

A Politician's—and Citizen's—Guide to Urban Transportation

(by Gordon Price)

Pity the politician who promises to fix the urban transportation problem. Traffic congestion may be their constituents' constant frustration, but given the resources and policy levers available to local government, there's only so much that can be done, and it's not nearly enough.

We can't just build our way out of congestion, and so we speak highly of alternative transportation options and better land-use policies. But these take time, and meanwhile drivers demand action. Their conclusion: someone do something!

Voters, however, want their infrastructure carrots before the fiscal sticks. Yet given the nature of our vehicle-based transportation system, with continually expanding demand, concrete solutions are often temporary or ineffectual—and staggeringly expensive. A billion dollars isn't much in the transportation game.

Politicians intuitively appreciate that transportation policy is rooted in feelings. Feelings about our cars, feelings about our homes and neighborhoods (places made possible by the car), and feelings (often guilt or frustration) about the consequences of our choices.

Expectations and emotions are shaped by advertising; issues are framed by media. Without an appreciation of the often unrecognized assumptions inherent in our auto-centric society, we won't understand the real nature of the problem.

THE PROBLEM

The Critical Expectation

Politicians are faced with a paradox: the pursuit of self-interest leads to unfortunate collective consequences that threaten the individual benefits achieved. Simply put: As more people want to drive the open road, the less likely it is for the road to be open.

Vehicle miles traveled around the United States have increased by 70 percent over the last 20 years, compared with a two percent increase in new highway construction. The US

General Accounting Office predicts that road congestion in the United States will triple in 15 years, even if capacity is increased by 20 percent.

In the Greater Vancouver Regional District, peak traffic volume is estimated to rise 60 percent in the next two decades—and that's after we've made substantial improvements and added capacity to both our road and transit systems.

Yet advertising, that most powerful of influences, markets mobility and freedom. We see the most beautiful images of the car on the open road. Those ads sell many things—and youth—but every ad reinforces one big idea: the car is never constrained by an excess number of other cars. You never see the car caught in congestion.

The freely moving car on the open road is one of our society's most hallowed images, synonymous with success, reinforced over many generations, marketed to the world—and yet increasingly frustrated at every turn. Cars and trucks are getting bigger and more powerful, engineered to be capable of speeds well beyond any legal limit, even as the roads become more clogged and average speeds decrease. This disconnect between promise and reality has produced responses of both rage and passivity, with an underlying sense of betrayal. This is not the way it was supposed to be.

People have always assumed that, as we buy more cars, we will build more roads. Each purchaser takes for granted that there will always be room for one more. Always room for one more—an assumption that there will be essentially unlimited capacity.

That is what traffic engineers have been trained for: to provide enough capacity to meet demand, which, if there is always room for one more, must be theoretically infinite. Their job is to translate infinity into reality.

In fact, engineers are never asked to determine what the upper limit on capacity should be—and how we could maintain that limit—so that the vehicles that do use a

properly managed system could function efficiently. To do so would imply a limit on the number of cars that can be served, and hence destroy the illusion on which the car industry and our planning is based.

The Practical Limit

Constituents expect problems of congestion to be solved, but not at their individual expense. People want carrots, not sticks—but don't want to pay for expensive carrots and don't want the sticks to hurt. Each wants the other to use transit.

The politician is caught between the expectation that enough room needs to be provided for an ever-increasing number of vehicles and the reality that there is not enough space, tax dollars or community support to do so.

Consider, for instance, the growth in vehicles in the Greater Vancouver Regional District. Currently, there are 1.1 million motor-vehicles. Each year that number increases by about 23,000—63 more vehicles per day, about three per hour, another car or truck every 20 minutes.

The average car length is about 15 feet. We'd need another 65 miles of asphalt just to park a year's worth of cars, and about 260 miles of single-lane roadway if they were all to drive safely at 30 mph.

To be conservative, let's cut the demand to a tenth of that. If we wanted to build only 26 miles (42 km) of new roadway by widening existing roads by one lane each (say, five arterials in Vancouver), we would have to spend (very conservatively) about \$20 million in construction costs.

