

print version

 Wired News

## Search:

Wired News

Search

 [an error occurred while processing this directive][an error occurred while processing this directive]  

[Issue 9.11](#) - Nov 2001

# The Ultimate Jam Session

**It takes more than technology to solve the world's traffic problems. While Singapore succeeds with an iron fist, the United States waits for the invisible hand.**

*By Dan Baum*

It's 8:10 am in this densely packed city of 4 million, and rush hour is in full frenzy. I dread leaving the hotel; traffic was a cacophonous nightmare when I lived in Singapore 18 years ago, and since then the population has almost doubled. So I do what I couldn't do in 1983 - I fire up my computer and go to a real-time online traffic map. Though most of the local freeways are depicted in green - moving at 38 mph or faster - the one I want is pink, which means traffic has slowed to between 13 and 25 mph. Why? Another click brings me the news that four minutes ago a car broke down in the right lane and police are arriving. A good alternative route is still green, so I resolve to head that way instead.

First, though, I have to get to the freeway. Automobiles pour from car parks as residents of the high-rises ringing the city center empty into the streets. We are bumper-to-bumper heading toward the on-ramp, and I tense up, ready to start flamenco dancing on the accelerator and brake at any second. Eerily, though, this solid stream of cars glides evenly through half a dozen green lights, and before I know it I'm at the freeway entrance.

As I wait for the metered signal to fire me into traffic, an LED sign overhead tells me it will take 17 minutes to reach my exit. "In your dreams," I snort. Yet after zipping under an electronic toll gantry that sucks 4 Singapore dollars (about US\$2.25) out of

my dash-mounted smartcard reader, I arrive in 18 minutes 22 seconds - a delay of only 7 percent.

Have I died and gone to commuter heaven? It feels like another world, but I'm only on the opposite side of this one. Singapore, that hyper-organized city-nation at the bottom of the Malay Peninsula, is a living laboratory for intelligent transport systems, a catch-all phrase for high tech strategies to gather data, manage flow, and inform drivers of congestion ahead. Traffic does indeed move noticeably smoother here than in American metropolitan areas of comparable size - Atlanta, for instance. This morning's miracle was courtesy of smart intersections that varied their red/green cycles according to traffic, intelligent ramp meters that knew the density of the congestion they spat me into, electronic toll collection, and the real-time Web site. And all that was in turn dependent on having all 92 miles of Singapore's freeways and many surface roads wired for both electronic data collection and video surveillance, so that the island's entire road system is essentially one sentient organism. Most of it operates automatically. The rest is controlled from a video-walled Dr. Strangelove-style war room, where technicians boil as much of the random as possible out of Singapore traffic.

The average American commuter, in contrast, wastes almost an entire workweek a year - 36 hours - sitting in traffic, a figure that has tripled in the past two decades. Tot up the hours lost and the gasoline wasted, and the Texas Transportation Institute figures road congestion squandered \$78 billion nationwide in 1999, substantially more than the 50 states together spent on all forms of transportation - highway, air, water, and rail - the previous year. One recent drivers' poll suggests congestion and the aggressive driving it inspires are a bigger hazard than drunk drivers.

So as I board the flight home, I tell myself that I have seen the future: better commuting through electronics. But the Singapore miracle has less to do with technology than with bureaucracy. Plenty of US cities already deploy hardware as advanced as Singapore's. The island nation's genius is that it has persuaded government agencies to cooperate in ways unparalleled elsewhere, and that it has done a remarkable job of rearranging drivers' expectations. When you're behind the wheel in Singapore, you're not a free agent on the open road but a closely observed cog in a big, smart machine. In that world of high tech traffic control, benign dictatorship is the killer app, and democracy is a bug.

