FARELESS TRANSIT IN THE PORTLAND METROPOLITAN REGION

Report of The Fareless Transit System Research Work Group

prepared for

Vera Katz
Mayor, City of Portland

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METROPOLITAN REGION

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> "The invisible hand of the market finds it harder to get a proper grip on private motoring than almost anything else. If drivers were made to pay more of the true cost of each trip, they might either travel less or use public transport...."
>
> *The Economist.* June 22, 1996

> Imagine the effect if cars had fare boxes...if every time a driver wanted to make a trip, he or she had to dig in a pocket to find $1.40 exact change to put in the fare box....

1. Summary

In her State of the City speech, Mayor Vera Katz forcefully reminded us that we need to build out our transportation system as an interrelated system, including light rail, transit-oriented developments, buses, streetcars, bicycle and pedestrian ways. And we need to consider economic incentives and disincentives to get people onto transit and out of their cars. She stated that we not only need to provide access to transit, but level the playing field between the costs for transit riders and the costs perceived by auto users.

Above all, she reminded us that getting our transportation system right is about quality of life. The hard reality is that no single nor even combination of transportation investments will solve congestion as long as the region continues to grow. Surely we can and should continue to invest to maintain mobility. But the bottom line must be whether we are

providing people with *choices* for how they get around that preserve communities and neighborhoods and protect the environment.

Mayor Katz said: "Everything else that we do to protect and improve our quality of life gets stuck in a traffic jam if we don't have a transportation system that connects our communities, reduces our reliance on the automobile and increases our travel by bus, light rail, bicycle or by foot.

"How are we doing? Not good enough."

Mayor Katz used her speech to put forth for consideration by the region a bold stroke to help us do better: make the transit system free—a fareless system, and pay for it with a fee on parking.

Knowing that this might be a long-term proposition and that it had not been seriously considered before, she convened a group of citizens to research the role that making the transit system free might play in helping to keep us from strangling on auto traffic. She asked that the group provide a report that could serve as the basis for a larger regional deliberation.

Compared to other urban regions, Portland makes good use of transit. But, compared to other places, we expect more from ourselves for protecting our quality of life. Despite our comparatively good record, we are very likely to fall short of reducing the region's reliance on the automobile.

The solution: competitive and attractive alternatives for getting around. Giving people real choices rather than forcing them into their cars. Providing both high-quality transit service and motivation to use it.

Among other things that means a vastly more attractive transit system—a system that *attracts* riders. This will take more transit. The Region 2040 plan for growth management simply doesn't work if we don't add more transit. The proposed Transit Choices for Livability program has squared up to the need to provide more and different transit, especially in the suburbs.

But a transit system that truly *attracts* new riders will also be qualitatively different in the way that it welcomes people on board: simple amenities like bus shelters, clean vehicles, safe vehicles and waiting areas, on-time schedules. And definitely a system that removes

the barriers to getting on the bus or train. Two of these barriers spring from the simple mechanics of riding: routes and fares. Part of the problem is uncertainty and complexity.

The problem with fares is simple: imagine the result if people had to put $1.40—exact change, please—in a fare box in their car each time they wanted to take a trip. ($1.40 is the current Tri-Met all-zone fare.) And what if they had to carry either a mental or real map so that they could pay a different fare depending on where they were going?

Since gas taxes pay only a portion of the real cost of driving and drivers remain largely ignorant of the costs (including air pollution) they are imposing on others, putting a fare box in cars to keep the cost of driving "honest" might not be such a bad idea.

Hidden subsidies for auto use distort the travel market and induce extra driving (as if we needed something extra to get people into their cars). When we get into our cars to make a 10-mile trip (say Oregon City to Clackamas Town Center and back) we might think about the 50-cents to $1.00 we are paying for gas—but we don't think about the fact that the total cost to us, to taxpayers and to our fellow citizens is really about $5-to-$10.

Until we can put fare boxes in cars, leveling the playing field among the transportation choices that daily confront people will require making transit service more attractive and transit fares less unattractive.

But simply removing fare boxes from buses is not the answer, certainly not in the short term. After reviewing national and local experience about what affects transit ridership and looking at how fareless transit might fit into regional plans to expand transit service, the Work Group concluded that the region should concentrate on expanding the number of annual transit passes provided free or at minimal cost to employees and others. This is a more practical and productive step than a leap into a completely fareless transit system.

Tri-Met also can begin to reduce the complexity of the fare system.

A completely fareless transit system is a distant goal dependent upon first expanding transit service, improving the quality of using transit and finding additional revenue to achieve all these goals. Fareless transit by itself, especially as a short-term goal, would not reduce peak-hour auto commuting commensurate with what it would cost and the opportunities for expanding the quantity and quality of transit service it might displace. Alternatives to a full Tri-Met fareless system, such as making the City of Portland a fareless transit zone, create more problems than they solve.

An immediate and substantial step the region can take to respond to the Mayor's call to action is to aggressively pursue expansion of programs in which employers and others purchase annual transit passes to provide to employees. For those who receive the passes, the transit system in essence becomes "fareless."

Expansion of transit pass programs offers a number of advantages. It does help overcome the barrier to increased ridership stemming from complexity and cost of fares. It is responsive to demand. It can be done incrementally. It offers flexibility to tailor the pass programs and to link the programs to service expansion. It creates possibilities for partnerships among Tri-Met, employers and local governments, none of which individually has the financial resources to achieve the ends desired.

Tri-Met's experimental PASSport program offers a model on which to build. The Group recommends a number of steps to improve and expand the program, including eliminating an existing disincentive for employer participation and encouraging partnerships among Tri-Met, cities and businesses. The Group also recommends a demonstration project to put free passes the in the hands of all employees in the Tri-Met district for a trial summer period.

As a step toward expanding use of passes by targeted groups, the Group recommends that Tri-Met extend its discounted summer youth pass program year-round. This would encourage participation by cities and school districts to help make transit passes available to students and others

To reduce complexity in the fare system, the Group recommends that Tri-Met eliminate the zone system and charge one fare for rides throughout the system.

Mayor Katz also asked the Fareless Transit System Research Work Group to look at a region-wide fee or tax on non-residential parking to fund fareless transit. While the Group believes a parking tax or fee would be sound policy, it received mixed legal advice about the constitutionality of using such a tax for transit. Moreover, neither Tri-Met nor Metro currently has legal authority to impose such a regional tax without either compromising other financing sources or confronting overwhelming political barriers. While the hurdles to find new funding for transit are formidable, the payoff in livability for the region should motivate us to keep at it until we succeed.

2. Introduction

2.1. Mayor's charge to work group

In her February State of the City speech, Mayor Katz said:

> Everything else that we do to protect and improve our quality of life gets stuck in a traffic jam if we don't have a transportation system that connects our communities, reduces our reliance on the automobile and increases our travel by bus, light rail, bicycle or by foot....
>
> Our first challenge is to develop the region's transportation as an interrelated system and get people to use it.
>
> To...encourage transit use, the time has come to not only expand Fareless Square, but also to seriously consider a totally fareless transit system, paid for by a regional tax on parking lots....

The Mayor also identified as challenges reducing the restrictions that limit how transportation funding dollars can be used and finding the amount of funding needed for transportation.

The Mayor subsequently convened a group of citizens to research the potential for a fareless transit system. She charged the Fareless Transit System Research Work Group as follows:

> Many options to improve transit service, increase ridership, and decrease our reliance on the automobile have been evaluated by Tri-Met and others and some have, are, or will be implemented.
>
> A completely fareless transit system is one option that has not been seriously evaluated or debated in the region. We do not have the information collected or the analysis completed to have an informed discussion on instituting a fareless transit system regionwide. Your work will allows this region to make an informed decision about whether this is a viable option now or longer term. Specifically, I am asking the group to determine the feasibility, benefits, costs, and challenges of fareless transit; how to finance fareless transit, including investigation of taxing parking spaces; and the steps and timing for implementing fareless transit.

Mayor Katz has elevated the debate and raised the stakes for what we need our transportation system to do for us if we want it to be part of the solution, not part of the problem. This report of the Fareless Transit System Research Work Group to the Mayor is intended to stimulate public debate and consideration of fareless transit and, hopefully, other ideas to give people a choice for the trips they make other than "buckling up."

Attached to the report are a series of technical memoranda prepared for the Fareless Transit System Research Work Group by the firm of Parsons Brinckerhoff Quade & Douglas, Inc.

The group expresses its gratitude to Tri-Met for the cooperation and support, including consultants, it provided throughout the process.

2.2. Regional plans for transit

Tri-Met estimates that it can increase service by 1.5-percent each year given existing revenue sources. The Regional Transportation Plan and the proposed Transit Choices for Livability plan estimate that service needs to increase 3.8-percent each year to meet regional goals for growth management and livability. In recent years ridership has grown faster than service has increased. Tri-Met has been able to accommodate the growth because most buses were not full. Now many routes are completely full at rush hour; there is no excess capacity left. Finding new sources of revenue to pay for the increase in service that regional plans envision and customers want is a high priority for the region.

2.3. Tri-Met fare policy

The Tri-Met Fare Policy states:

> The fare policy is a balance between increasing ridership, increasing revenue, and lowering system costs. Based on Tri-Met's understanding of its market, the policy provides for a simple and equitable and fare [sic] system that encourages ridership growth.
>
> The written fare policy is divided into an overall policy statement and three objectives:
>
> Fare Policy Statement
>
> Tri-Met fares will encourage ridership growth and increase passenger revenue.
>
> A. Ridership: Encourage ridership growth by offering equitable and attractive fares.
>
> B. Revenue: Increase passenger revenue through increasing ridership and increasing fares to generally parallel increasing costs.
>
> C. System Cost: Address system costs through fares and system efficiencies.

3. Costs of auto dependence

Individually, we experience increasing frustration at being stuck in traffic. As a community we suffer excess air pollution, sprawl, economic loss from delays and a sense that, ironically, being in the driver's seat increasingly means we are losing control.

While we become increasingly reliant on the car, only recently have studies begun to show the gap between what we as motorists pay for the trips we make and the costs that those trips impose on society. Even more striking and influential in our behavior is the gap between what we are *conscious* of paying for trips we make by car and the real costs of those trips on us, or other taxpayers and on our fellow citizens.

3.1. Costs to drivers...to government...to society

When most of us decide to make a trip, we usually only consider the out-of-pocket costs, such as gas for the car, parking, or bus fare. Yet, the actual cost of travel includes a variety of other costs, some that we're familiar with, others that we rarely consider. For example, we easily recognize that the cost of taking a trip in an automobile also includes maintenance and insurance, as well as the cost to purchase the vehicle, in addition to the easily identifiable out-of-pocket costs. However, we may not consider that driving also involves government expenditures for roads and police that are not fully covered by the gas taxes and user fees that we pay. These costs are paid by other taxpayers. Less frequently, perhaps, do we think about the other costs that are indirectly imposed on society, such as pollution and noise and creating asphalt "barriers" that divide neighborhoods and limit pedestrian access.

Economists debate exactly what costs should be considered when looking at auto travel. For example, there is broad agreement about including the cost to local citizens and industry from air pollution, but what about the potentially much greater consequences of global warming? And what about the costs of maintaining a military presence in the Middle East to protect oil supplies? For this study, consultants included costs about which there is broad agreement; they did not include costs for global warming or security of petroleum supply.

3.2. Cost estimates

Parsons Brinckerhoff assembled data based on existing studies. (See Appendix B: "The Full Costs of Auto Travel: Technical Memorandum 2(a)"). They conclude:

- Society subsidizes auto travel at 17-to-26 cents per-mile. (Costs not paid by driver, rather by governments or society, directly or indirectly. Based on studies in other areas generally similar to Portland region.) For a typical person driving 15,000 miles per-year, the subsidy is approximately $2,550 to $3,900.

- In daily driving behavior, drivers are not aware of either the subsidy that society as a whole provides or the real full cost to themselves. The full cost for a 10-mile trip by automobile is $5 - $10 but the driver perceives cost of only 50-cents to $1. (Drivers are aware of gas and parking charges directly associated with trip, generally not aware of costs for each trip of ownership, insurance, accidents, pollution, "free" parking, etc.)

When combined with the relative lack of alternatives, society's subsidy of auto use and the hidden costs of auto use contribute to increasing use and dependence on the car.

4. Factors affecting transit ridership

The transit industry and academics have done much research about the factors that affect transit ridership. These studies have been generally consistent in putting safety and the quantity and quality of transit service available at the top of the list. However there are some limitations to these studies. First, they tend to look at factors in isolation rather than at a comprehensive set of interrelated changes (e.g., combining increased frequency, new amenities with reduced fares). Secondly, studies which rely on stated preferences in surveys and focus groups tend to rank fares or cost of service lower as a factor than do studies of actual system performance.

Even with these limitations, there is reasonable agreement about the individual factors that influence transit ridership.

The Fareless Transit System Research Work Group believes that these conclusions are useful but still represent a "business as usual" approach in the transit industry that falls short of trying to achieve a culture of transit use to compete with the culture of auto use.

4.1. Rank order

Based on studies of ridership and on stated preference surveys of riders and non-riders, the following is a rough rank ordering of the factors that affect ridership:

- Safety
- Cost of driving (direct costs such as gas and parking)
- Service frequency and reliability
- Availability and ease of use of schedule and route information
- Amenities (e.g. shelters) and driver courtesy
- Fares/cost of service

One study concludes that service frequency is about twice as important as price of fares in determining ridership.[1]

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[1] Cervero, R. (1990). "Transit pricing research: A review and synthesis." Transportation **17**: 117-139.

Based on its own surveys of riders and non-riders, Tri-Met rates factors affecting ridership along two dimensions: importance and how well Tri-Met currently is doing. Based on its most recent surveys, Tri-Met rates fares as less important than all factors other than availability of telephone operators. (Ranking as more important were safe operation of bus, on-time service, safety while waiting for bus, route and schedule information and courteous drivers.)

4.2. Effects of fares on ridership

The transit industry rule of thumb is that a 10% reduction in fares results in a 3% increase in ridership (ridership elasticity of cost of fare is 0.3).[2] Eliminating fares should result in at least a 30% increase in ridership.

Note, however:

- surveys of riders and non-riders generally tend to rank fares and cost of service lower in importance than do studies of actual response to changes in fares;
- free fare demonstration projects have shown significant ridership increases.

One study makes several telling observations about research into transit fares:

> The tendency has been to assess fare options using economic efficiency criteria, such as ridership and revenue changes. In actuality, however, social equity and environmental considerations may be just as important. (p. 118)
>
> ...[F]are elasticities would be considerably higher if automobile trips were priced closer to their true marginal social cost....Surely a discounting of bus fares from $1.00 to $0.75 could be expected to have far greater impact if a $5.00 per day charge was placed on previously free employee parking.[3] (p. 127)

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[2] Cervero, R. (1990).fn 1.

[3]Cervero, R. (1990) fn 1.

4.3. Peak vs. non-peak ridership

Individually and as a society, we care more about and pay more for trips made during peak hour periods of congestion. The cost of expanding the road system to "solve" congestion is enormous, and is at best a temporary fix that ultimately makes the problem worse by stimulating more single-occupant-vehicle (SOV) travel. The cost of travel delays from congestion is large and hits all on-road vehicles including buses (not true for dedicated high-occupancy lanes or light rail).

While society benefits the most from reducing single-occupant-vehicle (SOV) driving during the peak-hour commute, the easiest increases in transit ridership to generate occur during off-peak. Studies show that off-peak ridership is about three-times more sensitive to changes in frequency or fares than is peak ridership. I.e., for each 10% cut in fares, there will be a 6% increase in off-peak ridership and a 2% increase in peak-hour ridership.

However, because it is peak-hour congestion that we care most about, society may value a 2% reduction in car commuting in peak hours as much or more than it does a 6% reduction in car use at other times of the day. Moreover, because there are more people traveling during peak hours, each 1-percent shift from car to bus means more actual cars off the road than for the same 1-percent shift other times.

5. Fareless transit

Currently there are seven fareless transit systems in the US, all small systems. These are considered b to be quite successful. No system comparable in size to Tri-Met runs a fareless transit system.

5.1. Case Studies

There have been three fareless transit demonstration projects in the late Seventies and early Eighties (Trenton, NJ; Denver, Colorado; and Austin, Texas). Denver and Trenton were off-peak fareless experiments only. Both Austin and Denver combined service expansion with the free fare experiments. (See Appendix C, "Fareless Transit: Issues and Experiences: Technical Memorandum 2(b)," Parsons Brinckerhoff)

- All showed substantial ridership increases. Austin saw the largest increase, 70%.
- By far most of the ridership gains in the demonstration projects were from existing riders making more trips during off-peak periods. Although evidence is weak, it appears that less than 25% of increased ridership represented shifts to transit from cars. In Austin, only 6% of increased ridership were "new" riders (riders who previously did not use the system).
- Overall there is little evidence from the demonstration projects that fareless transit made a significant dent in single-occupant-vehicle travel for the peak-hour commute.
- Public reaction to the fareless demonstrations was positive but riders did complain about safety and deterioration in service quality including crowding.
- Bus operators were less positive about the demonstration projects, voicing concerns about increased rowdiness and customer complaints.