But the real expense is land, particularly along the routes on which the traffic concentrates—those that lead to the town center. Since almost all roads leading into Downtown Vancouver have residential zoning along them (and the average house price in Vancouver is \$343,000), a billion dollars might get us most of the way if we were to purchase the houses on one side of five arterials running through the city (say, First, Renfrew,

Knight/Clark, Oak and Granville—equal to about one year's demand for road space) to widen them by one lane.

The political prospects of that scenario is something less than zero. Even trying to acquire a few feet of property for a left-hand-turn bay at a major intersection can take years. If expropriation is required, the City would certainly end up paying massive legal fees—and the prospect of forcibly evicting thousands of people to widen roads is out of the question.

Even after the roads are widened, the real need for space remains largely unmet. The car must be parked, usually many times a day, and there must be a piece of asphalt waiting at every destination. If underground, the cost of a single parking space easily exceeds \$15,000. If surface, then the land must be cheap and the densities low in order to provide sufficient space.

Parking standards have driven urban design for most of the century. The need for wide roads and abundant parking is the reason why the endless strips of commercial frontage now appear everywhere and why the dominant form of commerce is the decorated box in the midst of the asphalt parking lot, with the big sign out front to attract the speeding passerby.

Who Pays?

Given the limits to road expansion, it's no surprise, then, that every car added to the road means less remaining space for those already there. That makes the space more valuable as it becomes scarcer. So what do we do?

We give it away for free. There's no cost to use the road, no matter how much space is used or how often—unlike the per-trip cost of transit and taxis. Consequently, there's an incentive to take advantage of unfilled road space. And so it is.

Take, for example, the Ford Excursion, the biggest sport-utility vehicle ever, over 19 feet long. Ford makes more than \$20,000 pre-tax profit with each sale, significantly more than the profit on smaller cars. But Ford does

not pay a cent to any municipality to build the additional space its product requires, save for the property tax on its dealerships. If Ford had to pay Vancouver for the marginal cost of the space the Excursion will take up, the vehicle would cost \$60,000 but the marginal cost of the new space could be \$106,000.

It is the local taxpayer who will pay, not the automobile company—the same local taxpayer who, though willing to spend tens of thousands of dollars for a new car, would be distressed at the prospect of paying hundreds of dollars in new taxes for more road space if charged directly at the time of sale.

So the cars and trucks keep coming, they keep getting bigger, and the expectation remains that government will build and maintain the needed road space, and it will get the money largely from local taxpayers. And it can't be done.

A Charge by Other Means

From the individual's point of view, driving more and driving longer continues to make sense. Why? Because the roadway is seen to be "free"—and so, typically, is the next trip. The marginal cost of the car is practically zero, at least when measured by the amount of money taken out of pocket. Except for the occasional cost of parking (over 90 percent of parking is free for most people), everything else has been covered—purchase price, insurance, gas—regardless of how much may be owed. The next trip appears to cost nothing. . . and we tend to use a lot of something that seems to be free.

Because the price of highway space is so low, we pay by other means. Just as cheap land leads to sprawl and cheap energy to pollution, cheap road space has led to congestion. Congestion is the means by which we price the value of the space. It works, but we hate it.

Many economists and environmentalists have suggested "road pricing" as a more rational way to allocate a scarce resource. But pricing the road is a touchy political problem. The road is our commons. No matter who

you are, you have the same right to the road. Rich or poor, powerful or weak, you are equal, even if you're caught in the same congestion. Especially when you're caught in the same congestion. To price the road on a per-trip or distance basis would change the status of road users. People would no longer feel equal.

Both the rich and poor feel they have a stake in the free roadway and the cheap car. To maintain the auto as a low-cost form of transportation means the poor meet the rich on common ground, while the de-facto subsidy for the rich remains disproportionately large. The left defends the free road so the poor can drive farther for cheaper housing and needed work. The right opposes the tax grab that road pricing would entail. The politician has little ground on which to stand.

We are confronted with a dilemma of our own making: limited resources, infinite demand. The only realistic tool we have—congestion—is seen as the problem, not as a necessary consequence. Those who benefit don't proportionately pay, and don't want to. We look for rational solutions for a problem largely emotional in character. We talk limits but we avoid action.

So how did we get into this in the first place?

