Win-Win Emission Reduction Strategies
Smart Transportation Strategies Can Achieve Emission Reduction Targets And Provide Other Economic, Social and Environmental Benefits

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Abstract
Win-Win Transportation Solutions are cost-effective, technically feasible, market reforms that solve transportation problems by increasing consumer options and removing market distortions that cause inefficient travel patterns. They can provide many economic, social and environmental benefits. If implemented to the degree that is economically justified, Win-Win Solutions could achieve the transportation component of Kyoto emission reduction targets while stimulating economic development and reducing other problems such as traffic congestion and accidents. This paper discusses the Win-Win concept and describes a dozen Win-Win strategies.
**Introduction - How Win-Win Strategies Work**

People often assume that environmental and economic goals conflict. For example, opponents of Kyoto emission reduction targets claim that energy conservation harms the economy. They are wrong. Some emission reduction strategies also support economic development.

This paper identifies a dozen such strategies, called *Win-Win Transportation Solutions*. These are cost-effective, technically feasible policy reforms that correct existing market distortions which cause inefficient travel patterns. These reforms provide multiple benefits, including congestion reduction, road and parking cost savings, consumer savings, safety, improved mobility for nondrivers, plus energy conservation and emission reductions.

These are, admittedly, big claims. To understand why such large benefits are possible it is useful to consider some basic economic principles. Efficient markets have certain requirements, including *consumer choice* (consumers have appropriate options to choose from), *efficient pricing* (prices reflect production costs), and *policy neutrality* (public policies do not arbitrarily favor one good over others). Current transport markets often violate these principles, which is economically inefficient and environmentally harmful.

For example, many commuters are offered subsidized parking but no comparable benefit for alternative modes such as walking, cycling, public transit, or telecommuting. When commuters are offered a choice of subsidized parking or its cash equivalent (called *parking cash-out*) automobile commute trips typically decline 15-25%. This suggests that implementing parking cash out could significantly reduce traffic congestion, accidents, energy consumption and pollution emissions by giving commuters more options, which eliminates the current bias which favors automobile commuting over other modes.

Another example of inefficiency is that many vehicle fees, including insurance, registration, taxes and leases, are *fixed*, they are not directly based on the vehicle’s annual mileage, although the costs they represent – accidents, road use and vehicle depreciation – do increase with vehicle travel. This fee structure give motorists an incentive to maximize mileage in order to get their money’s worth from their investments. Motorists paying thousands of dollars in annual fixed fees would feel that their money is wasted when they leave their car at home and use alternative modes. Converting these to distance-based fees gives motorists a new opportunity to save money when they reduce their mileage, providing a significant incentive to reduce mileage.

Other distortions involve planning biases that favor automobile transport over alternatives. For example, many jurisdictions have funds dedicated to roads and parking facilities that cannot be used for other transport improvements even when they are more cost effective and beneficial overall. Current transport planning tends to focus on a few objectives such as congestion reduction, and undervalues other objectives such as improved mobility for non-drivers and health benefits from more active transport. More objective and comprehensive planning tends to increase support for alternative modes and efficient market reforms (“Comprehensive Transport Planning,” VTPI, 2005).
Described differently, current transportation markets fail to give motorists the savings that result when they drive less. For example, a motorist who reduces mileage helps reduce traffic congestion, parking costs, accident risk and pollution emissions, but few of these savings are returned directly to that individual. As a result, consumers lack the incentive to shift mode or choose closer destinations when such alternatives are most cost effective overall. This is inefficient and unfair because people who drive less than average end up subsidizing the costs of others who drive more than average. Because lower-income people tend to drive less than average and rely more on alternative modes, market distortions that favor driving also tend to be regressive.

![Figure 1: Cycle of Automobile Dependency](image)

Individual market distortions reinforce the cycle of automobile dependency, leading to economically-excessive automobile ownership and use.
Many existing distortions reflect outdated goals and constrains. For example, in the past it may have made sense to encourage motor vehicle ownership and use in order to take advantage of economies of scale in vehicle and roadway production, but now that the vehicle industries and road systems are mature such policies are no longer justified. Similarly, until recently it was difficult to collect road tolls and parking fees, but new pricing systems make charging more convenient and cost effective.

