Does Transit Work? A Conservative Reappraisal

by Paul M. Weyrich and William S. Lind

"Read (This Study) and I Think You'll See Why Even Conservative State Governors Want More and Better Public Transit, Not Less."
The Honorable Tommy G. Thompson
Governor, State of Wisconsin

Dedication

To Richard Kunz, editor of The New Electric Railway Journal.

Through the darkest days of abandonments and "bustitution," he never lost faith in the future of rail transit.

1937 - 1998

RIP

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Foreword

by The Honorable Tommy G. Thompson

Governor, State of Wisconsin

One of the challenges that comes with being a governor is that you have to make things work. The decision you make today is likely to have real world consequences starting tomorrow. I like to think that makes governors more practical and less ideological. As a fellow governor, Lamar Alexander, likes to say, "How do liberal dog catchers and conservative dog catchers catch dogs? The same way."

I found it refreshing when two solid conservatives, Paul Weyrich and Bill Lind, decided to take a fresh look at mass transit. Their previous study, Conservatives and Mass Transit: Is It Time for a New Look?, proved to be the hit of the transit world when it was released a couple of years ago. And with good reason – it said something new. It said that there are sound, conservative reasons to support public transit, when public transit is done right.

As a governor, I know that mass transit is important for a variety of reasons to many people in my state. And I know that rail transit, including intercity rail, could and should play a much larger role than it currently does in serving the people of Wisconsin and the entire nation. That is why, when I was offered a position on the Amtrak board of directors, I took it.

As a conservative, I am sometimes troubled by the studies released by some conservative think tanks that attack public transit. Why do academic conservatives seem to believe that all transit is bad, when as a real world conservative, I know it isn't?

In this new study, Does Transit Work? A Conservative Reappraisal, Weyrich and Lind answer that question. They do so by pointing out something I had sensed but never quite put my finger on: the anti-transit conservative studies ask the wrong question. They base their anti-transit conclusions on the question: what percentage of total trips does transit carry? That number is relatively small. But it is an academic, not a real world number.

In the real world, roughly half of all Americans have any transit available to them and a still smaller number have the high quality transit available that would be utilized versus an automobile. If we look at how transit competes among that group of people, it performs vastly better than the anti-transit studies suggest. As governor of Wisconsin, that reflects transit reality in my state.

Like many officials at the state level, I encourage those in Washington and in various think tanks around the country to go into the field and witness for themselves just how viable rail transit can be and how important it is to working people. The American people need a dependable and affordable means to get to work and back each day. Think about it – the average price of a new car is now over $20,000. Good public transit can help working families keep a portion of that money in the bank instead of spending it at the gas pump. To them, and us, that's important.

So is this study. Read it, and I think you'll see why even conservative state governors want more and better public transit, not less.

Executive Summary

One of the principal arguments against mass transit is the "one percent argument" -- the assertion that transit carries only about one percent of total trips. This argument is relied upon heavily by many conservative and libertarian critics of public transit. In fact, the real figure appears to be somewhat higher.

But this paper argues that the central problem is not the answer but the question. Total trips is a poor yardstick with which to measure the effectiveness of public transit. Instead, the authors propose a new measurement: transit competitive trips. If we ask what percentage transit carries of the trips for which it can compete, we get a very different picture, one that accords much more closely with the real importance of mass transit in urban areas.

The study goes on to apply this new measurement to three transit systems, each of which represents high quality transit: Chicago's Metra commuter rail system and the Light Rail systems

in San Diego and St. Louis. In each case, the system does far better than the transit critics suggest. Taken together, the three case studies establish beyond question that when we measure transit with the correct yardstick, transit competitive trips, transit works.

Like the authors' previous study, Conservatives and Mass Transit: Is It Time for a New Look?, this study then goes on to suggest ways in which transit can compete more effectively. If transit authorities are willing to act imaginatively to improve transit quality, America could see another "transit era," a second coming of public transit.

Does Transit Work? A Conservative Reappraisal

A Study Prepared by the Free Congress Research and Education Foundation

> The first recorded example of mass transportation was the movement of Adam and Eve from the Garden of Eden. At that time 100% of the human population was moved at once in a single trip, a record never equaled since. [1]

In fact, according to most conservative studies of mass transit, it has gone straight down hill. Today, they argue, despite billions of dollars of investment, transit carries a pathetically small number of riders: about one percent of total trips. Does transit work? If that is all the people it carries, the answer would appear to be clear: no.

In our earlier study, Conservatives and Mass Transit: Is It Time for a New Look?, we surveyed three common conservative objections to public transportation: it is a government creation that would quickly disappear in a free market; no conservative constituencies actually ride transit; and transit does not serve any important conservative goals. We noted that each of these perceptions is true in some situations. But there are other situations in which each is not true.

In fact, the dominance of automobiles and highways is a product of massive government intervention in the marketplace, intervention stretching back to World War I. In countries such as Switzerland where government policy has been less one-sided, transit holds a far larger market share.

While few people who can get around any other way will take a bus on a traffic-clogged street, many are willing to take a train. High quality rail systems such as Chicago's Metra carry large numbers of middle and upper-income commuters, people whose demographics indicate they vote conservative. Conservative politicians who disdain any mass transit are neglecting part of their base.

And transit demonstrably does serve some important conservative goals, including economic development, which can be both spurred and shaped by rail transit systems; helping the poor move off welfare and into jobs (which they have to get to somehow); and strengthening the bonds of community, which is important to cultural conservatives.

Does Transit Work?

Well and good, some conservatives (and other transit skeptics) have replied. But in the end, the most important conservative question about anything is, does it work? Welfare did not work, and the country is finally moving to get rid of it (we happily join in the cheers for that!). The National Endowment for the Arts does not work (sorry, but poop is poop, not art), and with any luck we will be rid of it soon too. Why should we keep transit around, when it only carries one percent of total trips? That number seems to make it clear: transit just doesn't work!

The "one percent argument" isn't the only conservative argument against transit. For example, some conservative studies claim that new Light Rail systems all carry fewer riders than projected and cost much more than planned. In response, it is easy enough to point out a contrary fact: two of the country's newest Light Rail lines, those in St. Louis and Dallas, both came in on budget and carry more riders than projected.

But the one percent argument is tougher. And, with variations, it turns up in most critiques of mass transit.

A publication of the Road Information Program, A Mobility Comparison of Investments in Highways and Mass Transit, notes that

> Despite a 148.8 percent increase in operating subsidies between 1980 and 1990, mass transit was unable to increase its share of the nation's PMT. In fact, between 1980 and 1990, mass transit's share of the nation's passenger miles of non-marine, surface transportation decreased from 1.43 percent to 1.27 percent…total PMT provided by mass transit exceeded 1 percent of total transportation in only 10 states in 1990.[2]

A regional conservative periodical, K.C. Jones Monthly, based in Kansas, argued in a skeptical article, "Public Transit: A Worthwhile Investment?," that

> Public transit is clearly a declining industry. Ridership peaked during the World War II period at roughly 23 billion trips per year…. As World War II came to an end and life returned to a more normal mode, public transit lost most of its market advantages. Ridership declined by about two-thirds, from 23 billion annual trips to around 8 billion in recent years. Public transit's share of urban passenger miles fell from over 30% in 1945 to barely 2% in 1995.[3]

The libertarian Reason Foundation's paper, Myths and Facts of Nation's Transit Policy, states that "Early results from the 1990 NPTS (Nationwide Personal Transportation Study) show that public transit accounted for 2.5% of all person-trips in 1990 vs. 2.3% in 1983." The figures are for total trips nationwide, not just in metropolitan areas.[4] A 2.2% figure for total trips (in 1980) is given in False Dreams and Broken Promises: The Wasteful Federal Investment in Urban Mass Transit, published by another libertarian think-tank, the CATO Institute.[5]

The numbers rise, but only slightly, when the same studies look at commuting to work on transit in urban areas. The CATO study says "just over 5 percent of work trips were provided by transit,"[6] the Reason Foundation says 5.86%,[7] and an article in The Wall Street Journal, "Despite

Huge Outlays, Transit Systems Fail to Lure Back Riders," gives a figure of 5.3% in 1990, down from 6.4% in 1980. [8]

Are the numbers in these anti-transit studies correct? With minor variations, yes. An official U.S. Department of Transportation study, Journey-To-Work Trends in the United States and its Major Metropolitan Areas 1960-1990, says that in 1990 5.12% of commuters used public transit, down from 6.22% in 1980. [9] Another USDOT study, New Perspectives in Commuting, states that from 1980 to 1990 "the transit share declined from about 6.4% percent to about 5.3% of work travel."[10] The Federal Highway Administration's National Personal Transportation Survey, Summary of Travel Trends, dated March, 1992, shows the distribution of work trips for transit as 8.4% in 1969, 4.7% in 1977, 5.8% in 1983, and 5.5% in 1990. The increase from 1977 to 1990 is one of the few shown in any study of transit use. [11]

The Eno Transportation Foundation's highly detailed study, Commuting in America II, shows a more interesting variation: while stating that "transit's share of commuters declined from 6.3% to 5.1%" from 1980 to 1990, it also notes that "although bus service, the major mode used in transit, lost riders, other transit modes, specifically subways and commuter railroads, gained riders." The Eno study shows a gain in subway and elevated rail of 14.86% and in commuter rail of 3.61% over the decade.[12] As we will see below, the distinction between the performance of bus and rail is important.

And what of the magical one percent, the figure so often cited for transit's share of total trips? The actual number seems closer to 2%, but that's still beggarly enough. If transit only carries 2% of total trips, or around 5% of commuters in urban areas, how can continued funding for transit be justified? Aren't the critics right? Don't the numbers tell us – and we know numbers cannot mislead – that we should just park the buses, scrap the trains and be done with it?

Reality vs. Theory

Well, perhaps not. The rest of this paper will show why these numbers can mislead. But some philosophy may be helpful at the outset.

An old trait of conservatives is their insistence that reality is local and concrete, not airy and abstract. One fine day in the 18th century, that great Ur-conservative talker and man of letters, Dr. Samuel Johnson, went for a walk with his long-time companion, Mr. Boswell, around the Channel port of Harwich. Boswell, ever the quiz, asked Dr. Johnson what he thought of the theories of Bishop Berkeley, who opined that we cannot really know the existence of anything. "I observed," wrote Boswell, "that though we are satisfied his doctrine is not true, it is impossible to refute it." "I refute it thus," Dr. Johnson growled, kicking a large stone.[13]

The stone we would kick is the hard fact that, if transit suddenly ceased operating in any large American city, commuting would become almost impossible. Rush-hour traffic is already horrendous, to the point where in places like Los Angeles and Washington, drivers are shooting each other. The rush hour itself has become rush many-hours, even "permanent rush hour." In urban areas, there isn't any place to put more highways, never mind the fact that bisecting, trisecting and dissecting cities with limited access freeways makes them die. If all the people

now on trains, subways, Light Rail lines and buses suddenly joined the rush hour drive (and most can: in 1990 only 11% of American households had no vehicle, and 59% of those already lived in the center city),[14] getting to work might take as much time as the job itself.[15]

So we appear to have a contradiction. Common sense and experience, those two great conservative tests, tell us transit is important. The statistics that count total trips, even total urban commuting trips, tell us it isn't. What gives?

What has to give is the unit of measurement. The seeming contradiction stems from the fact that counting total trips (or total commuting trips) does not effectively measure the present impact or potential of public transit. The anti-transit studies are applying the wrong yardstick. They are, in effect, trying to measure flour with a ruler, or count inches with a spoon. Their numbers are correct, but the meaning they draw from them isn't. To measure transit's current worth or future potential, we need a different measurement.

What might that measurement be?