In the US, meanwhile, considerable time and effort - to say nothing of public treasure and venture capital - are being applied toward relieving traffic congestion with new technology. A privately built, electronically accessed, for-profit toll road in Southern California gives commuters willing to pay \$4.25 (or less, depending on the time of day) a chance to bypass 10 miles of clogged public highways between Anaheim and Corona. Six years ago the Cincinnati area began deploying a system of sensors, cameras, changeable highway signs, and a Web site that tells you how long it will take to drive a specified length of highway (but doesn't tell you how fresh the information is). Seattle makes video feeds available online so that ferry commuters can eyeball the queues before setting off. San Antonio got 61,000 volunteers to put transponders on their cars so its traffic engineers could watch them move through the city and thus measure flows. And, spurred by a federal law that will require wireless providers to be able to physically locate every cell phone, one California-based

company aims to turn every phone into a transponder - essentially wiring every road in America. Under way in this country is no less than a redefinition of what it means to drive a car. What used to be three components - driver, car, and road - are on their way to becoming one integrated system.

Traffic got its first technological fix in 1923, when a signal was installed at a Cleveland intersection, but a pair of seemingly unrelated events in 1991 gave birth to the age of intelligent transportation systems, or ITS. Congress passed a law letting states use federal highway funds for something other than construction - i.e., managing their roads better so they won't have to build more. And the US fought the brief Gulf War, which left defense contractors itchy to market the telegenic high tech gear they'd shown off on CNN night after night. Satellites, proximity radar, geopositioning systems, digital maps - all the stuff designed to detect movements of tanks and soldiers and deliver that data in real time to a general's computer screen - were well suited to monitoring urban traffic. Pots of smart-highway funds married orphaned war technologies, and the ITS industry was born. The federal government alone has spent more than \$1.3 billion on ITS since then, with an additional \$900 million in federal funds obligated through 2002. Combine state, federal, and private investment, and the ITS industry estimates that some \$209 billion will be spent on high tech traffic control in the next decade.

In the US, unlike in Singapore, the public sector is only part of the ITS game. The front-of-the-catalog niche occupied two years ago by Zip drives and now by CD-RW/DVD burners could be filled a year from now with gadgets ranging from dashboard devices to PDAs to wristwatches, all configured to deliver you traffic data in every conceivable format. This year, Motorola and the British company Trafficmaster are launching, in England and Germany, a dashboard-mounted gadget that will both report conditions for the road you're on (sensing your location via GPS) and suggest alternate routes. Metro Networks, the biggest purveyor of helicopter-relayed radio and TV traffic reports, is now selling its data to providers of cell phone and other in-car traffic services through its SmartRoutes subsidiary. CUE, which operates the radio data network behind half a dozen of the biggest pager services, sells a box that attaches to the onboard navigation system developed by Clarion, overlaying Metro Network's traffic data onto the nav system's digital map.

"In a perfect commuter's world," says Peter Dwyer, manager of a fledgling multi-agency Bay Area traffic-information project, "you'd be on [Highway] 24 when your car would suddenly say, 'Excuse me, the Caldecott Tunnel is pretty backed up, but there are still 34 parking spaces available at the BART station. Would you like me to reserve you one?' and you'd be able to speak back to it and reserve the spot."

So why can't you? Where is all this cool stuff that will lift the United States to a Singapore-style commuter Elysium? Mostly stuck on the launching pad. All the grandiose schemes for beaming traffic information into our molars depend, of course, on having that information. At the moment we don't. Despite the flurry of spending, only 5 percent of US freeways are equipped to collect real-time data, either through buried inductive loops that sense cars passing overhead or through optical sensors standing alongside the highway, according to the US Department of Transportation.

Even in the 75 biggest metropolitan areas, only 16 percent of freeway miles are intelligent. Moreover, almost none of the nation's arterials, or major surface roads, are wired, and they carry the vast majority of urban traffic. Lousy American data collection is why, for example, Motorola and Trafficmaster cannot even predict when their dashboard-mounted T-nav system, launching this year in Europe, will be available in the US.

**Wired streets, real-time sensors, and video surveillance citywide turn each Singapore driver into a closely observed cog in a big, smart machine.**

Without the hard numbers produced by sensor-equipped highways, Americans rely mostly on subjective and haphazard impressions shouted from privately operated helicopters. Pilots can cover only a fraction of a city's highways, and even when they see an incident, they can't feed speed and density data into a traffic manager's monitor, or a historical database, or a Web site - to say nothing of your Palm. The helicopter - noisy, dirty, expensive, and imprecise - is a blunt instrument indeed.