Win-Win solutions correct market distortions, as described in Table 1. This increases economic efficiency and equity overall. Win-Win strategies are a type of preventive medicine, equivalent to putting the transport system on a healthier diet. This can avert more difficult and expensive measures otherwise be required to address these problems.

**Table 1**  
**Win-Win Solutions Support Market Principles** (Litman, 2006)

<table>
<thead>
<tr>
<th>Market Requirements</th>
<th>Current Market Distortions</th>
<th>Win-Win Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Options.</strong> Consumers need viable transportation and location options, and information about those options.</td>
<td>Consumers often lack viable alternatives to owning and driving an automobile, and living in automobile dependent communities.</td>
<td>Many Win-Win Solutions directly increase travel options. Virtually all increase options indirectly by increasing demand for alternatives.</td>
</tr>
<tr>
<td><strong>Cost-based pricing.</strong> Prices should reflect long-term marginal costs.</td>
<td>Motor vehicle travel is significantly underpriced: many costs are either fixed or external.</td>
<td>Many Win-Win Solutions result in more efficient pricing.</td>
</tr>
<tr>
<td><strong>Economic neutrality.</strong> Public policies (laws, taxes, investments, etc.) should not arbitrarily favor one activity or group.</td>
<td>Tax policies, and many transportation planning and funding practices favor automobile travel over alternative modes or management strategies.</td>
<td>Many Win-Win Solutions help correct transportation planning, investment and pricing biases.</td>
</tr>
<tr>
<td><strong>Land Use.</strong> Land use policies should not favor automobile oriented development.</td>
<td>Many current land use policies encourage lower-density, automobile-dependent land use patterns.</td>
<td>Some Win-Win Solutions correct land use biases that encourage sprawl and automobile dependency.</td>
</tr>
</tbody>
</table>

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

This is not to suggest that automobile travel provides no benefits. It simply indicates that in a more optimal market consumers would choose to drive less than they do now, 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 be justified for undernourished people, 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. Given better options and more efficient pricing, many motorists would choose to drive less and be better off overall as a result.
A Dozen Excellent Win-Win Strategies

This section describes twelve excellent Win-Win strategies. For more information see Litman (2005) and related chapters in the Online TDM Encyclopedia (VTPI, 2005).

Planning Reforms

Conventional transportation planning and funding practices favor automobile travel and undervalue alternative modes in various, often subtle ways (Sussman, 2001; Beimborn and Puentes, 2003). Least-cost planning is a term for more objective and comprehensive planning which:

- Funds alternative modes and demand management strategies equally with roadway and parking facility expansion, based on cost effectiveness.
- Considers all significant impacts (costs and benefits).
- Involves the public in developing and evaluating alternatives.

Least-cost planning creates more efficient and equitable transportation systems. Although its impacts are gradual, they are very durable, since they affect the types of travel options available in a community. When fully implemented it typically reduces automobile travel 10-20% compared with what occurs with conventional, automobile-oriented planning.

Pay-As-You-Drive Pricing

Pay-As-You-Drive (PAYD) pricing (also called Distance-Based and Mileage-Based pricing) means that vehicle fees such as insurance and registration are based directly on the vehicle’s annual mileage. The more you drive the more you pay and the less you drive the more you save. For example, a $400 annual insurance premium becomes 3¢ per mile, and a $1,200 annual premium becomes 10¢ per mile. An average U.S. motorist would pay about 7¢ per mile for insurance plus 3¢ for registration fees and taxes. This should reduce affected vehicles’ annual mileage 10-15%, providing comparable reductions in consumer costs, congestion, facility costs, accidents, and pollution. This is more equitable and affordable. It is particularly beneficial to lower-income motorists, which drive significantly less on average and value opportunities to save money.