A Better Measurement: Transit Competitive Trips

A measurement that allows us to calculate better the importance of transit – present and potential – is transit competitive trips. We need to ask not what percentage of total trips transit carries, but what percentage it carries of trips for which it can compete. Measuring transit by counting trips it cannot compete for is like asking how much orange juice you can get from a bushel of apples. More precisely, counting total trips is measuring how much orange juice you can get from a bushel of mixed fruit, only a portion of which is oranges. The fraction will always be small, but the problem is the question, not the answer.

How can we determine which trips are transit competitive? For transit to be competitive, three criteria must be met. First, transit must be available. Second, the available transit must be high quality. And third, the trip purpose must be one for which transit can compete. Let's take a closer look at each of these criteria and see what they tell us.

First, a trip can only be transit competitive if transit is available. This is common sense: if there is no train or bus, you can't get there from here, at least not on public transit. But the point this criterion makes is less obvious: measuring total trips is irrelevant, because in much of America, no transit is available.

What are the numbers? The best official source is the American Housing Survey. The latest available figures are from the 1993 Supplement. According to that survey, 54.48% of American households had public transit available (the trend is down, from 58.9% in 1983.) The number tells us that, in terms of transit competitive trips, transit could not compete for any trips from almost half the households in America, because they had no transit available.[16]

Equally important is our second question: did they have quality transit available? As noted earlier, the vast majority of American households have at least one car. If the available transit is poor quality, they don't have to use transit, and most won't.

Here the American Housing Survey has even more interesting news. In 1993, only 28.8% of U.S. households reported that they had satisfactory public transportation available (down from 39.39% in 1983 and 54.52% in 1974, the first year surveyed).[17] And here's the kicker: while annual transit trips per household nationwide remained virtually steady from 1974 to 1993, annual trips per household where satisfactory transit service was available doubled over the same period, from a low of 150 in 1976 to 300 in 1993.[18] What has held down transit ridership is not unwillingness to use satisfactory transit, but its declining availability. In fact, the 1993 AHS Supplement indicates a virtual one-for-one correlation between households having satisfactory transit and households using that transit at least weekly.[19]

In the AHS surveys, a rating of "satisfactory" is subjective: the respondents define the term for themselves, and merely mark the box "Satisfactory Transit" yes or no. Is quality transit – our criterion for transit competitive trips – the same thing as this "satisfactory" rating? A look at some further AHS data suggests it is not, that another major factor plays a role in defining quality transit.

The data come from four cities: Atlanta, Chicago, Saint Louis and San Diego. Between 1982 and 1991, each city saw a decline in the number of households reporting available and satisfactory transit. That number fell by 12.3% in Atlanta, 7.4% in Chicago, a whopping 49.5% in St. Louis and 16.7% in San Diego.

But the four cities did not report uniform transit ridership results. In St. Louis, transit ridership fell 42.2% between 1980 and 1990, a close correlation. Chicago's ridership dropped 14%, almost double the drop in satisfactory transit. But in Atlanta and San Diego, ridership grew: by 9.3% in Atlanta and by an enormous 42.4% in San Diego. [20]

What explains these wild swings? In our view, the answer is high quality service. St. Louis' transit system remained all bus through the period surveyed (MetroLink, St. Louis' new Light Rail system, opened in 1993 and dramatically reversed the downward ridership trend). Atlanta began rail service (MARTA) in 1979, and San Diego's first Light Rail line opened in 1981. Both of those systems provide high quality service.

Doesn't Chicago disprove the case for rail? No. But it does demonstrate something else. CTA, the system serving the region's central city, includes both rail and bus. In fact, most of the decline in CTA's ridership was bus riders.[21] But rail also lost, especially in riders to the Central Business District. Why? Because rail service is not automatically high quality service. Throughout the 1980s and into the early 1990s, the quality of service on CTA's aging and underfinanced rail system dropped steadily. Not surprisingly, riders stopped riding. Rail almost always has the potential to deliver high quality transit and attract riders from choice, but it does not always live up to that potential. In the mid-1990s, as new resources began to flow to CTA's heavy rail operations and quality improved, so did ridership, rising from a low of 118.5 million in 1993 to almost 130 million in 1997. Bus ridership fell 11.6% over the same period.

As we noted in our first study, quality transit normally means rail transit, although express buses can also compete.[22] Beyond that, it means safe, clean, comfortable, on-time vehicles; pleasant stations; adequate parking; courteous personnel; and, above all, reliability (including in bad

weather). Commuters are creatures of habit, and nothing drives them to their automobiles more quickly than an inability to trust transit, to know that the train will be there when it is supposed to be, rain, shine, snow or sleet. When rail transit meets these quality standards, it is able to draw a significant number of travelers out of their cars. Over 60% of the riders of MetroLink in St. Louis previously drove to work alone. Vancouver's new commuter rail system, West Coast Express, found that 75% of its users were new to public transit. 75% of riders on Tri-Met in Portland, Oregon, the core of which is the MAX Light Rail system, could drive but prefer to use transit.[23]

Transit competitive trips, then, are trips for which high quality transit is available. When we consider that high quality usually requires rail, but that not all rail systems offer high quality, we begin to see where those 1% or 2% or 5% total trips numbers come from. The fact is, in today's America, very, very few people have high quality transit readily available.

One additional factor makes the availability problem even more clear. For transit to count as "available," it should be something people can walk to. If they have to take a low-quality transit system to get to the high-quality rail transit, many potential riders get filtered out.[24] More will drive to a train station or metro stop, assuming adequate parking is available. But for transit really to work, you have to be able to get to it on foot.

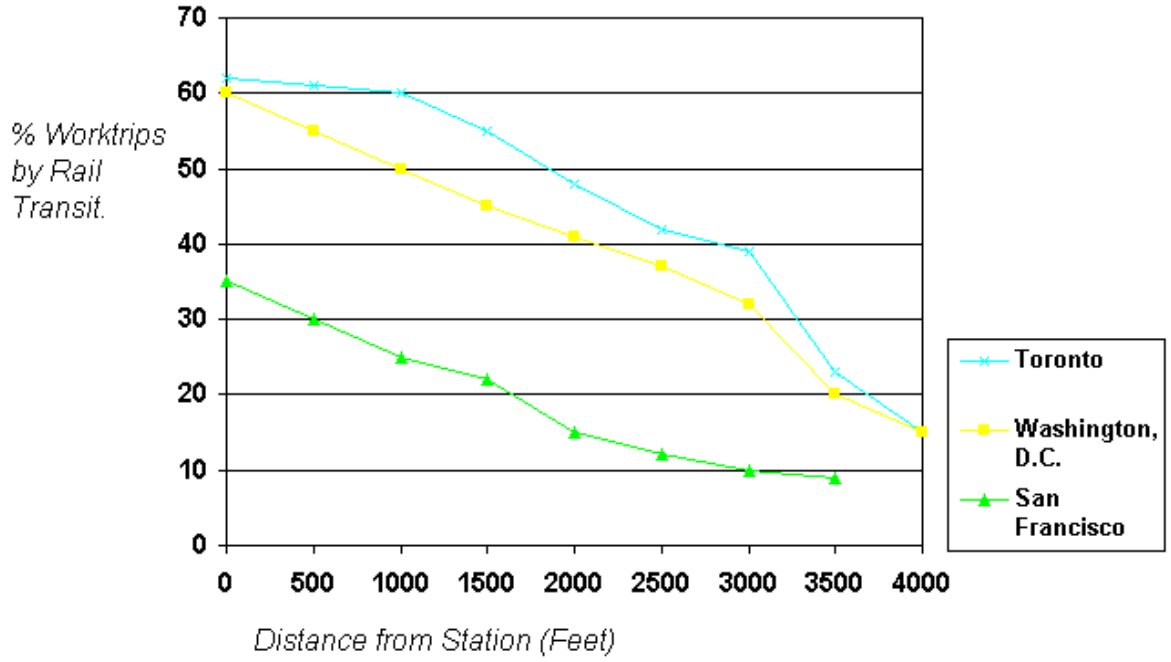
Chicago's Metra commuter rail system offers some useful numbers. Metra is a long-distance system. Nonetheless, in 1995 24.6% of Metra's inbound commuters walked to the station from their homes. 52.8% drove alone. A mere 3% took a bus. From the downtown station to their place of work, 85.5% walked and 10.7% used a bus (one quarter of that 10.7% was on private shuttles, not "omnibuses").[25] For shorter-range rail travel, the percentage of riders who depend on walking to the station from their home is generally higher, in part because parking at close-in stations in usually limited, expensive or both.

How far will people walk to get to a rail transit line? An interesting study, An Evaluation of the Relationship Between Transit and Urban Form,[26] addresses that question. Research done in Edmonton and Toronto, Canada, and published in 1982 "found the 'walking impact zone' to be as far as 4000 ft from the station,"[27] that is, some people would walk more than a half a mile to get to a rail transit station. But as the walking distance grows, the number of commuters using the rail system drops. The study includes a graph, "Market Share Related to Walking Distance," illustrating that point, drawn from Toronto, Washington, D.C. and San Francisco (BART).[28]

The 50% point appears to lie between 1000 and 2000 feet, based on the numbers from Toronto and Washington (San Franciscans seem to be a lazy lot, or perhaps it's all those hills). How many Americans reside within 2000 feet of a well-run rail transit line? We haven't found any numbers to answer this question, but we would bet the percentage is even lower than the 1% or 2% figure for total trips on transit. The point, again, is that people ride transit very little as measured by total trips because quality transit isn't there for them to ride. If you don't build it, they can't come.[29]

The definition of "transit competitive trips" has a third component. Transit can only compete for certain kinds of trips. Transit critics sometimes argue this is a recent development. We would suggest it is a historic constant.

Market Share Related to Walking Distance



If we turn to the past, say to the height of the streetcar era in the 1920s, we see that transit played an enormous role in the life of American cities. Not even the most ardent transit opponent questions that historical fact. But even then, transit was not used for all types of trips.

Before the automobile age, the great competitor of transit was walking. This goes back to the very beginnings of public transit:

> When most people lived within a few miles of their jobs, shopping, and recreational sites during the horsecar days, a considerable diversion from transit riding could be found in walking trips, fluctuating, of course, according to weather and season.[30]

In the 1920s, walking was the primary mode for a very important type of trip: shopping. In most residential areas, almost every street had a small store, usually part of someone's house, that sold basic items such as bread, milk and tobacco. Also in walking distance, usually on a major commercial street, were meat markets, bakeries, drug stores, hardware stores, shops that met people's everyday needs. Only major shopping trips, such as "going downtown" to a department store for clothing or furniture, were made by transit.

In addition, a great number of what are "trips" today were then needs met by home delivery. Instead of going to the grocery store, people phoned in an order and the groceries were delivered to their house, often by a boy on a bicycle. Most homes had the services of a milkman, bread man, ice man and "egg lady." Farmers came around in wagons or trucks in the summer, selling vegetables and fruits door-to-door. There were tens of thousands of "drummers" on the roads, selling brushes – remember the Fuller Brush Man? – vacuum cleaners, and a wide variety of other household goods house-to-house. And, of course, when you got sick, the doctor came to you, you didn't go to the doctor.