Compared to these cities, Portland has a relatively well-developed and well-used transit system. This could mean, that on a percentage basis, Portland would experience less ridership gain.

5.2. Overall conclusions from case studies

Based on experience so far:

- Smaller and medium communities are better served than are larger communities by free-fare transit.
- Free fare transit yields substantial ridership gains but there is little evidence that it significantly attracts new riders or shifts commuters out of their cars during rush hours.
- Without proper preparation, including providing added service and attention to security, free fare transit can result in deterioration of service quality.

It is notable that many of the complaints that arose in the experiments (overcrowding, slow down in service) would result from any successful program to boost ridership—if care is not taken to increase service and maintain quality and safety. These are financial and management issues, significant to be sure. They are not fatal flaws for fareless transit.

These studies and experiences teach caution about expecting fareless transit used in isolation from other transit improvements to be the primary tool for building ridership. They do not detract from the more fundamental fact: as long as use of the car is considered to be nearly free for any given trip, alternatives such as transit will have a hard time competing.

5.3. Tri-Met experience

Between 1973 and 1979, Tri-Met instituted a flat fare, reduced fares by 37% in real-dollar terms, and increased service by 76%. During this period ridership increased 85%. It is impossible to sort out the relative influence of the simplified flat fare, the reduced real-dollar cost of fares and the increase in service hours.

Based on more recent surveys and focus groups about fare simplification and free fares, Tri-Met concludes:

- System routes, maps and schedules create more confusion for potential riders than does the fare system
- Existing users of transit would support increased taxes to pay for reduced fares but non-riders would not
- Suburban residents rate need for service improvements considerably ahead of need for reduced or free fares

- Both riders and non-riders voice concern about safety
- By 2-to-1, public favored adding service over making the system free when asked which they preferred for spending $40 million per-year. (Note that this survey dealt mostly with adding service, so this probably skews the results toward the stated preference for adding service.)

A research report on focus groups done specifically on fareless transit stated:

> The fareless focus groups made it clear even though there is interest in the concept of a fareless system, there are major obstacles to enthusiastic acceptance and support. These obstacles focus on three credibility issues: Nothing's for free....if service is inadequate now, won't ridership increases make things worse...are we just building another service deficient, non-responsible bureaucracy.[4]

In sum, the public would need to be convinced that fareless transit will work and is part of an overall program of transit improvement.

5.4. Design for fareless transit in the Portland region

Tri-Met was asked to put forth a simple hypothetical scheme for how it would operate a completely fareless transit system. Parsons Brinckerhoff reviewed Tri-Met's estimate of increased ridership and service for reasonableness. This scenario is a "what if" case, not a proposal to fully implement fareless transit immediately. It assumes that funding is available.

It is estimated that elimination of fares by Tri-Met would increase ridership about 25-percent during peak hours and 60-to-65-percent off-peak at an annual cost of about $54 million. This cost does not include service improvements proposed in regional plans for which funding is not yet available and which would take precedence over funding fareless transit. (See Appendix D for details.)

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[4] Davis & Hibbitts, Inc. "Fareless System—Focus Group Research Findings," May 1, 1998, p. 1-2.

6. Regional Parking Tax

The Mayor asked that The Fareless Transit System Research Work Group specifically investigate use of a regional parking tax or fee to finance the costs of fareless transit. We looked at the legal, institutional and economic possibilities and consequences.

To do the evaluations, several starting assumptions were made:

- Target: approximately $50 million per-year
- Applies to whole region
- Applies broadly to commercial, industrial, institutional spaces, including employee parking
- Parking tax would be levied as a business license fee
- The purpose of the fee would be to raise revenue, not necessarily to influence driving behavior by making sure that drivers always pay directly for the cost of non-residential parking (this is a very laudable goal, but not the objective placed before the Group)[5]

The Group identified several major hurdles to adopting a region-wide parking tax. The first is uncertainty over whether a parking tax could be used for transit. The second is that neither Tri-Met nor Metro, the two regional governments, has the legal and political capacity to adopt a regional parking fee.

Local governments have authority to adopt parking taxes. They too would need to resolve uncertainty over the constitutional issues surrounding use of parking tax revenues for transit. If this can be done, parking taxes levied by local governments could be used to help fund the steps toward fareless transit outlined below. However, the City of Portland should not consider a parking tax limited to downtown or that would further exacerbate the position of downtown for competing for retail and office space with suburban locations.

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[5] All of the options considered look to raise revenue rather than to change the behavior of drivers by making them more aware of the true costs of driving. If parking taxes are applied directly to drivers in order to induce change in behavior, then the availability of options (vans, transit, etc.) becomes very important for the program to be acceptable—i.e., trying to use parking tax both to raise revenue for free transit and to change behavior is inconsistent unless revenue raised is great enough to both increase service and eliminate fares.

6.1. Constitutional issues

The Group was provided legal advice that leaves uncertain the possibility of using a parking tax to fund fareless transit or any other aspect of transit. To be workable, a parking tax or fee would need to avoid two limitations in the Oregon Constitution.

- **Property tax limitations**

  A tax levied on the amount or value of space devoted to parking may be subject to Measure 5 limitations. Revenue raised would be subject to the 10-mill cap for local governments, effectively reducing revenue available to jurisdictions subject to the cap (in "compression").

- **Constitutional restrictions against use of auto fees for transit**

  Oregon Constitution Article IX, Section 3a limits use of revenue from "[a]ny tax or excise levied on the ownership, operation or use of motor vehicles" to road-related purposes; with minor exceptions, e.g., park-and-ride lots, such funds are not available for transit operations or capital.

These Constitutional issues pertain no matter what jurisdiction seeks to enact a parking tax to use for transit.

6.2. Institutional Issues with Regional Parking Tax

6.2.1. Parking tax levied by Tri-Met

The constitutional question noted above about use of parking fees for transit is a threshold issue for all jurisdictions. In addition Tri-Met would face one other barrier to adopting a parking fee. Authority does exist for the Tri-Met Board to impose a business license fee on firms within the district that provide non-residential parking. (The business license fee could be based on factors other than parking as well.) But there is a major limitation: a business license in any amount, whether related to parking or some other basis, displaces all payroll tax paid by any business to which the business license fee applies. If Tri-Met were constitutionally able to apply a business license fee on parking, it would lose far more payroll tax revenue than it would gain from the fee.

In the past, Tri-Met did consider a business license fee applied to commercial (paid) parking businesses. Tri-Met estimated the value of 10% tax on gross receipts of paid

parking lots at $2.5 million per-year. But it also recognized the inequities this would create regionally as it effectively would hit only downtown Portland.

The Tri-Met Board can institute a one-time fee to be levied on new parking spaces, to be used for capital only.

6.2.2.Parking tax levied by Metro

Legally, Metro could probably impose a business license fee on non-residential parking up to about $7 million.

The Metro Charter requires that all "broad-based" taxes be submitted to voters. "Niche" taxes can be levied without vote up to a cap currently at $14.7 million. Current excise taxes use about $7.8 million of the "niche" tax authority. It is not certain that a business license fee on parking would be considered a niche tax.

All Metro actions are subject to referendum, with signature requirement less than 20,000.

Metro could submit to voters a business license fee on parking in larger amount.

If Metro were to levy a parking tax for fareless transit, there would need to be some reconciliation of the fact that the Tri-Met District is larger than Metro. Possible solutions are to (a) reconcile boundaries Tri-Met to Metro or (b) treat Metro district as fareless zone.

6.2.3.Parking tax by local governments through intergovernmental agreement (IGA)

Authorities exist for local governments to levy business license fees, but this is not a practical option for creating a region-wide fareless transit system. It would need the complete cooperation of all jurisdictions to avoid a crazy-quilt of fareless zones.

These same objections would not necessarily apply to a voluntary program in which local jurisdictions bought passes for their citizens. (Information about the economic aspects of a parking tax is to be found in Appendix E.)

6.3. Other Tri-Met finance options

Tri-Met currently uses the payroll tax as the primary resource to fund its operations. Increasing the payroll tax would require Legislative action.

Transit Choices for Livability has explored finance options for expanding transit service and concluded that there is little directly available. It is likely that TCL service expansion would have prior claim on any significant new revenue source.

The following revenue sources are authorized to Tri-Met for capital and operating expense:

Type	**Unit/Base**	**Revenue ($million)**	**Action required**
Income tax	0.1%	$135 (95)*	Board action
Payroll tax	0.00617%	$120	Capped; requires legislation to increase
Business license fee on wholesale petroleum	1% of gross	$14 (95)	Board action. Offsets payroll tax
Property tax	$0.50/$1000	$34 (95)	Submit to voters

*Note: numbers in parentheses denote year for which estimate was made.

Effectively, there is no option that does not require voter or legislative approval.

While surveys show broad support for expanding transit service, no new tax option has sufficiently strong voter support to make it immediately attractive. The Fareless Transit System Research Work Group has adduced no evidence that fareless transit would be more successful than service expansion in overcoming voter resistance to adopting new tax sources.

7. How we get there matters: Expanding use of transit pass programs

Putting an annual transit pass in someone's hands creates a fareless transit system for that person. Even if the pass is not free, once a pass is in hand, the more transit is used. The numbers are striking: only 23-percent of those who ride transit use passes, but they make 51-percent of all trips on transit. (Clearly, people who are dependent on transit buy passes, but it works the other way also: *transit passes make transit riders.*)

In addition to its regular program of selling monthly and annual passes directly to customers, Tri-Met offers several programs for employers and other institutions to buy passes and then re-sell them at discount or give them out. For employees who get the passes for free, the transit system is "fareless." And even for those who pay something for the pass, once the pass is in hand (like buying a car) each trip then is essentially free.

Such transit pass subsidy programs could be expanded and modified to serve larger and larger segments of the population. Right now the Tri-Met programs are aimed at employers. The concept could be expanded. More organizations (business, governments, civic, neighborhood associations...) could participate. More people could be eligible to participate, e.g. all the residents of a neighborhood or a city.

This has one other advantage: it recognizes that expanding transit use is often a partnership effort. No local government or business has abundant spare cash, but compared to the difficulties in the near term of coming up with new funding regionwide for transit, an expanded pass program would be able to tap into the variety of public and private general financing mechanisms already in place. For example, a city wanting to buy transit passes for some or all of its citizens would have at its disposal all its general financing authorities (except a few that might contravene the constitutional barriers noted earlier).

The first steps are to augment and expand several existing programs.

7.1. Tri-Met PASSport program

The existing Tri-Met experimental PASSport program is the model. This program allows employers to buy annual passes at a discount for all employees. There are two pricing structures for employers. In one, a set price per employee is determined for all employers within a geographic district, based on commute ridership levels for employers in that

district. The price increases as ridership in the district increases. In the other, the price to the employer is based on current ridership of their employees. The price increases for the employer as ridership increases. (See below for a recommendation to eliminate this as a disincentive.) If the employer already provides photo ID, Tri-Met simply adds a PASSport sticker to the ID, which is used for boarding. Otherwise, Tri-Met provides equipment to make new photo ID cards for employees.

The PASSport program is an experiment that will be evaluated in August, 1999. Currently over 100 employers covering 60,000 employees participate.

Conceptually, there is no reason this could not serve as a basic model for incrementally building toward a fareless system. Incentives for employer participation could be increased. The program could be broadened from its employer/employee focus.

Tri-Met also operates the TransitCheck program. Employers buy TransitChecks in whatever denomination they choose to distribute to employees as a transit bonus. Employees can use the TransitChecks to help pay for transit passes, which they order themselves. The most common amount of the TransitCheck is half the cost of the monthly pass. Currently, 30 companies covering 15,000 employees participate. The TransitCheck program requires much more initiative and generally more direct cost from the employee than the PASSport program

7.2. Increasing employer participation

The State's Employee Commute Option (ECO) rule provides an incentive for employers of 50 or more employees to participate in transit pass programs. The Work Group recommends two steps to increase participation:

7.2.1. Reducing the disincentive to PASSport employers for increasing ridership

One of the main disadvantages of the existing PASSport program is that the cost to employers increases as ridership increases. Tri-Met and the City of Portland, as well as other jurisdictions could counteract this disincentive in several ways:

- The marginal cost to Tri-Met of increased ridership on existing lines is very small. Because no new labor or capital cost is needed, adding ridership on lines where there is excess capacity increases system efficiency by lowering per-ride costs. Costs to

PASSport employers for increasing ridership should be based on marginal costs to Tri-Met rather than ridership. This would restrain cost increases to employers until new service needs to be added. And adding service can be a negotiated deal. In this way, employers are helping to pay for increased service, not increased ridership.

- Local governments could agree to help subsidize the increased cost of service triggered by PASSport success, as outlined above. This would further reduce disincentives to participation by employers.
- Further, where there are benefits to Tri-Met and local jurisdictions, all could agree to share with employers the cost of increased service. Thus, high levels of employer participation and increasing ridership could trigger increased support from Tri-Met and local jurisdictions. This model works best where (a) there is a concentration of employers and other trip generators; (b) local jurisdictions have the most interest in increasing service, and (c) employers agree to join together in a district PASSport program or through a TMA. This means that Regional Centers are more likely candidates for this sort of partnership to work.

Issues:

- Financing. The recommendation that Tri-Met base increased PASSport costs to employers on the cost of adding service should not affect Tri-Met costs but it might affect Tri-Met finances to the extent that it changes the revenue Tri-Met might otherwise receive. The justification is that the increased ridership arises from participation of employers in PASSport and therefore it is inaccurate to claim lost revenue from increased ridership. Beyond tying employer cost increases to Tri-Met cost increases rather than ridership, Tri-Met and local jurisdictions face the same problem of finding revenue as for the other possible programs and demonstrations.

7.2.2.Summer PASSport trial program for all employers

Tri-Met in conjunction with City of Portland and other local governments could run a one-time program in which all employers would be eligible to receive free three-month passes for all employees. This would introduce PASSport broadly. If conducted during June, July and August it would correspond to the time that Clean Air Days encourage transit use. This would be primarily a promotion but it would allow some measurement of short-term ridership increases and employer participation. (Caution should be exercised in attempting to use any short-term demonstration to gauge longer-term ridership potential.)

Tri-Met fare revenue for June, July, August 1998 was approximately $9.4 million. Tri-Met would need to estimate how much of this revenue would be lost through a summer promotion program; it likely would be half or more. The cost should be shared among Tri-Met and local jurisdictions. Additionally, DEQ, EPA and the Federal Transit Administration should be approached for demonstration funds.

Issues

- Setting up this program could require a fair amount of administrative work to educate and enlist cooperation of employers. There should be a fairly simple way to set this up: all employers are contacted and asked to certify the number of passes required for their employees. Normal Tri-Met monthly passes are mailed to the employers who distribute them to employees.
- Beyond the issue finding funding for the demonstration, neither Tri-Met nor local jurisdictions have identified funding to continue to subsidize PASSport program.

7.3. Broadening the PASSport Program

Over time the PASSport program could be broadened beyond employers. Organizations, apartment complexes, neighborhoods, cities and counties could participate by buying passes for all or segments of their populations. Financial and practical hurdles prevent a large leap but it is the right direction in which to move. The issues associated with a large-scale broadening of the PASSport program to all residents of the City of Portland are presented next, followed by a recommendation for a first step.

7.3.1.A City of Portland PASSport program

What would it cost to fund a program that gave all City of Portland residents free annual transit passes? Based on very preliminary work, Tri-Met estimates that Portland residents currently generate approximately $24.6 million in annual fare revenue. This does not include anything for administering the program or for additional service that would be needed to meet increased ridership.

7.3.1.1.Administration of broadened PASSport program

This program would entail some administrative costs and problems associated with issuing passes but these should not be insurmountable.

The PASSport program is now relatively easy to administer since most employers issue photo ID or Tri-Met arranges to have photo IDs made. Doing this for larger, more general populations would add cost and complexity.

For a large jurisdiction, the first step would be to identify and contact all eligible participants, let's say all residents of the City of Portland. Then, passes must be distributed. Since these passes have value, the system for distribution must be reasonably secure. For people who buy annual passes, Tri-Met mails monthly passes to minimize the risk of loss. This is not a concern in the PASSport program since participants have photo ID to which transit pass stickers are attached.

These do present knotty administrative issues for distributing transit passes to a large constituency. Possible solutions which should be further investigated include:

- Requiring an application by eligible participants. For example, all citizens of Portland are eligible but must fill-out an application. An application procedure could be run to mail out monthly passes as in the standard Tri-Met annual pass program or to provide photo ID's. This runs counter to the basic thrust of fareless transit which is to eliminate barriers to ridership. And it would entail costs of processing applications. But it might be a necessary step.

- Use of drivers licenses as photo ID. If agreement could be reached with the Department of Motor Vehicles, driver's licenses could be used for attachment of transit pass stickers. Because this is a well-developed data base, it should be relatively easy to distribute passes by mail to drivers who live within specified jurisdictions, e.g. all drivers who live within City of Portland. DMV would issue special "transit licenses" to those who do not drive. This would entail some initiative on the part of applicants, but for a very good bargain. Presumably it would not be a great additional cost to DMV.