A few US companies are developing digital solutions: One hopeful, Mobility Technologies, seems to offer a Web site as good as Singapore's, with dynamic traffic maps of myriad US cities. Radio stations and government agencies from Portland to Tampa offer similar sites, displaying highways supposedly colored according to how smoothly they're running and snappily refreshed every couple of minutes. But if you weren't aware that such sites existed, it's because nobody is marketing them aggressively. And that's because few companies are satisfied with the quality of their data. "If you direct somebody into worse traffic," says Lee Callaway, Motorola's senior marketing manager, "you're not doing them any favors." Mobility Technologies, whose Web site is still found under the company's old name - Traffic.com - is trying to pull ahead of the pack by relying on its own solar-powered, radar-based sensors along the freeways of Pittsburgh and Philadelphia; it was recently selected by the US Department of Transportation to wire the freeways in two additional, as yet unspecified, cities.

Four American cities - Phoenix, San Antonio, New York, and Seattle - have wired more road than most and deliver better-than-average reports, because they collectively got \$38 million from the Feds as a pilot program in 1997. The rest of the players in the infant American traffic-info biz - both public and private - like to boast they "aggregate data," meaning they're gathering up a mulligan stew of helicopter reports, snippets gleaned from police scanners, a smidgen of data gathered electronically, and call-ins from cooperating folks with cell phones who are notorious for not knowing where they are or in which direction they're headed. They're hoping, like Rumpelstiltskin, to spin straw into gold.

The lack of data drives Peter Dwyer crazy. A consultant to the San Francisco Metropolitan Transit Commission - a consortium of nine Bay Area counties - Dwyer notes the irony that the Bay Area is the high tech capital of the universe and claims the second-worst congestion in the nation. Less than a third of its freeways are wired, and many of the sensors are often broken.

On the outside, Dwyer's head affects a retro Civil War look, with muttonchop

sideburns and a little goatee, but the inside is deep in the future as he builds a Web-and-cell phone traffic delivery system for the Bay Area. The technology isn't a problem; what's delaying full implementation until this spring is the poor quality of the information the commission has to offer. "We didn't want to launch an enhanced service with the same old inadequate data," he says. "We're waiting until there's better stuff coming in."

The barriers to wiring San Francisco's - and the nation's - roads aren't technological or even strictly financial; they're institutional. State highway departments are used to seeing roads as inert slabs of asphalt that you flatten and largely forget about. Now they have to envision them as living things requiring observation and management. Politicians are used to putting money into road construction, cutting the ribbon for the cameras on opening day, and walking away. Now they're being asked to invest in arcane sensors and buy NASA-like control rooms for their highway-department hard hats. As for cities, it's all most of them can do to keep the potholes filled, let alone install and operate sophisticated data-collection equipment. "You can repave the road by the city councilman's house, or you can buy more hardware to let geeks gather data," says Mark Hallenbeck, director of the Washington State Transportation Center at the University of Washington. "More often than not, the road gets paved."

Vigorous public demand for more comprehensive real-time traffic information would speed things up. But "there's a chicken-and-egg problem," says Hallenbeck. The public isn't thirsting for better data because they don't know what's possible. They don't know what's possible because nobody's marketing traffic-data products and services. Nobody's marketing traffic-data products and services because the data isn't good enough.