The point is that these types of trips, especially most shopping trips, were never transit competitive, not even in transit's heyday. Yet today, they make up the single largest category of trips. A 1983 study found that 35.6% of total trips nationally were for shopping, medical or dental visits or other errands. In comparison, only 22.8% of total trips were work related, including commuting.[31] A regional study (of California) done in 1980 put home-based shopping trips alone at 26.1%, again the largest source of home-based trips. 86.4% of those trips were done by automobile. Interestingly, the past still showed its hand: the next most common mode for home-based shopping trips was walking, at 8.3%. This study gave transit 3.7% of shopping trips.[32] Other studies generally agree: the 1983 report cited previously gave transit a 1.1% share of "Family and personal business," down slightly from 1.6% in 1977 (in 1983, 87.9% of such trips were by car).[33]

Two Chicago studies make it clear that when the trip purpose is shopping, not even rail transit makes a difference – which again is historically consistent, because in the 1920s, our baseline, most public transit was by rail, on streetcars. The first Chicago study, done in 1970, notes the rising importance of shopping: "Among the nonwork trip purposes, shopping trips exhibited the greatest change in relative importance between 1956 and 1970. In 1970, trips with purpose to shop constituted 12.6 percent of all trips, while in 1956 they amounted to only 5.5 percent of the total…. Accordingly, more shopping trips are being made, and many of the shopping trips that were formerly accomplished by walking (which would not be included in the survey) are being made by auto."[34] The latter point is doubly significant: the shift of shopping trips from walking to automobile was still underway in the 1950s and 1960s, and surveys tended not to count such trips when made on foot, thereby ignoring a large and important share of trips now made by car that were not taken from public transit.

Of the shopping trips made in 1970 in Chicago, 96.1% were made by car, in a city with extensive rail transit. In fact, only .3% were made by commuter (suburban) rail and .8% by rapid transit. Bus actually did better, at 2.6%.[35] The second study, with data from 1994, confirms the general picture. Looking specifically at CTA's Orange Line, it found that only 2.2% of trips were for shopping.[36]

The point is conclusive: shopping and many other types of personal trips are not transit competitive trips today, because they never were. Their nature as non-transit competitive trips goes far, given their high share of total trips, to explain the magic 1% (or 2% or 5%) of total trips made on transit. Further, if transit is today a "failure" for not carrying more trips of this nature, then it was just as much a failure at its peak in the 1920s – when everyone agrees it was a success!

What, then, are transit competitive trip purposes? The most important is trips to and from work, commuting trips. This, too, has a long history, reaching all the way back to transit's glory days. A study of transit in Boston in 1930 states:

> During this time (1917-1927), the annual number of revenue passengers remained more or less fixed…but the change in character of riding is significant. The number of Sunday and holiday passengers declined about 20 percent. This is to be accounted for by two things –the automobile and the increasing prevalence of summer vacation…. Since 1917…there has been an accentuation of the peak hour of the day. This is but another example that the railway service is becoming more and more a business service.[37]

The trend toward commuting as transit's main function has strengthened with time and is evident in any transit operation in the nation, sufficiently so that one example is enough. The 1994 study of ridership on Chicago's Orange Line found that 60.6% of the riders were riding to or from work. The next largest category, school trips, was a distant 13.6%.[38]

In fact, the question should be put the other way: is commuting the only type of trip that we may classify as transit competitive? Our answer is no, and again it comes from history. When electric railways – streetcars, interurbans, and that favorite New England hybrid, the country trolley – first came on the scene in the 1890s, one trip purpose they competed for with gusto and success was entertainment trips. Many an amusement park began as an enterprise of the local trolley or interurban line, which rang up fares by the thousand as it hauled people from the sweltering city to its roller coasters, ponds and picnic groves. "Trippers" brought their own picnics and simply got off the car at a country stop, found a pleasant meadow to lunch in and, not infrequently, walked part of the way back along the line for a constitutional. Streetcars hauled vast throngs to ball games and other public entertainments: the local baseball team was not the "Brooklyn Trolley Dodgers" for nothing. In fact, just taking an open-air car out into the country on a warm summer evening was entertainment, and many people rode for the sheer joy of it. Some companies had "party trolleys" with Victrolas, and early in the century, an enterprising pair of newlyweds made their honeymoon journey from Delaware to Maine entirely by trolley car. They even wrote a book about it!

Is it fair to argue that today's transit should be able to compete in the entertainment market? Most transit professionals would probably argue not. But we disagree. The same standard that leads us to argue against expecting transit to carry many shoppers – history – argues for measuring its ability in the recreation market. And there is evidence that it can again compete here, from the fast-growing popularity of "heritage" trolley lines, which people ride both for transportation and for fun, to the throngs carried to and from the Atlanta Olympics on MARTA, 25.3 million people in 17 days.[39] In Washington, D.C., 70% of all trips to the new MCI sports center are on transit.

Thus we have our definition of transit competitive trips: availability of transit X quality of transit X trip purpose (commuting to work or entertainment). Does transit work? The answer depends on how many transit competitive trips it carries. To see what that answer is, let's turn to three case studies.

Case Studies

Our three case studies are Chicago's Metra commuter rail system and the Light Rail systems in San Diego and St. Louis. We chose them because, first, each represents high quality transit. They are not merely rail systems, but well run rail systems. Each should be able to compete effectively for transit competitive trips.

Second, these systems represent the future. Virtually all new rail transit systems in America will be either commuter rail or Light Rail. At costs sometimes exceeding $100 million per mile, Heavy Rail "metros" have essentially priced themselves out of the game. The most recent attempt to build a Heavy Rail system from scratch, Los Angeles's Red Line, quickly degenerated into a technical, financial and political fiasco. While analysis in terms of transit competitive trips can certainly be applied to Heavy Rail systems, doing so would be little more than an academic exercise, because no more are likely to be built.[40]

Finally, we chose these three systems because they give us different perspectives in time. Metra, which was established as a successor to private railroad commuter service in 1983, is a relatively new commuter rail system, but not so new that its performance is mostly speculation. San Diego offers the oldest "new" Light Rail system, that is, Light Rail in its "second coming" after the decline and near-disappearance of the streetcar. And St. Louis offers the "latest thing" in Light Rail, a system very similar to what any city now considering Light Rail would get (or at least should get). Its one line represents a classic "starter line," and it was built for the eminently reasonable price of $20 million per mile. St. Louis has also pioneered the use of volunteer labor on a modern Light Rail line (as distinguished from Heritage Trolleys), which we believe is a highly important precedent.

Before we look at the first of our cases, we need to add a word about method of analysis. Our goal is to determine how effectively these three high quality systems compete for transit competitive trips, i.e., what percentage of such trips they carry. In a world of ideal statistics, that would be relatively easy. First, we would determine the size of the population served by these three rail systems, based on the "catchment area:" the number of people who can walk to a train station or trolley stop, plus the number who can drive and find parking, plus the number of bus seats serving the train stops (minus some number reflecting reluctance to take a bus, even to a train). Then, other statistics would tell us how many commuter or entertainment trips that population generates. We would count the riders on the trains or Light Rail cars, compare that number with the total, and have the percentage of transit competitive trips carried by transit.

Unfortunately, in the real world, it's not that simple. Not surprisingly, since we are introducing a new measuring standard in "transit competitive trips," we find the statistics have not been compiled that way. No one has attempted to count transit competitive trips. We hope someone will do so. Many a useful and publishable paper is to be found in doing so. But so far, as best as we can determine, it hasn't been done.

That leaves us rummaging about in the data as we find it. It is not a satisfactory situation, but it is not a hopeless one either. There are indicators, enough that it is possible to put together a useful picture. Let's take a look at our three cases and see what we find.

Metra

Metra is the nation's second largest commuter rail system, with twelve lines, 546 route miles, 1.6 billion passenger miles in 1996 and 240 stations serving more that 100 communities.[41] By commuter rail standards, Metra easily meets the availability test for transit competitive trips (Heavy Rail, Light Rail and bus systems generally have better availability than commuter rail, because they are more concentrated in the city's dense core area). As already noted, Metra also meets the quality test: its 97% on-time performance is the best in the country.[42]

So how does it do? In short, vastly better than the 1% or 2% or 5% figures usually cited. Chicago's Central Business District (CBD) remains the economic heart of the region. "More jobs are concentrated in downtown Chicago than anywhere in the region, and more than half a million people commute to those jobs every day.… More than 1.1 million trips are made each day to Chicago's central area.… Between 50 and 60 percent of trips made to the CBD are on transit (emphasis added)."[43] Further, "Commuter rail has become the most prevalent form of transit for CBD work trips, followed by bus and rapid transit."[44] Specifically, Metra carried 21% of CBD commuting trips in 1990.[45]

A look at transit trends in Chicago makes the success of Metra and the high quality service it represents even more clear. Between 1980 and 1990, "transit's CBD market share for work trips dropped from 67% to 55%."[46] The principal drop was in bus riders; rapid transit fell slightly; and

> Metra ridership grew by about 15% between 1985 and 1995.… Generally, all Metra zones have been experiencing steady growth since 1985.… Ridership in zones A and B (combined) increased by about 800,000 annual riders between 1990 and 1994. These are the zones closest to the CBD. This 14 percent increase may be due to switching of CTA (Heavy Rail) passengers to Metra to benefit from better fares and a better passenger environment.[47]

In other words, people were showing preference for one rail system over another, in part on the basis of quality. And Metra's success continues to build: the most recent ridership statistics show Metra ridership up from 73.4 million in 1996 to 75.2 million in 1997.[48]

The importance of transit to Chicago is further illustrated by considering what would happen if the 50 to 60% of trips to the CBD made on transit shifted to automobiles.

> The Chicago area has the fifth worst traffic congestion in the United States, and congestion is increasing annually. Traffic reduces worker productivity and increases likelihood of accidents. A typical driver in Chicago spends 34 hours per year sitting in traffic. Delays caused by congestion are costly for businesses, particularly those dependent on frequent and timely deliveries and "just in time" inventory. The annual cost of Chicago area congestion has been estimated at $2.8 billion.
>
> The Chicago region could not afford to build its way out of traffic congestion. There is not sufficient funding in Illinois to maintain the existing highway system.

> Building of new roads is becoming extremely difficult in the face of cost, environmental restrictions, and public opposition. In much of the Chicago area, roadway capacity could not be expanded without demolishing homes and businesses.[49]

One statistic brings transit's role home to anyone who knows the city of Chicago. "The Dan Ryan/Kennedy Expressways carry 200,000 vehicles per day, while parallel CTA/Metra (rail) lines carry 182,000 riders."[50] If all 182,000 rail riders drove instead, those Expressways would simply stop, gridlocked.

Metra's phenomenal success, as the largest and still-rising mode in a transit service that carries 50-60% of all CBD trips, suggests a question: just who is riding those trains? The answer helps dispel some of the false images of transit we criticized in our earlier study. Metra's riders are overwhelmingly white (86%), well educated (66.7% college graduates), professional/technical (47.9%) or managerial/business owner (27%), and very, very well off. In 1995, 24.9% of Metra's riders had household incomes of $100,000 or more. Only 5.6% had incomes under $25,000. And -- perhaps the definitive indicator of Metra's ability to compete for transit competitive trips -- 85.6% of Metra's riders had an automobile available for the trip, if they wanted to drive.[51]

Consistent with our definition of transit competitive trips, in 1996 92.7% of Metra's riders were on work or business related trips. What about entertainment/ recreational travel? On the surface, the numbers are not encouraging. In 1996, only 2.7% of Metra trips fell into this category, down from 4.4% in 1991 and up just slightly from 2% in 1985.

However, 20% of one-way ticket users were on a social or recreational trip, and 43% of all Metra riders indicated they had used Metra for recreation at least once in the previous six months.[52] Metra itself sees a major future for this market. Its Marketing Plan for 1997 states, "The recreational market serves as the main focus of our secondary market."[53] "Recreational travel promotions include discount coupons and weekend Family Fares extended to include weekdays during the summer. Popular suburban attractions include the Ravinia Festival, Arlington International Racecourse, and riverboat casinos."[54] It will be interesting to follow Metra's progress in gaining recreational riders.

