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"Efficiency - Equity - Clarity"

Win-Win Transportation Solutions

Cooperation for Economic, Social and Environmental Benefits

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Abstract

Win-Win Transportation Solutions are cost-effective, technically feasible market reforms that help solve transportation problems by increasing consumer options and removing market distortions that encourage inefficient travel behavior. They provide multiple economic, social and environmental benefits. Although their individual impacts may appear modest, their combined benefits can be substantial. If fully implemented to the degree that is economically justified, Win-Win Solutions could significantly reduce motor vehicle costs. They are "no regrets" measures that are justified regardless of uncertainties about global warming or other environmental and social impacts. Because they provide multiple benefits they offer opportunities for cooperation and coordination among various organizations and political interests. This paper discusses the Win-Win concept and describes various Win-Win Solutions.

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Contents

Introduction

People often assume that environmental, social and economic goals conflict. For example, policies to reduce climate change emissions and programs to improve accessibility for disadvantaged people are often opposed on grounds that they are costly and harmful to the economy. But such conflicts can be avoided. Some strategies that support environmental and social objectives also benefit the economy.

This paper identifies more than a dozen such strategies, which we call *Win-Win Transportation Solutions*. These are cost-effective, technically feasible policy reforms and programs that help solve transport problems by improving transport options and correcting market distortions that result in economically excessive motor vehicle travel. These are considered "no regrets" strategies because they are justified even if the severity of environmental and social risks is uncertain.

To fully appreciate Win-Win Solutions it is necessary to use a more comprehensive evaluation framework than normally applied in transport planning. Many transportation improvements help solve just one or two problems but exacerbate others. For example, expanding roadway capacity helps reduce congestion on that link, but tends to increase total vehicle traffic which increases downstream congestion, parking problems, accidents and sprawl. Similarly, more fuel-efficient vehicles help conserve energy but by making driving cheaper they tend to increase congestion, accidents and sprawl (Litman, 2005a). Conventional planning, which considers just a few impacts at a time, tends to undervalue strategies that provide multiple benefits. Only by considering all benefits and costs are the full benefits of Win-Win Solutions perceived. The table below illustrates this concept.

Table 1 **Comparing Strategies** (Litman, 2005a)

Planning Objective	Win-Win Solutions	Roadway Expansion	Fuel Efficient Vehicles
Congestion Reduction	✓	✓	×
Parking Cost Savings	✓	×	×
Facility Costs Savings	✓	×	×
Consumer Costs Savings	✓	×	
Reduced Traffic Accidents	✓	×	×
Improved Mobility Options	✓	×	
Energy Conservation	✓	×	✓
Pollution Reduction	✓	×	✓
Physical Fitness & Health	✓	×	
Land Use Objectives	✓	×	×
Community Livability	✓	×	

Because Win-Win Solutions reduce total vehicle travel and increase walking and cycling, they support many planning objectives (✓). Other transport improvement strategies support fewer objectives, and because they increase total vehicle travel, contradict others (×).

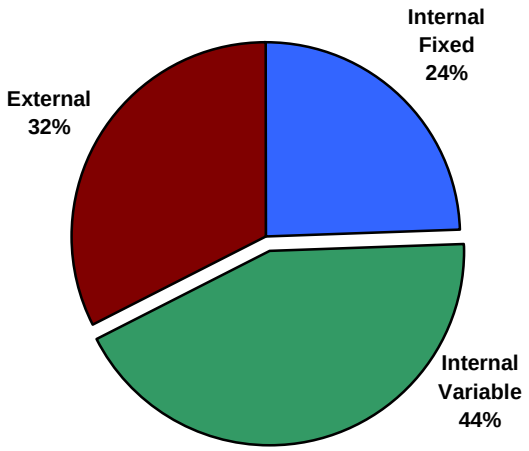
How Win-Win Strategies Work

These are, admittedly, big claims. To understand why such large benefits are possible it is useful to consider some basic market principles ("Market Principles," VTPI, 2005). Efficient markets have certain requirements, including viable consumer options, cost-based pricing, and economic neutrality. Transport markets often violate these principles.[1]

For example, although consumers have many options when purchasing a vehicle, they often have few alternatives to automobile transportation. This results, in part, from planning biases that favor automobile travel over alternatives. For example, many jurisdictions have dedicated funds for roads and parking facilities that cannot be used for other types of transportation improvements, even if they are more cost effective. This encourages decision-makers to choose automobile-oriented solutions to transportation problems, even when alternatives are better overall.

Another market distortion involves underpricing of vehicle travel. Current user fees do not accurately reflect the full marginal costs imposed by vehicle travel, as required for an efficient market. Although motor vehicles are expensive to own, they are relatively cheap to drive, costing just a few cents per mile in direct expenses. Depreciation, insurance, registration and residential parking costs are largely *fixed*, not directly affected by how much a vehicle is driven. This gives motorists an incentive to maximize their vehicle use in order to get their money's worth from such expenditures. Other costs are *external*, not borne directly by users, including subsidized parking, roads funded through general taxes, and uncompensated congestion, accident risk and environmental costs imposed on others. Less than half the costs of driving are efficiently priced, as indicated in Figure 1.

Figure 1 **Automobile Cost Distribution** ("Transportation Costs," VTPI, 2005)

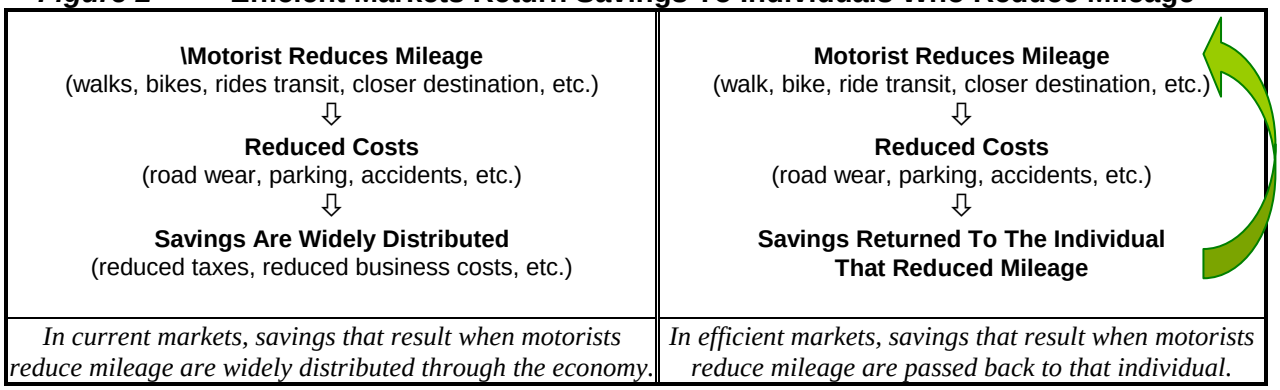


Automobile travel is underpriced. More than half of automobile costs are external or fixed.

[1] In this case, *transport markets* include anything that affects the type and amount of travel consumed, including the supply, price and management of transportation facilities and services, and land use policies that affect the location of destinations.

Put differently, current pricing fails to return to individual motorists the savings that result when they drive less. For example, when consumers shift from driving to an alternative mode or closer destination, they help reduce congestion, parking, accident and environmental costs, but these savings are not returned to the individual who makes the change. As a result, consumers lack the incentive to choose the most cost effective transport option overall, as illustrated in Figure 2. Such underpricing is also unfair because people who drive less than average are forced to subsidize the costs of others who drive more than average, and because lower-income people tend to drive less than average, market distortions that favor driving also tend to be regressive.

Figure 2 **Efficient Markets Return Savings To Individuals Who Reduce Mileage**



Win-Win Solutions correct such distortions, as described in Table 2. Win-Win strategies are a type of preventive medicine, equivalent to putting the transportation system on a healthier diet. This can avert more difficult and expensive measures that would otherwise be required to address transport problems.