If passes are freely available to some and not to others, (say City residents only), and photo ID is not used, then a gray market is likely to develop. Some people who get passes for free undoubtedly would prefer to sell them to those willing to pay. This would be a concern both for the City and for Tri-Met.

Depending on how the program is set up, people who obtain passes and then move from the City during the course of a year would have continued use of a pass for a while even though no longer eligible.

7.3.1.2.Financing a broadened PASSport program

In contrast to finding a new source of revenue to pay for a fareless transit system, expanding Tri-Met's pass programs allows for tapping into the private sector through the employer programs and into existing sources of finance for local governments. In turn, these can be used to negotiate cost-sharing with Tri-Met.

For local governments, having another mouth at the trough may not sound like good news. But until new revenue is found, it is a start.

One possible avenue open to financing purchase of transit passes for residents in designated areas might be through creation of "business improvement districts" (BIDs) or "economic improvement districts" (EIDs). Such districts would be formed to subsidize transit passes for residents of the district. However, the obstacles are formidable.

EIDs are funded by fees on business owners while BIDs are funded by fees on commercial property owners. A city council enacts a BID/EID. If payers of more than 1/3 of the annual fees levied within the BID/EID object, the district is not formed. Districts last 5 years and then must be renewed. Fees may be based on a variety of criteria. Since the passage of Measures 5 and 50, there has been a move away from basing district fees on the value of property. Criteria now used include size of the parcel, value of improvements, number of employees, and more complicated formulas which incorporate estimates of usage.

A BID/EID may be voluntary or involuntary. In a voluntary district, a payer may opt out by objecting to creation of the district. If more payers of more than 1/3 of annual fees collected object, the district is not formed, whether voluntary or involuntary.

A BID can be financed by a surcharge on an existing business tax or license fee. In this case, an "overlay" district is created with revenue from the surcharge dedicated to the purpose of the district. This type of district does not need to be re-created each five years.

The City of Portland has created a downtown EID that funds a clean and safe streets program. It encompasses a 212 block area, raises approximately $3 million per year, based on a rather complicated formula. Five-hundred-forty-seven properties comprise the district.

A city-wide BID financed by a surcharge on the business tax would be the easiest to administer. Other possible formulations are harder to envision. A city-wide BID/EID based on something other than a surcharge on the business tax would be extremely cumbersome because there are normally many individual property situations which need to be resolved,

depending on the criteria that is used. For example, properties that mix residential and commercial uses. On the other hand, creating smaller districts may lead to greater opposition from local businesses wondering why they are singled out for a program that helps local residents shop and work elsewhere.

7.3.2.Recommended step: Extend Summer Youth Pass Program Year-round

A full program of providing transit passes to all residents of the City of Portland is too big a bite. But Tri-Met and the City can take a sensible step by making transit passes more accessible for young people.

Tri-Met currently runs a discounted Summer Youth Pass program. This should be expanded to a year-round program. The normal monthly cost of a youth pass is $29. The cost of a Summer Youth Pass, for summer 1999 is $14.33 ($43 for three months). Youth are the most transit-dependent and the most limited in income. While kids do have more diverse travel needs during the summer, getting to and from school is an even greater concern,

If Tri-Met were to reduce the normal cost of youth passes, school districts and local jurisdictions could go further by bulk purchase of passes for kids most in need. It should be up to school districts and local jurisdictions to decide whether and how to provide subsidized passes (beyond the discount provided by Tri-Met) for youths based on need or, for that matter, all young people or students.

Issues:

- Financing. Tri-Met will have some lost revenue. But this should further encourage school districts and local jurisdictions to pitch in to help purchase pass to make sure all kids have a basic level of mobility regardless of income.

8. Other options

8.1. Fare simplification: eliminate zone system

Within the transit industry and at Tri-Met, the trend has been toward keeping cash fares reasonably high while offering "deep discounts" on passes. As a result of increasing use of passes and discounting for senior citizens and youth, the average fare actually paid is $0.67. Some would argue that going to a simple, reduced flat fare would reduce the attractiveness of passes.

Overall, the Fareless Transit System Research Work Group leans toward simplifying the fare as part of a long-term strategy. There is particular merit in eliminating fare zones because the zone system adds complexity and because the trips we most want to convert to transit are the longest trips.

Tri-Met should eliminate the zone fare system and establish one fare for rides throughout the system.

This will reduce complexity and confusion in the fare system. Although it appears from Tri-Met surveys that the public approves of distance-based fares for equity reasons, the benefit of simplifying the fare system weighs more heavily.

Tri-Met should establish the amount of the fare. The amount is less important than elimination of zones. This is true in part because the direction in which Tri-Met should continue to push is to convert customers from cash to passes. It is appropriate for Tri-Met to maintain cash fares at levels that allow books of tickets and passes to be sold at discounts. It is tempting to say that fares ought to be set at a level for the convenience of the customer, say $1.00 or $1.25, but the price could not remain at this level over time given inflation. Therefore, setting a "simple" fare level would be a temporary expedient.

Issues:

- There could be some reaction from customers who believe that distance-based fares are more equitable, but there is no reason to expect this to be significant or to affect ridership.

8.2. City-wide free-fare zone

Anyone riding a bus or MAX within "Fareless Square" in downtown Portland does so without paying a fare. This "fareless zone" was created to help induce commuters to leave their cars at home; the cost of lost revenue was thought to be small since relatively few rides originated from within the downtown. While theoretically feasible to create large free-fare zones, such as the entire City of Portland, this would create substantial problems:

- If Fareless Transit applies only within City of Portland, commuters will seek parking places right at edge of City. The normal antidote in such situations is to create parking permit zones, but these may not be satisfactory to affected neighborhoods.
- Fare enforcement difficulties at the boundary of the zone.
- Effect on business location and central business district competitiveness. If a city-only system were to be financed by taxes on only downtown business or parking, this would create further imbalances in business location decisions and end up contributing to sprawl.
- Potentially this could create a patchwork of system of fareless zones within the overall system.

The Fareless Transit System Research Work Group does not believe this is a workable option.

9. Conclusions

1. Making transit a truly attractive alternative to the automobile will require building a transit system that competes better than today with the culture of auto dependence. Customers must be attracted to transit both by the ease and reliability of service and by the quality of riding experience, including amenities such as shelters and transit centers with shops.

2. Drivers do not pay the full cost of driving, imposing many costs on other taxpayers and society. Moreover, when people get in their cars to make a trip, they are conscious of only a small fraction of the total cost of that trip. When combined with the relative lack of alternatives, society's subsidy of auto use and the hidden costs of auto use contribute to increasing use and reliance on the automobile.

3. One significant difference to overcome is the fact that drivers do not have to dig in the their pockets to find $1.40 exact change to put in a fare box each time they want to make a trip. Nor do they have to carry around a mental zone map to get the fare right. This difference is a barrier to developing a fully competitive transit alternative.

4. A substantial step toward making transit a more competitive alternative can be made by expanding the use of transit passes provided free or at discount to employees and others. The experimental Tri-Met PASSport program allows employers to buy passes in bulk to give to all employees. Such transit pass subsidy programs could be expanded and modified to serve larger and larger segments of the population. Not only employers but also cities, counties, employer and other groups banded together in transportation management associations could participate in an expanded pass program.

    - For the passholder, the system is truly free (both the pass and each ride).

    - It allows concrete progress in the short term by expanding incrementally, allowing flexibility and opening up opportunities for partnership. Financing a fareless system (or service expansion for that matter) is a major stumbling block. While neither local governments nor businesses have abundant spare cash for buying transit passes, an expanded pass program taps into a greater variety and capacity of financing mechanisms. These range from simple purchase by employers or other groups to the full financing capacity of cities.

- The program could be coordinated with service improvements. This potential for efficient targeting of both passes and service improvements is a distinct advantage. The combination of pass programs and service improvements targeted to regional centers can be a tool for reinforcing Region 2040.

5. Tri-Met, the City of Portland and other jurisdictions should take the actions recommended in "Next Steps" to expand the number of employers that provide transit passes to employees, to simplify the fare system and to make transit passes more accessible and affordable for youth.

6. A completely fareless transit system is a distant goal dependent upon first expanding transit service, improving the quality of using transit and finding additional revenue to achieve all these goals. Expansion of the transit system as anticipated in regional plans is an essential base that must be built first, and the financing for this is still uncertain. Fareless transit by itself, especially as a short-term goal, would not reduce peak-hour auto commuting commensurate with what it would cost and the opportunities it might displace for expanding the quantity and quality of transit service. Alternatives to a full Tri-Met fareless system, such as making the City of Portland a fareless transit zone, create more problems than they solve

7. Financing investments to make transit more competitive, both by expanding service quantity and quality and by making the fare system less of a competitive disadvantage, is a major challenge for the region. Adopting a regional parking tax to pay for fareless transit faces high hurdles. Tri-Met effectively has no other financing source available to it without action of the Legislature or vote of the people. Despite these obstacles, the region should pursue development of a regional parking tax and greater flexibility from the Legislature for financing transit. It should also pursue policies that give drivers true price signals about the costs to society of the trips they make.

10. Next steps

The assignment to the Fareless Transit System Research Work Group was to produce a report which could serve as the basis for broader and deeper public consideration of fareless transit. The Group recommends:

1. This report should be made broadly available within the region for comment by citizens and groups.

2. Tri-Met and local jurisdictions should take two steps to expand employer participation in the PASSport program:

- The current program penalizes employers for increased ridership by raising the price they pay for passes. Employers should face increased prices only when service is added. This also opens up avenues for partnerships among local jurisdictions, employers and Tri-Met to provide a negotiated and targeted package of service improvements and subsidies for purchase of passes.

- Tri-Met in conjunction with City of Portland and other local governments should run a one-time program in which all employers would be eligible to receive free three-month passes for all employees. This would introduce PASSport broadly. If conducted during June, July and August it would correspond to the time that Clean Air Action Days encourage transit use.

3. Tri-Met should eliminate the zone fare system and establish one fare for rides throughout the system. This will reduce complexity and confusion in the fare system.

4. Tri-Met should extend its summer youth pass program year-round. This would sharply reduce the cost of passes for young people during the school year and encourage school districts and local jurisdictions to work with Tri-Met for bulk purchases of passes.

5. Recognizing constitutional and institutional difficulties, the region should seek to implement a regional parking tax.

6. Local and regional governments should continue to examine the true costs of dependence on the car and ways to make sure that driving pays its true costs.

Appendix A

The Fareless Transit System Research Work Group

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Appendix B

THE FULL COSTS OF AUTO TRAVEL

Technical Memorandum 2(a)
Fareless Transit Study

Prepared for
Tri-Met for
Mayor's Fareless Transit System Research Workgroup

Prepared by
Parsons Brinckerhoff Quade & Douglas, Inc.

July 17, 1998

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1.0 Introduction

This technical memorandum is the first in a series of four that explore various aspects of fareless or free-fare transit. These memoranda are being produced in support of the Mayor's Fareless Transit System Research Workgroup. The Workgroup is a citizen committee charged with considering the financial, policy, and operational implications of a fareless transit system and regional parking tax in the Portland region and reporting back to the Mayor on their findings. Parsons Brinckerhoff is under contract to Tri-Met to produce the four technical memoranda and to support the Mayor's Workgroup. This study will answer several key questions:

- What are the full costs of auto travel and how are those different than what we pay every day to drive our cars?
- How much is spent in Portland on auto travel?
- What have been the experiences of other transit districts that have implemented fareless transit?
- What might happen if the full cost of auto use were borne by auto users?
- How much does the Portland region save in private, governmental and societal cost every time an auto user switches to transit?
- How could a parking tax pick up lost fare revenue?

The four technical memoranda are described below.

Full Cost of Auto Travel – This memorandum summarizes the available literature on the full cost of auto travel and creates a theoretical and policy framework for discussing specific costs in the Portland region.

Effects of Full Cost Pricing for Auto Travel in Portland – This memorandum takes the results of the full costs of auto travel and applies these costs in a general way to the Portland region to determine the cost of auto travel as it applies to Portland. Specifically, this memorandum will show what private, governmental, and societal costs are avoided when an auto trip switches to transit.

Fareless Transit Operational, Policy and Financial Issues - Several transit providers have had experience with free fare demonstration projects. This memorandum summarizes those experiences and more fully develops the operational, financial and policy implications of eliminating fares on the Tri-Met system.

Financial Impacts of Regional Parking Tax – This memorandum concludes the series by discussing the fiscal impacts of a regional parking tax and the mechanisms through which it could be applied. A regional parking tax is linked to fareless transit as a way to replace Tri-Met revenue lost by the elimination of fares.

The present report concludes that, for a hypothetical ten-mile trip, the driver may be aware of spending about 50-cents to one dollar while the actual cost of that trip to the driver and to

society may be on the order of five to ten dollars. The technical memoranda and deliberations of the Workgroup will explore the implications of this "gap" and how fareless transit, funded by a parking tax, might reduce some of the social costs associated with automobile use.

1.1 Why Be Concerned About The Costs Of Driving?

When most of us decide to make a trip, we usually only consider the out-of-pocket costs, such as gas for the car, parking, or bus fare. Yet, the actual cost of travel includes a variety of other costs, some that we're familiar with, others that we rarely consider. For example, we easily recognize that the cost of taking a trip in an automobile also includes maintenance and insurance, as well as the cost to purchase the vehicle, in addition to the easily identifiable out-of-pocket costs. However, we may not consider that driving also involves government expenditures for roads and police that are not fully covered by the gas taxes and user fees that we pay. Less frequently, perhaps, do we think about the other costs that are indirectly imposed on society, such as pollution and noise.

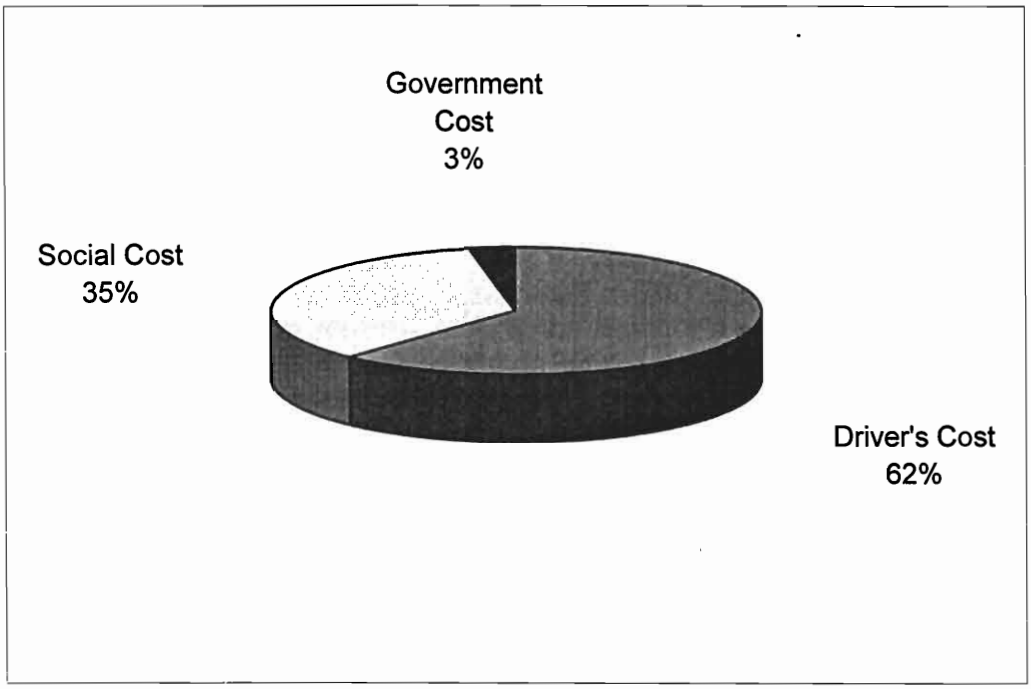
Studies such as this are undertaken in order to enable policymakers and the public to more fully understand the full costs associated with driving. They also provide an estimate of the extent to which automobile drivers cover the total costs of vehicle use. There is general agreement among transportation researchers that society subsidizes the use of automobiles, both directly and indirectly. However, arriving at a reliable estimate of the magnitude of subsidization is a difficult task that involves, among other things, attempting to place dollar values on "goods" such as clean air, land loss, or noise. Most would agree that, despite the difficulties inherent in having drivers pay more of their fair share, there are important social, environmental, and economic gains to made from doing so.

Numerous estimates have been made to derive the extent to which society subsidizes the use of the automobile, with a commensurate amount of variability in those estimates. A substantial amount of the variability stems from the difficulty of measuring many of the costs involved. An additional amount of variability arises from differences among researchers regarding what types of costs to include. For example, some argue that the costs that society incurs by defending oil reserves in the Persian Gulf are an important cost to be quantified and included. Others take a much more conservative view and only include costs for which dollar amounts can be more easily estimated.

At the aggregate level, Apogee Research, Inc. cites Moffat's estimate that the total U.S. costs for automobile transportation in 1990 were $1.1 to $1.5 trillion. Of this drivers spent $750 to $900 billion, government spent $35 billion (in excess of receipts), leaving society as a whole to cover to the remaining $340 to $590 billion. This is depicted in Figure 1, below, which indicates that the social costs are greater than one-third of the total. On an individual level, Litman estimates that for every $1 spent operating a vehicle, approximately $2.61 worth of costs are generated that society bears.