Metra is a testimonial to what high quality transit can do in terms of competing for transit competitive trips. To its credit, it is not resting on its laurels. In 1991, Metra adopted a program called "Future Agenda for Suburban Transportation," or FAST. FAST will add service to 50 more municipalities and 100 stations, plus 280 route miles, expanding transit availability – the sine qua non of competitive success. It will also add up to 36,000 new parking spaces, beyond the 18,000 added since 1988. Parking is a major component of transit availability. And FAST will add a whole new dimension of quality service: speed. In addition to its 97% on time service, Metra will attempt to cover 50 miles in 45 minutes. In rush periods, that will make Metra faster than driving. Metra understands that for its upscale clientele, time is money.[55]

Speaking of money, how much does Metra cost? Metra recovered 58% of its operating expenses from the farebox in 1997 – the highest percentage in the country for a commuter rail service –

plus 5% of passenger revenues for capital financing. And it did so with fares that were less than 5% above 1983 rates.[56]

In sum, from every perspective, Metra does it right – and it works!

San Diego

While the San Diego Trolley and Chicago's Metra commuter rail system both run on rails, the similarity largely ends there. The two cities are very different. San Diego's CBD is much less important to the region than Chicago's. While Chicago's commuting market includes a large proportion of wealthy executives and managers, San Diego's is tilted toward immigrant laborers. San Diego is also very much part of California's well-known "car culture." To a visitor from an eastern city like Chicago, San Diego appears to be an endless string of suburbs, connected by roads.

The two rail systems are as different as the two cities. Metra is a long-distance, high speed commuter rail line. San Diego's Trolley is just that: a streetcar system, though one with a great deal of private right-of-way. Stops are frequent, runs are comparatively short and speeds are much lower: while Metra can talk of "50 miles in 45 minutes," the average speed of the San Diego Trolley is 21.9 miles per hour. San Diego recently began service on its own commuter rail system, the Coaster, but this study will focus on the Trolley.

The San Diego Trolley has much to tell other cities which are considering Light Rail. The San Diego Trolley is the first Light Rail system built in the United States since World War II. Its initial line, running from downtown south to the Mexican border opposite Tijuana, opened on July 26, 1981. The system has steadily expanded since, but its history now reaches back almost 20 years. That is enough time to look at initial promises with some perspective and see whether they have been borne out.

But first, we need to see how the Trolley meets our basic criteria: availability and quality of service. Availability presents a mixed picture. In downtown San Diego, it is excellent. Not only is the Trolley in easy walking distance of the main business district, it also directly serves the downtown entertainment and convention centers, the waterfront and the Santa Fe railroad station, which is the end of the line for the Coaster commuter train (in fact, the Trolley has two direct interchange stations with the Coaster). The only important downtown destination not served is the airport, a line to which is planned.

The Trolley's availability outside the downtown is mixed. The Orange (east) Line serves many suburbs, the Blue (south) Line fewer. The most recent line extension intersects the critical I-15 corridor, but that corridor is merely intersected, not served directly along its length. Nor does I-5 have a parallel Trolley line except for a 3.5 mile segment from downtown San Diego to Old Town. On the whole, the Trolley serves residents south and east of the city better than those to the north, where the more affluent suburbs generally lie; this is evident in the demographics of the ridership.

In terms of quality, the Trolley rates high overall. The equipment is simple but reliable and comfortable. Track quality is excellent. Stations are basic but adequate, and the "honor fare" system is easy to use. However, two factors detract from quality service. There is a perception of danger from crime. The actual crime statistics are not bad, but the mix of races and social classes on board some lines causes apprehension. This is a growing problem on transit nationally, reflecting decreasing order in the society as a whole; we will come back to this problem in the conclusion to our study.[57]

The other detractor is the time between trolleys, which generally run on a fifteen minute interval; the Blue Line has a 7.5 minute interval during rush hours between Old Town and the Mexican border. In the palmy days of the streetcar, many a system advertised, "Always a car in sight." New Orleans's St. Charles Avenue line, the last survivor from those happy times, still follows that attractive practice. When a rider has to wait up to a quarter of an hour before the wire sings and a car appears, he starts thinking of getting around some other way. Originally, much of the San Diego system was single track, which limited frequency. Now that it is all double track, frequency should increase.

There is a third way in which the San Diego Trolley does not quite measure up to Metra, though it is in no way San Diego's fault. The available statistics do not allow us to measure its success in attracting transit competitive trips quite so well. But we can find some useful indicators, and as with Metra, they point to success far beyond one percent.

A first indicator is predictive success. If we look at the original ridership predictions, then compare them with actual ridership, what do we find? Many transit critics have said that original predictions have virtually always been high, as a tactic to "sell" Light Rail. Then, the real numbers come in much lower.

According to a 1982 study, by 1995 the original Blue (south) Line of the San Diego Trolley should have been carrying from 28,000 to 30,000 daily riders.[58] In fact, by 1991 – four years early – it was carrying approximately 32,000 riders per day. Ridership was up to 34,000 per day by mid-1995 and to 51,135 per day in May 1998 (including 5,080 on the Old Town segment and 5,350 per day on the Mission Valley line). In 1991, ridership for the second line to open, the Orange (east) Line, also "exceeded expectations; ridership on that line was 24,560 per day in May 1998."[59]

A 1992 study offers a number of other indicators as to the Trolley's success in capturing transit competitive trips. "The Trolley has taken single-occupant vehicles off the road, while increasing transit ridership in its corridors."[60] In 1985, 29.6% of Trolley passengers previously drove alone; by 1990, that figure was up to 36.9%.[61] "41 percent of trolley passengers (36.1% in 1995) ride by choice, compared to only 26% (24.9% in 1995) for all transit users…. the data seem to indicate that the boost in choice riders for the region depends heavily on LRT (light rail) service."[62] The study "indicates that a higher proportion of trolley riders earn $30,000 or more than riders of the system as a whole. Taken together, these data seems to indicate that the trolley attracts middle- and upper-middle-income workers, even though they could drive to work."[63]

The 1992 study also has something to say about how the Trolley works in cost terms. Over its first ten years, as ridership grew continuously, the real cost per passenger dropped from $.91 to $.56, the cost per train mile fell from $6.82 to $5.60 and the cost per car mile went down from $3.47 to $2.23 (all figures in 1982 dollars).[64] And there is icing on that cake: "The closest the trolley came to breaking even overall was in FY 89 when the recovery ratio reached 95.31 percent…. In FY 89, 90 and 91, the South Line actually ran a profit."[65] In contrast, in FY 89 the San Diego bus system recovered 42.9% of its costs from the farebox.

What has happened since 1991? A recent report by the San Diego Metropolitan Transit Development Board shows an interesting picture. It compares the vital statistics of transit in San Diego – bus and trolley – in 1976, 1986 and 1996. The contrast between 1986 and 1996 is the most instructive, as Light Rail was in operation in both years. Between 1986 and 1996, service miles grew from 13,687,286 to 21,216,572 (23,990,000 in 1998). That growth included almost a doubling of the Light Rail system. This substantial addition of high quality rail transit worked its usual magic: ridership grew from 35,192,140 to 62,168,114 (72,744,800 in 1998) - substantially more, as a percentage, than the growth in service miles. The growth in total system ridership shows that rail riders are not merely people who previously took the bus; in fact, in 1990, just under 25% of Trolley riders formerly took the bus.[66] Finally, with all this growth, costs fell. Between 1986 and 1996, the farebox recovery ratio for the whole system – Light Rail and bus – rose from 44.15% to 52.5% (51.9% in 1998), and the subsidy per passenger declined from $.76 to $.69 ($.71 in 1998).[67]

How does the San Diego Trolley perform in competing for the two classes of trips that transit should be able to compete effectively for, trips to work and recreational trips? 44.8% of riders are using the Trolley to go to and from work. This compares to 40.6% of riders of the system as a whole, indicating the Trolley competes for commuters slightly better than the bus system.[68] We must say we would expect this difference to be higher.

The explanation is not inadequate parking. 47.9% of Trolley patrons walk to the Trolley stop, which is consistent with our concept of availability. 13.9% drive to the Trolley, compared with only 2.6% who drive to take a San Diego Transit bus.[69] This is consistent with rail transit's superior ability to draw riders from choice.

But in fact, not many people drive to the Trolley. With an average weekday ridership of 75,692 (in May 1998), the San Diego Trolley offers only 5800 parking spaces. And, on average, only 25% of these spaces are filled.

A possible explanation is reflected in another key measurement of the San Diego's Trolley's ability to compete: the percentage of patrons who are riders from choice. In 1995, only 36.1% of the Trolley's riders had a car available.[70] That is less than half the figure for Chicago's Metra. We suggest the reason is the demographics of the area served. As noted previously, the San Diego Trolley offers little service to the wealthier suburbs, which generally lie north of the city. Those suburbs are more likely to generate park-and-ride business, as Metra's experience demonstrates.

If we look at our final indicator and ask how San Diego's Light Rail system does in competing for recreational trips, we find a surprise: it does remarkably well. In 1995, almost 18% of all trips on the Trolley were for recreation or entertainment.[71] A more recent measurement comes from Super Bowl Week in 1998, when nearly one million people used transit to get to and from Super Bowl events.

> During the week leading up to the Super Bowl, San Diego Trolley estimates well over 400,000 riders used the trolley to go to Super Fest, the Players' Party behind the convention center, and the NFL Experience in Mission Valley…. Platforms at key stations were filled with waiting riders, some eight to nine deep. San Diego Trolley put extra trains into service, with frequencies approaching every three minutes, and demand was so high, San Diego Trolley provided non-stop service round-the-clock both Friday and Saturday nights into Sunday morning…. On Super Bowl Sunday…Estimates are that San Diego Trolley carried more than 30,000 fans (twice what had been predicted) to the stadium by the 3:18 kickoff…. As the game went into its final 28 seconds, with spectators still in their seats, San Diego Trolley had 21 train sets standing by in pocket tracks and nearby locations. Within 30 minutes after the gamed ended, the system had sent 14 trains out of Qualcomm Stadium, packed with departing fans.[72]

Shades of 1910! This picture virtually duplicates the scene at any ball game, amusement park or church revival meeting at the height of the streetcar era. The fact that it can be duplicated in 1998 is clear evidence that rail transit can compete for entertainment trips. It is doing so not only in San Diego, but in Cleveland, in Atlanta – where MARTA's rail system was the transportation backbone of the Olympics – and wherever else rail serves major recreational and entertainment locations.

In sum, while the data is less solid for the San Diego Trolley than for Metra, it is clear that in San Diego Light Rail is competing for transit competitive trips more effectively than are buses. More than a third of the Trolley's riders have a car available but choose to take the Trolley instead. As Trolley service is expanded in the northern suburbs, that figure should rise. And the Trolley's recent gains in ridership – in 1997, it carried 19.5 million people, the highest number in its history – show that it is competing ever more effectively within those portions of the metropolitan area that it serves today.

St. Louis

San Diego offers a look at the oldest post-war Light Rail system in the country; St. Louis is one of the newest, having opened in 1993. Known as MetroLink, the single 18-mile line runs from East St. Louis, Illinois, across the Mississippi River to St. Louis, Missouri, through the downtown and out to the airport. It serves many of the city's central attractions, including the historic riverfront district at Laclede's Landing, the Convention Center, Busch Stadium, the Kiel/Civic Center, Union Station (redeveloped as shops, restaurants, and the Hyatt Regency St. Louis), Washington University Medical Center, the University of Missouri-St. Louis and the Lambert-St. Louis International Airport. A fleet of 31 electric Light Rail Vehicles provides service every seven minutes during rush hour and at 10 to 15-minute intervals otherwise from

5am to 1am daily.

MetroLink offers service of the highest quality. Since opening day, trains have been 99+% on time. Cleanliness is to Swiss standards. Among its amenities, one is unique: a corps of unpaid volunteers mans stations to provide information and assistance, especially to first-time riders. Perhaps most important, MetroLink goes where people want to go – something not always true of rail transit lines in other cities.