Table 2 **Win-Win Solutions Support Market Principles** (Litman, 2005)

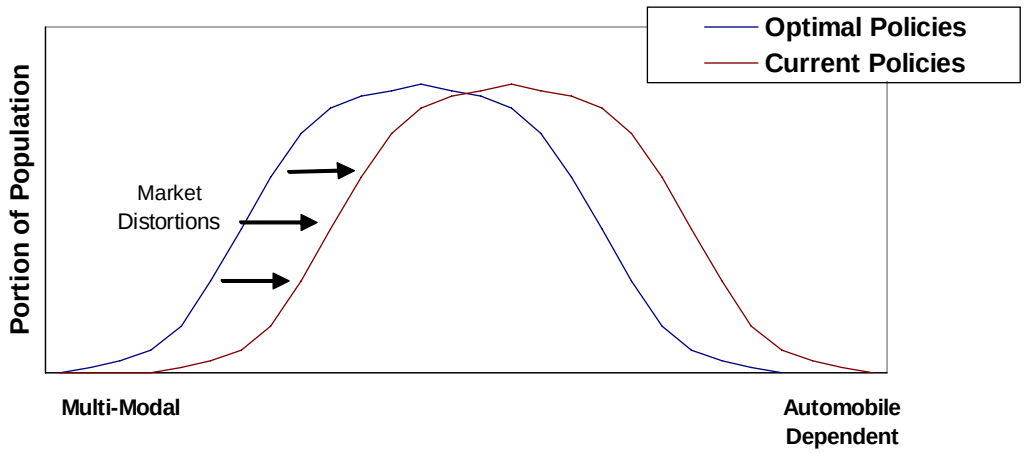
Market Requirements	Current Market Distortions	Win-Win Solutions
Options. Consumers need viable transport and location options, and information about those options.	Consumers often lack viable alternatives to automobile transport, and living in automobile dependent communities.	Many Win-Win Solutions increase travel options directly, and all increase options indirectly by stimulating demand for alternatives.
Cost-based pricing. Prices for each good should reflect its production costs.	Motor vehicle travel is significantly underpriced: many costs are either fixed or external.	Many Win-Win Solutions result in more efficient pricing.
Economic neutrality. Public policies (laws, taxes, investments, etc.) should not arbitrarily favor one activity or group.	Many laws, tax, planning and funding practices favor automobile travel over alternatives.	Many Win-Win Solutions help correct biases that favor automobile transport over over modes and goods.
Land Use. Land use policies should not favor automobile oriented development.	Many current land use policies encourage lower-density, automobile-dependent land use patterns.	Some Win-Win Solutions correct land use biases that encourage sprawl and automobile dependency.

Win-Win Solutions correct market distortions, creating a more efficient and equitable transport system.

Although individual market distortions may seem modest and justified, their effects are cumulative and synergistic (total impacts are greater than the sum of individual impacts), significantly increasing transport problems and costs. For example, to individual businesses it makes sense to subsidize employee parking, since this is generally not taxed as income and so is worth more than an equal value given as wages. But when employees can *cash out* parking subsidies (they can choose the cash equivalent if they use alternative commute modes), automobile commuting typically declines about 20%, indicating that a significant portion of traffic problems result from a single market distortion which favors driving over other commute options.

Current transportation market distortions skew travel decisions in ways that increase automobile travel beyond what would occur in a more optimal market. For example, distortions may cause somebody who would otherwise drive for 50% of their travel to increase this to 60%, and somebody who would otherwise drive for 60% of their travel to increase this to 70% because they lack appropriate alternatives and incentives.

Figure 2 **Market Distortions Increase Automobile Travel Demand**

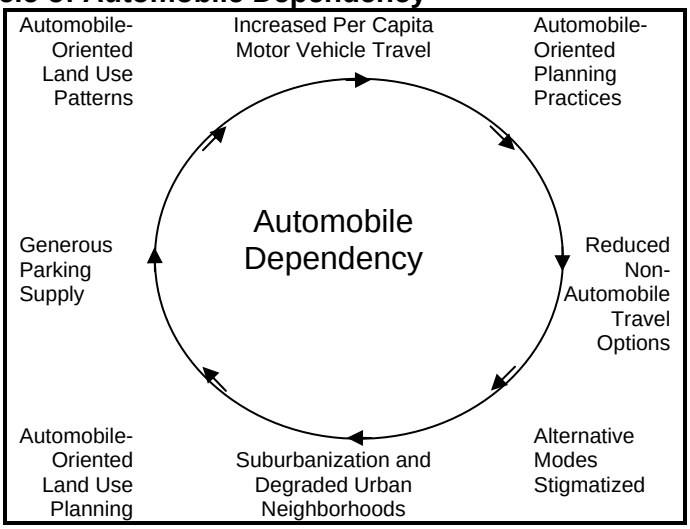


Current transportation markets are distorted in various ways that increase automobile dependency. Win-Win Solutions help correct these distortions, causing consumers to shift their travel behavior, making them better off overall.

These distortions, since they are well entrenched and provide direct benefits to motorists. They are *economic traps*, in which individuals perceive economic incentives for actions that make them worse off overall. Reforms face skepticism and obstacles; they are often greeted with “why me,” “why now” and “why bother.” Yet, many transport problems are virtually unsolvable without such reforms. For example, urban traffic congestion will never decline significantly without some combination of improved travel options and pricing reforms (Goodwin, 1997). When people vote against transport market reforms they are voting in favor of continued congestion and other problems.

These distortions have many impacts so analyzing them individually underestimates their total harm and potential benefits from reforms. For example, underpriced parking not only increases parking problems, it also exacerbates traffic congestion, roadway costs, crashes and pollution. Similarly, underpricing road use increases not only congestion and roadway costs, but also parking costs, crashes and pollution. Individual distortions contribute to a cycle of automobile dependency, as illustrated below.

Figure 3 **Cycle of Automobile Dependency**



Individual market distortions reinforce the cycle of automobile dependency, leading to economically-excessive automobile ownership and use.

Existing distortions are the legacy of past constraints and objectives. For example, until recently it was difficult to charge efficiently for roads and parking facility use, but new pricing methods are more cost effective and convenient. Similarly, in the past underpriced driving may have been justified to take advantage of economies of scale in vehicle and roadway production; but such policies are not justified in a mature transport system. In other words, the justification for Win-Win Solutions increases with improved technology and diminishing marginal benefit from vehicle travel.

This is not to suggest that driving should be prohibited or that it provides no benefits. This analysis simply indicates that in a more optimal market consumers would choose to drive less and be better off as a result. As an analogy, food is essential for life and therefore provides tremendous benefits. However, this does not mean that everybody should increase their food consumption or that society should subsidize all food. At the margin (relative to current consumption) many people are better off eating less. Food subsidies may sometimes be justified, but it would be economically and medically harmful to subsidize all food for everybody. Similarly, that mobility provides benefits does not prove that *more* driving is better, that current levels of driving are optimal, or that driving should be subsidized. At the margin, many motorists would prefer to drive less, provided that the alternatives are convenient, comfortable and affordable.

Implementation

This section discusses various aspects of Win-Win implementation.

How Much

Some Win-Win Solutions are clearly justified by market principles. Nearly all economists support cost-based pricing and neutral public policies. For example, Pay-As-You-Drive vehicle insurance (described later) is clearly justified to the degree that insurance claims are affected by a vehicle's mileage during the policy term. Similarly, increased investments in alternative modes is certainly justified if they are the most cost effectiveness way to achieve conventional transport planning objectives (traffic and parking congestion reduction, increased safety), and possibly higher to achieve other, more difficult to quantify benefits such as equity objectives and improved public health.