PAST & PRESENT

Conquest

In 1908, Henry Ford introduced the Model T. His genius was evident, not only in the development of the assembly line, but also in the creation of the mass market. By paying his workers \$5 a day, they could afford the \$850 car. Personal, affordable transportation for the average man (and freedom from the transportation monopolies) became a reality.

"I will build a motor car for the great multitude," said Ford, "so low in price that no man making a good salary will be unable to own one and enjoy with his family the blessings of hours of pleasure in God's great open spaces."

Of course, never again would the spaces be quite so open. The building of roads and the conquest of a continent were synonymous. In 1919, an army convoy struggled to cross America. Among the officers was a young lieutenant named Dwight D. Eisenhower. The army discovered, not surprisingly, that the trip was almost impossible.

The Great Compact

When asked about the lack of good roads, Henry Ford was said to have replied: If we build the cars, they'll build the roads.

Road-building soon became the greatest public-private partnership in history. For most of this century, our auto-based transportation system has been built on this understanding: the Private Sector will produce the vehicles and the Public Sector will build the pathways.

There is no real constraint on the number of vehicles the private sector can produce. Government, however, undertakes to build the roads and bridges necessary. For most of the 20th century, government has devoted huge resources to constructing road capacity, to the point where people believe it is an entitlement.

Consider the irony: at the turn of the century, good roads were first promoted by cyclists. In the US, roads were frequently built to give vehicles access to the first national parks (Yellowstone, Yosemite and Rainier) and to scenic wilderness (the Columbia Gorge Highway). Consider the image: roads were wide open highways to wide open spaces.

The first problems were elsewhere.

Congestion in the City Functional

Rather quickly, it became apparent that there wasn't enough space for everyone downtown. The streetcar and the motor-vehicle just couldn't get along. The streetcar lost. Throughout the inter-war period, transit systems lost revenues, capital and the political support needed to grow. "Strangulation" was the word used to describe traffic conditions in the city.

Consequently, cities were redesigned to serve the automobile. In Los Angeles, for instance, the Major Traffic Street Plan of

1924 led to the widening of arterial roads in a crosstown grid. Little attention or money was paid to the transit system. Vancouver in 1928 undertook a similar treatment – another "City Functional" plan authored by Harland Bartholomew (who helped author the 1924 L.A. plan) that became the basis for street improvements through to the 1980s.

The success achieved by the expenditure of many millions on public works was short-lived: increasing the traffic capacity of major roads eventually made the existing problem worse. Wider streets eased congestion and encouraged more residents to leave public transportation for their automobiles, leading to more congestion. By 1930, the Traffic Commission of Los Angeles once again despaired that "traffic conditions ... are becoming chaotic."

Romance of the Open Road

The congestion in the city made the desire to escape all the stronger. Among the first major urban roads in North American cities were parkways. Frederick Law Olmsted designed 1,400-foot-wide swaths of green through Brooklyn in the early 1860s, modeled after the verdant avenues of Paris.

In 1936, Robert Moses's improvements to Riverside Park on the west side of Manhattan allowed the creation of a curving parkway through upper Manhattan. The Henry Hudson Parkway needed only to be connected to the Bronx River Parkway, the first grade-separated road in America, to provide a useful commuter route out of Manhattan.

The consequences on land development were initially unforeseen. In the late 1920s, the parkways connected the city (still served mainly by mass transit) to lower densities and to the amenities of the countryside—at least for the prosperous middle-class. After World War II, the mass-production of suburban houses pioneered at Levittown on Long Island and at Lakewood in Los Angeles realized the possibilities of a new way of life for more and more people—one increasingly dependent on the car.

Cold-war Commitment: the Federal-Aid Highway Act of 1956

Automobile industrialists such as Carl Fisher had been pushing for national routes like the Packard-sponsored Lincoln Highway since before World War I. The Bureau of Public Roads under “Chief” Tom MacDonald assembled the coalition needed to drive a public-roads agenda. Federal-aid highway acts, beginning as early as 1916, gave the federal government a role in promoting the creation of state highway departments and in providing matching funding for a coordinated system of national roads.