MetroLink was built for the remarkably low price of $20 million per mile, total system cost – track, overhead wires, cars, everything. Part of the reason for the low price – freeways in cities can easily run $100 million per mile – was highly imaginative use of existing facilities. MetroLink crosses the Mississippi River on the Eads Bridge, built in 1874. It passes under downtown St. Louis in an old railroad tunnel, opened at the same time as the bridge. Most of the rest of MetroLink runs on the right-of-way of the former Wabash Railroad. Both in its construction and its operations, MetroLink offers a model for other cities considering Light Rail. In fact, if MetroLink does not offer its services as a consultant, it should.

MetroLink's availability is excellent in terms of destinations. However, the line does not serve many residential areas directly (planned extensions will change this). And parking is limited, currently to about 3000 spaces.

Yet from its opening day, MetroLink has been highly successful, carrying far more riders than projected. An early study, done only a year after the line opened, noted that

> Ridership graphs (for all public transit in St. Louis) swung from a long trending downward slope to a sudden and steep upward climb with the introduction of the multi-modal transit system. Total ridership on Bi-State's bus, rail, paratransit system for Fiscal Year 1994 was 45.6 million commuters, an increase of 21 percent over the past fiscal year. The reason for the increase was the popularity of MetroLink which brought new customers scurrying to public transit.[73]

Specifically, "Bi-State projected 13,000 MetroLink riders for initial service, increasing to 17,000 at the end of the first year. By July 1994 – the twelfth month of service – weekday ridership was 44,414. Average Saturday and Sunday ridership for July 1994 was 50,725 and 50,623."[74] So much for the critics who claim that Light Rail systems always carry fewer people than projected.

Absent better data, one of the strongest inferences that a transit system is competing effectively for transit competitive trips is the proportion of riders from choice, and, more broadly, "upmarket" passengers. "The survey (in 1993 of public transit riders in St. Louis) substantiated past findings in that patrons use buses due to limited access to automobiles and to avoid traffic congestion, while most MetroLink passengers use Light Rail for economical reasons and are customers of choice."[75] In a 1997 survey, only 27% of MetroLink's passengers either did not drive or had no car available, compared to 61% of bus passengers.[76] 38% of bus passengers owned no car, but only 9% of rail riders; conversely, 55% of rail patrons owned two or more cars, but only 32% of bus passengers.[77] 34% of train passengers were black, and 62% were white; for buses, the numbers were almost reversed, with 63% black and 32% white.[78] 59% of

bus passengers had incomes below $25,000, compared to 24% of rail riders; 32% of the latter had incomes over $55,000, compared to 8% of bus patrons.[79] The survey makes clear the relationship between quality transit and upmarket passengers: Light Rail passengers gave satisfaction percentages in the 70s, 80s, and 90s, compared to the 50s and 60s for bus riders.[80]

Nor can it be argued that MetroLink has merely shifted riders from buses to trains. In 1993, the year the rail line opened, "79% of MetroLink passengers were new to public transit."[81] In a 1995 survey, 85% of MetroLink's passengers had not previously used the bus.[82] In fact, bus patronage rose when MetroLink opened, and between five and nine percent of local bus riders started using transit because of Light Rail.[83]

These last numbers point to a surprising fact: in St. Louis, people do seem willing to use a bus to get to a train. The 1995 passenger survey notes, "The rate of transfer from train to buses has moved from 26 percent in 1993 to 43 percent in 1995."[84] One reason may be that St. Louis did an unusually thorough job in rerouting its bus lines to become feeders to the rail system. Professor William D. Warren notes, "Rail transit systems should be networked with existing bus services, a feature that is often absent or ineffective in old and new rail systems. MetroLink interfaces directly with 46 Bi-State bus lines…. Many bus routes have at least two station connections with MetroLink."[85]

The data make it clear that MetroLink has greatly enhanced the ability of St. Louis' transit system to compete effectively for transit competitive trips. Les Sterman, Executive Director of the East-West Gateway Coordinating Council, the region's official Metropolitan Planning Organization, says, "It's reinvigorated the public transportation system, which was an object of scorn and lightly used by people who had no choice. Now, MetroLink is used by all kinds of people from all economic strata."[86] The trends noted in earlier studies have continued. By FY 1997, transit ridership in St. Louis was up to 53.4 million, a 41% increase since MetroLink opened. 90% of that increase was due to Light Rail, yet bus ridership also rose by one million. Light Rail has also proved economical to operate. In FY 97, the farebox recovery rate for MetroLink was 41.8%, compared to 20.3% for the bus system. Light Rail's cost per passenger was 22 cents, compared to 68 cents for bus.[87]

How effectively does MetroLink compete for work trips and recreational trips? The 1997 riders' survey showed 69 percent were commuting to work, a respectable figure. On the other hand, the same survey found only 7% of trips were for recreation, down from 20% in 1995. Here, the earlier figure may be more representative; the 1997 survey was taken in April, a time when there are very few sporting events or tourists. The 1995 survey was taken in the summer.[88]

Other evidence points to substantial recreational travel:

> For each St. Louis Rams football game, Bi-State buses and trains carry 20% to 25% of game attendance, one of the highest market shares in the NFL (3000 on buses and 15,000 on trains). As a result of the destination orientation of the existing system and special event marketing, Light Rail ridership remains high throughout the work day. On weekends, Saturday ridership averages 84%, and Sunday 56%, of weekday ridership. This ridership pattern is in sharp contrast to

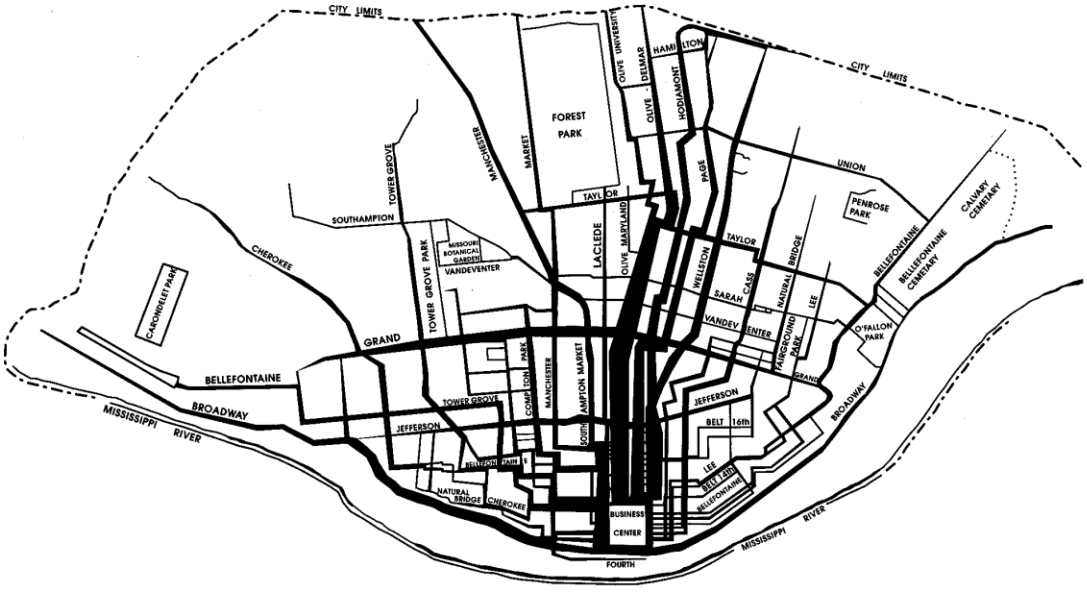
most other Light Rail systems which are often underutilized outside the morning and afternoon peak commuting periods.[89]

St. Louis offers a final way to assess the ability of Light Rail to compete for transit competitive trips. Here, history reaches out her skeletal hand, taps us on the shoulder and asks, "May I draw your attention to a surprising fact?"

In 1886, St. Louis installed its first cable car line (many cities, not just San Francisco, once had cable cars). The cable cars ran from downtown, at Sixth and Locust Streets, northwest to Morgan Street. There, they connected with a narrow-gauge steam railroad that ran far out into the countryside, ending at the town of Florissant.

The fact that this corridor was the first to be converted from horsecars to cable cars suggests that it was the city's most important artery. In 1891, the same line became the first in St. Louis to be converted to electric traction. Astoundingly, not only was the cable line converted, but the narrow-gauge steam railroad as well, resulting in an eighteen mile electric railroad – the longest in the country.[90] The conversion further attests to the corridor's importance.

Daily Flow of Traffic on Streetcar Lines, 1926



Proportionate volume of travel is represented by the width of the lines.

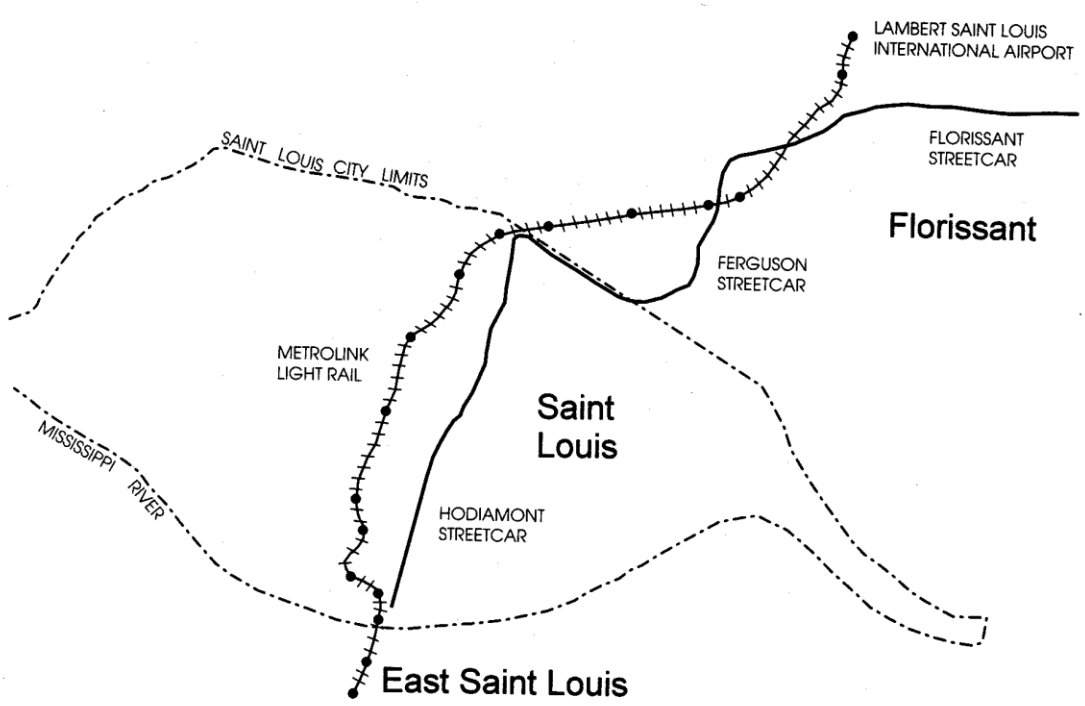
By the mid-1920s, at the height of streetcar patronage both in St. Louis and in the United States generally, a portion of this corridor, the Hodiamont line, was one of the five principal streetcar routes in the city. All five routes ran parallel to one another, closely grouped, toward the west-northwest from downtown. The map "Daily Flow of Traffic on Streetcar Lines, 1926" shows the grouping clearly.[91]

What do we find if we compare St. Louis's early transit corridor with MetroLink? Here is history's first surprise: MetroLink, which opened in 1991, is exactly the same length as the city's first electric line, eighteen miles. Further, it runs almost parallel to that first line, from beginning to end, usually less than a mile away – that is, within walking distance.