There is legitimate debate as to the optimal level to which some strategies should be implemented, such as the magnitude of fuel taxes, transit investments and Smart Growth policies. However, as long as market distortions favoring automobile travel and sprawl continue to exist, policies that support alternative modes, discourage driving and encourage more accessible land use are justified on second-best grounds. Only when all justified reforms are fully implemented and sufficiently established to offset decades of existing distortions can transport and land use markets be optimal.

Travel Impacts

Win-Win strategy impacts vary depending on the type of travel affected. For example, since commuting represents about 25% of all travel, an incentive that reduces automobile commuting by 20% reduces total vehicle travel about 5% (0.25 x 0.2) if implanted at every worksite, or about 2% if implemented only in urban centers. Some strategies may have rebound effects. For example, telecommuters often make additional vehicle trips for errands they otherwise make when driving to work. Some strategies have synergistic effects. For example, transit improvements can stimulate more mixed use, walkable land use which provides additional vehicle travel reductions. Recent studies suggest that vehicle travel has become less price sensitive, apparently due to more automobile-dependent land use development that reduces travel options (Hughes, Knittel and Sperling, 2007). This emphasizes the need for integrated programs that include improved travel options, incentives and more efficient land use. For example, road pricing alone may do little to reduce vehicle traffic unless implemented with improved travel options.

Some strategies do not affect travel directly but provide support for implementing strategies that do. For example, Commute Trip Reduction programs typically reduce automobile commute trips to a worksite by 10-30% compared with not having the program, although it is the specific strategies implemented by the program, such as financial incentives, improved travel options and encouragement programs, that actually affect travel behavior. It would therefore be inappropriate to add the travel impacts of the Commute Trip Reduction program to the effects of the individual strategies when calculating the cumulative effects of these strategies implemented together.

Win-Win Strategies

This section describes specific Win-Win strategies. For more information see appropriate chapters in the "Online TDM Encyclopedia (VTPI, 2005) and other referenced documents.

Least Cost Transportation Planning

Conventional transport planning and funding practices tend to favor automobile travel and undervalue alternative modes in various, often subtle ways (Sussman, 2001; Beimborn and Puentes, 2003; Litman, 2006; "Comprehensive Transport Planning," VTPI, 2005). For example, conventional evaluation practices rely primarily on indicators of motor vehicle travel quality, such as roadway level-of-service, Volume/Capacity ratios and average traffic speed, which ignore impacts on other modes. As a result, these planning practices favor roadway capacity expansion even if it degrades walking and cycling conditions (and therefore transit access, since most transit trips involve walking links), and leads to more dispersed, automobile-dependent land use patterns. Described differently, conventional planning tends to favor automobile travel at the expense of alternative modes, motorists at the expense of non-motorists, and *mobility* at the expense of *accessibility*.

Conventional transport planning undervalues nonmotorized travel (Litman, 2003), because travel surveys undercount short trips, non-commute travel, travel by children, and non-motorized trip links. For example, a *bike-transit-walk* trip is usually categorized simply as a transit trip, and an *automobile-walk* trip is usually categorized simply as an automobile trip, even if the nonmotorized links occur on public facilities and take a significant portion of total travel time. Conventional travel surveys typically indicate that nonmotorized modes represent only about 5% of trips and so deserve relatively little support, but more comprehensive surveys indicate that 10-20% of trips involve nonmotorized travel and so justify more support for walking and cycling improvements.

There is often significant funding dedicated to roads and parking facilities that cannot be shifted to other modes, and funding dedicated to capital projects that cannot be used for management programs. This encourages decision-makers to expand roads and parking facilities even when alternative options are more cost effective overall.

Least-cost transportation planning is a term for more neutral and comprehensive planning that:

- Considers demand management equally with facility capacity solutions.
- Considers all significant impacts (costs and benefits), including indirect effects.
- Involves the public in developing and evaluating alternatives.

For example, Least Cost Planning means that funding available for roadway capacity expansion projects could be used for transit improvements or other mobility management programs if they are more cost effective at achieving transportation planning objectives, taking into account all economic, social and environmental impacts.

Implementation

Least-cost planning shifts planning and investment decisions to better support alternative modes and management programs. Although it does not affect travel directly, it can have a significant effect on travel behavior, particularly over the long term. It is generally implemented by transportation planning organizations, but can also be applied by businesses, for example, when evaluating solutions to parking problems.

Travel Impacts

Least-cost planning can affect virtually all types of travel. It's impacts vary depending on circumstances, and often take many years to be fully realized, but often result in 10-20% reductions in automobile travel compared with what would otherwise occur. However, Least Cost Planning does not affect travel directly, rather, it helps implement other transport management strategies and programs that do.

Regulatory Reforms

Many jurisdictions limit transportation service competition. Private bus and jitney services are often prohibited or restricted to favor public monopoly transit. Regulations should be minimized and focused to address specific problems. A variety of regulatory reforms can encourage competition, innovation, diversity and efficiency ("Regulatory Reform," VTPI, 2005).

Implementation

Regulatory reforms can reduce obstacles to development of alternative modes and management programs, based on economic neutrality and to achieve various planning objectives. It is generally implemented by local, regional and state/provincial governments.

Travel Impacts

Regulatory reforms can affect various types of travel. Impacts vary depending on circumstances and can take many years to be fully realized, but can result in 1-4% reductions in automobile travel compared with what would otherwise occur, particularly in urban areas where demand is greatest for alternative transport services.

Transportation Demand Management (TDM) Programs

Transportation Demand Management programs include a wide variety of services, including rideshare matching, transit improvements, bicycle and pedestrian facility improvements, parking management, and promotion of alternative modes ("TDM Programs," VTPI, 2005). *Transportation Management Associations* are private, non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district or industrial park. This achieves more efficient use of resources and allows businesses of all sizes to participate in commute trip reduction programs.

Implementation

TDM programs and TMAs can be justified based on their cost effectiveness at achieving conventional planning objectives, and often more to achieve other objectives, such as improved mobility for non-drivers and community livability. TDM programs are generally implemented by business associations and local governments.

Travel Impacts

TDM programs and TMAs impacts vary depending on circumstances. They are most common in urban areas. Where implemented they can often reduce automobile travel 10-20% compared with what would otherwise occur.

Commute Trip Reduction Programs

Commute Trip Reduction (CTR) (also called *Employee Trip Reduction* or *Vehicle Trip Reduction*) are employer programs to encourage commuters to reduce their automobile trips. CTR programs typically include some of the following TDM strategies:

- Rideshare matching.
- Alternative scheduling (flextime and compressed work weeks).
- Telework (allowing employees to work at home, and using telecommunications to substitute for physical travel in other ways).
- Marketing and promotion activities.
- Guaranteed Ride Home.
- Worksite walking and cycling improvements and encouragement.
- Company travel policy reforms, such as allowing reimbursement for bicycle or transit mileage for business trips when these modes are cost effective.
- Commuter Financial Incentives (described below).

Implementation

Commute Trip Reduction programs can significantly increase use of alternative modes. They should be implemented to the degree justified by their cost effectiveness at achieving conventional planning objectives, such as traffic congestion reduction and parking cost savings, and often more to achieve other, more difficult to quantify objectives such as improved mobility for non-drivers and pollution reduction. They affect commute travel. These programs are generally implemented by businesses and local governments.

Travel Impacts

Commute Trip Reduction programs affects the 15-20% of travel that consists of urban and suburban commuting. CTR programs that do not include financial incentives (described next) typically reduce automobile commuting 5-15% compared with what would otherwise occur.