Figure 1

Allocation of Transportation Costs in the U.S., 1990



Source: Moffat Study, cited in Apogee Research, Inc., *The Costs of Transportation, Final Report,* 1994.

1.2 Ways to Think About Costs

The concept of cost can be thought of in a variety of ways, based on the way in which they are perceived, the party that bears them, the way in which they are paid, and so on. The three most common are discussed below. Understanding these distinctions helps to explain the ways in which drivers do not directly experience the full cost of each individual trip.

- **Market and Non-market Costs**

  We are most conscious of market costs. For example, the dollar amount that we pay for toasters, shoes, and computers are set in competitive markets. Non-market costs are those that markets cannot easily set prices for, such as the value of your time spent walking to a bus stop, or value of clean air. Many non-market goods have significant value and the difficulty of assigning appropriate costs to them is a complicating factor in the effort to arrive at the full cost of driving.

- **Fixed and Variable Costs**

  Some of the costs of operating a vehicle do not vary with the amount of miles driven, and so are considered fixed. Examples of these are the cost of purchasing and insuring an automobile. Other costs will increase as the amount of miles driven increase, such as gas, congestion, and pollution costs. This distinction is important because, when it comes to deciding whether or not to make a given trip, drivers tend to consider only the variable costs. Because the total cost is not perceived, more driving occurs than would otherwise be the case if all costs were paid by the automobile user.

- **Private, Government, and Social Costs**

  Private costs (also called user costs or internal costs), are those that a purchaser of a good pays. Social costs (also called external or public costs) are those that the user does not pay, and which are borne more broadly by other individuals or society as a whole. For example, an individual buys a car stereo for a given amount of money, the private cost. If this person is the type to play the stereo at full volume, he or she will then be imposing costs on society in terms of noise and sleepless nights. Note that these external costs are also non-market costs as well. Typically, the effort to identify the full costs of automobiles is motivated by the desire to "internalize" external costs, i.e. make the user pay.

  Government costs fall in between private and social costs. They are those that are borne by local, regional, state, and federal governments to provide and maintain the infrastructure necessary for automobile use. There are less-visible forms of government support for vehicle use as well. This includes the portion of police, fire, and justice expenditures that go toward meeting the many requirements of automobile users. Many, but not all of these costs are paid for by drivers in the form of gasoline taxes and registration fees.[1] Table 1, below, shows the share of transportation expenditures that were covered by transportation-generated revenues in 1993.

Table 1
1993 Government Transportation Expenditures
Covered by Transportation-Generated Revenues*

Mode	Federal Government	State and Local Government
	Percent	
Highways	93	84
Air	61	90
Transit	78	32

* *(excludes social costs)* Source: *Transportation Statistics Annual Report, 1997,* U.S. Department of Transportation.

As Table 1 indicates, all forms of transportation receive some level of subsidization. For example, 93 percent of the federal costs associated with highways were covered by revenues.

[1] *All estimates used in this report will be net of the revenues that government receives from automobile users.*

It should come as no surprise that transit receives relatively high levels of subsidization, and that highway travel receives the smallest share. However, the percentages above do not include the full range of costs that society bears from the use of automobiles, which is the topic of this report.

2.0 Types of Costs

This section reviews the types of costs that occur from the use of automobiles. For this review of costs, we divide the types of costs between the parties who bear them, i.e., private, government, and society as a whole, as mentioned in the previous section. Note that only the private costs are the ones that are borne by the person making the automobile trip. Government and social costs can be thought of as a subsidy to the driver.

Table 2, below, lists a comprehensive range of automobile costs, developed by Apogee Research, Inc. The cost categories for which estimates are provided in this report are described below.

2.1 Private Costs

Private costs are those which are borne by the individual automobile user. Some these costs will vary according to the number of miles driven, others will be fixed costs.

- **Vehicle Ownership and Operation**

  These costs include purchasing, financing, insuring, and registering an automobile, as well as the cost of gas, oil, tires and other parts, and repair. These are the costs that people most frequently think of when considering the cost of driving an automobile. Vehicle operation costs will vary according to the amount of driving done, the condition of the vehicle, the level of congestion, and other driving conditions.

- **Non-residential Parking**

  This is the amount paid by a driver to park his or her vehicle at a paid parking space.

- **Residential Parking**

  This is the amount that drivers spend to park their vehicle at their place of residence. This charge is frequently bundled into other costs, such as the cost of the house.

- **Accidents**

  Accidents impose costs for the user, the government, and society as a whole. For the user-based category, the costs are associated with medical bills, vehicle damage, pain and suffering, and lost wages, and therefore have both market and non-market characteristics.

- **Travel Time**

  The time we spend getting from one place to another is valuable to us and can represent a significant cost to the automobile user. Time is also a crucial determinate of the mode they will chose. The value that drivers place on time will vary according to many factors,

such as the trip purpose, companions, and driving conditions, and therefore very difficult to estimate. Economists typically calculate time costs as a function of the average wage for the driver and weight activities according to their level of discomfort. For example, waiting for a bus is weighted as 2.5 times more onerous than riding on a bus or in a car.

Table 2
The Full Range of Automobile Costs

Type of Cost	Market or Non-market?	How the cost is perceived or experienced
Private Costs (borne directly by the		
Vehicle purchase and debt	Market	Fixed payment
Gas, oil, and tires	Market	Out-of-pocket
Repairs and parts	Market	Fixed and out-of-pocket
Auto Insurance	Market	Fixed payment
Registration and other fees	Market	Fixed payment
Parking, user paid away from	Market	Out-of-pocket
Parking, at home	Market	Bundled with other costs
Accidents, private expenses	Non-market	Out-of-pocket
Travel Time	Non-market	Variable
Government Costs[a]		
Capital investment	Market	Taxes, all levels of government
Operations and maintenance	Market	Taxes, all levels of government
Driver Education and DMV	Market	Taxes, state and local
Police/Justice/Fire	Market	Taxes, state and local
Parking (subsidies)	Market	Federal, tax revenue forgone
Energy (defense costs)	Non-market	Taxes, federal
Accidents (health care)	Non-market	Taxes, all levels of government
Pollution (health care)	Non-market	Taxes, revenue forgone
Social Costs		
Parking (free commercial)	Market	Bundled with other costs
Pollution (health, environmental)	Non-market	External
Private infrastructure repair	Market	External
Accidents (productivity, pain and	Non-market	External
Energy (trade effects)	Non-market	External
Noise	Non-market	External
Land loss	Non-market	External
Property values	Market	External
Aesthetics	Non-market	External
Induced land use patterns	Non-market	External
Barrier Effect	Non-market	External

Adapted from *The Costs of Transportation: Final Report.* Apogee Research, Inc, and, *The Costs of Travel in Boulder.* Parsons Brinckerhoff.

[a] Government costs are net of user payments from gas taxes, registration, etc.

2.2 *Government Costs*

Government costs, net of the revenue received from gas taxes, licensing, and other fees, include the following.

- **Local, Federal, and State Highway Investment**

  This category includes the amount of money that governments spend on construction, maintenance, land acquisition, and financing for highways and roads. Calculating this cost component requires subtracting all user fees (tolls, fuel taxes and registration fees).

- **Municipal Services**

  Municipal services include the necessary costs for the "protection of health, safety and welfare related to transportation use" (Apogee Research, Inc. pg. 138). These services include police, planning, justice, street lighting, parking enforcement, and emergency response services.

- **Accidents**

  In addition to the costs that the individual user incurs from traffic accidents, the government also incurs costs from uninsured motorists, rehabilitation, legal fees and litigation, and property damage.

- **Deferred Investment/Maintenance**

  The cost of repairing the damage caused by motor vehicles is often greater than the funds that are available for repairing it. Because damage that has been done must someday be repaired, "the gap between current spending and needed investment can be considered deferred investment" (Apogee Research, Inc., pg. 155).

2.3 *Social Costs*

Social costs are those, which are borne by society as a whole, include the following.

- **Non-residential Parking**

  When parking is not specifically paid for by the user we still pay for it in a variety of ways. Many of the goods and services we purchase include the cost of "free" parking in front of the store, which is paid for by all purchasers, not just those who arrived in an automobile. "Free" employee parking often involves a subsidy from the government through a tax write-off to the employer. Because land is valuable, all parking has a cost associated with it. However, these costs are frequently bundled in with other goods so that we are not aware of its cost.

  The amount of land allocated for parking is substantial. Delucchi estimates that parking spaces for vehicles use approximately 2,000 to 3,000 square miles of land in the U.S (Delucchi 1997, pg. 17). A tremendous amount of this parking is offered at no cost to the user. Using the 1990 Nationwide Personal Transportation Survey, Shoup notes that, nationwide, motorists reported that 99 percent of all automobile trips had free parking. It

has been estimated that the total value of the parking that is provided free ranges from $60 to $200 billion per year (K.T. Analytics, Inc.).

- **Accidents**

  Society bears a substantial portion of the costs associated with automobile accidents, particularly from losses in productivity, disability payments, property damage, pain and suffering, and accident prevention. Litman cites studies estimating that upwards of 30 to 50 percent of the total costs of accidents are borne externally.

- **Pollution**

  Air pollution from automobiles causes a myriad of negative effects to individuals, society, and the environment, including health problems, crop damage, acid rain, ozone depletion, global warming, and diminished quality of life. Measuring these costs is difficult, in part because many non-market elements are involved, such as quality of life and integrity of the environment. A report for the Washington Council of Governments noted that:

  > *while there is wide consensus about the fact that drivers create real external costs through air and noise pollution, the estimation is very complex. There are many pollutants and they affect human health in a variety of ways over many years. The costs associated with these effects are hard to quantify and value. They are very context specific and depend on existing pollution levels as well as local weather and other conditions* (K.T. Analytics, Inc., pg. 14).

  Nevertheless, because motor vehicle use is responsible for a significant amount of air pollution it is important to estimate its contribution to it. Further, newer estimates of the costs of air pollution, which are based on more reliable estimates of vehicle emissions and the resultant health risks, put the range of costs in the tens or hundreds of billions of dollars per year, up from older estimates in the billions of dollars (K.T. Analytics).

  Water pollution and changes in water flow can also result from the use of motor vehicles. These stem from road salting, fluid leakage, air pollution settlement, increased runoff from roads and parking lots, flood control, and shoreline modifications. As with air pollution, these are also difficult to quantify.

- **Barrier Effect**

  Roads, which are intended to facilitate transportation, also form barriers, especially to non-motorized travel (Litman). The barrier effect tends to decrease pedestrian and bicycle activity, increase dependence on automobiles, disrupt the continuity of neighborhoods, and especially affect vulnerable populations (children, elderly, and handicapped). Litman cites studies of home-to-school transportation in which school principals noted the "'volume and speed of vehicular traffic' as the primary barrier to increased walking and bicycling by students" (pg. 3.13-1). Efforts to quantify this cost are limited to studies in Sweden and Denmark.

- **Noise**

  Motor vehicles produce a variety of sounds and vibrations that negatively impact individuals and communities. Excess noise can cause a significant amount of stress, disrupt sleep, decrease property values, and impact our overall quality of life. There are also visual and aesthetic impacts that result from efforts to mitigate noise from

highways, such as from the presence of huge sound-walls in neighborhoods. Estimating the social costs of noise from motor vehicles generally focuses on its impacts on property values.

3.0 Cost Estimates

Table 3, below, provides estimates of the total cost of driving, divided into private, government, and social costs. The appendix contains the full breakdown of each subgroup.

Table 3
Private, Government, and Social Costs of Driving

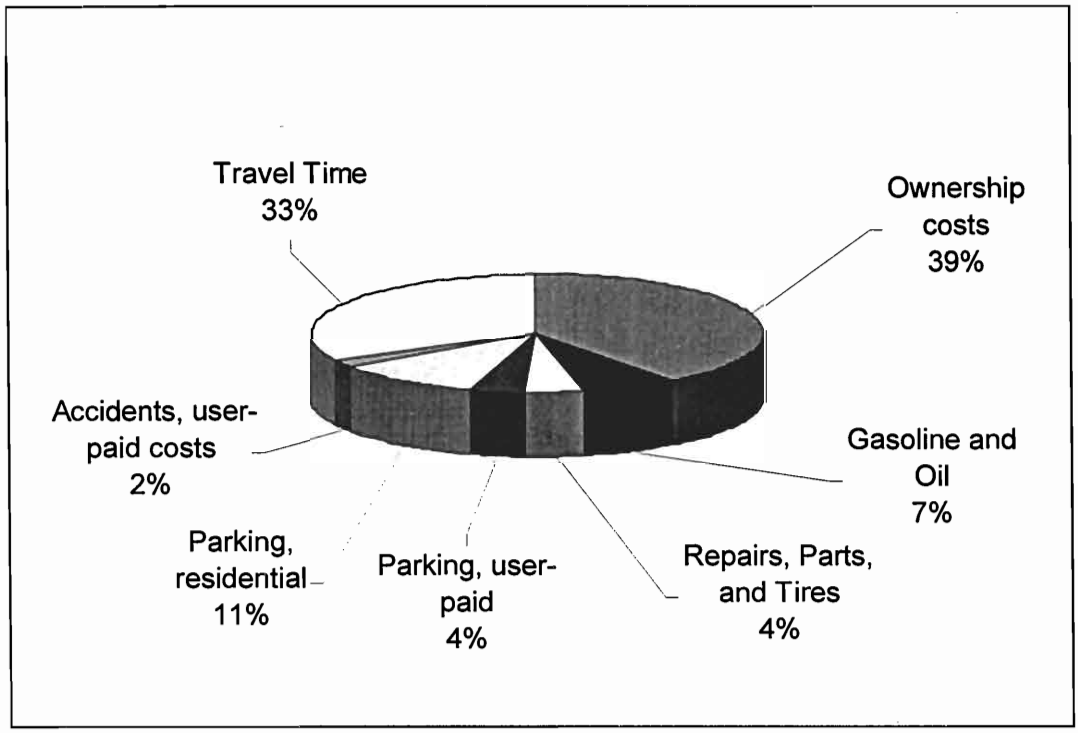
Type of Cost	Estimate	Percent of Total[a]
	Dollars per Vehicle Mile	
A. Private		
Total Private Cost	**$0.47 – $1.12**	**79%**
Cost of Auto Use	$0.35 – $0.72	53%
Cost of Time	$0.12 – $0.40	26%
B. Government Costs[b]	**$0.05 – $0.08**	**6%**
C. Social Costs	**$0.12 – $0.18**	**15%**
Total without travel time	**$0.52 – $0.98**	**74%**
Total with travel time	**$0.64 – $1.38**	**100%**

[a] *Percent is based on the midpoints of the estimates.*
[b] *Government costs are net of receipts to avoid double-counting.i.e. – Gas Tax counted only as a private cost*
Source: Apogee Research Inc. and Parsons Brinckerhoff.

Please note that the figures in Table 3 represent the range of estimates for peak travel in three different locations – Boulder, Colorado; Boston, Massachusetts; and Portland, Maine. The ranges are dependent upon local conditions and should not be applied directly to other areas. These estimates do provide a useful starting point for understanding the full range and magnitude of costs that are involved in driving. The above estimates indicate that the costs of driving, even those that are individually borne, are quite high. An individual generally only considers the out-of-pocket costs of gas, oil, and parking when contemplating a trip. The relative share of the out-of-pocket costs are shown in Figure 2, below.

Figure 2

Breakdown of Private Costs



Note: "Ownership costs" include depreciation, financing, insurance, registration, and taxes.

Drivers tend to consider only the costs of gasoline and parking when thinking of the costs of a trip. Figure 2 shows that these costs represent only 12 percent of the drivers actual private costs. These costs, equaling five to twelve cents, are a fraction of the total private costs estimated to be $0.47 to $1.12.[2] This indicates that individuals are likely to be underestimating the costs of their travel by automobile, even without the additional costs to government and society included.

It is interesting to note the gap between the cost that drivers perceive and the total cost. The commonly-perceived costs of gas and parking total five to twelve cents per mile,[3] while the total costs of driving are estimated to be 64 cents to $1.38 per mile. This results in a gap between perceived costs and actual costs of 59 cents to $1.26 per mile. If we accept the notion that cost plays a major role in our buying habits, the magnitude of the costs of driving that vehicle users do not readily perceive is very large indeed.

The estimates also indicate the importance of the value of time in the total costs of travel. As mentioned before, the value that is placed on time varies significantly depending on many factors, such as trip purpose (e.g. work or vacation). Nonetheless, when an individual is deciding whether to use an automobile, bus, train, bike, or feet, he or she generally bases the

[2] Please see the appendix for a breakdown of the private, social, and government costs.

[3] The appendix contains a breakdown of each cost category.

decision on the out-of-pocket costs and perception of travel time, and it is the value placed on time that often sways people toward the automobile.