It is astonishing that two lines separated by precisely a century in time should be so similar in length and location. Mere coincidence? Maybe. But maybe not. Cities, like other great institutions, have remarkable continuity over time, continuity that often escapes the usual models and analysts.

Whatever the cause, the fact of these two lines' similarity is beyond dispute. Again, the map "MetroLink Route Compared to Early Streetcar Line Route" is helpful.

MetroLink Route Compared to Early Streetcar Line Route



What about ridership? Here, clearly, the historical parallel must break down. St. Louis in the 1990s is vastly different from St. Louis in the 1920s. The population of the city proper is smaller; suburban population is greater. The city center is less important in terms of jobs, shopping and other activities. In the 1920s, the streetcar was the principal means of local transportation, a role long since assumed by the automobile. MetroLink can hope to carry only a tiny fraction of the ridership of the earlier streetcar line at its heyday. Right?

In 1925, the three lines which together parallel MetroLink – Hodiamont, Ferguson and Florissant[92] – carried 25.5 million passengers. 20.5 million of that total rode the Hodiamont line, line 15. Discounting for segments of the other two lines not paralleled by MetroLink, the total

ridership in 1925 on parallel lines was about 23 million.[93] In FY 1997, the total ridership on MetroLink was 14,485,500 – almost two-thirds of the total on the parallel streetcar routes at the height of the streetcar era![94]

No one would argue that the streetcar was unimportant to St. Louis in 1925 or that it carried only a tiny fraction of transit competitive trips. So how can it be that Light Rail today is unimportant, unsuccessful or unable to compete, when it carries two-thirds of the ridership it carried in 1925 in the area it serves?

Nor is the statistic a fluke. We can also compare ridership across the Eads Bridge in 1925 and 1997. In 1925, that bridge carried a streetcar line, as today it carries MetroLink. In 1925, streetcars carried about 21,000 people across the Eads Bridge daily.[95] In 1997, MetroLink carried 9,220 daily over the Eads Bridge, almost half the 1925 ridership.[96]

And we can compare totals. In 1925, St. Louis's streetcars carried about 800,000 people each work day on 463 miles of single track.[97] In 1997, MetroLink carried 42,000 weekday riders on 36 miles of single track,[98] or about one-twentieth the ridership on about one-thirteenth the track.

However we compute it, we see roughly the same picture: despite enormous changes in the city of St. Louis and the displacement of the streetcar by the automobile as most people's primary means of travel, Light Rail now carries between one-half and two-thirds the ridership it did in 1925, in the area served. As a sober, scholarly historian might put it, Wow! Clio sits back with a quiet smile on her face, her mission accomplished and the critics confounded.

Taken together, what do our three case studies say to our basic question, does transit work? They establish beyond question that when we measure transit with the correct yardstick, transit competitive trips, it measures up well. Chicago's Metra, the San Diego Trolley and St. Louis's MetroLink Light Rail line all carry far more than 1% or 2% or 5% of transit competitive trips. We cannot determine exactly what percentage of transit competitive trips they do carry, because the question has not been asked this way before. As we said earlier, one of the purposes of this paper is to encourage the field work and other research necessary to answer the question definitively. But if we don't know precisely what the answer is, we know what it is not: the tiny number assigned by transit critics.

Not only is their answer wrong, so is their question. It is useful to review why it is wrong, why "total trips" is not a useful measurement in light of our case studies. Total trips does not consider whether transit is available. Metra service is eagerly sought throughout the Chicago area, but not everyone has it. Nor does total trips take quality into account. Both San Diego and St. Louis show riders' marked preference for rail over buses, but most people in both cities have nothing but bus service available near their homes. Total trips does not take trip purpose into account. When we do so, we find quality transit competes effectively for the kinds of trips transit has always carried, including not just commuting but also recreational travel. At the San Diego Super Bowl, both teams had to be "trolley dodgers."

In contrast, transit competitive trips is a real-world measurement. It only measures transit where transit is able to compete, that is, where it is available. It recognizes that all transit is not created

equal, that many people are willing to take a train even when they have a car available, but they are not so willing to take a bus on a traffic-clogged street. We may wonder why this is so, and some may lament the fact, but it is a fact and our measurements must reflect it. Finally, transit competitive trips recognizes that transit never competed for certain types of trips, and it is unreasonable to expect it to do so now.

So, does transit work? Yes, it does. Each of our case studies shows independently, and all together demonstrate conclusively, that high quality rail transit can compete effectively for work and recreational trips in the area that transits serves. We would add that buses on busways and in other "express" service can also compete for transit competitive trips, though perhaps not so as well as rail. The plain fact is, a lot of Americans have always liked riding trains and trolley cars, and they still do. They like it well enough to leave their car at home or in a parking lot when there is a train or trolley they can ride.

Making Transit More Competitive

In our previous study, Conservatives and Mass Transit, we argued that there were sound reasons for conservatives to support mass transit. However, we also said that transit advocates and officials should listen to some conservative critiques of the industry, because they offer ways transit could be improved. Now, having argued that "transit competitive trips" is the correct measuring stick for determining if transit works, we again want to turn the telescope around. We believe the transit industry could do better than it does in competing for those trips. To see how it might do so, let's look at each of the elements that make up our definition of transit competitive trips: availability, quality and trip type.

Improving Transit's Availability

As both this study and its predecessor have emphasized, all transit is not created equal. If our goal is to attract riders from choice, buses on city streets are not sufficient. Therefore, when we speak of transit availability, we mean availability of transit people may actually want to use. That means rail or express bus service.

The easiest and most efficient way to improve the availability of quality transit can be stated in five words: more parking at transit stations! St. Louis's experience notwithstanding, we believe that in most places many potential riders from choice are not willing to take a bus to get to a train, nor to take a local bus to get to an express bus. If the distance is such that they cannot walk, they will either drive to the train station or express bus stop or not use public transit at all.

Yet how often do we see rail systems costing hundreds of millions or even billions of dollars skimp on parking to save a few centimes! Soon after the system opens, it reports – as if with pride – that all the parking spaces at its outlying stations are filled by 8 AM or perhaps even earlier. Frankly, at that point someone should be fired, or sued, or – happy conservative thought – exiled. That system may be turning away thousands of customers.

Why does it happen? Part of the reason may be that transit authorities and consultants have it backwards. They think they look good if all the available parking is occupied, but may be

criticized if some sit empty. The opposite is the case: parking should be sufficient so that at any time of day, anyone wanting to use the system knows that if they drive to a station, they will find a place to park. In fact, we should make a "planner's rule" of it: parking is only sufficient when some spaces are always empty.

But we think something else is at work here as well: a liberal mindset. Liberals believe that people should be willing to take the bus. The "omnibus" is, by its name, "for all," and liberal egalitarianism is offended by the notion that some people don't see themselves as merely "all." Who do they think they are, anyway, wanting to drive their Volvo to the train instead of taking the "sensible, environment-friendly" bus?

As conservatives, we insist on the Reality Principle. "They" are potential customers of transit, and if we want to turn them into transit users, we must meet them on their terms. That means parking spaces at rail transit stations. So the first suggestion we would offer for improving transit's ability to compete is parking, parking and more parking.

A second challenge is more difficult: providing more rail transit. We recognize that buses on busways and other express bus service can offer quality transit, and we encourage transit systems to provide more of both. But in most cities, we believe riders from choice will respond better to rail service than to any variety of bus. Further, as the costs in St. Louis illustrate, rail can be substantially more efficient to operate than bus service.

The problem with rail service is capital cost. Here, we think an old conservative habit can be helpful: look to the past.

As we said in our first study, "hi-tech" can be the enemy of rail transit. Both of the authors have operated electric rail vehicles built before 1910 that have balancing speeds in excess of 80 miles per hour. Both have ridden PCC streetcars and rapid transit cars that provide smooth, quiet, comfortable rides with 1930s technology. Why must Light Rail systems so often overbuild track, stations and wiring and pay $3 million for modern Light Rail Vehicles when older technologies and approaches, vastly simpler and less expensive, did the job just fine?

We don't have to theorize about the value of history in lowering rail transit costs. Heritage Trolley lines in a growing number of cities offer concrete examples. In Dallas, Memphis and New Orleans, Heritage Trolley lines designed as tourist attractions are providing useful transit service to local residents. Those lines are built and operated at a fraction of the cost of modern Light Rail systems.[99]

A typical transit consultant might say, "But those are only downtown circulators. You couldn't run a regular suburban Light Rail line that way."

Why not? Have we forgotten the Chicago, Aurora and Elgin? The North Shore Line? Those lines operated into the 1950s and 60s, carrying large numbers of people with high reliability and comfort, using equipment that in some cases dated to the wooden car era. Let us offer another rule of transit planning: What worked then can work now.

And, we would add, it might work better. Riders might prefer the ambience of a classic interurban car to the plasticized blandness of a "Standardized Light Rail Vehicle." Why else is New Orleans building new streetcars to a 1920s design, using trucks, motors and controls from the Czech Republic?

In our view, volunteer labor also has potential for making Light Rail more affordable. Unlike buses, trains and trolleys draw large numbers of fans. Many are willing to work as well as ride. St. Louis again shows the way forward. Part of the reason St. Louis now has MetroLink is the work done over many years by a volunteer group, Citizens for Modern Transit. This organization worked tirelessly to educate local people about Light Rail and its benefits. Once the referendum approving MetroLink passed, CMT did not disband. On the contrary, its members now work as volunteers throughout the MetroLink system, providing information and guidance to riders. They are especially helpful to first-time riders, and their friendly presence helps first-timers have a good experience and return as regular customers.

Commuter rail is currently the fastest-growing segment of the rail transit industry, largely because capital costs are kept comparatively low and start-up time is reduced by use of existing tracks. A new generation of rail buses can reduce start-up costs further. Rail buses are simple versions of the classic "Budd car," or Diesel Multiple Unit rail vehicle. Some are nothing more than bus bodies on rails. Europe now offers a flood of new designs of rail bus, many quite innovative and comfortable, and some inexpensive.

Most American cities have overbuilt rail systems reaching out from the city center, dating to the days when everything moved by rail. Often, these lines have surplus capacity. Just as cities are wise to begin Light Rail with a single "starter line," so rail bus service on some of these existing railroads can be a good "starter" for commuter rail. As the passenger count builds, regular commuter trains can be introduced, and the rail buses can be shifted to new routes. This way, initial costs are kept low, and expansion comes as a political support base is built among people who use the new service.

Remember, many Americans have never even ridden on a train. You can't expect them to support spending public money on trains until they have a chance to ride one. Rail buses can give them that opportunity at small up-front cost.

Improving Transit Quality

Offering rail transit service is central to quality transit. But rail does not automatically equal high quality. And there are ways the quality of bus service can be improved – including buses on city streets.

At first glance, the "basics" of quality rail service seem obvious enough: running on time; clean cars and stations; polite, helpful train crews, etc. A few things should be "basic," but are often overlooked: the need for comfortable seats, destination signs easily read at a distance and in all light conditions (LED signs do not meet this test) and the enforcement of rules against playing radios, including earphones cranked up to the point where the sound fills half the car (and not with Bach or Mozart).

The earphones problem touches on what must become one of the basics, maybe the basic: order. A major reason people drive is that the private automobile is private. It insulates its occupants from the disorder of an increasingly disorderly society.

When people travel, they want predictability, security and sameness. Put bluntly, they want to be sure that they won't have to sit near someone who stinks, dresses or behaves bizarrely, or projects an air of menace. The private automobile assures them of that. Unless public transit can do the same, they will drive.

The beginning of order is safety from crime. Most transit authorities understand that. The problem is that police are expensive. One transit cop can easily cost more than $50,000 per year in wages and benefits. If a transit authority employs the number of police needed to give both real security and the perception of security, it can quickly find its operating ratio heading for the ceiling. But if it does not do so, it quickly loses its ability to attract riders from choice.

