic.”

The train can be seen to be more than symbolic of good transportation. Arnold Pacey writes about the “virtuosity values” of technology, the enjoyment of “having mechanical power under one’s control, and of being master of an elemental force.” Thus trains are seen as “powerful,” “advanced,” and “modern.” As one member of Congress put it: “There’s something modern, exciting about a red trolley moving along at a nice clip, a little more of the space age.”

There’s a romantic and sexual element to technology too. “I’m sorry you never saw them. They were stunning. I’ve got pictures of them. They were knock-outs.” The imagery may be of bronzing bodies on the beach, but the subject is rail cars. And, was it accidental that the Los Angeles County Transportation Commission opened the Blue Line tunnel into downtown Los Angeles on Valentine’s Day, advertising it with a picture of the tunnel contained in a heart-shaped cut-out and with the headline “A Tunnel Just Waiting for a Train?”

The great danger, of course, is that the “thrill” associated with particular technologies can undermine the task of making appropriate decisions.

**Metaphor** is an instrument of understanding, specifically as Lakoff and Johnson define it, “understanding one kind of thing in terms of another.” Donald Schön characterizes the functioning of metaphor as follows. The meaning of a concept employed as a metaphor, A, is taken as a program for the exploration of its subject, B. In doing this, “expectations from A are transposed to B as projective models.” A thereby pulls the strings of B, “fixing and controlling” the way in which B is understood.

In doing its work metaphor clarifies. It makes it possible to understand abstract things in tangible ways. We say someone has a “hot” temper, for example. A “temper” is a complex concept to understand. But heat is something we have all experienced, and provides a compelling descriptive device for presenting the temper.

In using the concrete to pin down the abstract, metaphor makes fiction appear to be fact and does so transparently. We will look in class at the complex and intriguing “balance” metaphor to try to understand what people mean when they call for “balanced transportation.” But, to get a ready idea of the concept and function of metaphor, here are some examples of the “addiction” metaphor at work from a TV report on transportation alternatives. There is talk of being “hooked” on gas, and of “withdrawal symptoms” when gas is hard to get. A psychiatrist is even brought on to say: “What will happen when it’s taken away? It’ll be a shaker-upper. They will be in a sort of transportation shock.” The reporter confirms that “In Southern California our dependence is staggering.”

Now, what is the whole point of this? Well, if we see something as an

addiction it means it's intrinsically bad. It's a habit we've acquired that we'd rather do without, and what we really need is an "antidote." Under the influence of this metaphor, rail seems to provide an appropriate antidote. As one county supervisor said of Long Beach light rail: "We should set this project as the number one priority so we can begin to reduce our dependence on the freeways and smog-producing automobiles."

How did we become addicts? We lost the Pacific Electric and — the rail system gone — we became hooked on gas. The TV reporter says as much. GM killed the Red Cars, leaving only the Long Beach line, which "died" in 1961. "And so the seeds of our addiction to the automobile were born." Implication: bring back the rail system, and we'll be cured of our addiction.

The metaphor is misleading because the automotive life is for most people the way of choice, not of desperate compulsion. By making it seem like an addiction, the metaphor can not only cast the car and the highway as a demon drug, but also suggest that there is a simple "antidote," when no such easy answers really exist. Thus is the power of metaphor to persuade and lead astray.

As we will see, the system of images, symbols and metaphors comes together in the form of **myth**. The myth represents a complex of perceptions and stories about the world and has all the power of religious belief: it is not something to question. More devastating: we are not even aware when we are under the power of myth. We will investigate the myth that rail transit can alleviate the transportation problems of Los Angeles, and ask whether there is evidence that it has influenced decision making in the Southland.

## Poverty and Transportation

For our final topic before concluding, we'll look at the disturbing question of what transportation means for people of low income and low opportunities, and how changes in transportation systems can affect them.

The Long Beach light rail line is seen as a way to provide benefits to the low income communities of Watts and Compton. Claims are made that these will reach beyond the mere provision of transportation. In particular, rail is said to be capable of providing links to employment opportunities as well as to places. A 1971 study by Caltrans, however, found that in practice such links were weak. "If jobs are not available for whatever reason, no amount of transport will create them."

There are questions, furthermore, whether the orientation of the rail service is most appropriate for the community's needs. Census data prepared for the *Los Angeles Times* showed that less than 10% of mid-corridor residents worked in downtown Los Angeles. "By far, most residents of the corridor either work within the area or travel to widely dispersed

locations such as the Westside, South Bay and San Gabriel Valley.” Most public transport uses are of a local nature, for which buses can provide a higher level and greater variety of service. The degree of transferring needed when using rail services make them inappropriate for most short trips.

There are other equity issues, too, which receive less attention than the promotion of rail. The fares policy has consistently favored long-distance commuters, relative to those taking shorter inner urban trips, and could be an important target for adjustment to make it more equitable.

Perhaps most noteworthy, however, is that while transportation was an area the McCone Commission identified for improvement in its report on the Watts riots, a follow-up study a decade later found that transportation was the only area where there had been substantial improvement. We need to study the symbolic appeal of light rail to see why it is so unusually important in this context.

While the more complex social problems of poverty are intangible and hard to deal with directly, light rail offers a solid symbol of progress. It receives strong support within the community. The then Mayor of Compton, Walter Tucker, went to college by Red Car: “If I hadn’t had the Red Car — I don’t know what — I probably wouldn’t have been able to get in and out... This is one of the reasons why they had the Watts riots; it’s because they didn’t have transportation in and out to Watts to the hospitals and a lot of things... It[light rail] would definitely serve a purpose.”

But perhaps we should look to one of the few detractors, a previous Compton councilman, Maxcy Filer, who said that he had the money being spent on light rail “he could build a plant where there are jobs in the community, then the people... wouldn’t have to travel so far... Now, if you’re going to help the unemployment rate, I’ll put them on the bus now... You find the jobs and I’ll find the transportation.”

We need to ask to what extent transportation is symbolically related to other problems, and what chance we have of addressing those major problems when transportation is cast as such a ready panacea.

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## Conclusion — Will Transport be "Maker" or "Breaker" of Cities?

We will end by looking at a paper with the same title as the Colin Clark piece with which we began. Peter Hall provides an up-to-date appreciation of Clark's work, and we will use it to reach conclusions from

our explorations so far and to produce questions for further inquiry ahead. If the transportation system and the pattern of land uses and activities in the city exist in a "symbiotic relationship," what are we to do when the two of them "get out of step?" To what extent can we intervene, should we do so, and how should we do so? Should the

city take its form from particular transportation technologies? Or can we find transportation technologies to facilitate the existence of the city of our dreams?

### Reading — Conclusion

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