The hope of breaking this deadlock is probe technology, which aims to make Singapore's wired highways look like relics. The approach wires the cars, not the roads, and promises to transform the 120 million cell phones now circulating America's highways into traffic-data sensors. In fact, any device that can emanate wireless signals - including two-way PDAs and pagers - can be tracked. Probe technology may get a boost from a federal law, passed in 1996 and slated to go into effect in October, requiring cell phone service providers to be able to pinpoint any cell that has called 911. US Wireless, based in San Ramon, California, has developed a way to track phones without having to put a bulky and expensive GPS chip in each one. Using a proprietary technique called location pattern matching, the company can measure the signal as it bounces off buildings en route to a cellular tower, and from reading that pattern, find the phone. As long as a phone is in use, US Wireless can find it - achieving accuracy to within 20 meters - and, from a control room, watch it move. The result, says Uday Nagendran, the company's director of mobile services, is a live-action schematic of a city's roads, big and small, for a fraction of the cost of hardwiring highways. For the past year, US Wireless has been watching traffic this way in a 24-mile-long stretch of highway in suburban Washington, DC, to let the Maryland and Virginia Departments Transportation evaluate the technology. And it aims to be Paul Dwyer's savior; US Wireless has a six-year, \$5.2 million contract to deploy its technology throughout the cell phone-heavy Bay Area by the middle of 2002. It also has a partnership with CUE to provide traffic information to the

CUE/Clarion dashboard device.

But even if probe technology lets us leapfrog the old Singapore-style sensors and loops, America's polyglot democracy will continue putting up barriers. Consider Dwyer's vision of a talking car that can sense what's ahead and reserve a parking space for you at the subway station. The technologies - cell phones, digital maps, and text-to-speech software - have all been around for years. What stands in the way, besides the lousy traffic data, are the dizzying levels of bureaucratic cooperation such a scheme will require. The California Department of Transportation (Caltrans) will have to make highway decisions with surface roads in mind. Local governments will have to consider how their traffic lights affect congestion on state highways and in neighboring towns. State and local agencies will have to be in constant contact. Highway engineers who think only about car travel will have to tune in to mass transit, and transit operators who consider cars the enemy will have to start looking at them as partners. Everybody will have to generate compatible data in device-agnostic formats, and disparate - perhaps competing - corporations will have to collaborate so that the dashboard can talk to the PDA can talk to the cell phone.

"This is not rocket science," says Joe Peters, who assesses ITS programs for the US Department of Transportation. "The technology is here. The institutional issues are the killers."

It's the interconnectedness - of roads, transit systems, technologies, and government agencies - that makes Singapore such a stunning model of ITS. Everything in Singapore begins with the wired roads. Optical sensors that detect vehicle type and speed are bolted to lampposts every 500 meters along the expressways; video cameras sprout every kilometer. All are connected via fiber optics to a kind of mission control, where technicians sit under weird, timeless light and manage highways the way air traffic controllers manage the sky over O'Hare.

Tan Seow Lee, a schoolmarmish manager, runs Singapore's Expressway Monitoring and Advisory System. Although my visit has been cleared at multiple levels of authority, she appears painfully nervous about saying the wrong thing. As we talk, her eyes never leave the 26 data and video screens covering one wall. It's 9:23 am and everything seems to be running smoothly, but, infected by her anxiety, I find myself equally transfixed by the cars on the Ayer Rajah Expressway. What most concerns Tan is not the video but a phalanx of colored numbers marching across a black screen, quantifying the occupancy of every lane of expressway throughout the system. When 20 percent of the screen's surface is occupied, a roadway is considered congested; at the moment, the system is running at an average 12.7 percent.

A red alert flashes on a big screen and Tan flies to a console, punching buttons to activate the video camera nearest the reported slowdown. "Ah," she says with a jittery giggle, zooming in and pointing to a color video screen. "There is a curve in the road there - you see? - and the camera sometimes interprets that as congestion." In the event of a real problem, the operator would choose from a menu of alerts to appear on dynamic signs along the highway - ACCIDENT: MERGE LEFT or TREE

PRUNING AHEAD - and if necessary dispatch one of dozens of patrolling tow trucks. The video feed also goes to radio stations, which explains why, as I was driving from Ang Mo Kio to Toa Payoh that morning, I'd heard the DJ exclaim, "Whoa! It looks like a whole lot of pineapples fell off a truck on the Kranji near Choa Chu Kang!" as if he were watching it with his own eyes.