Pay-As-You-Drive pricing requires odometer audits, which means that a service station or insurance broker checks vehicle odometers and records mileage readings. This typically requires 5 to 10 minutes, and less if performed with other vehicle servicing (tune ups, emission inspections, etc.), with incremental costs of $5 to $10. Once the system is established, there is virtually no incremental cost to pricing other fees by mileage.

Parking Cash-Out

Parking Cash Out means that commuters who are offered a subsidized parking space can instead choose the equivalent cash value or other benefits. For example, employees might be able to choose between a free parking space, a monthly transit pass, vanpool subsidies, or $50 cash per month. This typically reduces automobile commuting by 10-30%, and is fairer, since it gives non-drivers benefits comparable to those offered motorists.
Parking Pricing

Parking pricing means that motorists pay directly rather than indirectly for using parking facilities (Shoup, 2005). This is facilitated by using better pricing methods that accommodate various payment options and only charge motorists for the amount of time they are parked. Cost-based parking pricing typically reduces vehicle trips 10-30% compared with unpriced parking, depending on circumstances.

Road Pricing

Road Pricing means that motorists pay directly for driving on a particular roadway or in a particular area. Congestion Pricing (also called Value Pricing) refers to road pricing with higher fees during peak periods to reduce traffic congestion. Economists have long advocated road pricing as a more efficient and equitable way to fund transport facilities and services and improve traffic efficiency. Experience that road pricing typically reduces 10-20% of affected vehicle travel, with larger reductions achieved when it is implemented in conjunction with improvements in alternatives such as transit service.

Transportation Demand Management Programs

Transportation Demand Management (TDM) programs include a wide variety of services and incentives to encourage use of alternative modes. Commute Trip Reduction programs target travel to work. School and Campus Trip Management programs, which encourage students and staff to use alternative modes when traveling to school and campus, have proven to be highly effective. 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. TDM programs typically reduce affected automobile travel 10-30% compared with what would otherwise occur.

Transit and Rideshare Improvements

There are many ways to improve public transit and rideshare services, including additional routes, increased service frequency and operating hours, HOV priority, comfort improvements, lower and more convenient fares, improved user information, marketing programs, transit oriented development, improved security, and special services such as commuter express buses and special event shuttles. Typically, 5-10% of current automobile trips will shift to high quality transit, and quality transit can leverage additional travel reductions by stimulating more compact development. People who live in transit-oriented communities tend to drive 10-30% less than residents of more automobile-oriented areas.

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. There are many ways to improve walking and cycling, including improved facilities, traffic calming, encouragement programs, bike parking, and more attractive streets. Walking and cycling improvements provide many benefits including congestion reduction and parking cost savings, improved mobility for non-drivers, improved public health and tourism development. Residents of communities with good walking and cycling conditions typically drive 5-15% fewer vehicle miles than in more automobile-dependent communities.
**Smart Growth**
Current land use development practices tend to increase vehicle travel by dispersing destinations, separating activities and favoring automobile travel over alternative modes. *Smart Growth* refers to development practices that result in more compact, accessible, multi-modal communities where travel distances are shorter, people have more travel options, and it is possible to walk and bicycle to more destinations. Smart growth policies typically reduce per capita vehicle travel 10-30%. Although these land use changes take many years to be achieved, they provide diverse and durable benefits.

**Freight Transport Management**
*Freight Transport Management* includes various strategies of increasing the efficiency of freight and commercial transport. 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 and rail, and better siting of industrial locations to improve distribution efficiency. Although only about 10% of total traffic consists of commercial vehicles, they tend to be heavy vehicles that impose large impacts. Reductions of 5-20% of freight vehicle travel can be achieved.

**Carsharing**
Carsharing provides affordable, short-term (hourly and daily rate) vehicle rentals in residential areas, giving consumers a convenient and affordable alternative to private ownership. Because it has low fixed costs and high variable costs, carsharing encourages users to minimize their vehicle travel and use alternatives when possible. Motorists who shift from owning a vehicle to carsharing typically reduce their vehicle travel by 30-60%.