The New York Regional Plan of 1929 had proposed a comprehensive motorway system connecting 22 counties across three states. An auto-centric vision of the future was unveiled in the General Motors pavilion at the 1939 World’s Fair, portraying an urban region of separated uses with unparalleled mobility, made possible by sweeping, infinite arterials of freely flowing traffic.

With the Depression and War, pressure on road space eased even as thousands of new miles were constructed. In the 1930s, planning was already underway for freeways, styled after the German autobahn system and pioneered in California along the Arroyo Seco, connecting Pasadena and Downtown L.A. But the money needed for such vast visions was insufficient.

As Allied military leader in World War II, Dwight Eisenhower had seen the German autobahn network firsthand (contrasting it, no doubt, with what he seen on his cross-continent expedition of 1919). In 1956, as President, he signed the Federal-Aid Highway Act, unleashing billions of dollars through the Highway Trust Fund to build the interstate freeway network: the largest public works project in human history.

The Interstates are the single biggest engineering projects of any town or city they go through. They changed the economy and culture of America. The system—over 40,000 miles crisscrossing a continent—was largely built in two decades. Towns and cities hardly knew what hit them.

Unlike the German autobahn system, the Interstates go to and through the centers of urban regions, built to the same standards as those that pass through open country. This required vast amounts of land and the expropriation and destruction of any preexisting urban fabric in the way.

Freeways were thrust into downtown cores in an attempt to give easy access to and from the burgeoning suburbs. In the end, those same central areas were weakened or destroyed by the roads on which the middle-class fled. Retail services, businesses and jobs withdrew to the new main streets of suburbia—the belt freeways.

At the time, mostly good things seemed to happen. Suburbia was the fulfillment of an American (and Canadian) Dream built on insured mortgages, technically magnificent infrastructure for water and roads, cheap land and even cheaper energy. The lifestyle made possible was broadly shared, optimistic, ebullient.

And Government was now ahead of its obligation to build sufficient road capacity to meet a rapidly expanding need.

The Free Way

If good roads were good for business, it seemed reasonable that more roads would mean more prosperity, thereby justifying a no-charge philosophy for the pathway. Before the 1950s, bridges and freeways weren’t necessarily free: users paid tolls. But thanks to an aggressive lobby by truckers and road builders, Government created a continent-spanning system of highways that would, with the exception of older roads and bridges in the east, seem to the casual driver to be unlimited and free.

Just as in the United States, Canadians also undertook to build massive new and “free” infrastructure. Indeed, Canada was ahead of the Americans in authorizing federal funding for the Trans-Canada Highway in 1949.

Vancouver, Canada’s most modern city, hired consultants direct from Los Angeles who,

like Bartholomew, suggested that Vancouver should build something rather like the Los Angeles system. What they proposed for Vancouver would have laid concrete on elevated decks, in tunnels and trenches over and through much of the lands now sprouting residential towers.

The Partnership Broken

In an historic turning point, Vancouver refused to build any freeways at all. It was the most important thing that never happened. The City had broken the agreement: no more roads, no matter how many more cars.

By the early 1970s, in almost every major city, citizens and councils rejected freeways that meant the destruction of the city's fabric. The lack of sufficient financial resources (and mounting public protest) effectively ended the freeway era. Instead, vehicle growth would have to be absorbed on existing streets, the heritage of the street improvements of the 1920s.

However, by not building more road space, Government was violating an essential condition of the partnership. Since car buyers couldn't individually purchase the space on which to run the cars they bought, there wouldn't be as much room for each new car on the road. Driving conditions would noticeably worsen. So too would the cost of insurance, accidents and the quality of life. The dream of the car—flowing freely along beautifully engineered roads—ran into the reality of congestion, faster even than in the 1920s.

As it turned out, it wouldn't have mattered even if Vancouver had built the freeways. As people consumed the road space at ever faster rates (a consequence of an urban form dependent on cars and a distribution system dependent on trucks), the freeways filled up. Cities with good rapid-transit systems faced road congestion; cities with great freeway networks faced congestion; cities with neither faced congestion.

Congestion, it turns out, is an inevitable consequence when the private sector produces an unlimited number of vehicles and expects

the public sector to spend limited resources to build an unlimited amount of space for them to run on. Alternative transportation options may help accommodate growth beyond congestion, but they cannot prevent congestion.