Is there a way out of this box? Perhaps there is: the Police Corps. The Police Corps is an idea now in its initial trial stage in several cities, including Baltimore, Maryland. Modeled on ROTC, the Police Corps offers college scholarships in return for a few years of service as police after graduation. Currently, Police Corps graduates are to be used solely for community policing, that is, walking a beat in a neighborhood the officer can get to know. We strongly support community policing, and would not wish to take officers away from it.

But could not transit reasonably be defined as part of the community? The same logic applies: an officer who always works the same bus or rail route gets to know the regular riders, becomes known and trusted by them and learns who the usual troublemakers are. He is likely to be more effective in maintaining order than a transit cop who works the whole system and is only called once trouble has erupted. From the rider's standpoint, that's too late. The purpose of community police is to stop trouble before it happens, which is precisely what quality transit requires.

Police Corps officers are not free, but they cost substantially less than regular police.[100] If the transit industry made a bid to become part of the Police Corps community policing program, it might find a way to afford the police presence it requires without breaking the bank. Other means can supplement: private security guards, who also cost less than regular police; offering free passes to all police who live and work in the area served and advertising their presence; and offering free rides to any public safety personnel in uniform, including firemen, EMS technicians and military personnel. A public safety uniform always connotes order and assistance, even if the person in uniform is unarmed.

And order is broader than mere safety from crime. Order includes the absence of beggars and bums (excuse us: "the homeless"), no yelling, running hordes of schoolchildren and no "bad boys in the back of the bus."

There is one simple action that would allow transit to offer far greater assurance of order to riders from choice: separate first class accommodation at a higher fare. Amtrak has recently started offering this, with its new "custom class" service. More and more Amtrak trains carry a custom class car. For a slightly higher fare, the passenger gets some minor amenities: better

seating, free newspapers, coffee and soft drinks. More important, he gets assurance of a better class of fellow passenger. Not surprisingly, custom class service is proving very popular.

Commuter trains could easily offer custom class service modeled on Amtrak's. Heavy Rail systems, which virtually always run trains of two cars or more, could designate one car on each train as custom class, with a different ticket (in the case of farecards that are read automatically, this could be a paper supplement, checked by roving inspectors). Light Rail systems could do the same in rush hour when running in multiple. And in off-peak periods, perhaps one train an hour could be custom class only; off-peak passengers often have the time to plan what train they will take.

The custom class concept can also be applied to buses. Ironically, if you visit some of the former Communist countries in eastern Europe, you will find separate first and second class buses. The first class buses cost more to ride, offer some minor amenities such as curtains at the windows and will stop anywhere on the route, not just at designated bus stops, to pick up or discharge a passenger. The latter service is particularly useful to the elderly – as is the assurance that they won't be surrounded by screaming kids.

There are possible variations on this theme. At a transit conference, the head of one midwestern city's transit service said to an author of this paper, "The elderly are often reluctant to take the bus, because they are afraid the kids will hassle them. I've thought about running buses off-peak where you have to show a Senior Citizen I.D. card to get on." Our answer was, "Do it!."

"Elder Buses," "custom class" cars and the like permit public transit to offer what the private auto offers: isolation from disorder. People using such services can buy what they want most, assurance that they will be traveling with other people like themselves. Transit must offer that assurance if it wants riders by choice. If the Politically Correct crowd howls, tell them to pound sand. Most of them don't actually ride the bus or train anyway. They just think other people should.

Type of Trip

We expect work and recreational travel will remain the bread-and-butter of transit. With regard to work trips, a change in Americans' behavior may offer an opportunity. Increasingly, people combine trips to and from work with other purposes: dropping off or picking up the kids from day care, shopping and other errands. A study of Metra notes:

> The relationship between the commuter, the station and surrounding business has changed. The new relationship was tested against a "null hypothesis" that commuters engage in few activities other than boarding or alighting the train, and seek to get to their destination as quickly as possible without interruption or distraction. The findings of this study prove that the null hypothesis is false. The commuter does have a strong relationship with the station and activities around it, although that relationship is quite different from what it was in the past.

> In the past, the role of "commuter" and "shopper" were performed by different individuals….
>
> At present, the "commuter" and "shopper" are often the same individual…. Although the distances between home, work and shopping have expanded, commuters now focus on condensing the time devoted to those functions. Convenience is now an overriding consideration. As a result, the household shopping function has been brought back to the station area.[101]

As noted, none of the three systems surveyed does well in attracting shopping trips. In 1996, only .7% of all trips on Metra were for shopping.[102] For St. Louis's MetroLink the figure is 5%,[103] and for the San Diego Trolley 12.9%.[104] We do not expect substantial improvement, because as we noted in the beginning of this study, most shopping trips were never made by transit.

But if shops, day care centers, dry cleaners and other sources of errands are concentrated at suburban rail stations, then these errands can be performed as part of the commuter's work trip. That trip always involves a mode other than the train: walking, car or bus. The errands can be done at the point of modal transfer, the station. While this does not benefit the transit system directly, nor show up as a shopping trip on transit, it does help serve transit's social purpose of decreasing traffic. Shopping trips that are combined with the journey to or from work diminish other shopping trips, which in turn reduces the number of cars on the roads. And this benefit can legitimately be included by transit spokesmen when discussing the merits of transit.

Can transit systems work to encourage the practice of combining work trips with other trip purposes? Certainly they can. They can consider the availability of other services or land on which to build them when choosing stations locations. They can work with local planning and zoning commissions and chambers of commerce to provide such services at transit stops. And once again, they can provide adequate parking: most people who intend to shop, drop off or pick up children, or perform other errands at the transit stop will want to drive to that stop. Some transit systems are already thinking this way. In rebuilding the Windermere station on the Red Line, RTA authorities in Cleveland included a day care center.

Conclusion

Quality transit works, and we can see that it works when we measure it correctly, by the yardstick of transit competitive trips. In our view, quality transit works so well that, if we can keep the cost of providing it within reason, America could see another "transit era," a second coming of public transit, especially rail. One study of the streetcar notes that:

> not every mode of transport is necessarily on its way to extinction after decline has set in. Some do experience a "second youth" and the beginning of a new life. Such a second life may be the result of qualitative changes within the system, or of external circumstances favorable to new growth, or both.…[105]

The external circumstance is present, in the development of traffic conditions that make driving a nightmare in more and more American cities, and not only in rush hour. The potential for qualitative changes within the system is also present, in that much can be done through imaginative ideas – not all of which are expensive – to improve the quality of public transit, to break out of the mindset that transit is only for the poor who have no other way to get around and to go for the rider from choice. If transit authorities will only adopt the old motto of Marshall Fields department stores and "Give the customer what he wants," a second Golden Age of public transit could lie before us. Carpe diem!

Endnotes

[1] Report on Rapid Transit For St. Louis, submitted to the Board of Aldermen, September, 1926, p. 34.

[2] A Mobility Comparison Of Investment In Highways And Mass Transit, The Road Information Program, Washington, D.C., 1992, p. 7 & 11.

[3] "Public Transit: A Worthwhile Investment?," By John Semmens, in K.C. Jones Monthly, #143, July-August, 1997, p. 10.

[4] Myths and Facts of Nation's Transit Policy by Peter Gordon, Reason Foundation Policy Insight No. 131, October 1991, Table 6, p. 13. The final figure from the 1990 NPTS was 2.2% and the 1995 NPTS gives 1.8%.

[5] False Dreams and Broken Promises: The Wasteful Federal Investment in Urban Mass Transit, by Jean Love and Wendell Cox, CATO Institute Policy Analysis No. 162, October 17, 1991, p. 8.

[6] Ibid., p. 8.

[7] Myths and Facts of Nation's Transit Policy, op.cit., Table 6, p. 13.

[8] "Despite Huge Outlays, Transit Systems Fail to Lure Back Riders," by Frederick Rose, The Wall Street Journal, June 29, 1993.

[9] Journey-To-Work Trends in the United States and its Major Metropolitan Areas 1960-1990, by Michael A. Rossetti and Barbara S. Eversole, USDOT, Nov. 1993, Table 2-1, p. 2-2.

[10] New Perspectives in Commuting, by Alan E. Pisarski, USDOT, July 1992, p. 6.

[11] National Personal Transportation Survey, Summary of Travel Trends, Federal Highway Administration, March 1992, p. 22.

[12] Commuting in America II: The Second National Report on Commuting Patterns and Trends, by Alan E. Pisarski, Eno Transportation Foundation, Inc., Lansdowne, VA, 1996, p. 63.

[13] Life of Johnson by James Boswell, entry for 6 August, 1763 (Oxford University Press, Oxford, 1983) p. 333.

[14] Commuting in America II, op.cit., p. 34-35.

[15] There is no question that transit use has multiple, profound effects on highway congestion. One of the most important is travel time: "the time it takes to complete a journey, door-to-door, tends to be the same across different modes of transportation. Furthermore, it is the journey time by the transit mode that seems to determine the journey time for other modes." See The Congestion Management Role of Transit in Strategic Corridors, by Daniel Brod and David Lewis, Transportation Review Board Paper No. 971393, presented at the TRB Annual Meeting, January 12-16, 1997.

[16] Annual Housing Survey, 1983, Part A, General Housing Characteristics,

H50/83-A, U.S. Dept of Commerce, Table A-4; Supplement to the American Housing Survey for the United States in 1993, H151/93-1, U.S. Dept of Commerce, Table 1-4.

[17] Ibid., plus Annual Housing Survey, 1974, Part A, General Housing Characteristics, H150-74-1, U.S. Dept of Commerce, Table 1-4.

[18] Ibid., plus APTA 1997 Transit Fact Book, American Public Transit Association, Washington, D.C., 1997, Table 32.

[19] Supplement to the American Housing Survey for the United States in 1993, op.cit.

[20] Data calculated from:

Supplement to the American Housing Survey for Selected Metropolitan Areas in 1991, H171/91, U.S. Department of Commerce, (Section name same as each Metropolitan Statistical Area Name), Table 4 (of each Metropolitan Statistical Area section).

Annual Housing Survey: 1982, Housing Characteristics for Selected Metropolitan Areas, Atlanta, GA, H-170/82-21, U.S. Department of Commerce, Part B, Table A-4.

Annual Housing Survey: 1979, Housing Characteristics for Selected Metropolitan Areas, Chicago, IL., H-170/79-22, U.S. Department of Commerce, Part B, Table A-4.

Annual Housing Survey: 1980, Housing Characteristics for Selected Metropolitan Areas, St. Louis, Mo. - Ill., H-170/80-59, U.S. Department of Commerce, Part B, Table A-4.

Annual Housing Survey: 1982, Housing Characteristics for Selected Metropolitan Areas, San Diego. St. Louis, Mo. - Ill., H-170/80-59, U.S. Department of Commerce, Part B, Table A-4.

1990 Census of Population, Social and Economic Characteristics, Metropolitan Areas, 1990 CP-2-1B, U.S. Department of Commerce, Table 42.

1980 Census of Population, Characteristics of the Population, General Social and Economic Characteristic, California, PC80-1-C6, U.S. Department of Commerce, Table 118.

1980 Census of Population, Characteristics of the Population, General Social and Economic Characteristic, California, PC80-1-C12, U.S. Department of Commerce, Table 118.

1980 Census of Population, Characteristics of the Population, General Social and Economic Characteristic, California, PC80-1-C15, U.S. Department of Commerce, Table 118.

1980 Census of Population, Characteristics of the Population, General Social and Economic Characteristic, California, PC80-1-C27, U.S. Department of Commerce, Table 118.

[21] CBD Transit Market Strategies Study, prepared for RTA by Parsons Brinckerhoff Quade & Douglas, Inc., March 1997, p. 3.