Commuter Financial Incentives

Commuter Financial Incentives means that commuters are offered financial incentives to use alternative travel modes ("Commuter Financial Incentives," VTPI, 2005). *Parking Cash Out* means that commuters who are offered a free or subsidized parking space have the option of choosing the cash equivalent, and *Transit Benefits* means that employers help fund their employees' transit and rideshare fares. For example, employees might be able to choose between a free parking space, a monthly transit pass, a vanpool subsidy, or $50 cash per month. These payments may be prorated, so for example, employees who drive 30% of the time receive a 70% cash-out payment. These incentives tend to reduce automobile commuting by 10-30%, and are fairer, since they give non-drivers benefits comparable to those offered motorists.

Implementation

Commuter Financial Incentives are usually implemented at least to reflect modal neutrality (subsidies for alternative modes are at least equal to automobile parking subsidies), or based on their cost effectiveness at achieving conventional transportation planning objectives (such as congestion reduction and parking cost savings), and often more to achieve other planning objectives such as reducing pollution emissions. They are generally implemented by businesses, often with local government support.

Travel Impacts

Commuter Financial Incentives affect the 15-20% of travel that consists of urban and suburban commuting. They typically reduce automobile commuting 10-30% compared with what would otherwise occur.

Increased Fuel Taxes - Tax Shifting

Since governments must tax something to raise revenue, many economists recommend shifting taxing to activities that are harmful or risky, for example, reducing taxes on employment and commercial transactions, and increasing taxes on non-renewable resources, particularly vehicle fuel (Durning and Bauman, 1998; CBO, 2006). Current fuel taxes are relatively low, particularly in the U.S. and many developing countries. Transition costs are minimal if implementation is predictable and gradual, and such taxes can be progressive with respect to income if revenues are used in ways that benefit lower-income people.

There are several specific justifications for increasing taxes on petroleum products in general and motor vehicle fuel in particular ("Fuel Tax Increase," VTPI, 2005):

- To reflect inflation. Fuel taxes are generally based on units sold (gallons or liters), as opposed to a percentage of the retail price, and so their real value declines with inflation. The real, inflation adjusted value of fuel taxes has declined significantly in many jurisdictions. Increasing taxes and indexing them to inflation is justified to maintain constant revenue.
- As a comprehensive road user fee. Fuel taxes are generally considered a road user fee. In many jurisdictions, particularly in the U.S. and developing countries, they collect significantly less than roadway costs.
- To encourage energy conservation in order to reduce dependence on imported resources, increase economic efficiency, reduce pollution emissions (including climate change emissions) and to leave more petroleum for future generations.
- To internalize petroleum production subsidies, external costs and tax exemptions.

Implementation

Virtually any tax shift may be justified as a tax shift, particularly if it is predictable and gradual (such as a 10% annual fuel tax increase over several years), although total increases may be limited by fuel tax rates in nearby jurisdictions. Optimal fuel taxes are at least high enough to cover a fair share of all public costs for providing roadway and producing and importing petroleum, and could be higher to achieve other social objectives, such as reducing pollution emissions. This would increase fuel taxes by 40-100%. It is generally implemented by state/provincial and federal governments, although some areas have local fuel taxes.

Travel Impacts

The elasticity of vehicle travel with respect to fuel price tends to be –0.1 to -0.3, and the elasticity of fuel consumption with respect to fuel price is –0.3 to –0.7 (in the longer term motorists can respond to higher fuel prices by purchasing more fuel efficient vehicles). Gradually increasing fuel taxes so prices increase by 40-100% would reduce automobile travel 5-15% compared with what would otherwise occur, and reduce fuel consumption by 25-65%. It affects virtually all types of motor vehicle travel.

Pay-As-You-Drive Pricing

Pay-As-You-Drive (PAYD) pricing (also called *Distance-Based* and *Mileage-Based pricing*) means that vehicle insurance or other fees are based directly on how much it the vehicle is driven ("Pay-As-You-Drive Pricing," VTPI, 2005). This can be done by changing the pricing unit (i.e., how fees are calculated) from the vehicle-year to the vehicle-mile, vehicle-kilometer or vehicle-minute. Existing pricing factors are incorporated so higher-risk motorists pay more per unit than lower-risk drivers. For example, a $375 annual insurance premium becomes 3¢ per mile, and a $1,250 annual premium becomes 10¢ per mile. An average U.S. motorist would pay about 7¢ per mile for PAYD insurance. Similarly, currently fixed vehicle taxes, registration, licensing and lease fees, and taxes can be converted to distance-based fees by dividing existing fees by average annual mileage for each vehicle class. For example, if a vehicle's annual registration fees are $300 and its class averages 12,000 annual miles, the distance-based fee is 2.5¢ per mile.

Pay-As-You-Drive pricing requires annual odometer audits, which means that a service station, vehicle emission inspection station or insurance broker checks the vehicle's speedometer for signs of tampering and records the odometer reading. Such audits typically require 5 to 10 minutes, and less if performed with other vehicle servicing (tune ups, emission inspections, etc.), with an incremental cost of $5 to $10. Once the system is established, there is virtually no incremental cost to pricing any fee based on mileage.

Pay-As-You-Drive pricing helps achieve several public policy goals including fairness, affordability, road safety, consumer savings and choice, and reduced traffic problems such as traffic congestion, road and parking facility costs, pollution emissions and sprawl. PAYD should reduce average annual mileage of affected vehicles by 10-15%, reduce crash rates by a greater amount, increase equity, and save consumers money. It reduces the need for cross-subsidies currently required to provide "affordable" unlimited-mileage coverage to high-risk drivers. It can particularly benefit lower-income communities that currently pay excessive premiums. Some insurance companies now offer versions of PAYD pricing, but implementation is limited.

Implementation

PAYD insurance could be a consumer option, in which case only a small portion of total vehicle travel would be affected (10-30% depending on circumstances), or it could be mandatory, in which case it would affect virtually all private vehicles. PAYD insurance is implemented by insurance companies, which can be encouraged or mandated by state/provincial policies and incentives. PAYD registration is implemented by state or provincial governments.

Travel Impacts

Pay-As-You-Drive insurance can apply to virtually all private automobile travel, and PAYD registration fees and taxes could apply to all vehicles. PAYD pricing typically reduces affected vehicles' average annual mileage 10-15%, depending on how the fees are structured.

Road Pricing

Road Pricing means that motorists pay directly for driving on a particular roadway or in a particular area ("Road Pricing," VTPI, 2005). *Congestion Pricing* (also called *Value Pricing*) refers to road pricing with variable fees designed to reduce traffic congestion. Transportation economists have long advocated road pricing as a way to fund transportation improvements and to reduce congestion problems. Road tolls are justified since many road and bridge projects would otherwise be funded trough general taxes, or by taxes paid by motorists who seldom or never use costly new facilities. Some roads include both priced and unpriced lanes, allowing motorists to choose between financial or timesavings. Experience with road tolls and various types of congestion pricing indicate that motorists respond to such fees, shifting travel time, route, destination and mode, increasing overall transportation system efficiency.

Implementation

Road pricing is generally implemented by changing uses for the costs of new highways, or for driving under urban-peak conditions with rates high enough to reduce traffic volumes to optimal levels. It is generally implemented by regional or state/provincial governments, sometimes through public-private partnerships.

Travel Impacts

Road pricing typically reduces 10-20% of affected vehicle travel (travel on roads with road pricing fees). Although only a small portion of total vehicle travel occurs on new highways or under urban-peak conditions, the prime candidates for road pricing, this travel imposes relatively high parking, pollution and congestion costs (since these costs are highest in urban areas), so total benefits are relatively large. For example, road pricing imposed on the 10% of vehicle travel that consists of urban-peak highway traffic might reduce total vehicle mileage by just 1-2%, but reduce parking and pollution costs by 5-10% and congestion costs by 10-30%.