**Revenue-Neutral Tax Shifting**
Since governments must tax something, many economists recommend shifting taxing to activities that are harmful or risky, for example, from employment and sales taxes to vehicle fuel in order to increase employment and business activity while recovering more roadway costs, recovering petroleum externalities, and encouraging energy efficiency and technological innovation. Transition costs are minimal if implementation is predictable and gradual, and it can be progressive with respect to income if revenues are used in ways that benefit lower-income people. Gradually increasing fuel taxes so prices increase 50% over what would otherwise occur would reduce fuel consumption by about 30% and vehicle mileage by about 10% compared with what would otherwise occur.
Summary of Win-Win Solutions

Table 2 summarizes the Win-Win strategies described in this paper.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Transport Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning Reforms</td>
<td>More comprehensive and neutral planning and investment practices.</td>
<td>Increases support for alternative modes and mobility management, improving options.</td>
</tr>
<tr>
<td>Pay-As-You-Drive Pricing</td>
<td>Converts fixed vehicle charges into mileage-based fees.</td>
<td>Reduces vehicle mileage.</td>
</tr>
<tr>
<td>Parking Pricing</td>
<td>Charges users directly for parking facility use, often with variable rates.</td>
<td>Reduces parking demand and facility costs, and encourages use of alternative modes.</td>
</tr>
<tr>
<td>Road Pricing</td>
<td>Charges users directly for road use, with rates that reflect costs imposed.</td>
<td>Reduces vehicle mileage, particularly under congested conditions.</td>
</tr>
<tr>
<td>Transportation Demand Management Programs</td>
<td>Local and regional programs that support and courage use of alternative modes.</td>
<td>Increased use of alternative modes.</td>
</tr>
<tr>
<td>Transit and Rideshare Improvements</td>
<td>Improves transit and rideshare services.</td>
<td>Increases transit use, vanpooling and carpooling.</td>
</tr>
<tr>
<td>Walking and Cycling Improvements</td>
<td>Improves walking and cycling conditions.</td>
<td>Encourages use of nonmotorized modes, and supports transit and smart growth.</td>
</tr>
<tr>
<td>Smart Growth Policies</td>
<td>More accessible, multi-modal land use development patterns.</td>
<td>Reduces automobile use and trip distances, and increases use of alternative modes.</td>
</tr>
<tr>
<td>Freight Transport Management</td>
<td>Encourage businesses to use more efficient transportation options.</td>
<td>Reduced truck transport.</td>
</tr>
<tr>
<td>Carsharing</td>
<td>Vehicle rental services that substitute for private automobile ownership.</td>
<td>Reduced automobile ownership and use.</td>
</tr>
<tr>
<td>Revenue-Neutral Tax Shifting</td>
<td>Increases fuel taxes and other vehicle taxes.</td>
<td>Reduces vehicle fuel consumption and mileage.</td>
</tr>
</tbody>
</table>

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

Table 3 indicates estimated vehicle travel reduction of these strategies. Each of these strategies has been successfully implemented, although no community has implemented all to the degree that is justified by economic principles. It is difficult to predict the total impacts of a comprehensive Win-Win program because their effects overlap and have synergistic effects. Despite these uncertainties, an integrated Win-Win program, with strategies implemented to the maximum degree economically justified, would probably reduce total vehicle travel 30-50% compared with conventional planning and pricing practices (Litman, 2006). This is the magnitude of reductions required to achieve the Kyoto targets, and would provide other economic, social and environmental benefits. Although some strategies take years to implement, their effects are durable and so ideal for solving long-term problems such as climate change.
Table 3  Travel Impacts (Win-Win Evaluation Spreadsheet, www.vtpi.org/win-win.xls)