[22] Houston, Texas, which has created an extensive express bus system, saw ridership increase 14.7% from 1988 to 1997.

[23] All three figures from "Rail Transit: The People's Choice," by Lloyd H. Flem and Carl Schiermeyer, in Railway Age, September 1997, p. 71 ff.

[24] "Importantly, the overall attractiveness of a trip is constrained by the quality of its least desirable segment. For instance, commuting by public transit may not be desirable if the commuter railroad is excellent but the subway is problematic." City Congestion Management in New York City: Managing Why People Drive, Michael J. Rossmy and Steven A. Brown, Transportation Research Record 1237, p. 13.

[25] Results of Metra On-Board Surveys – 1985, 1991 & 1996, Staff papers, Chart. "% of AM Peak Metra Riders by Access/Egress Mode" (1995).

[26] An Evaluation of the Relationship Between Transit and Urban Form, Research Results Digest, June 1995, (sponsored by the FTA, TRB, NRC) #7.

[27] Ibid., p. 31.

[28] Ibid., p. 33.

[29] We do not intend to understate the importance of driving to a rail transit stop. Clearly, a significant number of people are willing to do that. The problem is that parking is often insufficient or unavailable. See "Parking Pileups Make the Train a Pain," Wall Street Journal, October 22, 1998.

[30] "Public Transportation and Passenger Characteristics," Highway Research Record, Number 417, Highway Research Board, Washington, D.C. 1972, p. 7.

[31] Transportation Planning Handbook, John P. Edwards, Jr., editor (Institute of Transportation Engineers, Prentice Hall, Englewood Cliffs, NJ, 1992) p. 41, Table 2.23.

[32] 1980 Regional Travel Characteristics, Working Paper 8, June 1983. By Hanna Kollo, National Transportation Library, Table. 2.23.

[33] Transportation Planning Handbook, op.cit., Table 2.24.

[34] Chicago: Chicago Area Transportation Study and Northwestern Indiana Regional Planning Commission, November, 1975, p. 15.

[35] Ibid., Table 9, p. 44.

[36] Diverting Auto Users to Transit: Early Lessons from CTA's Orange Line, by Sarah LaBelle and Darwin Stuart, Paper No. 95..0..1..3..4, TRB 74th Annual Meeting, January 22-28, 1995, Washington, D.C., Table 9, p. 11.

[37] Materials for the Study of Public Utility Economics, by H.B. Doran, (MacMillan, New York, 1930) cited in "Public Transportation and Passenger Characteristics," op.cit, p. 10.

[38] Diverting Auto Users to Transit, op.cit, Table 9, p. 11.

[39] The Way to the Games, MARTA, December 1996, p. 4.

[40] We are aware that San Juan, Puerto Rico, is building a Heavy Rail metro. However, we regard this as a special case, since the politics are quite different. More indicative was the vote in Los Angeles on November 3, 1998, to ban the use of any county transit tax money to plan, design, build or operate new subway lines. The ban, which got 69% of the vote, does not apply to Light Rail or surface or elevated Heavy Rail.

[41] Building the Case: Metra Infrastructure and Capital Need Requirements. Metra publications, p. 2. Track miles include South Shore line, from Keeping Track, Metra 1997 Program and Budget Document, Nov. 1996, p. 32.

[42] Material from Metra Internet Website, May 5, 1997.

[43] CBD Transit Market Strategies Study, op.cit, p. 1. The figure in 1990 was 55%.

[44] Ibid., p. 3.

[45] Journey to Work Trips to Downtown Chicago, table prepared by Metra July 8, 1998, based on 1990 U.S. Census data.

[46] CBD Transit Market Strategies Study, op.cit., p. 23.

[47] Ibid., p. 24 and 25.

[48] Transit Ridership Report: Fourth Quarter 1997, American Public Transit Association, April 1998, p.5.

[49] CBD Transit Market Strategies Study, op.cit., p. 8.

[50] Building the Case: Metra Infrastructure and Capital Need Requirements. Metra publication, unpaginated. APTA calculates that the Dan Ryan/Kennedy Expressways carry 75,000 vehicles in peak periods, compared to 125,000 peak period riders on parallel CTA/Metra rail lines.

[51] Results of Metra On-Board Surveys – 1985, 1991 and 1996, Metra publication, unpaginated.

[52] Final Report 1996 On-Board Ridership Survey, Midwest CompuService, Inc., June 1997, pp. 17, 58.

[53] Metra Marketing Plan for 1997, Metra publication, p. 2.

[54] "Metra Marketing Plan Addresses Customer Needs," Passenger Transport, April 14, 1997, p. 13.

[55] FAST, Metra brochure, unpaginated.

[56] Percentage from 1997 Operating and Capital Program and Budget, Metra publication, p. 16 (capital) and p. 18 (operating); fares from Metra, op.cit,; best recovery ratio in U.S. from Metra Internet Website, op.cit.

[57] According to a SANDAG study of February, 1997, almost 63% of Trolley riders see the system as safe, but only 48.8% of non-riders do. Relevant to the perception of safety is the changing ethnic and age mix of Trolley ridership. A comparison of the 1990 and 1995 On-Board Transit Surveys shows that over the five-year period, Hispanic ridership rose 5% (to almost half) and black ridership rose 8%, while white ridership fell 14%. Similarly, ridership of persons 12 to 18 years old rose 63%, mostly for school trips, while ridership in every older age group fell, except for those aged 35 to 49 years. In our view, these are at least partially cause and effect relationships.

[58] Trends Before the San Diego Trolley, U.S. Department of Transportation study DOT-1-82-40, July 1982, p. 9.

[59] San Diego Trolley: Performance Trends, by Dennis J. Wahl and Harvey A. Humiston, Transportation Research Record 1361, National Academy Press, Washington, D.C., 1992, p. 278; updates from San Diego MTDB.

[60] Ibid., p. 278.

[61] Ibid., p. 283, figure 8.

[62] Ibid., p. 279. Updated figures from San Diego MTDB.

[63] Ibid., p. 280. In 1990, 34.8% of Trolley riders had incomes over $30,000; in 1995, that figure had dropped to 28.7%. Total system riders showed a similar drop over the same period, from 29.5% to 23.8%. This may reflect a general decline in the local economy in these years. Data from San Diego MTDB.

[64] Ibid., p. 286, Table 4.

[65] Ibid., p. 280.

[66] Ibid., p. 283, figure 8.

[67] San Diego MTDB 1976-1996: 20 Years of Service, San Diego Metropolitan Transit Development Board, San Diego, CA, undated, unpaginated. Updates from MTDB's Short-Range Transit Plan Update FY1998-2004.

[68] 1995 San Diego Regional Onboard Transit Survey, pp. 47, 59.

[69] San Diego MTDB.

[70] 1995 Onboard Survey, op.cit., p. 58. Only 24.9% of all San Diego riders - rail and bus -- had a car available, so the Trolley was still more effective in competing for riders from choice than the bus.

[71] San Diego MTDB.

[72] "Super Bowl Fans Score a Million Rides on Transit," in Passenger Transport, Vol. 56, No. 6, February 9, 1998, p. 1 and p. 16. On the Blue Line, Saturday ridership was 50,083 in May 1998, just slightly below average weekday ridership of 51,135.

[73] Partners in Progress: Bi-State Development Agency Annual Report 1994, p. 4.

[74] "Why Success in St. Louis?," by William D. Warren, IR News 180, Sept-Oct 1995, p. 22-23.

[75] Partners in Progress, op.cit., p. 5.

[76] Summary of Results: Systemwide On-Board Survey Spring, 1997, prepared by Bi-State Development Agency, p. 6, Table 6.

[77] Ibid., p. 13, Table 17

[78] Ibid., p. 12, Table 16

[79] Ibid., p. 14, Table 19

[80] Ibid., p. 10, Table 12 and 13

[81] Partners in Progress, op.cit, p. 5.

[82] Market Research Report On-Board Survey, Summer 1995, prepared by Bi-State Development Agency, p. 5

[83] Ibid., p. 6.

[84] Ibid., p. IV. The 1995 survey noted, "Only one-fifth of MetroLink riders transfer off train to a bus, while about half of all bus riders eventually transfer to another bus or to the trains (p.5). The combining of transfer to bus and train makes it difficult to compare 1997 results with those from 1995.

[85] "Why Success in St. Louis?," op.cit., p. 25.

[86] "Setting the Pace of Change," by Steve Frenkel in The Neighborhood Works, May-June 1997, p. 11.

[87] "Bi-State Development Agency MetroLink Light Rail System," in The Potential of Public Transit As A Transportation Control Measure, Case Studies, (Draft Document), National Association of Regional Councils, October 30, 1997, p. 8.

[88] Summary of Results, 1997, op.cit. p. 3, Table 2.

[89] "Bi-State Development Agency MetroLink Light Rail System," op.cit., p. 4.

[90] Report on Rapid Transit for St. Louis, op.cit., p. 35.

[91] Map from Ibid., p. 80.

[92] Only a portion of the Kirkwood-Ferguson line is paralleled by MetroLink, and Florissant lies beyond the airport where MetroLink ends.

[93] Report on Rapid Transit for St. Louis, op.cit, ridership portrayed graphically on p. 60, Figure 4a (Hodiamont), p. 68, Fig. 55 (Kirkwood-Ferguson) and p. 70, Fig 56 (Florissant).

[94] "Bi-State Development Agency MetroLink Light Rail System," op.cit., p. 8.

[95] Report on Rapid Transit for St. Louis, op.cit., p. 73.

[96] From correspondence with Bi-State Development Agency, 1998.

[97] Report on Rapid Transit for St. Louis, op.cit., pp. 45, 73.

[98] "Bi-State Development Agency MetroLink Light Rail System," op.cit., p. 1.

[99] The 1996 National Transit Database, which includes operating costs for 20 light rail systems, indicates that heritage trolley lines have very low operating costs per vehicle mile and vehicle hour, generally have low costs per passenger trip, but, because of short runs and slow speeds, can have high costs per passenger mile. For example, in operating cost per vehicle mile, Memphis ranks 15th (20th is lowest), New Orleans 17th and Galveston 19th. In expense per vehicle hour, Memphis is 19th, New Orleans 18th and Galveston 20th. In expense per passenger trip, Memphis is 11th, New Orleans 20th and Galveston 19th. But in expense per passenger mile, Memphis is 2nd, New Orleans 16th and Galveston 9th. The only Heritage Trolley line that is expensive to operate in virtually every respect is that in Seattle, Washington. Interestingly, it is also unusual in that it is operated as part of the regular transit system by transit system employees. We would guess that the least expensive Heritage Trolley line, both to build and to operate, is Dallas' McKinney Avenue line (it is also one of the best). Unfortunately, it is not part of the NTDB survey.

[100] Police Corps officers receive the same pay and benefits as other police, although there are savings in training and pension costs. More importantly, under the statute that established the Police Corps, each officer is accompanied by a $10,000 annual grant.

[101] "Local Economic Impacts in Commuter Rail Station Areas," Metropolitan Conference on Public Transportation Research Proceedings, June 9, 1995, University of Illinois at Chicago, presentation given by Cassandra Jansen, authors Camiros and Valerie S. Kretchman Associates Inc., p. 2.

[102] Results of Metra On-Board Surveys 1985, 1991 & 1996, op.cit., unpaginated.

[103] Summary of Results, 1997, op.cit., p. 3, Table 2.

[104] 1995 San Diego Onboard Survey, op.cit., p. 59. The comparatively high figure for San Diego reflects the demographics of the area served, where many people are transit-dependent.

[105] Urban Rail in America: An exploration of criteria for fixed-guideway transit, by Boris Pushkarev and Jeffery Zupan, Regional Plan Association Inc., New York, New York, November 1908, p. 10.