Parking Management

Parking Management includes a variety of strategies that encourage more efficient use of existing parking facilities, improve the quality of service provided to users, and improve parking facility design, as summarized in the table below. Parking Management can help address a wide range of problems, and can help achieve various economic, social and environmental objectives.

Table 3 **Parking Management Strategies** ("Parking Management," VTPI, 2005)

Management Strategy	Description
Shared Parking	Parking spaces are shared by more than one user, allowing facilities to be used more efficiently.
Regulate Parking Facility Use	Manage the most convenient parking spaces to give priority to higher-value trips.
More Accurate and Flexible Standards	Reduce or adjust standards to more accurately reflect demand at a particular location, taking into account geographic, demographic and economic factors.
Parking Maximums	Establish maximum in addition or instead of minimum parking standards.
Remote Parking	Encouraging longer-term parkers to use off-site or fringe parking facilities.
Improving User Information and Marketing	Provide convenient and accurate information on parking availability and price, using maps, signs, brochures and electronic communication.
Improved Walkability	Improve pedestrian conditions to allow parkers to conveniently access more parking facilities, increasing the functional supply in an area.
Unbundle Parking	Rent or sell parking spaces separately from building space, so occupants pay for just the number of parking spaces that they use.
Tax Parking Facilities	Impose special taxes on parking facilities and commercial parking transactions.
Improve Enforcement and Control	Enforcement should be consistent, fair and friendly. Parking passes should have clear limitations regarding where, when and by whom they may be used.
Bicycle Facilities	Supply bicycle parking, storage and changing facilities.
Develop Overflow Parking Plans	Encourage use of remote parking facilities and promote use of alternative modes during peak periods, such as busy shopping times and major events.
Address Spillover Problems	Use management, pricing and enforcement to address spillover parking problems

This table summarizes various parking management strategies.

Implementation

Parking management is most often implemented in urban areas, where parking facility costs are high and opportunities for sharing and mode shifting is greatest, although it can be useful in a wide range of situations to achieve various objectives. It is generally implemented by property owners and local governments, often with local or regional government support and encouragement (such as more flexible parking requirements and incentives for developers and employers that implement parking management programs).

Travel Impacts

Parking management (excluding parking pricing described below) primarily affects travel in urban and suburban areas. Where applied it typically reduces automobile trips 5-10%, and much larger reductions in parking costs. Since parking management is usually implemented in urban areas, it also tends to provide relatively large congestion and pollution cost reductions.

Parking Pricing

Parking pricing means that motorists pay directly for using parking facilities. Parking pricing may be implemented as a parking management strategy (to reduce parking problems in a particular location), as a mobility management strategy (to reduce vehicle traffic in an area), to recover parking facility costs, to generate revenue for other purposes (such as a local transportation program or downtown improvement district), or for a combination of these objectives ("Parking Pricing," VTPI, 2005). Resistance to parking pricing can be reduced by using improved pricing methods, which offer various payment options and only charge motorists for the amount of time they are parked.

A related strategy is to *Unbundle Parking*, which means that parking is sold or rented separately from building space. For example, rather than renting an apartment for $1,000 per month with two parking spaces at no extra cost, each apartment can be rented for $850 per month, plus $75 per month for each parking space. Occupants only pay for the parking spaces the actually need. This is more efficient and fair, since occupants only pay for the amount of parking they need and want.

Implementation

Parking pricing is generally implemented by changing uses for parking facility costs, or as a way to reduce parking demand to optimal levels, particularly in urban areas or commercial centers with parking problems.

Travel Impacts

Cost-based parking pricing (i.e., prices set to recover the full cost of parking facilities) typically reduces parking demand 10-20% compared with unpriced parking. It is generally implemented by local governments and facility managers.

Transit and Rideshare Improvements

There are many ways to improve public transit and rideshare services, and encourage transit and rideshare use, including additional routes, increased service frequency and longer operation hours, rideshare matching and promotion programs, rider comfort improvements, reduced and more convenient fares, improved rider information and marketing programs, transit oriented development, pedestrian and cycling improvements around transit stops, bike and transit integration (bike racks on buses, bicycle parking at stations, etc.), Park & Ride facilities, improved security for transit users and pedestrians, and transit services targeting particular needs such as express commuter buses and special event services ("Transit Improvements," VTPI, 2005).

Implementation

Transit and rideshare improvements can be justified based on their cost effectiveness at achieving conventional planning objectives (congestion reduction, parking cost savings, etc.), and to achieve other, more difficult to quantify objectives (basic mobility for non-drivers and improved community livability), or to correct decades of automobile-oriented planning practices. Transit and rideshare improvements are generally implemented by local, regional and state/provincial governments, often with federal support.

Travel Impacts

Transit and rideshare improvements primarily affect urban travel. Transit and ridesharing improvements have both direct and indirect travel impacts. Direct impacts reflect the passenger-miles shifted from driving to these modes. This primarily affects urban commute travel. Indirect impacts reflect the effects that transit and rideshare improvements can have on per capita vehicle ownership and land use patterns, which affects both commute and non-commute travel (Litman, 2006). People who live in communities with good transit services tend to drive 10-20% less than residents of more automobile-oriented areas.

HOV Priority

HOV Priority refers to strategies that give *High Occupant Vehicles* (buses, vanpools and carpools) priority over general traffic ("HOV Priority," VTPI, 2005). HOV priority measures can be justified as a more efficient and equitable allocation of road space (travelers who share a vehicle and therefore *impose* less congestion on other road users, are rewarded by *bearing* less congestion delay), an efficient use of road capacity (they can carry more people than a general use lane), and as an incentive to shift to more efficient modes. HOV Priority strategies include:

- HOV highway and arterial lanes.
- High Occupancy Toll (HOT) lanes (HOV lanes that allow lower occupancy vehicles that pay a toll.
- Busways (special lanes for transit buses with features to improve transit service quality).
- Queue-jumping lanes and intersection controls that give priority to HOVs.
- Preferred parking spaces or parking fee discounts provided to rideshare vehicles.

Implementation

HOV Priority can attract more peak-period travelers to transit and ridesharing. Implementation can be based on their cost effectiveness at achieving conventional planning objectives, and often more to achieve other, more difficult to quantify objectives. It is generally implemented by regional and state/provincial governments, often with federal support.

Travel Impacts

HOV priority primarily affects travel on major roadways under urban-peak conditions which represents a relatively small portion of total travel (typically 5-10%), but provides proportionally larger reductions in congestion and parking costs. A major HOV priority program which provides substantial time savings to high occupant vehicles typically shifts 10-20% of automobile trips to transit and ridesharing, and so typically reduces 0.5% to 2% of automobile miles.

Walking and Cycling Improvements

Walking and cycling travel can substitute for some motor vehicle trips directly, and supports other alternative modes such as public transit and ridesharing. Residents of

communities with good walking and cycling conditions drive less and use transit and rideshare more. There are many specific ways to improve nonmotorized transportation (Walking and Cycling Improvements," VTPI, 2004):

- Improve sidewalks, crosswalks, paths and bikelanes.
- Increase road and path connectivity, with special shortcuts for nonmotorized modes.
- Pedestrian oriented land use and building design.
- Traffic calming, speed reductions and vehicle restrictions, to reduce conflicts between motorized and nonmotorized traffic.
- Safety education, law enforcement and encouragement programs.
- Convenient and secure bicycle parking.
- Address security concerns of pedestrians and cyclists.

Implementation

Walking and cycling improvements can be justified based on their cost effectiveness at achieving conventional planning objectives (congestion reduction and parking cost savings), and often more to achieve other objectives (such as equity, basic mobility for non-drivers, improved public health, livable communities, tourism development), or to correct decades of automobile-oriented planning practices. It is generally implemented by local and regional governments.