<table>
<thead>
<tr>
<th>Name</th>
<th>Potential Portion of Vehicle Travel Affected</th>
<th>Typical Reductions Of Affected Travel</th>
<th>Total Reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning Reforms</td>
<td>100%</td>
<td>10-20%</td>
<td>10-20%</td>
</tr>
<tr>
<td>Pay-As-You-Drive Pricing</td>
<td>80%. Private automobile travel.</td>
<td>10-12%</td>
<td>8-10%</td>
</tr>
<tr>
<td>Parking Cash-Out</td>
<td>20%. Commute travel.</td>
<td>10-30%</td>
<td>2-6%</td>
</tr>
<tr>
<td>Parking Pricing</td>
<td>40%. Mainly urban travel.</td>
<td>10-20%</td>
<td>4-8%</td>
</tr>
<tr>
<td>Road Pricing</td>
<td>30%. On new or congested roads.</td>
<td>10-20%</td>
<td>3-6%</td>
</tr>
<tr>
<td>TDM Programs</td>
<td>40%. Mainly urban travel.</td>
<td>10-20%</td>
<td>4-8%</td>
</tr>
<tr>
<td>Transit &amp; Ridesharing</td>
<td>30%. Mainly urban travel.</td>
<td>10-30%</td>
<td>3-9%</td>
</tr>
<tr>
<td>Walking &amp; Cycling</td>
<td>20%. Shorter-distance trips.</td>
<td>10-30%</td>
<td>2-6%</td>
</tr>
<tr>
<td>Smart Growth Reforms</td>
<td>40%. Mainly urban travel.</td>
<td>10-30%</td>
<td>4-12%</td>
</tr>
<tr>
<td>Freight Transport Man.</td>
<td>10%. Freight and commercial travel.</td>
<td>5-20%</td>
<td>0.5-2%</td>
</tr>
<tr>
<td>Carsharing</td>
<td>5%. Suitable households.</td>
<td>20-40%</td>
<td>1-2%</td>
</tr>
<tr>
<td>Tax Shifting</td>
<td>100%</td>
<td>5-15%</td>
<td>5-15%</td>
</tr>
</tbody>
</table>

This table indicates the portion of roadway travel affected and the magnitude of reductions caused by Win-Win Solutions, assuming they are implemented to the degree economically justified.

This estimate can be validated by comparing annual vehicle mileage in economically similar countries that have different transport policies (Figure 2). Northern European countries with policies similar the Win-Win Solutions recommended here have 30-40% lower per capita vehicle mileage, although these countries have yet to widely implement some strategies such as Pay-As-You-Drive fees and congestion pricing, indicating potential for additional vehicle travel reductions there.

Figure 2  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.

Some Win-Win strategies mainly reduce urban-peak driving and so provide particularly large congestion, parking cost, and emission reduction benefits. As a result, commute trip reduction programs and transit service improvements that reduce total vehicle mileage by 5% might reduce congestion by 10%. Similarly, freight transport management reduces heavy vehicle travel, providing large congestion, road and accident cost reductions.
Consumer Impacts
Some people are skeptical that Win-Win strategies are beneficial overall since they reduce vehicle travel. But Win-Win strategies improve travel options and provide efficient financial incentives, and so only reduce motor vehicle travel when travelers consider themselves better off overall. Higher value automobile trips continue. Any travel foregone consists of lower-value automobile travel that consumers willingly forego in return for savings and benefits.

For example, many Win-Win strategies improve travel options or land use accessibility. Strategies such as Parking Cashing Out and Pay-As-You-Drive pricing 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. Motorists who continue driving are no worse off, and benefit from reduced congestion, accident risk and pollution.

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 choices for people who cannot drive due to physical or economical constraints.

At the margin, that is, compared with current levels of automobile travel, many motorists would prefer to drive less and rely on alternatives more, provided that they are convenient, comfortable, secure and affordable. Win-Win strategies provide such options, making consumers better off overall.

There are other examples of consumers’ willingly changing behavior, including recycling, smoking reductions and seat belt use. In each case, a combination of public education, coordinated policies and improved services caused consumer to modify their behavior patterns, indicating that people welcome such changes if given suitable support.