Turning to social costs, these are two to three times the amount that drivers are paying for gasoline. In other words, an individual spending $10 worth of gas may be generating $30 worth of costs for society in general. The costs associated with air pollution represent approximately half of the total social costs, which likely represents a conservative estimate, according to updated estimates of emissions and their effect on health.

In terms of subsidies to drivers, we can look at the amount of the costs that are borne external to the driver, or the total of government (net of automobile-related receipts) and social costs. According to these estimates, the total subsidy to individual drivers equals 17 to 26 cents per mile.

Figure 3, below, shows the relative share of the total costs borne privately, by government, and by society in general.

Figure 3

Share of Private, Government, and Social Costs

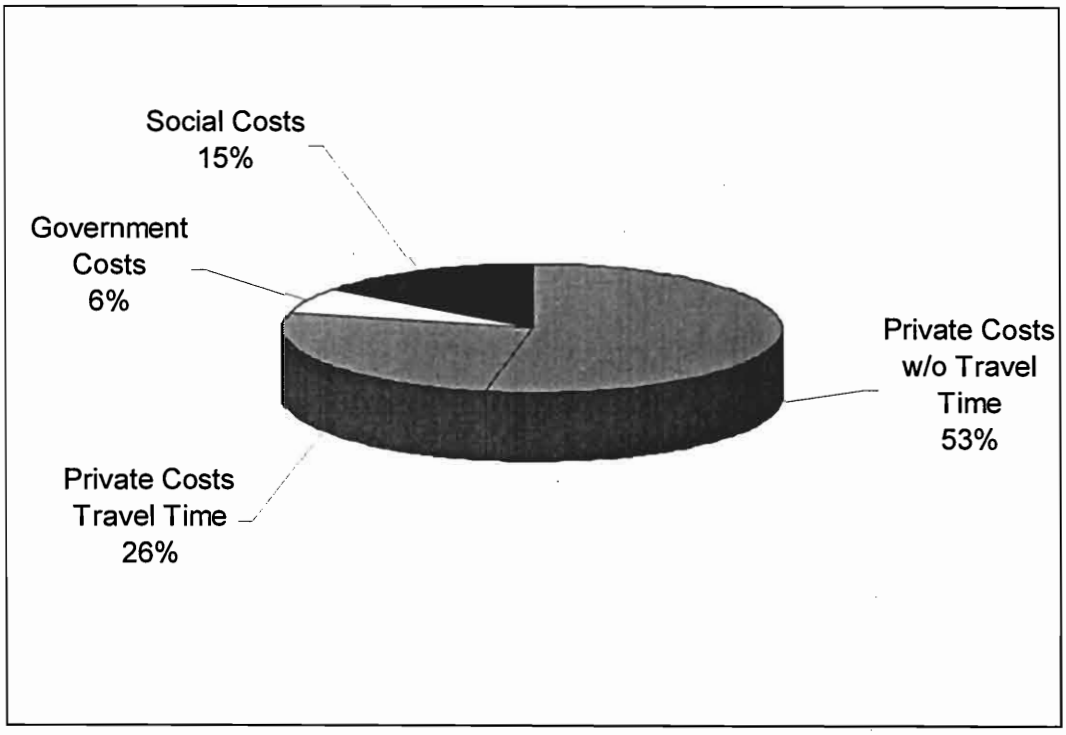


Figure 3 shows that, although drivers bear the majority of costs themselves, social costs are significant and represent 15 percent of the total cost of driving. When government costs are included, almost one-quarter of the total cost is borne by someone other than the person making the trip at the time he or she is traveling. The commonly perceived costs (such as gasoline and parking charges), when measured against the full per-mile costs of an automobile trip, are a fraction of the total, representing a mere eight percent of the full costs.

4.0 Conclusion

Some continue to point out that transit receives substantial amounts of subsidization, but less frequently do we acknowledge that automobile use is subsidized as well. While subsidization for transit is fairly visible, for automobiles it is not. Subsidies for automobile use are diffused throughout society in general, for example, through parking that is provided at no perceivable cost to the driver or through the widespread effects of pollution.

According to the estimates presented above, in a hypothetical ten-mile trip (in an area similar to those for which our estimates were derived), the driver may be aware of spending about 50 cents to one dollar, but may actually be incurring costs on the order of five to ten dollars. Meanwhile, their trip is being subsidized by government and society as a whole, by around $2.00 to $2.50. This gap between what the driver is perceiving and the actual costs leads to travel decisions based on only a small part of the cost of the trip. It could be argued that this leads to a substantial increase in the amount of driving than would occur if drivers were covering more of their share of the costs of the trip.

When these costs are aggregated over the entire quantity of driving that occurs, the cost to society from automobile use is large. The average vehicle-miles traveled *per automobile* in the cities for which costs were derived total between 12,000 and 15,000 per year. This equates with an average subsidy of $2,040 to $3,900 per automobile per year.

The next technical memorandum to be prepared for the Mayor's Working Group on Fareless Transit will apply the generalized costs developed in this memorandum to the situation in the Portland region. This will more clearly illustrate the magnitude of costs incurred by government and society in the subsidization of auto travel in this region. It will then be possible to put in perspective the savings to the region when an auto trip switches to transit.

5.0 Appendix

Table A-1
Breakdown of Cost of Driving Estimates

TYPE OF COST	ESTIMATE	PERCENT[a]
PRIVATE		
Depreciation and Financing	0.20 – 0.25	22
Insurance	0.05 – 0.12	8
Registration and Taxes	Up to 0.01	<1
Gasoline and Oil	0.04 – 0.07	5
Repairs, Parts, and Tires	0.03 – 0.04	3
Parking, user-paid	0.01 – 0.05	3
Parking, residential	0.01 – 0.16	8
Accidents, user-paid costs	0.01 – 0.02	1
Subtotal: Private	**0.35 – 0.72**	**50**
Travel Time	0.12 – 0.40	26
Total: Private	**0.47 – 1.12**	**76**
GOVERNMENT[b]		
Federal/State Capital Investment	***	***
Federal/State Op. & Maintenance	***	***
Local Capital, Operating & Maintenance	0.01 – 0.03	2
Police, Fire, and Justice	0.01 – 0.02	1
Accidents, Government	0.01	1
Deferred Investment	0.02	2
Total: Government	**0.05 – 0.08**	**6**

Table A-1: Breakdown of Cost of Driving Estimates, *continued*

TYPE OF COST	ESTIMATE	PERCENT[a]
SOCIAL		
Parking, social	0.02 – 0.03	2
Accidents, social	0.01 – 0.02	1
Air Pollution	0.05 – 0.09	7
Water Pollution	0.01	1
Barrier Effect	0.02	2
Noise	0.01	1
Total: Social	**0.12 – 0.18**	**14**
GRAND TOTAL WITHOUT TRAVEL TIME	**0.52 – 0.98**	**70**
GRAND TOTAL WITH TRAVEL TIME	**0.64 – 1.38**	**94[c]**

*** Costs are less than one-half cent.

[a] Percent is based on the midpoints of the estimates.

[b] Government costs are net of user payments.

[c] Percent total equals less than 100 due to rounding.

Source: Apogee Research Inc., *The Costs of Transportation: Final Report*; and, Parsons Brinckerhoff, *Cost of Travel in Boulder*.

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Appendix C

Fareless Transit: Issues and Experiences

Technical Memorandum 2(b)
Fareless Transit Study

Prepared for
Tri-Met, for the
Mayor's Fareless Transit System Research Workgroup

Prepared by
Parsons Brinckerhoff Quade & Douglas, Inc.

September 23, 1998

PB
100 YEARS

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1.0 INTRODUCTION AND SUMMARY

This technical memorandum is the second in a series of three that explore various aspects of fareless transit, in support of the Mayor's Fareless Transit System Research Workgroup. The Workgroup is a citizen committee charged with considering the financial, operational, and policy implications of a fareless transit system and a regional parking tax in the Portland region.

The technical memoranda are described below.

The Full Cost of Auto Travel – The first memorandum summarized the available literature on the full cost of auto travel and created a theoretical and policy framework for the remainder of the study.

Fareless Transit: Issues and Experiences – Several transit providers have had experience with free fare demonstration projects. This memorandum (the present one) summarizes those experiences and more fully develops the operational, financial, and policy implications of eliminating fares on the Tri-Met system.

The Effects of a Regional Parking Tax – This memorandum will conclude the series by discussing the supply and demand effects of a regional parking tax. A regional parking tax is linked to fareless transit as a way to replace Tri-Met revenue lost by the elimination of fares.

1.1 Summary

The present report describes the results of several fareless transit demonstrations in large cities, compares the importance of different service characteristics relative to decreasing fares in attracting additional riders, and reviews Tri-Met's findings from its own research.

Three large transit systems had fare-free transit demonstrations in the late 1970s and early 1980s. Their experiences provide insight into the issues surrounding fareless transit:

- All three experienced a substantial increase in ridership.
- Crime and undesirable behavior on buses were problematic.
- Crowding on buses, associated with not providing the necessary service increases to accommodate additional riders, was also a problem.
- Driver morale decreased, which can be associated both with security issues and crowding.
- No significant decrease in roadway congestion was found.

These issues indicate that:

- Free fare transit is more easily implemented in small and medium-sized communities.

- For maximum success, extensive pre-implementation planning is required, with a commitment to increase service, ward off security issues, and generate complete support within the transit agency.
- Portland's already high levels of ridership relative to its service area population suggest that the gains from implementing a fareless service would be less in percentage terms than the three demonstration cities experienced.

Statistical analysis and ridership surveys provide a picture of the factors that affect ridership. In general, personal safety, on-time performance, and frequency of service rate as very important, while the cost of service is rated as less important.

Although previous fareless demonstrations indicate that there may be significant problems in a fare-free system, no major transit system in the country has attempted to implement a fareless system that built on the lessons learned in Denver, Austin, and Mercer County. If Tri-Met seeks to do so, it should:

- Address security issues swiftly;
- Build community awareness of goals and objectives;
- Educate riders on what to expect;
- Secure unwavering transit agency support at all levels; and,
- Add service at the start of program to avoid overcrowding.

2.0 OTHER EXPERIENCES WITH FARELESS TRANSIT

A recent study found that approximately 61 U.S. cities and four Canadian cities have "free or reduced fare transit services in their downtowns" (Fisher 1998). System-wide fareless transit in large cities (population greater than 100,000) is rare, and has only occurred on a demonstration basis in three cities. These will be described below. Permanent fareless systems are more common for small providers. These are considered to be quite successful, with strong ridership levels and few issues with problem riders (Hodge et al. 1994).

2.1 Small System Experience

A number of relatively small transit systems provide free service to their passengers. The state of Washington is especially well-represented in this area – Chelan-Douglas, Island, Mason, and Skagit counties each have fareless systems. Skagit Transit has 11 fixed-routes, one express route, as well as a paratransit service, which serve four small towns. The Board of Directors decided on a fare free system because of its belief that, "for smaller rural transit systems, collecting a fare generates virtually no useable income," and that charging riders goes against its mission to "enhance the quality of life" through the provision of excellent service (Day).

The cities of Amherst, Massachusetts; Niles, Illinois; Logan, Utah; and Commerce, California also all have fareless systems. The primary goal of each system is to provide mobility to residents, and, in some cases to relieve congestion (Hodge et al.).

Topeka, Kansas and Salt Lake City, Utah each implemented month-long system-wide fareless service in 1988 and 1979 respectively, to increase public awareness of their systems. Topeka's ridership increased 83 percent during the demonstration, dropping to a 5.5 percent increase over pre-demonstration levels three months after the demonstration, and was considered successful in generating public awareness of new routes (Hodge et al.).

2.2 Large System Experience

The demonstration projects that were carried out on three large systems – Denver, Colorado; Mercer County, New Jersey; and Austin, Texas – in the late 1970s and early 1980s are more relevant for Tri-Met's consideration. The demonstrations in Denver and Mercer County were sponsored by the Urban Mass Transportation Administration (UMTA), predecessor of today's Federal Transit Administration. Austin's demonstration was sponsored by its transit agency, Capital Metro. Table 1, below, provides a comparison of the three projects.

Table 1: Case Studies Relevant to Portland

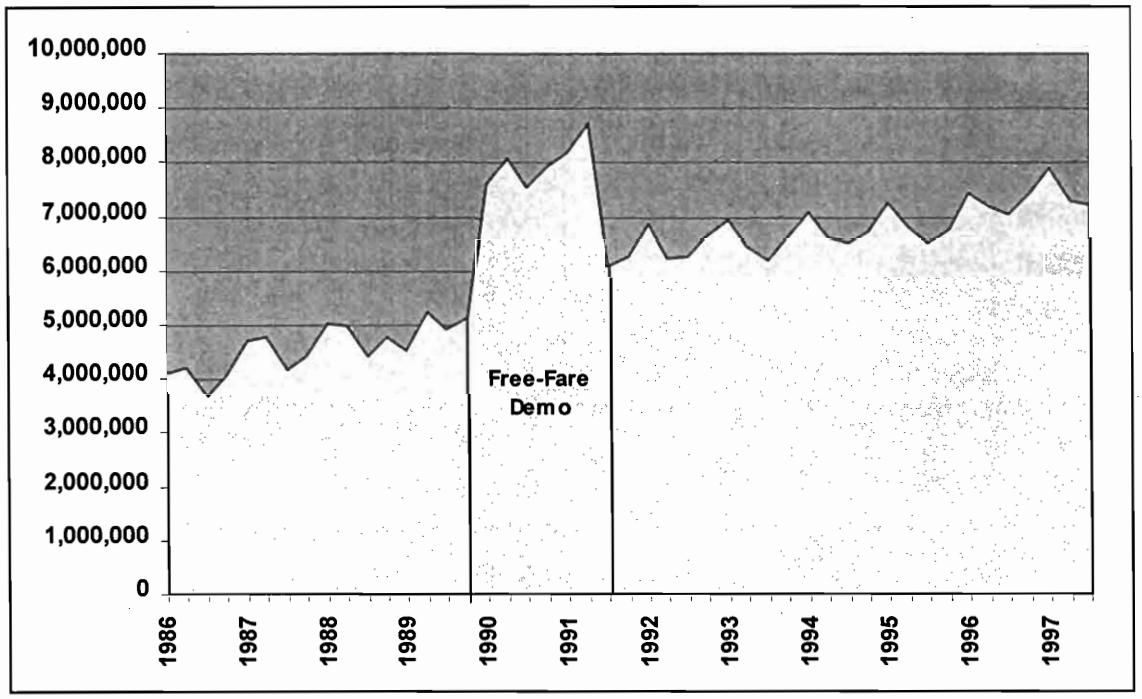
	Austin, Texas	Denver, Colorado	Mercer County, New Jersey
Demonstration Period	1989 – 1990	1978 – 1979	1978 – 1979
Service Area Characteristics (at time of demonstration)	Medium-sized city, with 605,000 inhabitants	Large city with 1.5 million inhabitants	Approximately 308,000 inhabitants in service area, which includes Trenton, the state capital
Free Fare Transit Service Characteristics	Peak and off-peak	Off-peak only Demonstration included central city and suburbs Significant other restructuring of system at time of demonstration	Off-peak only Demonstration included a declining central city (Trenton) and growing suburbs
Ridership Changes	70% ridership increase	49% increase system-wide 52% off-peak	24% increase system-wide 45% off-peak
Customer Reaction	81% favorable to very favorable reaction to elimination of fares 53% concerned about crowding 51% concerned about late buses	*Rider complaints regarding:* Obnoxious behavior Crowding Decreased schedule reliability	*Rider complaints regarding*: Obnoxious behavior Crowding Decreased schedule reliability
Driver Reaction		Decline in morale Increase in rider complaints about drivers	92% said job less enjoyable 95% received negative comments from riders
Security Issues	160% increase in security-related incidents	19% of riders said "politeness" declined	Media cited "rowdiness, vandalism and harassment"

Sources: *Austin:* NSI Research Group, 1990; Tri-Met, 1998. *Denver:* Studenmund et al., 1979; Spear and Doxey 1981. *Mercer County:* Studenmund et al., 1979.

Denver's demonstration grew out of what was intended to be a one-month "transit awareness program," and included some significant route restructuring and service expansions over the course of the demonstration (Donnelly et al.). Austin's 15-month program grew out of a plan to promote the system and educate the public about a major service expansion. The program was ended "because it had achieved its purpose . . . and because of the increased number of security incidents" (Hodge et al., pg. 10). Researchers also note that a significant number of Austin Metro's employees were resistant to the demonstration from the beginning. Mercer County's demonstration was in part an effort to revitalize the Trenton's deteriorating downtown (Studenmund).