Travel Impacts

Walking and cycling improvements primarily affects short-distance trips (less than three miles) but can influence longer trips by supporting shifts to public transit. Also, a short walking or cycling trip often replaces a longer automobile trip, for example, when improved walking conditions convince people to shop locally rather than driving to a more distant store. People who live in more walkable and bikeable communities typically drive 10-20% less than they would in more automobile-oriented communities, but some of this reflects self-selection (people who prefer nonmotorized travel choose more walkable communities). Comprehensive nonmotorized improvement programs can probably reduce per capita vehicle travel by 1-4%.

Smart Growth Land Use Policies

Current zoning and development practices tend to increase vehicle travel by limiting density, separating activities, dispersing destinations and favoring automobile access over alternative modes. *Smart growth* development practices, such as those described below, can provide many benefits, including more diverse and efficient transportation ("Smart Growth," VTPI, 2005).

- Create more self-contained communities and neighborhoods. For example, develop schools, convenience shopping and recreation facilities in neighborhoods.
- Encourage cluster development. Keep clusters small and well defined, such as "urban villages" with distinct names and characters.
- Encourage infill development. Use variable impact fees and utility pricing that reflects the higher costs of providing public services to lower-density sites. Encourage the rehabilitate and redevelopment of older facilities and brownfields.
- Concentrate commercial activities in compact centers or districts. Use access management to prevent arterial strip commercial development.
- Develop a network of relatively direct, interconnected street. Keep streets as narrow as possible, particularly in residential areas and commercial centers. Use traffic management and traffic calming to control vehicle impacts rather than dead ends and cul de sacs.
- Apply reduced and more flexible parking requirements, particularly for developers who implement mobility management programs.
- Design streets to accommodate walking and cycling. Create a maximum number of connections for non-motorized travel, such as trails that link dead-end streets.

Implementation

Smart growth policies can be justified based on their effectiveness at achieving various economic, social and environmental objectives, including infrastructure cost savings, transport cost savings, community livability, and environmental quality. They can be implemented in most urban and suburban conditions. Although smart growth implementation can take many years, it tends to provide many benefits and its effects are very durable. Smart growth policies are generally implemented by developers, and local and regional governments.

Travel Impacts

Comprehensive Smart Growth programs primarily apply in urban and suburban areas. They can result in significant (10-30%) reductions in per capita vehicle travel by affected residents and employees over the long term. Short term impacts depend on the speed of development and redevelopment occurring and the types of strategies implemented.

Location Efficient Development

Location Efficient Development consists of various incentives to concentrate residential and commercial development in areas with accessible land use and good transport options (walking and cycling conditions, transit and carsharing services). These features result in reduced automobile ownership and use, which provides transportation cost savings to consumers. Location Efficient Mortgages recognize these potential savings in credit assessments, giving homebuyers an added incentive to choose efficient locations.

Implementation

Location efficient development can be implemented based on its cost effectiveness at achieving conventional planning objectives, and often more to achieve other objectives, such as improved accessibility for non-drivers and increased consumer affordability. It directly affects travel by households and businesses that can change from more automobile-dependent to more multi-modal locations. It is generally implemented by developers, lenders, and local and regional governments.

Travel Impacts

Location efficient development tends to reduce residents' vehicle travel by 10-20%. Similarly, employees working at location efficient businesses tend to reduce their automobile commute trips by 10-20%. Location efficient mortgages affect residential location decisions by a relatively small portion of total households (those that face borrowing constraints and are amenable to shifting location), but a more comprehensive location efficient promotion program may have much larger effects.

Mobility Management Marketing

Mobility Management Marketing involves various activities to improve consumers' knowledge and acceptance of alternative modes, and to provide products that better meet travelers' needs and preferences ("Mobility Management Marketing," VTPI, 2005). Given adequate resources, marketing programs can significantly increase use of alternative modes and reduce automobile travel.

Implementation

Mobility management marketing be justified based on their effectiveness at achieving conventional transport planning objectives, such as congestion reduction, and even more to achieve additional, more difficult to quantify objectives such as improved mobility options for non-drivers and community livability. It is generally implemented by local and regional governments, and by public transit agencies.

Travel Impacts

Mobility management marketing tends to affect local personal travel. Effective marketing programs can significantly increase use of alternative modes, and typically reduce automobile travel by 5-10% (Cairns, et al., 2004).

Freight Transport Management

Freight Transport Management includes various strategies of increasing the efficiency of freight and commercial transport ("Freight Transport Management, VTPI, 2005). This can include improving distribution practices so fewer vehicle trips are needed, shifting freight to more resource efficient modes (such as from air and truck to rail and marine), improving efficient modes such as marine, rail and bicycle, better siting of industrial locations to improve distribution efficiency, improving vehicle operation and implementing fleet management to reduce impacts such as noise and air pollution, and by reducing the total volume of goods that need to be transported. Because freight vehicles tend to be large, energy-intensive and high polluting, a relatively small improvement in freight efficiency can provide significant benefits.

Implementation

Freight transport management be justified based on its effectiveness at achieving conventional transport planning objectives, such as congestion reduction, and even more to achieve additional, more difficult to quantify objectives such as improved productivity. It is generally implemented by local and regional governments.

Travel Impacts

Although commercial vehicles represent less than 10% of total traffic, they tend to be heavy vehicles that impose large impacts. Reductions of 5-15% of freight vehicle travel can be achieved.

School and Campus Trip Management

These programs help overcome barriers to the use of alternative modes, and provide positive incentives for reduced driving to schools and college or university campuses ("School Transport Management," VTPI, 2005). School trip management usually involves improving pedestrian and cycling access, promoting ridesharing, and encouraging parents to use alternatives when possible. Campus trip management programs often include discounted transit fares, rideshare promotion, improved pedestrian and cycling facilities, and increased parking fees. These programs give students, parents and staff more travel choices, encourage exercise, and reduce parking and congestion problems. They often reduce car trips by 15-30%.

Implementation

School transport management can be justified to achieve conventional planning objectives such as congestion reduction and parking cost savings, and to achieve additional, more difficult to quantify objectives such as increased physical exercise and community livability. It is generally implemented by schools and local governments.

Travel Impacts

School and campus transport management affects 5-10% of trips involving travel to schools. Such programs typically reduce automobile travel by 5-15%, reducing 0.25-1.5% of total automobile trips.

Carsharing

Carsharing provides affordable, short-term (hourly and daily rate) motor vehicle rentals in residential areas as an alternative to private ownership ("Carsharing," VTPI, 2005). Because it has lower fixed costs and higher variable costs than private vehicle ownership, carsharing tends to significantly reduce annual vehicle mileage by participants.

Implementation

Carsharing be justified based on its effectiveness at achieving conventional transport planning objectives, such as congestion reduction and parking cost savings, and even more to achieve additional, more difficult to quantify objectives such as improved mobility for non-drivers. It is generally implemented by private companies or non-profit organizations, often with local or regional government support.

Travel Impacts

Carsharing services are usually located in urban areas where there are suitable travel options so a significant portion of residents do not need own an automobile. In a typical region 20-40% of residents live in neighborhoods suitable for carsharing, and perhaps 2-5% of those residents would carshare rather than own a private vehicle ownership if the service were available. People who shift from owning a private vehicle to carsharing are typically lower-annual-mileage drivers who reduce their vehicle travel about 50% (i.e., they reduce their mileage from 6,000 to 3,000 annual miles). This suggests that carsharing services can reduce total vehicle travel by 0.1% to 0.6%. Parking cost savings, congestion reductions, consumer cost savings and pollution cost reductions tend to be particularly large since these reductions are concentrated in urban areas.