So what, then, do we do?

SOLUTIONS

Don't Spend Money

This is tough to say. But there's little gain in spending money just to solve congestion problems by building more road space. Going into debt and raising taxes won't help much in the long run.

Building more roads has had virtually no impact on the growth of traffic congestion in major urban areas in the United States in the last 15 years. Data from the Texas Transportation Institute revealed that urban areas which added more lanes spent roughly \$30.8 billion more than those that didn't. Yet the average of TTI's Roadway Congestion Index for the two groups is almost identical, at .93 and .92. As the saying goes, widening roads to ease traffic congestion is like trying to cure obesity by loosening your belt.

For thirty years now, the City of Vancouver has built little new capacity for the car.

Yet the result of limited capacity and expensive parking has been by general agreement one of the most livable cities on the continent. This is not a coincidence.

Charging for Parking

In the Central Area of Vancouver, we have traffic-calmed neighbourhoods and eliminated vast amounts of free parking. (In the West End, 85 percent of street and lane parking is assigned to residents, for which they pay a yearly fee.) Meter parking runs to 8 pm, even on Sundays. Parking must be paid for in parks.

Charging for parking is perhaps the only "TDM" (Transportation Demand Management) measure that has really worked. One result: the number of vehicles flowing

in and out of the core has leveled off and is actually beginning to drop, even as the residential population doubles and tourism significantly increases.

People have a huge incentive to stay in cars when they get free parking. But to get the benefit of “free parking” they have to spend over \$7,000 a year on paying for and operating their vehicles (according to the Canadian Automobile Association). By getting that parking benefit as cash on their paycheck, they’d be free to chose other means, potentially saving \$7,000 and still collecting the \$150 per month for transportation costs that “free” parking actually costs.

The challenge is to market that concept to employers, who need to see the savings on their bottom line. Since a single space of structured parking can easily cost \$15,000, a reduction in need has enormous impacts on the cost of building and subsequent lease rates.

However, unless parking is universally priced, those who offer it for “free” have a competitive advantage over those who charge. They also escape, so far, the scrutiny of Revenue Canada. Though a transit pass provided by an employer is considered a taxable benefit, free parking is not, so long as it unassigned.

Congestion is Our Friend

Since congestion is inevitable, given the current circumstances, we might as well figure out how it can help us.

If the car and truck are to move freely on a road system with limited capacity, somewhere there has to be a constraint on the number of vehicles that can be accommodated. It makes more sense to decide where congestion is best located, rather than allowing unlimited demand to erode the integrity of the entire network.

Example: Lions Gate Bridge. The bridge reached its design capacity sometime in the late 1950s, and the cars have been backing up ever since. This grand-daddy of all choke points in the Lower Mainland is now a North Shore tradition. (The politeness of the zipper,

where several lanes of cars merge together, is actually a source of community pride.)

The bridge and causeway through Stanley Park have provided excellent storage, allowing vehicles to be filtered onto the downtown peninsula in manageable quantities by the signal system. Otherwise, cars would congest where the damage would be maximized—on the complex grid of downtown streets. The decision to maintain the bridge to its existing three-lane capacity was a key transportation decision in the 1990s. In return, the experience for the driver has been improved with the widening of the lanes.

Some would give no ground to the car; others would take no ground away. The challenge is to find a limit on capacity that ultimately benefits the users of the transportation system and the communities affected, without gratuitously punishing those who accept the limits.

Maximum Desirable Capacity

Once it’s accepted that capacity will be limited, the question immediately arises: how much is enough? What level of traffic do we want to achieve?

Engineers can determine the level of service for any particular road: Level of service “A,” for example, is where the volume of traffic is so low that the design of the highway actually dictates the maximum safe speed for the vehicles. Level of service “F” is capacity failure: a very long parking lot with only occasional movement. The assumption, of course, is that in an ideal world the “F”s should be “A”s, even if in reality things are heading the other way.