Tan admits primly that one could in theory track an individual car as it wanders around Singapore; the video cameras have ample resolution to see license plates. But "we don't abuse the system that way," she says crisply. Her thin and ineffably nerdy colleague, Ho Khim Thiam, is eager to show me the system that controls major intersections, and when he zooms in on the busy crossing of Orchard and Scotts roads, the surveillance question comes up again. A young woman in a halter top is crossing the screen; her bosom bounces as she strides along, unaware she's being watched, and Ho and I fall into an appreciative silence. "We train our operators not to sit and watch pretty girls," he says finally, grinning sheepishly and changing the image to a real-time, CG schematic of the same intersection. Have the police ever used the video system to follow anyone? Ho repeats Tan's words exactly: "We don't abuse the system that way." How about the Internal Security Division? "We don't abuse the system that way," says Ho. In Singapore, TAKE OUR WORD FOR IT might as well be stamped on the currency.

For all the high tech wonders of Singaporean ITS, the dirty little secret of the island nation's traffic success is decidedly low tech. Multi-agency infighting is avoided because Singapore has, essentially, only one agency. Local, state, and national government are one. More important, the people, unlike Americans, do what they're told. They made a Faustian bargain with their first prime minister 40 years ago, when the country was newly independent from Britain and desperately poor. Lee Kuan Yew promised to make the people rich if they'd cede him total control over every aspect of their waking lives, forgiving all manner of surveillance, badgering, and indignities. (This is the country, after all, that bans chewing gum.) Both sides have delivered on the bargain. Singaporeans are rich enough to drape themselves with a dazzling assortment of cell phones and disc players, but they seem less akin to sovereign citizens than to employees in a nonunion company. Dissent, individualism, and disrespect are tolerated here to about the extent they're sanctioned in the executive ranks at IBM. Like a board of directors, the Singapore government can examine such problems as traffic congestion, decide what's best, and implement solutions without consulting the rank and file. So Singaporean ITS is a kind of control experiment, unfolding in a politics-free environment exactly as its engineers would script it.

In 1975, Singapore's engineers looked at their country and saw that an alarming 10 percent of it was already paved. More than half of all workers were commuting by car, and traffic was a mess, but building roads forever was not an option. Without having to wait for public sector approval or private sector action, government invested S\$200 million (US\$110 million at current rates) to wire almost every strip of asphalt.

**In the world of high tech traffic control, benign dictatorship is the killer app, and democracy is a bug.**

Moreover, the government fundamentally disapproves of driving and has no

compunction about expressing its disapproval in the form of draconian fees and fines. Officials drew a line around the heart of downtown 26 years ago and required anyone crossing it in a car during morning rush hour to have an expensive road-tax sticker. Compliance was assured by grim-faced policewomen who patrolled the line with pads and pencils, recording the license numbers of violators. Today, electronic gantries detect the category of vehicle passing underneath, check the time of day, and deduct the appropriate toll from the smartcard fitted into the reader on the vehicle's dashboard.

The point of tolls in Singapore is not to collect money, insists Gopinath Menon, the Land Transport Authority's erudite and soft-spoken senior traffic manager, but to change behavior. That's why Singapore rejected the kind of system used by New York's E-ZPass or California's FasTrack, which automatically puts the toll charge on a user's credit card. In the US, he says, "the charge goes on your credit card and you pay it without thinking. But in Singapore you see the charge appear immediately on your dashboard." Menon lowers his eyebrows sternly. "You need to feel the pain."

Pain is a crucial component of Singaporean traffic policy, and the most painful part of driving in Singapore is getting a car in the first place. None are manufactured on the island, and buyers pay a breathtaking 140 percent registration fee plus another 31 percent import duty. Add to that the Certificate of Entitlement the government requires, for which you bid at an Internet auction, and the real price of a \$25,000 car can go as high as \$90,000, plus \$600 or so more a year in road tax. The result is that in Singapore there is one car for every nine people, as opposed to one for every two in the United States.

To be fair, as Singapore squeezed cars off the island it also built a remarkably comprehensive and comfortable public transit system. The subway is fast and spotless. Elsewhere in the city, immaculate, air-conditioned, and often television-equipped buses go everywhere, driving in their own lanes on major avenues. Singapore has made it tough to own a car but easy to live without one.