Traffic Calming and Traffic Management

Traffic calming includes various strategies to reduce traffic speeds and volumes on specific roads ("Traffic Calming," VTPI, 2005). Typical strategies include traffic circles at intersections, sidewalk bulbs that reduce intersection crossing distances, raised crosswalks, and partial street closures to discourage short-cut traffic through residential neighborhoods. This increases road safety and community livability, creates a more pedestrian- and bicycle-friendly environment, and can reduce automobile use.

Implementation

Traffic calming can be justified based on its safety benefits, to improve mobility for non-drivers, and to increase community livability and property values. It is generally implemented by local governments.

Travel Impacts

Traffic calming primarily affects local street travel, and can provide modest reductions in affected travel by improving the relative convenience, speed and safety of walking and cycling. In a typical community perhaps 3-6% of total travel may take place on roads suitable for traffic calming, and perhaps 3-6% of mileage on those roads is reduced, resulting in 0.1% to 0.4% total reductions in vehicle mileage.

Summary of Win-Win Solutions

Table 4 summarizes these various Win-Win Solutions.

Table 4 **Win-Win Solutions**

Name	Description	Transport Impacts
Planning Reforms	More comprehensive and neutral planning and investment practices.	Increases investment and support for alternative modes and mobility management, improving transport options.
Regulatory Reforms	Reduced barriers to transportation and land use innovations.	Tends to improve transport options.
Transportation Demand Management Programs	Local and regional programs that support and courage use of alternative modes.	Increased use of alternative modes.
Commute Trip Reduction (CTR)	Programs by employers to encourage alternative commute options.	Reduces automobile commute travel.
Commuter Financial Incentives	Offers commuters financial incentives for using alternative modes.	Encourages use of alternative commute modes.
Fuel Taxes - Tax Shifting	Increases fuel taxes and other vehicle taxes.	Reduces vehicle fuel consumption and mileage.
Pay-As-You-Drive Pricing	Converts fixed vehicle charges into mileage-based fees.	Reduces vehicle mileage.
Road Pricing	Charges users directly for road use, with rates that reflect costs imposed.	Reduces vehicle mileage, particularly under congested conditions.
Parking Management	Various strategies that result in more efficient use of parking facilities.	Reduces parking demand and facility costs, and encourages use of alternative modes.
Parking Pricing	Charges users directly for parking facility use, often with variable rates.	Reduces parking demand and facility costs, and encourages use of alternative modes.
Transit and Rideshare Improvements	Improves transit and rideshare services.	Increases transit use, vanpooling and carpooling.
HOV Priority	Improves transit and rideshare speed and convenience.	Increases transit and rideshare use, particularly in congested conditions.
Walking and Cycling Improvements	Improves walking and cycling conditions.	Encourages use of nonmotorized modes, and supports transit and smart growth.
Smart Growth Policies	More accessible, multi-modal land use development patterns.	Reduces automobile use and trip distances, and increases use of alternative modes.
Location Efficient Housing and Mortgages	Encourage businesses and households to choose more accessible locations.	Reduces automobile use and trip distances, and increases use of alternative modes.
Mobility Management Marketing	Improved information and encouragement for transport options.	Encourages shifts to alternative modes.
Freight Transport Management	Encourage businesses to use more efficient transportation options.	Reduced truck transport.
School and Campus Trip Management	Encourage parents and students to use alternative modes for school commutes.	Reduced driving and increased use of alternative modes by parents and children.
Carsharing	Vehicle rental services that substitute for private automobile ownership.	Reduced automobile ownership and use.
Traffic Calming and Traffic Management	Roadway designs that reduce vehicle traffic volumes and speeds.	Reduced driving, improved walking and cycling conditions.

There are various Win-Win Solutions, which encourage more efficient transportation.

Nearly all of these strategies have been successfully implemented somewhere (CCAP, 2005; ICLEI, 2005; VTPI, 2005), although virtually no community has implemented all strategies to the degree that is cost effective and justified by economic principles. It is difficult to predict exactly how individual Win-Wins Solutions would affect vehicle travel if implemented to the degree that is economically justified, but their effects can be significant, as indicated in Table 5, which shows their typical range of impacts.

Table 5 **Win-Win Travel Impacts**

Name	Directly Affects Travel?	Portion of Vehicle Travel Affected	Typical Reductions By Affected Travel	Total Reductions
Planning Reforms	No	100%	10-20%	10-20%
Regulatory Reforms	No	20-40%	5-10%	1-4%
TDM Programs	No	30-50%. Mainly urban travel.	10-20%	4-8%
Commute Trip Reduction (CTR)	Yes	15-20%. Urban commute travel.	5-15%	1-3%
Commuter Financial Incentives	Partly (includes parking pricing)	15-20%. Urban commute travel.	10-30%	1-6%
Fuel Taxes - Tax Shifting	Yes	100%	5-15%	5-15%
Pay-As-You-Drive Pricing	Yes	80-90%. Private automobile travel.	10-15%	7-13%
Road Pricing	Yes	5-15%. Driving on new or congested roadways.	10-20%	1-3%
Parking Management	Yes	40-50%.	5-10%	2-8%
Parking Pricing	Yes	40-50%.	10-20%	3-10%
Transit and Rideshare Improvements	Yes	20-40%. Mainly urban travel.	10-20%	2-12%
HOV Priority	Yes	5-10%. Congested roadways.	10-20%	1-2%
Walking and Cycling Improvements	Yes	10-20%. Shorter-distance trips.	10-20%	1-4%
Smart Growth Reforms	Yes	30-50%. Mainly urban travel.	10-30%	3-15%
Location Efficient Housing and Mortgages	No (Is a Smart Growth Reform)	10-20%. Travel by households that can change location.	10-20%	1-6%
Mobility Management Marketing	Yes	30-50%. Mainly urban travel.	5-10%	2-5%
Freight Transport Management	Yes	5-15%. Freight and commercial travel.	5-15%	0.3-2%
School and Campus Trip Management	Partly (is a type of CTR program)	5-10%. School and campus trips.	5-15%	0.3-1.5%
Carsharing	Yes	1-2%. Households that can choose this option.	20-30%	0.2-0.6%
Traffic Calming	Yes	3-6%. Local urban travel.	3-6%	0.1-0.4%

This table indicates the portion of vehicle travel affected and the magnitude of reductions caused by Win-Win Solutions, assuming they are implemented to the degree economically justified. The "Directly Affects Travel" column indicates to whether a strategy affects travel itself or helps implement other Win-Win strategies that do, and so whether or not it whould be counted toward cumulative effects.

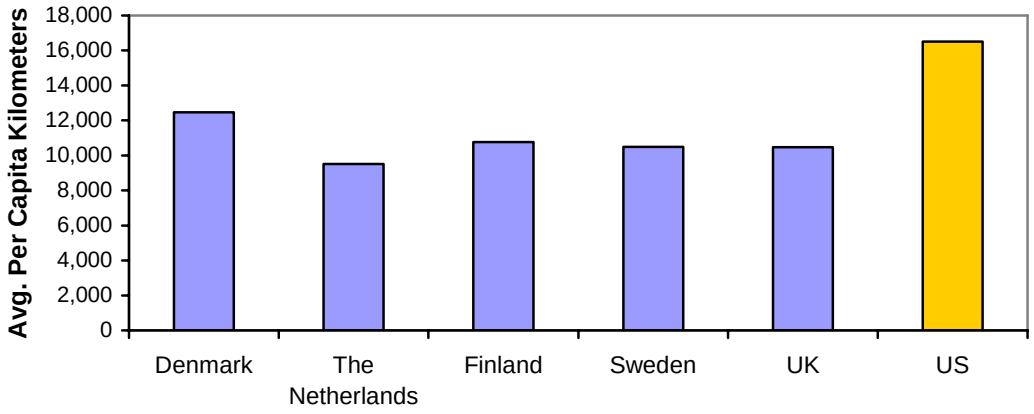
It is even more difficult to predict the cumulative impacts of a comprehensive program of Win-Win strategies because their effects often overlap (some, such as planning reforms and TDM programs, do not directly affect travel, rather they help implement strategies that do), because some effects are synergistic and indirect, and because as more strategies are implemented the marginal impact of each additional strategy declines. For example, if one strategy reduces automobile trips by 20%, and a second strategy causes an additional 15% reduction their combined effect is 80% x 85% = 68% ([100%-20%] x [100%-15%]), a 32-point reduction, rather than 20% + 15% = 35%. This occurs because the 15% reduction applies to a base that is already reduced 20%.