It would be more helpful to know what the “desirable” capacity should be, given the need for freely moving traffic with the least negative effects, controlled by “metering” points that allow the rest of the system to function. Metering is already used at many freeway on-ramps to prevent saturation of the roadway. Bridges, likewise, provide points where flows can be regulated. Traffic should be stopped or slowed at certain places so the

system as a whole can function, with feedback mechanisms that both explain and reassure the driver that short-term delay will provide eventual benefit.

Once we decide what we want and why we want it (which is a political decision, not a technical one), we can then ask engineers and planners, in cooperation with the communities affected, to design a system which has a reasonable chance of providing it. We have to accept that this a subjective process, art as much as science. These are issues of quality, not quantity. We may wish, in some instances, slower moving traffic because it's quieter and safer. Hence the "desirable" in "maximum desirable capacity" (MDC).

We also need to know what the most desirable combination of vehicles is: how many buses, trucks, cars and bikes generate the best results, given the stated desires of the community. Those will vary, of course, and so should the nature of the traffic.

Intelligent Transportation Systems

Even if MDC can be agreed on, can it be achieved? Perhaps not—but at least we should know when we've passed it. Tomorrow, perhaps, the goal can be met, given the new tools that technology will provide us. Intelligent Transportation Systems can be used to manage the system within the limits we've agreed to, and to provide better information on the alternatives.

Intelligent Transportation Systems (ITS) take the latest communications technologies and apply them to the transportation network (highways, bridges, transit systems and intermodal points), including the cars, buses, trucks and trains on them, to achieve better management through integration and information.

Examples: traffic-signal synchronization, real-time transit scheduling, electronic toll collection and fare payment, faster emergency responses, and extensive traveler information delivery. Freeway management systems, primarily through ramp metering, have reduced crashes by a quarter to a half.

Electronic fare payment for transit systems have resulted in increased revenues up to a third. ITS has huge implications for commercial vehicles, providing opportunities for electronic clearance at borders and ports, as well as automated roadside safety inspections.

Too often, unfortunately, ITS is sold as a way to raise capacities, shoving more vehicles more efficiently onto the road. It's the same old illusion.

What's Good for Goods Movement

Truckers can measure the cost of congestion quite specifically, and they aggressively lobby for more road space to reduce congestion. But they don't want to pay directly for the additional benefit. Historically, they've been the strongest advocates for the free road. Car drivers have gone along, even though they've disproportionately paid, because they get the free road too—leading to the congestion that frustrates the trucker.

The more difficult but more effective solution is to charge appropriately for special-purpose facilities where justified—say, to port facilities and inter-modal exchanges. The price of the road space could (and in fact should) be appropriately included in the cost of the goods delivered. Since we pay one way or the other, the fairer way is user pay.

Pricing for Benefits

Here's one recipe: Free up existing space by charging for priority use. If trucks and car pools are caught in congestion, allocate a HOT lane—a High Occupancy Toll lane—for their use. Then use the money for alternatives, such as transit.

Again, technology will help. Intelligent Transportation Systems provide us with the opportunity to both increase the utility of the road and to charge for the value received without having to stop traffic or impose highly visible and resented tolls.

Environmental concerns, particularly climate change, will help justify action. When the majority of greenhouse gases come out of the tailpipe, and every push of the accelerator

may be moving us more quickly towards the vagaries of climate change and the disruption of our environment, is not some individual sacrifice worth the price?

And shouldn't vehicle users be paying directly for the pollution they generate? Industry does. Why not cars?

Pricing the road and freeing up existing space for those who really need the room is a far better way to grow for everyone. It has a better chance of succeeding than the pretense that we will build our way out of congestion without having to pay for it, or trying to apply general-purposes taxes.

But, remember, public opinion may well be hostile because the price is very visible and the "commons" is less equitably shared. There must be a demonstrable benefit for those who are charged, and it must be visible.

Transit

In order to avoid the difficult choices, community leaders and politicians often champion increased public transit. And since such systems are massively expensive, they are sold with the promise that they will reduce congestion on the roadways.

Such promises load transit with unrealistic expectations. There are few cities in the world with excellent mass transit systems that don't also have traffic congestion. The presence of the former does not guarantee the absence of the latter, so long as more vehicles continue to be sold than for road space available. Transit may help handle additional growth when road capacity is limited, but given "free" use of the roadway, drivers won't likely see any fewer cars in front of them.