The bossiness of the Singapore government pervades all aspects of life. Posters throughout the island command you to THINK ENGLISH, SPEAK ENGLISH, or EXERCISE! MAKE THE TIME! A large sign at the entrance to the history museum bluntly orders: BE NOSTALGIC. Singapore is what Beverly Hills would be if it were surrounded by water and ruled by William Bennett.

In the US, meanwhile, we're starting to address the institutional barriers to ITS. Metropolitan New York is the most bureaucratically complicated traffic zone in the country - involving towns and highway authorities in three states. Two decades ago those disparate agencies created what one official calls "the United Nations of Transportation in greater New York."

Transcom includes 16 transit agencies ranging from the New York City Metropolitan Transit Authority and the Port Authority of New York and New Jersey to the Connecticut Department of Transportation and the New Jersey Turnpike Authority. They joined forces long before the age of ITS for more prosaic, though nonetheless

essential, reasons. The Port Authority, for example, "would never on its own shut down both the Lincoln and Holland tunnels at the same time," says Matt Edelman, Transcom's executive director. "But if, say, the city is working on Canal Street coming out of the Holland, and the New Jersey DOT is working on I-495 going into the Lincoln, it amounts to the same thing."

Communication through Transcom is supposed to avoid that. Now at the dawn of ITS, Transcom already has a control room that works a little like Singapore's, though it operates, admittedly, with a lot less data. The agency plans to be beaming traffic information to individual subscribers through a Web- and phone-based program it calls Trips123 by the end of this year.

In an American version of Singapore's government-legislated car shortage, Caltrans is experimenting with a fleet of shared cars that have reserved spaces at train and transit stations. CarLink, as it's called, works this way: For \$300 a month - including fuel, insurance, maintenance, and cleaning - participants get access to brand-new Hondas that they're free to use as their own during weekends and evenings. On Monday morning, they drive the car to the Palo Alto Caltrain station, avoiding the hassle of looking for parking spaces by pulling into reserved CarLink spots. They lock the cars and board the train for work. A few minutes later, other CarLinkers (employees at one of the firms in the Stanford Research Park) begin arriving by train at the Palo Alto station. They walk to any of the CarLink autos, pass a smart fob in front of the transponder mounted on the car's window, open the door, and drive to work. All day long, they can use the cars for work or personal errands, and their companies can use them as fleet vehicles. At the end of the day, they drive back to the station, and leave the cars to await the Palo Alto residents who will soon be arriving by train.

Susan Shaheen, who conceived the CarLink idea as her PhD dissertation five years ago, runs the Caltrans experiment. This summer, she launched a second pilot with 27 cars and no termination date; if it succeeds, as she expects it will, CarLink will keep growing and inspire copycats. Washington, DC, recently put out a Request for Proposals for a CarLink-type program.

The really out-there American ITS engineers aim to use technology to get rid of the most irrational element in the traffic loop: the driver. Such visionaries look beyond ramp meters and talking cars to a post-rapid-transit future in which cars act like conventional automobiles around town but, for the long-haul part of the commute, drive themselves with the speed, safety, and fuel efficiency of a train. Steven Shladover, who helps run the traffic-research arm of UC Berkeley, has the Brylcreem-slick, Eddy Attaboy confidence of a junior Nixon staffer. Shladover has a fleet of six Buicks that have successfully cruised at freeway speeds along Interstate 15, each one a scant 4 meters from the next and all communicating wirelessly at 50 times a second. He calls it platooning. "You can do it with a 166-MHz Pentium chip and a bucketful of 80-cent magnets," Shladover boasts.

Platooning aims to make more efficient use of the highway, thereby reducing congestion. "On a smooth-running freeway only 5 percent of the road surface is covered by cars," says Shladover. "What a waste of resources!" Automated cars reduce driver fatigue and eliminate human error, Shladover maintains, and they use

less fuel than other cars because they go at even speeds and draft each other. Looking ahead to pollution-free fuel-cell engines, automated cars combine the flexibility of private vehicles with the speed and safety of public transit. The one thing Shladover can't engineer, though, is a radical change in human nature: How do you get people to let go of the wheel?