Many strategies tend to reduce higher-cost trips and so provide proportionately large reductions in congestion, parking, accidents and pollution. For example, congestion pricing and HOV priority only reduce a small portion of total vehicle travel but provide relatively large reductions in congestion costs. Similarly, freight transport management reduces heavy vehicle travel, providing relatively large congestion, road and accident cost reductions. Pay-As-You-Drive vehicle insurance tends to reduce relatively high-risk vehicle miles, and so provides relatively large safety benefits.

Despite difficulties quantifying these impacts it appears that well-coordinated program of Win-Win Solutions, with strategies implemented to the degree economically justified, would probably reduce total vehicle travel 30-50% compared with current planning and pricing practices (for analysis see the *Win-Win Impact Evaluation Spreadsheet* at www.vtpi.org/win-win.xls).

This estimate can be validated by comparing annual vehicle mileage in the US with other wealthy countries that have different transport policies (Figure 4). Northern European countries with more diverse transportation systems and higher fuel taxes have 30-40% lower per capita vehicle mileage, although these countries have yet to widely implement some Win-Win strategies such as Pay-As-You-Drive fees and congestion pricing, indicating potential for additional, cost-effective vehicle travel reductions there.

Figure 4 **Per Capita Vehicle Travel, 2000** (European Commission & USDOT Data)



Per capita vehicle travel is 30-40% lower in wealthy countries that have Win-Win type policies.

Consumer Impacts

Some people are skeptical that Win-Win strategies are beneficial overall, since they cause consumers to reduce their vehicle travel. But if properly implemented these strategies benefit consumers overall. Many Win-Win strategies improve travel options and provide positive incentives, so consumers only reduce their driving when they consider themselves better off. Motorists who continue driving are no worse off, and benefit from reduced congestion, accident risk and pollution.

For example, some Win-Win strategies improve walking, cycling, rideshare, transit and telecommuting options, or help increase land use accessibility. Strategies such as Parking Cashing Out and Pay-As-You-Drive vehicle insurance return to individual motorists the savings that result when they drive less, offering motorists a new opportunity to save money that does not currently exist.

Some strategies apply negative incentives, such as parking pricing, road pricing and fuel taxes. But these increased fees are offset by reductions in other consumer costs and taxes that currently subsidize road and parking facilities, and petroleum production, and motorists benefit from reduced traffic congestion. Similarly, traffic calming reduces vehicle speeds, which is a cost to motorists, but a benefit to pedestrians and local residents, and reduces motorist crash risk.

Many trips would not change, but marginal vehicle trips would be reduced. Consumers could consolidate trips, choose closer destinations, and use alternatives such as walking, cycling, transit, ridesharing, telecommuting and delivery services.

Win-Win Solutions tend to increase equity. For example, with current “free” parking, everybody pays for parking indirectly, through higher taxes, rents and retail prices, but some people benefit little, and so overpay their fair share. Parking Cash Out means that non-drivers receive employee benefits comparable in value to the parking subsidies given motorists. Flexible zoning requirements allow non-drivers to avoid paying for parking spaces they don’t need. Pay-As-You-Drive insurance avoids cross-subsidies from low- to high-mileage motorists. Virtually all Win-Win Solutions increase travel options for people who cannot drive due to physical or economical constraints.

Although it may seem difficult for consumers to support reforms that reduce driving, there are examples of successes, including recycling, smoking reductions and increased seat belt use. In each case, a combination of public education, policy changes and support services have significantly affected behavior, indicating that consumers may support such policies.

Economic Impacts

Economic Development refers to progress toward a community's economic goals, including increases in economic productivity, employment, business activity and investment. Many people assume that since motor vehicle ownership and use tend to increase with economic development, motor vehicle travel must support economic development and market reforms that reduce vehicle travel must be economically harmful. Transport planning decisions are sometimes portrayed as a tradeoff between the economic development benefits of increased mobility, and social and environmental benefits from reduced demand. But, Win-Win Solutions actually support economic development overall by increasing transport system efficiency ("Economic Development Impacts," VTPI, 2005).

At the margin (relative to current consumption patterns), automobile ownership and use provide less economic productivity and employment benefits than other types of investments and expenditures. Transport, like any economic input, can experience diminishing returns: beyond an optimal level, additional vehicle traffic provides smaller benefits per additional unit of consumption.

Some transportation activity provides large economic benefits. For example, one delivery truck may contain goods that contribute to millions of dollars in production. However, this does not justify underpricing. On the contrary, it justifies planning and pricing strategies that allow higher value trips to have priority over lower-value trips, and improvements to alternative modes that impose less traffic costs.

Empirical evidence comparing productivity in various urban regions indicates that excessive motorization reduces economic development. Economic growth rates tend to decline in automobile dependent regions. Although expenditures on motor vehicles and roads support many industries, they provide less employment and business activity than most alternative consumer expenditures. Regions that already have adequate paved highways are unlikely to see major economic development benefits from increased road capacity. Many benefits associated with roadway capacity expansion are economic transfers rather than true productivity gains. Alternative investments and TDM strategies that lead to more efficient use of existing transport systems are likely to provide greater economic benefits.

Many Win-Win Solutions reflect efficient market principles. TDM can help create a more efficient transport system that increases productivity and economic development, and makes consumers better off overall. The total economic benefits can be large. Efficient market reforms can reduce per capita vehicle use by a third or more, providing hundreds of dollars in annual per capita economic savings and productivity gains. This can make consumers wealthier, increases investment and supports economic development. However, such programs must be well planned to provide maximum economic development benefits.

Conclusions

Win-Win Solutions are cost-effective, technically feasible policy reforms and programs that help solve transport problems by improving transport options and correcting market distortions that result in economically excessive vehicle travel. They help create a more equitable and efficient transportation system that benefits consumers overall, supports economic development and helps achieve other strategic planning objectives. Many transportation problems are virtually unsolvable without such reforms.

Conventional transport planning tends to treat these strategies as measures of last resort, to address specific problems such as congestion and air pollution where other solutions have failed. Win-Win Solutions takes the opposite approach – it applies market reforms whenever they are cost effective, taking into account all costs and benefits, and consider capacity expansion as a fallback if these reforms fail.

Most individual Win-Win strategies provide modest benefits, and so are not considered the best way to solve any particular problem. As a result, they are often overlooked. However, their impacts are cumulative and synergistic. An integrated program of Win-Win strategies is often the most cost-effective way of addressing problems and improving transportation overall.

Win-Win Solutions are the best way to create sustainable transportation systems that balance economic, social and environmental objectives. If fully implemented to the degree that is economically justified Win-Win Solutions could reduce motor vehicle costs by 25-50%, although exact impacts are difficult to predict and vary depending on geographic, demographic and economic conditions. They could meet Kyoto emission reduction targets while *increasing* consumer benefits and economic development.

Because Win-Win Solutions provide many different benefits, organizations and individuals representing a wide range of interests have reasons to support their implementation. This offers the opportunity for political coalitions to advocate for these reforms. Transportation professionals, local government and taxpayer groups, environmental organizations, economic development and business interests, social equity advocates, and even motorists all have reasons to support Win-Win Solutions.

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