Transit investments are still justified, particularly to handle transportation demand in a more efficient and environmentally benign way—but, to repeat, it won't solve the congestion problem if growth in vehicles saturates the capacity available. Transit is best at helping to shape the city, directing growth to places that can be designed to be less car dependent, and to accommodate

growth in transportation demand once congestion has limited the road space.

Most people, in truth, have wanted the kind of city best served by car: low-density, single-family, single-use. Ironically, in order for that city to function without debilitating congestion, it needs a good transit system, one appropriately scaled to the kind of city where the automobile retains a significant role. The car cannot function efficiently without transportation alternatives, and transit must be integrated into a transportation system where the car is still considered essential.

User Choices

The good news: there is a huge latent supply. There are a lot of unneeded trips in cars. If we get even some of those trips off the road, we will have solved a good portion (not all) of the problem—at a very low price.

People have considerable discretion—more than they believe. For people to give up the occasional car trip and find a substitute can be surprisingly easy to do when people so desire, and the payoff is big.

Often the impediment to using other options is that people no longer are conversant or comfortable with them. They don't know how to use a bus—what it costs, how to transfer, what time to allocate—and they are not comfortable with the social implications. Increasingly, they have never had a "learning" experience.

Instead, the most significant rite of passage in a young person's life is the day they get a driver's license. By the time they've reached 16, they should already be familiar and comfortable with a broad range of transportation choices, so that automobile is not seen as the only option for every trip. Such programs as "Way To Go," which encourages children to walk and cycle to school, are critical to future success.

City Building

It has taken almost a century of building for the car to get us to our current dilemma. It will take some considerable time to achieve long-term solutions. Ultimately, they can only

be found in the way we build our cities. We will have to establish virtuous cycles to offset the vicious ones, where success leads to more success. Fortunately, we can see places where it's beginning to happen.

Take, for instance, Vancouver—or at least its Central Area, where growth is concentrated. The megaprojects that now dominate the skyline occupy those lands once slated for freeways. Instead of paying for the capital costs of a freeway system, on which we would now be spending millions to maintain, Vancouver is using its capital dollars to build alternative ways of moving about the city—on transit, bike and foot. As these alternatives are developed, we are noticing a stabilization of vehicles coming in and out of the core.

In fact, throughout the City of Vancouver people are creating new mental maps. The bikeway and greenway system—our legacy to future generations—is a hub-and-spoke system, too, only it gives people who have only perceived urban space through their windshields, timed out in kilometers per hour, a whole new experience. As they navigate the bikeway and greenway system, they learn anew how their neighborhoods feel and how they in turn connect with other communities in new and pleasurable ways. And the system itself is cost-effective, mixed in use, flexible, beautiful and safe.

Given enough choice, people adapt and the city reflects the changes. Here's a small but indicative one. At Sunset Beach at the entrance to False Creek, parking is no longer free. Since the number of stalls needed is less, the freed-up space was barricaded off for roller hockey and blade training. It's a win-win-win: Parks Board gets revenues, skaters get play space, drivers get sufficient parking.

Solutions

There is no single solution. Top-down planning can never be comprehensive enough or flexible enough. Give people enough transportation options and they can, by and large, work out their own solutions. That, in turn, is dependent on the design and integration of land-use and transportation

choices.

Ideally, people should have at least five choices—feet, bike, transit, taxi and vehicle—and the ability to mix and match them appropriate to the kind of trip and the circumstances faced. The combinations and the mix make it all work.

The trip is only a few blocks? Walking is best. It's raining? Grab a taxi. The trip is around five kilometers? Cycling may be the faster alternative. Going to a town centre in the suburbs? Try transit. Yes, the car is perfectly appropriate for many trips, but not all. Once the car is used less frequently, needs may be met more affordably by a car co-op or the occasional rental, with considerable savings.

Of course, the provision of alternatives assumes a city designed around more than the car—and a citizenry comfortable with the choices. In the end, the answers are found in the plans we have to implement. Concentrate growth. Build complete communities. Provide transportation choices.

But to do so, we will first have to be aware of the impediments to success, rooted in the unrealistic beliefs and assumptions we have associated with the success of the car.

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