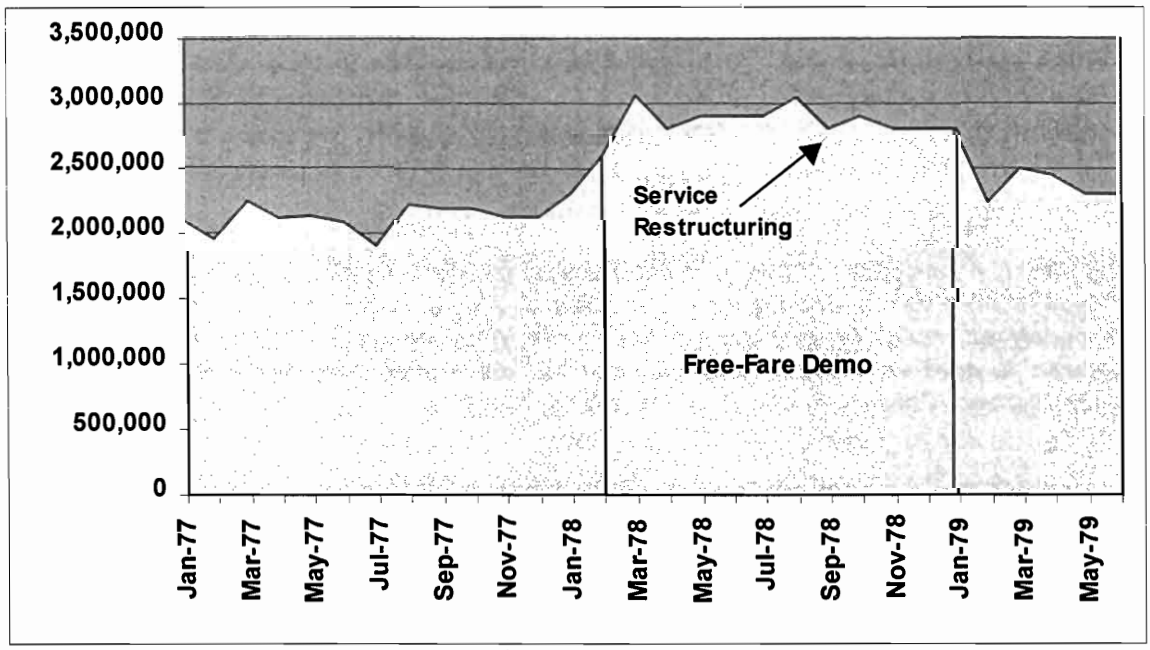
Despite the differences among the three systems, each experienced an immediate and substantial increase in ridership. The following three figures depict these increases.

Figure 1: Austin Fareless Ridership



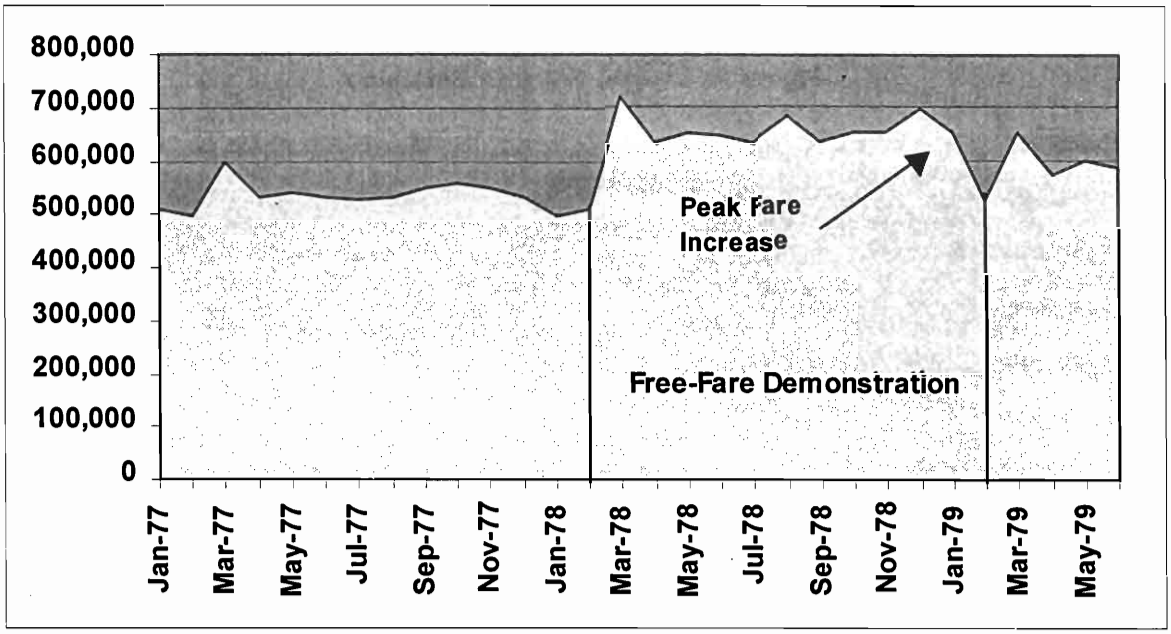
Source: Capital Metro, Fax from Rob Latsha, July 1998.

Figure 2: Denver Fareless Ridership



Source: Spear and Doxey, 1981.

Figure 3: Mercer County Fareless Ridership



Source: Spear and Doxey, 1981.

As these charts indicate, the ridership increases for the three demonstrations were dramatic, particularly in Austin and Mercer County. Because Denver's demonstration was coupled with significant restructuring and was not accompanied by a large public awareness campaign at the beginning, its gains were less-obviously tied to the fareless project.

However, these demonstrations are generally held as evidence that fareless systems in larger cities are not successful. Although ridership increases were dramatic in all three cases, the accompanying problems are seen as offsetting this benefit. Some researchers also comment that some sort of price is necessary to provide the sense that something has value. In an analysis that was performed after Denver's fareless experiment, the consultants noted that:

> *the principal conclusion of this evaluation is that free fare transit may be a more effective short-term marketing instrument than a desirable permanent element of transportation policy for metropolitan areas...complete removal of fare barriers appears to generate enough undesirable side effects to undermine its overall effectiveness (Donnelly et al. 1980, pg. xii).*

Other researchers have commented that, in order to meet the goals of reducing congestion and promoting transit use, the Denver and Mercer County demonstrations would have needed to have been fareless in the peak as well as off-peak (Hodge et al.). Further, the many security-related issues might have been reduced with a more comprehensive preparatory process and an effort to increase service levels in anticipation of crowding (or to react quickly once crowding was evident).

To summarize generally from these experiences with fareless transit:

- All three experienced an immediate and substantial increase in ridership.
- Crime and undesirable behavior on buses were problematic.
- Crowding on buses, associated with not providing the necessary service increases to accommodate additional riders, was also a problem.
- Driver morale decreased, which can be associated both with security issues and crowding.
- No significant decrease in roadway congestion was found.

These issues indicate that:

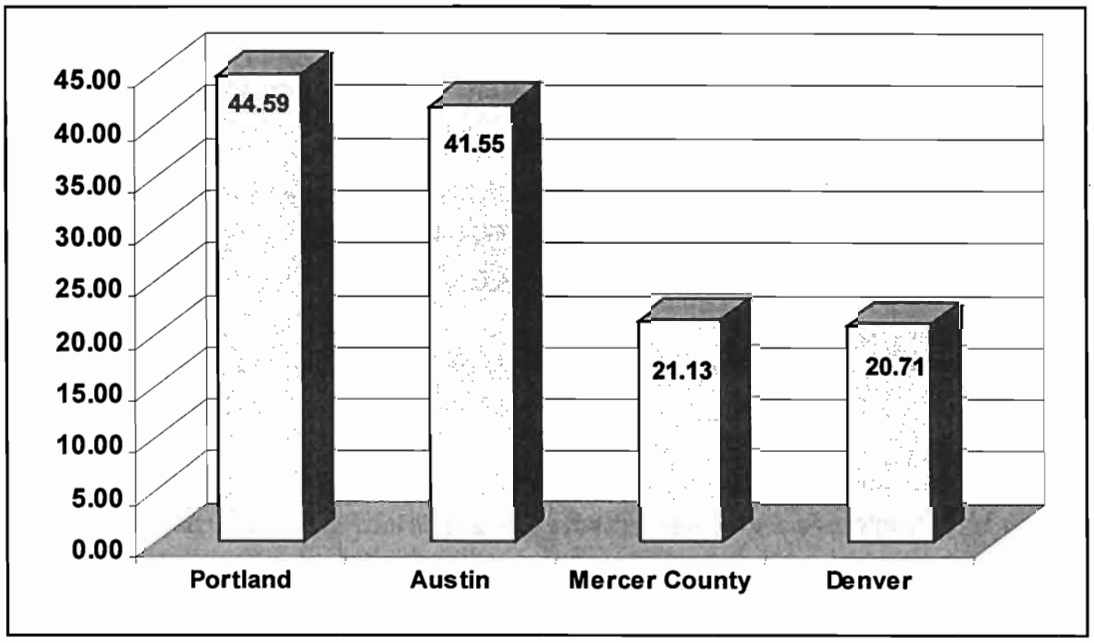
- Free fare transit is more easily implemented in small and medium-sized communities.
- For maximum success, extensive pre-implementation planning is required, with a commitment to increase service, ward off security issues, and generate complete support within the transit agency.

2.3 How Portland Compares to Demonstration Cities

It is informative to compare Portland's transit situation today with those of the other areas at the time of their demonstrations. In general, Portland has higher ridership per capita; a more mature, highly developed system; a very strong downtown; and community attitudes that support innovation.

Figure 4, below, compares Tri-Met's per capita ridership levels to those of the demonstration cities at the time of their demonstrations. Note that Portland's level was the highest, and occurred without any type of special fare program in place.

Figure 4: Annual System per Capita Ridership Levels



Note: Portland and Austin figures are for 1989, Mercer County figures are for 1980, and Denver's figures are for 1978 (population) and 1980 (ridership).

Sources: *Portland:* Tri-Met historic service data, provided by Nancy Jarigese; *Austin:* APTA Librarian and Tri-Met, March 1998; *Mercer County:* Studenmund, 1979 and U.S. Bureau of the Census, on-line; *Denver*: Studenmund, 1979.

Given Portland's already high levels of ridership relative to its service area population, it is possible that the gains from implementing a fareless service would be less in percentage terms than the three demonstration cities experienced.

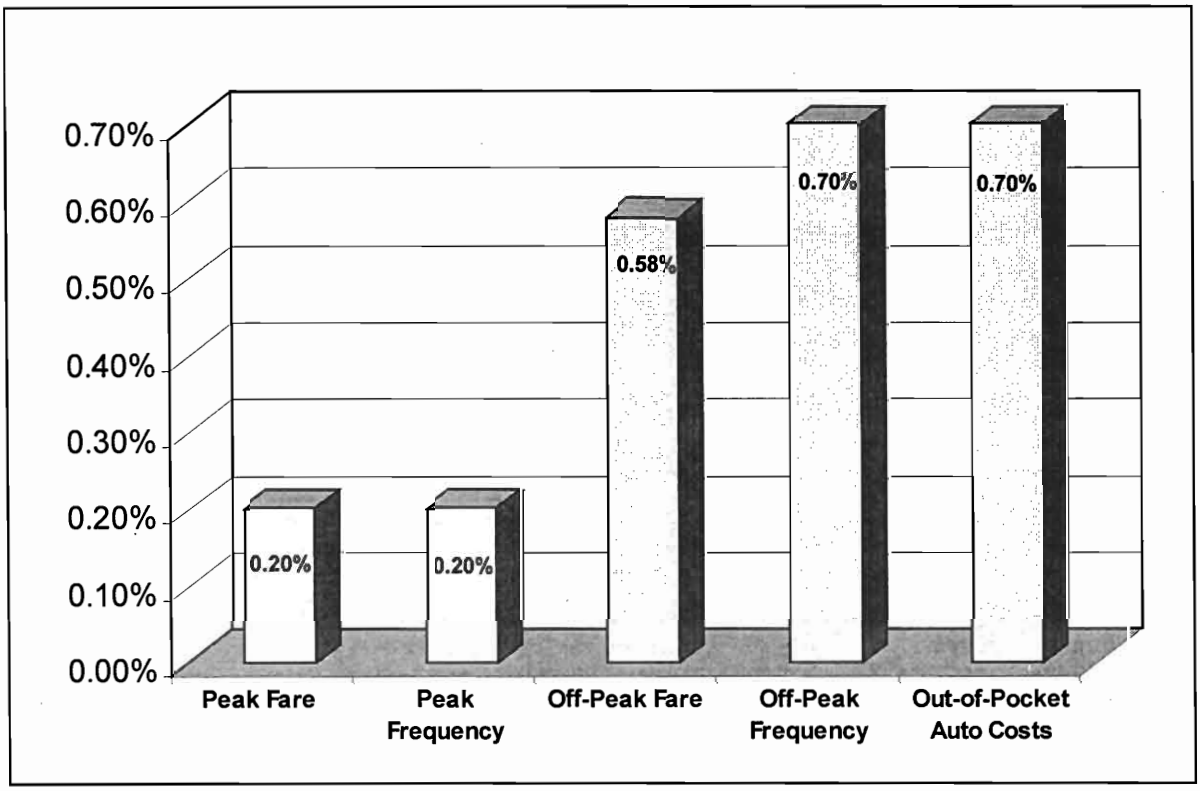
3.0 FACTORS THAT INFLUENCE RIDERSHIP

Operators of transit systems are almost always looking for ways to increase ridership; indeed, this is often their primary goal. Two tools, the direct observation of ridership response to service changes (which yield elasticity estimates), and the use of rider/non-rider surveys, are used to help determine what particular factors are most important to riders.

3.1 Elasticities

One way of comparing the relative importance of the cost of fares with other service characteristics is through the use of elasticities, which measure the percentage change in one factor in response to a one percent change in another. Figure 5, below, compares elasticities for several transit service characteristics.

Figure 5: Ridership Response to One Percent Change in the Listed Factor



Sources: Peak and Off-Peak Frequencies, Out-of-Pocket Costs: ECONorthwest. 1991. *A Framework for Developing and Evaluating Policies to Influence Transit Ridership and Urban Form*. Peak and Off-Peak Fares: APTA. 1991. *Effects of Fare Changes on Bus Ridership*.

Note the strong influence of changes in the out-of-pocket costs of driving. As we noted in the first Technical Memorandum, it is the out-of-pocket costs of driving (gas, oil, and parking) in addition to the time costs, that have the greatest influence on mode choice.

In terms of the factors that transit agencies can affect, the elasticities in Figure 5 indicate that changes in peak fares and frequency each have small ridership responses. However, decreasing off-peak fares and increasing off-peak service have the greatest effect. The logic behind this is simple. Because off-peak frequencies are substantially lower than at the peak, small increases in service represent a proportionally greater increase than they would in the peak.

3.2 Attitude and Awareness Surveys

Attitude and awareness surveys provide an another method of analyzing the relative importance of different service characteristics. Tri-Met has conducted surveys to assess the attitudes and awareness of its customers and area residents since 1977. These surveys have tracked changes in the level of ridership, perception of service quality, attitudes toward public transportation in general, as well as commuter characteristics. Information from these surveys, as well as from surveys conducted by other transit providers across the country, provide valuable information regarding the importance of fare, relative to other service characteristics, in generating ridership.

Of the surveys that we have reviewed for this report, the cost of transit does not rank as an important barrier for riders. Instead, riders and non-riders alike tend to mention service factors such as safety, on-time performance, and convenience as being most important.

Austin's Capital Metro conducted surveys with its the free-fare riders as well as the general public following the free-fare demonstration. Table 2, below, contains the responses to the question: *How important are the following factors in decision to ride the bus?* For the general public as well as the free-fare riders, the cost of service plays a minimal role in decisions to ride the bus. Instead, safety, convenience, and performance are the most important factors.

Table 2: Capital Metro Ridership Survey

	General public	*Free-fare riders*
Factor	***Rank***	
On-board safety of riders	1	1
On-time performance	1	3
Convenience of routes	3	2
Cleanliness inside the buses	4	3
Frequency of service	4	3
Hours of service	6	6
Courtesy of drivers	7	7
Cost of service/Fare	8	8
Outside appearance of buses	9	9

Note: 1 = extremely unimportant, 5 = extremely important; ties indicate factors received same score.

Source: NSI Research Group. 1990. *Final Report from the Free Fare Telephone Survey.*

Responses to a survey conducted by Tri-Met in the Fall of 1997 were remarkably similar, as shown in Table 3, below. Respondents[1] were asked to rate a) the importance of eight factors in their decision about whether or not to take Tri-Met; and, b) how good a job Tri-Met is doing on each of them.

[1] 1,006 interviews were conducted among a random sample of Tri-Met service district residents.

Table 3: Tri-Met Ridership Survey

	Importance	*How Tri-Met is doing*
Factor	*Rank*	
Safe operation of bus	4.60	4.07
On-time service	4.56	3.87
Personal safety when waiting	4.40	3.80
Available route/schedule info	4.36	3.74
Courteous drivers	4.02	3.70
Shelter where waiting for bus	3.97	3.42
Cost/Fare	3.58	3.29
Available telephone operators	3.42	3.27

Note: 1 = not important at all/poor job, 5 = very important/excellent job.

Source: Gilmore Research Group. 1998. *Fall 1997 Attitude and Awareness Survey.*

For both Tri-Met and Austin Metro riders cost is rated as relatively less important, with safety and performance rated relatively important. According to these examples, ridership increases would be more likely to result from improving customers' sense of safety and/or increasing reliability than from decreasing fares.