**Economic Impacts**

Many people assume that since motor vehicle travel tends to increase with economic development, strategies 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 environmental benefits from reduced traffic. But Win-Win Transportation Solutions actually support economic development overall by increasing transport system efficiency.

Win-Win Solutions reflect market principles. They help create a more efficient transport system that increases productivity and economic development by reducing economic costs such as congestion, road and parking facility costs and land consumption, accident damages, and fuel consumption. These economic savings and productivity gains make consumers wealthier, and allow more investment in other sectors.

For example, economic productivity increases if businesses have access to a larger pool of employees (or conversely, if employees have access to more potential worksites). Although driving is sometimes the most cost-effective commute option, in many situations, transit, ridesharing, cycling, walking or telecommuting is more efficient overall. Win-Win strategies improve travel options and provide incentives for commuters to choose more resource effective options when possible, increasing economic efficiency.

Many claimed economic benefits associated with increased vehicle travel are economic transfers rather than true productivity gains. Although increased automobile and petroleum consumption benefits some economic sectors, it burdens others. Each dollar spent on motor vehicles means one less dollar to spend on other goods. Expenditures on automobiles, fuel and roadway facilities provide relatively little regional economic activity because they are capital intensive and largely imported for other areas. For example, a study in San Antonio, Texas found that each 1% of regional travel (53 million vehicle miles) shifted from automobile to transit increases regional income by $2.9 million (about 5¢ per mile shifted), resulting in 226 additional regional jobs (Table 4).

*Table 4  Economic Impacts of $1 Million Expenditure* (Miller, Robison & Lahr, 1999)

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Regional Income</th>
<th>Regional Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile Expenditures</td>
<td>$307,000</td>
<td>8.4</td>
</tr>
<tr>
<td>Non-automotive Consumer Expenditures</td>
<td>$526,000</td>
<td>17.0</td>
</tr>
<tr>
<td>Transit Expenditures</td>
<td>$1,200,000</td>
<td>62.2</td>
</tr>
</tbody>
</table>

*This table shows regional economic impacts of one million dollars spent in central Texas. Automobile expenditures provide relatively little economic benefit compared with a typical bundle of consumer goods, and far less than expenditures on public transit. Win-Win Solutions tend to shift expenditures in ways that increase regional employment and business activity.*
Conclusions

There are many possible ways to conserve energy and reduce pollution emissions, but some provide more benefits than others. A gallon of fuel savings from reduced vehicle travel is worth far more than a gallon saved by increasing fuel efficiency, because decreased vehicle mileage provides other benefits such as reduced congestion, roadway and parking cost savings, road safety and improved public health. This is not to suggest that other energy conservation strategies should be ignored, but these additional benefits of mileage-reduction strategies should be recognized when evaluating options.

Win-Win Transportation Solutions are market-based policy reforms that increase efficiency by removing distortions that limit consumer choice and increase vehicle travel. They help create a more equitable and efficient transport system that supports economic development and helps achieve other strategic planning objectives. Many transport problems are virtually unsolvable without such reforms.

Conventional transportation planning tends to treat mobility management strategies as measures of last resort, to address specific problems such as congestion and air pollution, where other solutions are infeasible. 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.

If fully implemented to the degree that they are economically justified Win-Win Solutions could probably reduce motor vehicle emissions and other costs by 30-50%, although exact impacts are difficult to predict and vary depending on geographic, demographic and economic conditions. This approach could meet Kyoto emission reduction targets while increasing consumer benefits and economic development.
Win-Win Emission Reduction Strategies

References and Information Resources

For more detailed information on these strategies see “Win-Win Transportation Solutions” (Litman, 2006) and the “Online TDM Encyclopedia (VTPI, 2005), available at [www.vtpi.org](http://www.vtpi.org).


USEPA, Gateway to International Best Practices and Innovations [www.epa.gov/innovation/international/transportation.htm](http://www.epa.gov/innovation/international/transportation.htm), EPA National Center for Environmental Innovation