The Maltese psychologist Edward de Bono argued in a 1967 treatise that we often misapprehend the nature of the problem we are trying to solve. In an oft-told example, the owners of an office tower with unbearably slow elevators were at the point of replacing them - a hugely expensive undertaking - when an engineer realized the problem wasn't the speed of the elevators, but the frustration of the employees who waited for them. The engineer suggested installing floor-to-ceiling mirrors in all corridors where riders waited for elevators. The complaints stopped immediately - with so much people watching to do, everyone stopped perceiving the slow elevators as a problem.

Traffic congestion is a real problem: It causes accidents, pollutes the air, and slows business. But there's a lateral problem: People hate wasting time sitting in traffic. Press ITS geeks hard enough, and they'll concede that one of the most important short-term benefits to ITS may be making the traffic-congested commute easier to bear, even if no shorter. "Part of what we do is make people feel better about it," says Peter Dwyer, consultant to the San Francisco MTC. "If I know that I'm sitting in traffic because there's an accident 2 miles ahead, at least I know what I'm up against. I can make a call and say how late I'll be. One of the unmeasurable benefits is peace of mind." Relieve a measure of frustration, in other words, and complaints ebb. A lot of the "traffic problem" goes away.

Steve Wollenberg believes that, for a few years anyway, people will continue spending hours in their cars trapped in traffic, and will pay to relieve their irritation by making formerly wasted hours productive. Wollenberg, a tall, shy, baby-faced engineer, has been wandering the wilderness since the dawn of the ITS era - 1991 - when he commuted almost daily from San Francisco to San Jose. "I had lots of time to sit in the car and think about it," says Wollenberg, whose collection of personal digital assistants is the largest I've ever seen. "I had one of those early Motorola cell phones, the brick, and I thought, if I could deliver personalized traffic news through this, people might pay for it."

Thus began Wollenberg's 10-year trek toward the promised land of profitable traffic-news delivery, a journey the whole industry shared. In the past decade, Wollenberg has tried selling cell phone- and PDA-delivered traffic news. He has tried corporate sponsorship, giving the services away free, and selling ads. Nothing has worked, largely because the data isn't yet worth paying for.

So on the can't-beat-'em-join-'em principle, Wollenberg now toils at MobileAria, a cubicle-and-Coke-machine startup in Silicon Valley with funding from Palm and Delphi Automotive Systems that aims to profit from commuters' misery. MobileAria's killer product is a kind of smart clamp that holds your Palm and your cell phone and contains text-to-speech software, letting you talk to your PDA and the world while you drive. Only part of what you get is driving-related: Ask your dashboard for road conditions ahead, for example, and the clamp's built-in GPS will determine your

position, your cell phone will connect to the Net, and the data it receives from MobileAria's server will be delivered using text-to-speech software. More important, though, the unit will also read email from your Palm and let you dictate answers, turning your traffic-bound car into a hands-free office. (Delphi is selling through its Web site a version of this device that does everything but connect to the Internet. MobileAria's Net-ready version is expected to be out by the end of the year.)

Wollenberg is the kind of traffic-technology entrepreneur Singapore cannot even imagine. To the Singaporeans, ITS is entirely a function of government, imposed from the top down to make society function more smoothly and, only as an afterthought, to make the lives of individuals more pleasant. The likes of MobileAria and CUE care less about eradicating traffic than about pleasing their individual customers. This is why somebody like Wollenberg - after a decade of trying to move people through traffic more quickly - can envision getting rich off just the opposite: a nation of people trapped in traffic jams, hands on the wheels and feet on the pedals, watching the overcrowded road.

**The really out-there ITS visionaries aim to get rid of the most irrational element in the traffic loop: the driver. But that will require a radical change in human behavior: How do you get people to let go of the wheel?**

---

*Dan Baum ([danbaum@pacbell.net](mailto:danbaum@pacbell.net)) is the author of Citizen Coors: A Grand Family Saga of Business, Politics, and Beer. He lives in Watsonville, California.*

[Copyright](#) © 1993-2004 The Condé Nast Publications Inc. All rights reserved.

[Copyright](#) © 1994-2003 Wired Digital, Inc. All rights reserved.