4.0 TRI-MET FARE RESEARCH

Tri-Met has studied fare issues in the past. Most recently, focus groups were held to assess the benefits of fare simplification in the Spring of 1995, and to assess opinions regarding a fareless system in the Spring of 1998. The responses provide insight for the current study.

4.1 Fare Simplification Research

The results from the fare simplification research indicate that the most difficult or confusing aspect of transit use comes from maps and schedules (for riders) and from figuring out how to get to a destination (for non-riders). Only a minority of the group perceived fares as an obstacle to riding.

Participants stated that fare simplification would not have an impact on amount that they use transit. Riders noted that, although the simplification might result in a lower fare, they would probably not increase their use. Non-riders indicated that fares are not an important factor in their decision not to ride.

4.2 Fareless Transit Research

Tri-Met's focus groups on fareless transit, conducted several months ago by Davis and Hibbits, Inc., included riders and non-riders from the city and the suburbs. The following points highlight their findings:

- In the telephone interviews that were part of the study, 29 percent of the respondents indicated that they would be more likely to use transit if it were free.
- Suburban residents emphasized that, regardless of fare, improving service to their area would be necessary for increasing ridership.
- For all types of participants, safety on buses and MAX is a critical concern.
- There is a significant "credibility gap" that Tri-Met would be able to handle the increased demands for service under a fareless system.
- A significant amount of education would be needed to alleviate concerns regarding how revenue would be raised and allocated in a fareless system.

In summarizing their findings, Tri-Met concluded that the studies

> *reinforce what Tri-Met has seen in numerous studies over the years: residents are much less concerned with the fare and fare payment, than they are with the level of services provided. Lack of service when and where residents need it is a much higher barrier to ridership than the fare (Tri-Met 1998).*

5.0 CONCLUSION

We have described the results of several fareless transit demonstrations in large cities, compared the importance of different service characteristics relative to decreasing fares in attracting additional riders, and reviewed Tri-Met's findings from its own research.

To summarize generally from other experiences with fareless transit:

- All three experienced a substantial increase in ridership.
- Crime and undesirable behavior on buses were problematic.
- Crowding on buses, associated with not providing the necessary service increases to accommodate additional riders, was also a problem.
- Driver morale decreased, which can be associated both with security issues and crowding.
- No significant decrease in roadway congestion was found.

These issues indicate that:

- Free fare transit is more easily implemented in small and medium-sized communities.

- For maximum success, extensive pre-implementation planning is required, with a commitment to increase service, ward off security issues, and generate complete support within the transit agency.
- Given Portland's already high levels of ridership relative to its service area population, it is possible that the gains from implementing a fareless service would be less in percentage terms than the three demonstration cities experienced.

Statistical analysis and ridership surveys provide a picture of the factors that affect ridership. In general, personal safety, on-time performance, and frequency of service rate as very important, while the cost of service is rated as less important.

Although previous fareless demonstrations indicate that there are significant problems in a fare-free system, no major transit system in the country has attempted to implement a fareless system that built on the lessons learned in Denver, Austin, and Mercer County. If Tri-Met seeks to do so, it should:

- Address security issues swiftly;
- Build community awareness of goals and objectives;
- Educate riders on what to expect;
- Secure unwavering transit agency support at all levels; and,
- Add service at the start of program to avoid overcrowding.

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Appendix D

Design for fareless transit in the Portland region

Tri-Met was asked to put forth a simple hypothetical scheme for how it would operate a completely fareless transit system. Parsons Brinckerhoff reviewed Tri-Met's estimate of increased ridership and service for reasonableness. This scenario is a "what if" case, not a proposal to fully implement fareless transit immediately. It assumes that funding is available.

Ridership and service projections

Based on case studies, research and transit industry experience, the best estimate is that elimination of fares by Tri-Met would yied an overall increase in ridership of 50-percent, distributed as follows:

+25% in peak hours

+60-65% in off-peak

If anything, this projection may be a bit optimistic given that Tri-Met is a mature system with good market penetration already.

(It should be kept in mind that these are estimates, not projections based on detailed analysis. Such analyses should be made at a point closer to a decision to implement a fully fareless system.)

To accommodate the projected ridership increase:

- no additional service is needed during off-peak hours
- peak service would need to increase 15%

Operational design

The Tri-Met system would operate as at present except that passengers would board through any door and would not pay fares.

The Fareless Transit System Research Work Group believes that no documentation or ID should be required to ride if the system were to be free. Tri-Met proposed that all riders be required to possess ID of some sort.

Issues

The overriding issues for implementing a fareless transit system are finding replacement revenue and weighing elimination of fares against other potential uses of revenue including security, service quality and service quantity.

Several other issues do not loom as large:

Security

Security is a paramount concern for riders regardless of fare structure. In a fareless transit system, security concerns can be met through a combination of providing expanded service to avoid overcrowding, training of drivers, and adequate security personnel. It is not necessary to require passengers to carry ID.

Service quality and overcrowding

Overcrowding is an issue attendant to any significant increase in ridership. It is the "success" problem. It should not be a barrier to fareless transit.

LIFT

In addition to regular fixed-route service, operates the LIFT program which provides on-demand lift-equipped mini-bus service for those with mobility limitations. Tri-Met believes that elimination of fares on the regular system would require, by law, elimination of fares for the LIFT program, resulting in increased demand and costs for LIFT.

Costs

Fares currently provide about 20% of Tri-Met's operating budget.

Tri-Met has estimated the cost of going to a fareless transit system below:

Costs of Fareless Transit (annual $million)

Lost fares	$41
Increase peak service 15% for 25% ridership increase (operating cost)	8
Annual capital charge for additional peak buses and rail cars	5
Total Annual Fareless Transit Costs	**$54**

There is no additional cost to accommodate the off-peak ridership increase of 60% because existing service can accommodate it. (This may be an optimistic estimate by Tri-Met which would need to be tested more carefully before implementing fareless transit. Tri-Met was asked to provide estimates only, not detailed projections.)

The Fareless Transit System Research Work Group Key understands that fareless transit would not precede or preclude the service expansion proposed by regional transportation plans and the proposed Transit Choices for Livability (TCL) project. If those costs are also considered, the total need for new revenue facing Tri-Met would be daunting:

Cost of TCL plus Fareless Transit System (annual $million)

Total Annual Fareless Transit Costs	$54
Annual capital and operating costs for TCL ($14 by 2002, $34 by 2005)	41
Total annual cost for TCL and Fareless Transit	**$95**

The TCL financing plan has identified sources for only a fraction TCL costs:

TCL finance plan (annual $million)

Identified potential sources:	
STP regional funds for capital	$3
Bus efficiency improvements	5
Pursue state funding for elderly and disabled service	8-10
$0.05 fare increase in 1999 dedicated to TCL service	1-2
Potential sources to be explored for TCL:	
Systems Development Charge linked to transit service, for capital	?
New broad-based sources "more closely tied to individual participation in the regional transportation system"	?
Allocating unanticipated growth in payroll tax revenue in future years to TCL service	?

Appendix E

The Effects of a Parking Tax

Technical Memorandum 2(c)
Fareless Transit Study

Prepared for
Tri-Met, for the
Mayor's Fareless Transit System Research Workgroup

Prepared by
Parsons Brinckerhoff Quade & Douglas, Inc.

September 21, 1998

PB 100 YEARS

CONTENTS

TABLES AND FIGURES

1.0 INTRODUCTION AND SUMMARY

This technical memorandum is the third in a series of three that explore various aspects of fareless transit, in support of the Mayor's Fareless Transit System Research Workgroup. The Workgroup is a citizen committee charged with considering the financial, operational, and policy implications of a fareless transit system and a regional parking tax in the Portland region.

The technical memoranda are described below.

The Full Cost of Auto Travel – The first memorandum summarized the available literature on the full cost of auto travel and created a theoretical and policy framework for the remainder of the study.

Fareless Transit: Operational, Policy, and Financial Issues – Several transit providers have had experience with free fare demonstration projects. This memorandum summarized those experiences and more fully developed the operational, financial, and policy implications of eliminating fares on the Tri-Met system.

The Effects of a Regional Parking Tax – The present memorandum concludes the series by discussing the supply and demand effects of a regional parking tax. A regional parking tax is linked to fareless transit as a way to replace Tri-Met revenue lost by the elimination of fares. As assumed for this study, it is not conceived as a tool for transportation demand.

1.1 Summary

This technical memorandum has looked at the effects of a tax on parking spaces in the Portland metropolitan area. The $75 per space per year tax, set to gross approximately $50 million per year (the amount needed to approximately cover lost fare revenue), would apply to all non-residential, off-street parking. If such a tax were to be implemented, it would be the first in the country to apply to parking spaces for which there is no existing charge to the driver.

Our study identified the following likely effects from a parking tax applied as described above:

1.1.1 DOWNTOWN

- Parkers would pay directly, because the owners of parking should be able to pass the charge on, and, since a fee is currently levied, it should be a relatively easy task to increase that fee by the amount under consideration.
- The demand for long-term parking should decrease slightly, while the demand for short-term parking likely remains unchanged.
- The supply of parking should remain unchanged.

1.1.2 SUBURBS

- All customers of suburban retail and commercial establishments would pay indirectly, through increases in the costs of goods and services.
- The demand for parking would remain unchanged, because parkers are not directly experiencing the cost.
- The supply would likely decrease slightly, primarily at small, single establishments that have significantly more parking than is used.

1.1.3 REVENUE POTENTIAL

- Due to the fact that supply remains relatively unchanged (and assuming that the political and implementation issues can be resolved), the $75 per year per space parking tax should be a reliable source of income.
- The problems inherent to defining a parking space (i.e., of the spaces that are in use, many are not marked specifically for parking, others that are marked are being used for other purposes) may present a challenge to revenue collection.

2.0 OVERVIEW OF PARKING TAXES

This section will provide an introduction to parking taxes. It will describe the type of tax that is being assumed in order to analyze possible impacts on the supply and demand for parking; the amount and type of parking in the Portland metropolitan area; and, provide a summary of the experiences of other cities with parking taxes.

2.1 Type of Tax

The type of tax that is being assumed for this study is one that would apply to all non-residential, off-street parking spaces within the Urban Growth Boundary. The amount of the tax under consideration for this analysis was derived to gross approximately $50 million per year (the amount needed to approximately cover the lost fare revenue). Depending on the exact number of spaces that would be subject to the tax, $75 per space per year would gross slightly more than the required amount.

2.2 Inventory of Parking

Metro's on-going work to inventory the amount of parking in the Portland metropolitan area provides the following information about the current supply in the region, as shown in Table 1, below.

The effort to define and count parking spaces is not trivial. The inventory of the amount of parking available in downtown Portland is reasonably accurate, however in suburban and industrial areas, the precision of the count diminishes substantially. In particular, large amounts of parking exist in an un-marked or un-paved form, such as graveled areas that serve as permanent or occasional parking. Other clearly-marked spaces are being used for the long-term storage of machinery and other goods, and have been effectively taken out of availability (CH2MHILL 1993).

Keeping the above issues in mind, Table 1 provides an estimate of the number of non-residential parking spaces available in the Portland metropolitan area.

Table 1: Inventory of Non-Residential Parking Spaces

Location	Number of Spaces	Number of Spaces Subject to Tax	Percent of Total Parking[1]
Downtown:[2]			
Off-street, City-owned	3,500	3,500[3]	0.4
Off-street, Privately owned	32,952	32,952	3.4
On-street	6,300	0	0.7
Outside of Downtown:			
Structured Parking	13,349	13,349	1.4
Institutional Parking:			
Hospitals	17,145	17,145	1.8
Colleges/Universities	14,237	14,237	1.5
High Schools	11,502	11,502	1.2
Other Off-street Parking	599,724	599,724	62.6
Park-and-ride Spaces	4,512	4,512[3]	0.5
On-street Parking[4]	254,999	0	26.6
TOTAL	958,220	696,921	100.1

[1] Percent is derived from "Total Number of Spaces." Does not equal 100 due to rounding.

[2] Downtown is the area bounded by the Willamette River, I-405, and NW Hoyt Street/Broadway.

[3] Designation as subject to taxing is uncertain.

[4] This count includes commercial/industrial zones only.

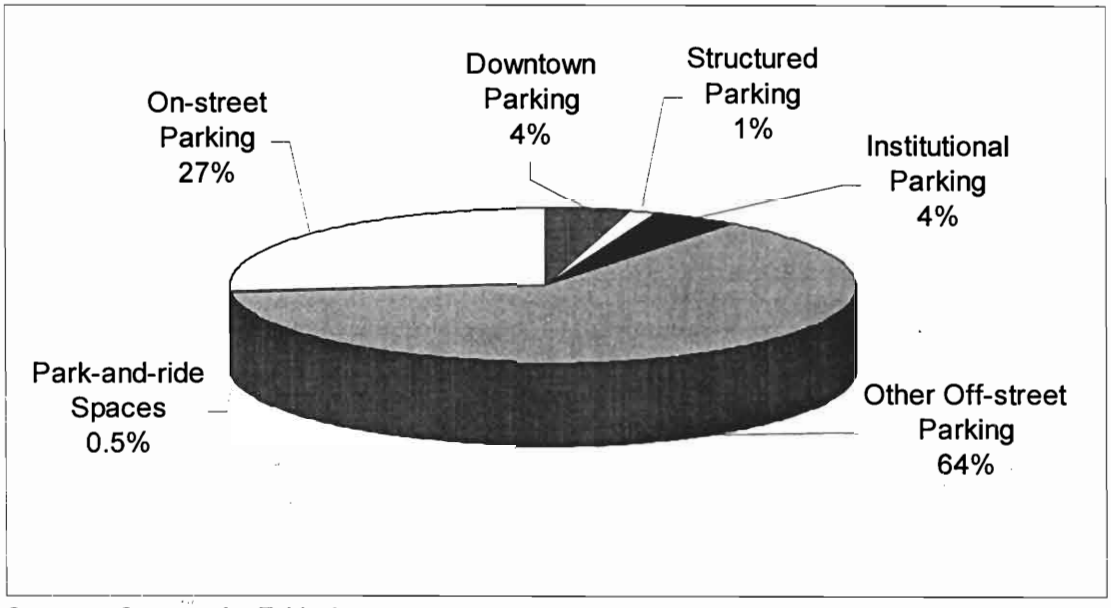
Sources: Downtown parking data from Keith Erandsing at the City of Portland Office of Transportation. Structured parking, and other off-street parking counts are from Metro's March 1997 GIS data. The remaining counts are from Metro's 1995 Regional Parking Study Data.

As can be seen from the table above, the majority of parking spaces are listed as "other off-street parking." This category represents surface parking that is outside of downtown and is not associated with hospitals and schools. Therefore, this parking is associated with a wide range of land uses that include restaurants, retail, employment centers, and industrial areas. Much of this type of parking is provided free to the parker.

The second greatest source of parking is in the "on-street" category. The count provided in the table above represents less than is actually available as the "outside of downtown" count does not include on-street parking outside of areas that are zoned commercial or industrial. On-street parking will not be subject to the parking tax.

Figure 1, below, provides a picture of the relative amounts of different types of parking. Note that the amount of parking downtown is a small proportion of the total. The largest percentage of parking falls into the "other" category. This type of parking will also contain most of the spaces that are the most difficult to inventory.

Figure 1: Parking Percentages in Portland Metropolitan Area

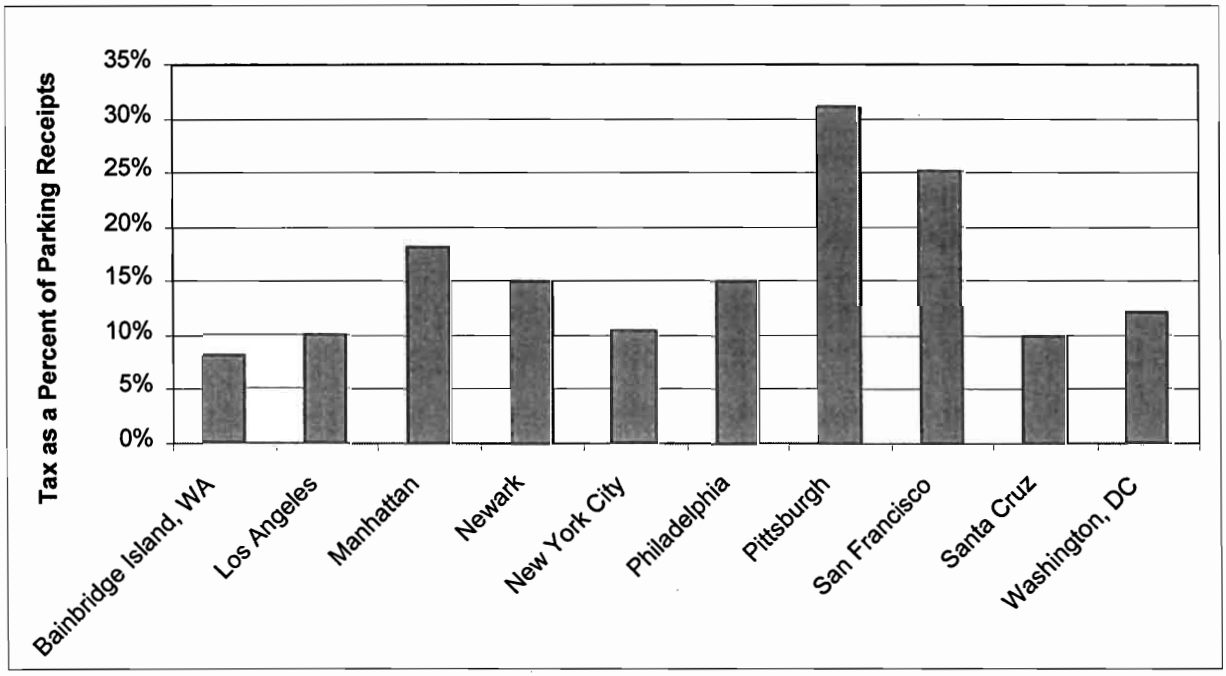


Sources: Same as for Table 1.

2.3 Other Experiences With Parking Taxes

A number of other cities currently have some sort of a parking tax in place. Each of these cities levy their parking tax on commercial parking only, and do not include residential. Some cities offer exceptions for certain types of parking, such as hotel guest parking.

Figure 2: Parking Taxes in Other Communities



Note: Baltimore and Chicago each have fixed, per-transaction taxes of $0.60 and $1.25 per daily parker, respectively.

Sources: Most of the cities with parking taxes were first identified in *TRAC: Local Option Commercial Parking Tax Analysis.* Final Report, Research Project GC 8719, Cy Ulberg et al. These were updated using websites for individual cities and calls to finance departments.

Figure 2 shows communities that currently have a percentage tax on commercial parking receipts. Note that these apply to commercial (fee-paid) parking only. No other city currently has a parking tax of the type that Portland is considering.

The State of Washington passed enabling legislation in early 1990 that authorized local governments to impose two different types of taxes, one that would be imposed on persons engaged in a commercial parking business, or, as an alternative, one that would be imposed on those who park in a commercial parking facility (Ulberg et al. 1992). As of this writing, two communities have taken advantage of this provision, SeaTac and Bainbridge Island.

In 1988, Montgomery County, Maryland, proposed a parking tax that would have been similar to the one that Portland is currently considering. It would have levied a $60 per space tax "on any person who made land available for parking by employees of any business" (McGarry 1990, pg. II-4). The parking tax would have exempted retail parking, persons with fewer than 10 spaces, parking meters with less than two hours, park-and-ride lots, vehicle storage areas, and federal/state facilities (ibid.). McGarry notes that the business community was universally opposed to the tax. The tax passed a vote by the County Council, but was vetoed by the County Executive and never implemented.

The sections that follow provide an analysis of the possible changes in supply and demand for parking, revenue potential, and the extent to which drivers will experience the tax.

3.0 EFFECTS OF A PARKING TAX

This section will describe some of the likely effects of a parking tax that is implemented as described previously. It is important to keep in mind that this tax is not envisioned as a tool for decreasing the use of private automobiles (though it may do so), but rather a logical means of generating the revenue needed to fund the proposed fareless transit system for Portland.

We will analyze the issue of who will pay the tax by looking at two scenarios that describe how parking is paid for. First, parking is directly paid for by parkers themselves at commercial lots or by business owners who lease space in commercial lots. This scenario reflects what we see in downtown areas, in which parking is scarce, and therefore a direct fee is charged for their use. Parking, in these cases, is an easily identifiable, discrete cost. A second scenario, which occurs most frequently in the suburbs, is that in which parking tends to be ample and therefore parkers are not directly charged. The cost of parking is bundled in with building ownership/leasing costs. In this scenario, owners and renters may not even be aware of the cost of parking relative to other business costs.

In both cases, it is necessary first to determine who will directly pay the tax, which will help us to determine what will happen to the supply and demand for parking. This, in turn, leads to estimates of expected revenues from the tax.

3.1 Downtown

In downtown areas, a direct charge is usually levied for parking because of the scarcity and value of land. In this scenario, because parking is a discrete cost of which people are consciously aware, it is a much easier task to determine who pays and what will happen to supply and demand.

3.1.1 WHO PAYS?

The responsibility for paying the parking tax to the government will reside with the owner of the space, who will experience the tax as an increase in the cost of doing business. What the owner will do with this cost will depend upon several things, including the level of competitiveness of the business, the impact of the tax relative to other expenses, and the way in which parking costs are actually paid.

In downtown Portland, parking is a discrete cost that is paid directly by parkers themselves or by business owners who pay to lease parking for employees or customers in commercial lots. Because of the strong demand for parking downtown, it is likely that the increased cost from a parking tax will be passed on to those who are now paying for the space.[1]

[1] Given the "parking lid" of the 1970s and 1980s in downtown Portland, demand is particularly strong, which facilitates passing along the tax.

3.1.2 SUPPLY

For the supply of parking downtown to diminish, the tax on parking spaces would need to be high enough to make other uses of the land more valuable to the owner. Parking is owned by commercial parking operators and building owners, the ones who make the decision to supply a given amount of parking, as permitted by the city. The tenants do not generally make decisions regarding the amount of parking that is supplied. Thus, supply changes should be analyzed by looking at the costs of owning buildings downtown.

Data from the Building Owners and Managers Association (BOMA) for 1995 indicate that the average annual building ownership costs (retail and office) in downtown Portland are in the range of $5.00 to $6.50 per square foot, amounts that do *not* include mortgage costs (this information was not available). The cost per square foot of the $75 per space tax is about $0.26, meaning that building ownership costs increase by approximately four to five percent per square foot, for the portion of the building that contains parking spaces.[2] Given that the supply of parking downtown is fairly limited relative to demand even at current prices, and that the owners of parking would likely have no trouble passing the increased costs on to parkers themselves, it is unlikely to effect the supply downtown.

3.1.3 DEMAND

In order for a shift to occur in the demand for parking, the increased cost of parking needs to directly reach people who park. As we mentioned earlier, the cost of the tax will likely be passed on to the parker directly.

Elasticities measure changes in demand that result from changes in some variable. A 1990 study that reviewed several case studies found that the price elasticity of demand for work-related parking ranged from –0.08 to –0.23 (Shoup and Willson). This means that a ten percent increase in the cost of parking could result in up to a two percent decrease in the demand for parking for work-related trips. In other words, the demand for work-related parking is fairly inelastic.

The cost of long-term parking downtown ranges from approximately $62 to $200 per month.[3] This is an annual cost of $744 to $2400. If the entire $75 per year tax were passed along to the parker, it would represent an increase of three to nine percent annually in the cost of parking. Based on the range of elasticity estimates, this increase could result in a 0.2 to 2.1 percent decrease in the amount of parking demanded for work-related trips. Of the 32,952 off-street, non-residential,

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[2] Because ownership and leasing costs are expressed in amounts per square foot, we express the $75 per space tax as a cost per square foot as well. With about 255 to 330 square feet as a standard size per parking space, an annual $75 per space tax equals $0.23 to $0.29 per square foot, or about $0.26. This is the amount that average annual ownership costs would rise, for the portion of the building that contains parking, which represents a four to five percent increase. If we were also to include mortgage costs, the percentage increase would be even smaller.

[3] Estimates based on telephone calls to a number of parking providers in downtown Portland.

commercial parking spaces downtown, the possible decrease equals as much as 700 or so fewer spaces demanded. This assumes that all of these spaces are being used for long-term parking, though we do not know what percentage actually fall into this category. Thus, it can be expected that there would be a small decrease in demand for long-term parking downtown.

How much would short-term parking costs increase for individual parkers? The city operates seven garages that offer short-term parking for $0.95 per hour for the first four hours.[4] Assuming conservatively that each space is rented a total of 300 days out of a year (not every space will be rented every day), an additional $0.24 per square foot would be needed per day to cover the additional cost of the tax. Distributing this over eight hours yields an additional $0.03 per hour. Given the turnover of short-term spaces, the effect on any given parker would be quite small. Note that these estimates of usage are very conservative and it is likely that the dollar increase per hour is even smaller. The percentage increase for the commercial lots, which charge over $3.00 per hour, would be even smaller. At such low increases in cost, there is likely to be little decrease in demand for short-term parking downtown.

3.2 Suburbs

In the suburbs, the supply of parking has traditionally been more ample than downtown and it has consequently been provided at no cost to the parker. The cost of parking is not experienced as a discrete charge, but is bundled into the tenant's rent and is eventually paid for by the purchasers of goods and services (e.g., hamburgers, light bulbs, root canals, plywood). Because of this, it is a much more difficult task to assess the effects of a tax on parking (and it will likewise be a more difficult task to assess the tax itself).

3.2.1 WHO PAYS?

When vacancy rates are high, it is possible that the additional cost of the parking spaces might not be passed along to tenants (in the form of increased leasing costs) in an effort to attract new tenants or keep current ones. When vacancy rates are low, which is currently the case in the Portland metropolitan area (Grubb and Ellis), it is more likely that building owners will pass the entire cost of a parking tax on to their tenants. As with building owners, the tenants will experience this as an increase in the cost of doing business, and will wish to pass the cost on to their customers.

As long as tenants are not directly competing with businesses that are not facing the tax, it is likely that they will be able to pass the cost on to their customers, in

[4] The price increases substantially after the first four hours, to $3.00 per hour, to discourage long-term use.

one form or another.[5] However, it is very unlikely that parkers themselves will be asked to cover the cost directly. First, the tax itself represents a very small proportion of the other costs of leasing retail or office space, as will be discussed in the next section. Second, charging for something that has traditionally been free is difficult and would only be undertaken in extreme circumstances. And, third and most importantly, the provision of parking is clearly considered to be a crucial component of doing business. Businesses in urban areas are frequently concerned that the *lack* of parking for them relative to their competitors in the suburbs puts them at a strong disadvantage relative to their suburban counterparts and so they frequently pay part or all of their customer's parking costs. Further, efforts to reduce the amount of parking available to businesses are often met with vehement opposition.

Thus, rather than pass the increase directly on to parkers, it is likely that the additional cost will be rolled into the prices of the goods and services provided by these businesses, in the same way that increases in the costs of electricity or water would be, and the tax will be borne by their customers indirectly.

3.2.2 SUPPLY

Parking in suburban areas is almost always owned by the owners of buildings. The decision to supply a given amount of parking is made by these individuals based on the cost and availability of land as well as zoning requirements. As opposed to the situation downtown, tenants in suburban-style office and retail buildings do not generally contract for a given amount of parking. Instead, parking comes with the building, and is either shared with other tenants (as in malls and strip developments), or serves one building. In either case, it is likely that some contraction in supply could occur only if the cost of the tax is high enough to make other uses more desirable.

Data from BOMA indicate that average retail and office building ownership costs are not substantially different in the suburban areas of Portland, and are in the range of $5.00 to $6.00 per square foot. The parking tax will represent an increase in operating costs (exclusive of finance costs) of approximately four to five percent, for the portion of the costs that apply to the parking area. Note that the amount of the ownership costs that are given over to parking are not likely to be explicit. Although more parking is supplied than is demanded in many suburban-style retail and office developments, the mechanism of price is separated from the supply decision to an extent that only a significant increase in cost per square foot would trigger any kind of noticeable decrease in supply.

However, there are certain types of building/parking configurations that would feel the increased cost of the tax more than others and might have an incentive to

[5] In a situation in which a parking tax is levied in one city only, it is likely that businesses that must pay the tax would face increased competition from businesses located outside of the taxing jurisdiction. Because the parking tax under consideration here would apply to the entire Portland metropolitan area, it is less likely that businesses would face competitive pressures to absorb the tax.

decrease supply. These are the individual establishments that are commonly situated along arterials, and which have the same or more land in parking as in building space (these are the small insurance shops, cafes, printers, bars and so on that fill in the gaps between the larger strip developments and malls). These businesses, which may have many spaces that are never used, will be likely to notice a $75 per space per year tax and would be likely to take as many spaces as possible out of availability. Note too that the method of removing these spaces presents interesting possibilities. Because the amount of space that becomes available would not likely be enough for new development, these parking spaces may be "converted" with the use of cement blocks.

Thus, at the level of parking tax assumed for this study, it is likely that the supply of parking in the suburbs would change only by a small amount.

3.2.3 DEMAND

In suburban situations, in which the added cost of the parking tax is rolled into the cost of goods and services, the parking tax can be expected to have little or no effect on the demand for parking, as it would not likely reach the person parking.

3.3 Revenue Potential

As noted previously, the annual tax per space was calculated to gross approximately $50 million per year, given the number of spaces that would be subject to the tax. Depending on whether or not the city-owned spaces (3,500) and the park-and-ride spaces (4,512) are taxed, approximately $51.7 to $52.3 million in gross revenue would be raised. This figure assumes that no spaces are taken out of supply.

Our discussion concluded that a few spaces are likely to be lost, perhaps on the order of one to two percent overall. This loss would lead to revenues of approximately $50.6 to $51.7 million per year.[6] Note that the costs of administering the tax, and the difficulties of obtaining an accurate inventory could also affect net revenue.

Because of the minimal losses in supply associated with a tax of this level, the tax could be a relatively stable source of revenue, assuming that the political and implementation issues could be dealt with.

3.4 Reaching the Driver with a Parking Tax

We have emphasized during the course of this study that this type of parking tax should not be viewed as a transportation demand tool, but rather as a logical source of revenue for the funding of transit. However, there have been questions regarding how it could be used to affect the use of automobiles, and we will address this issue briefly here.

[6] The low figure represents a two percent loss of spaces and not taxing the city-owned or park and ride spaces. The higher figure represents a one percent loss and taxing both of these types of spaces.

In order to reach drivers with a parking tax, it is necessary that they pay the tax directly at the time of their trip. As we saw in the discussion of who would pay the tax, only a small portion of drivers will actually have the tax passed on to them directly. In the remaining cases, we conclude that, although the costs of the parking tax will be passed along to consumers, in most cases it will occur in an indirect manner.

The implication is that some notable institutional and social changes would be required for drivers to experience a parking tax of the type that has been considered in this study.

First, employers must pass the tax on to their employees. Assuming that some combination of penalties and incentives could force employers to do this, the task would be most straightforward for the downtown employers who currently subsidize or cover the full cost of parking for their employees. The costs in this case are clear, and people are accustomed to paying for parking downtown. However, for the suburban employers who provide ample "free" parking for their employees, the situation is often the reverse.

Second, a parking fee would need to be charged directly to the parkers in the vast amount of parking that is provided at no obvious charge at suburban commercial and retail establishments. In other words, parking meters at fast food restaurants and paid parking lots at shopping malls would be necessary in order for a great number of parkers to feel the tax.

4.0 CONCLUSION

This technical memorandum has looked at the effects of a tax on parking spaces in the Portland metropolitan area. The $75 per space per year tax, set to gross approximately $50 million per year (the amount needed to approximately cover lost fare revenue), would apply to all non-residential, off-street parking. If such a tax were to be implemented, it would be the first in the country to apply to parking spaces for which a fee is not currently charged.

Our study identified the following likely effects from a parking tax applied as described above:

4.1 Downtown

- Parkers would pay directly, because the owners of parking should be able to pass the charge on, and, since a fee is currently levied, it should be a relatively easy task to increase that fee by the amount under consideration.
- The demand for long-term parking should decrease slightly, while the demand for short-term parking likely remains unchanged.
- The supply of parking should remain unchanged.

4.2 Suburbs

- All customers of suburban retail and commercial establishments would pay indirectly, through increases in the costs of goods and services.
- The demand for parking would remain unchanged, because parkers are not directly experiencing the cost.
- The supply would likely decrease slightly, primarily at small, single establishments that have significantly more parking than is used.

4.3 Revenue Potential

- Due to the fact that supply remains relatively unchanged (and assuming that the political and implementation issues can be resolved), the $75 per year per space parking tax should be a reliable source of income.
- The problems inherent to defining a parking space (i.e., of the spaces that are in use, many are not marked specifically for parking, others that are marked are being used for other purposes) may present a challenge to revenue collection.

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Appendix F

Additional Comments Of Members Of The Fareless Transit System Research Work Group

- It is important to stress that improvements of the transit system must be linked to the Region 2040 Plan. Making transit more usable benefits every person in the region including those who don't ride.
- The steps we recommend have to be seen as first steps. They are doable. But we must keep on working to make transit a truly viable alternative for people.
- While expanding the use of employer-purchased passes is good, we need to keep in mind the ordinary citizen out there who doesn't have that choice. As more people do get access to free or heavily subsidized passes through their employers, ultimately there will be an equity issue for those who can't.
- All the improvements suggested, as well as everything else Tri-Met does to increase ridership, needs careful monitoring and evaluation. As employer participation in the PASSport program increases we also need to monitor how this affects ridership.
- We need to recognize the work the TCL committee did and make sure the service improvements it recommended get implemented before spending large amounts of money to change the fare system.
- Tri-Met and the City should get together on a PASSport program for residents of an apartment or condominium. Try a residence-based program as well as the employer-based program.
- Tri-Met needs to take advantage of every opportunity to add riders where they have excess capacity. The cost is very low.
- Tri-Met should definitely look to using the system development charge where feasible.