

# THINKING ABOUT CHOICES IN TRANSPORTATION

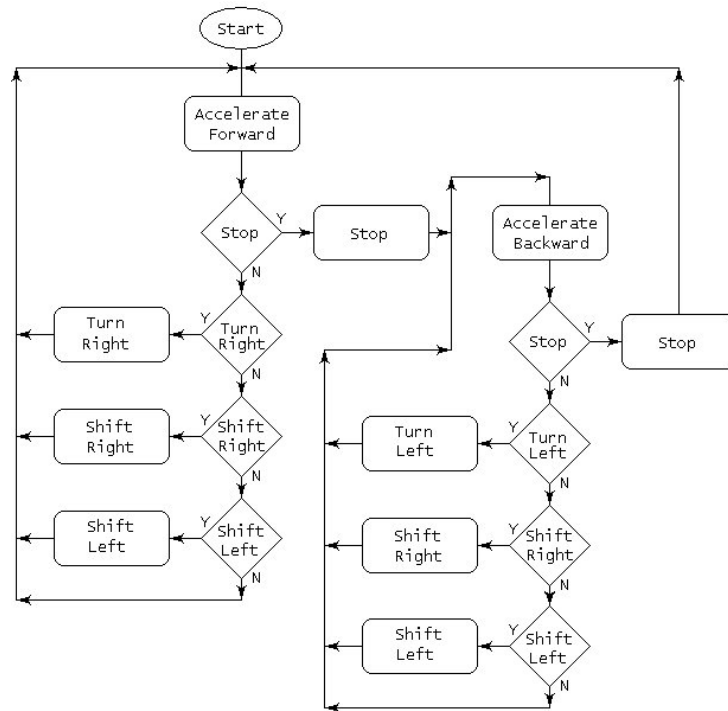


DIAGRAM CREDIT: BRIGHAM YOUNG UNIVERSITY MAZE NAVIGATIONAL LINE TRACKING ROBOT COMPETITION

## A CONFERENCE BACKGROUND PAPER

John Niles, July 2008

*“What is freedom? Freedom is the right to choose: the right to create for oneself the alternatives of choice.”*

Archibald Macleish

Around the topic of sustainable transportation, many people believe that availability of choices is desirable. What does “choice” mean?

Is it having a choice between a Toyota, Chevy, or Volkswagen? Does choice mean the opportunity to pick out a new car with great gas mileage, one that is not too big for the congested urban environment? After all, more choices in smaller, efficient cars are arriving at dealers every year, especially now with gas at over \$4 per gallon.

But no, this is not what most sustainability advocates mean by transportation choices.

Choice typically means having a mode of travel that is other than a car.

Helicopters? No. That’s for the booming megacity of Sao Paulo, Brazil, where traffic jams can be 100 miles long and 420 helicopters are the vehicles of choice for wealthy executives and journalists to move about quickly from rooftop to rooftop. Definitely bad for the environment.

Segways? Maybe. Electric golf carts, now relabeled for the streets of some U.S. Sunbelt communities as “neighborhood electric vehicles?” Maybe. Automated people movers? Sometimes. At airports. Whatever.

More generally, the preferred alternatives of sustainability advocates are public transit, non-motorized cycling, and walking.

The prominent 1991 Ahwahnee Principles of New Urbanism and Smart Growth posit the following view of a preferred urban transportation future: *“As many activities as possible should be located within easy walking distance of transit stops. ... The location and character of the community should be consistent with a larger transit network. ... The regional land-use planning structure should be integrated within a larger transportation network built around transit rather than freeways.”*

Why are the non-motorized modes plus transit more acceptable than other modes? There are two reasons:



First, they consume less petroleum-based energy per passenger mile of travel and, thus, generate less air pollution and greenhouse gas (GHG) than cars.

Second, these modes facilitate clustered residential and commercial land development patterns and higher densities that allow lifestyles consuming less energy and generating less air pollution and GHG.

Here, then, is the transportation ↔ land use connection so familiar to those focused on sustainability.

Many believe that to keep not only transportation but civilization itself sustainable, leaders of urban regions must follow the Oregon example and draw a boundary between the city and the countryside, or at least protect the rural areas from development, as in the example of the British Columbia agricultural land reserves. Within the boundaries, communities should focus on encouraging smaller residential units situated in densifying clusters organized around points of transit access, either train stations or hubs for bus service. In doing so, people then have an alternative to hopping in the car. They have the opportunity to more frequently and conveniently walk or bike to nearby employment and services, or to ride on public transit to other clusters of employment and services.

As the Smart Growth America web site frames the issue, *"mixing land uses, clustering development, and providing multiple transportation choices helps us manage congestion, cut pollution and save energy. Those who want to drive can, but people who would rather not drive everywhere or don't own a car need to have other choices."*

What are some of the issues that arise in this view of transportation choices?

One consideration is the actual, documented environmental impact of the various surface transportation modes.

The *Transportation Energy Data Book* from the U.S. Department of Energy points out that across America, public transit buses consume more energy per passenger mile than cars do. Trains do better on this score than cars and buses, but the long, full subway trains of New York City and the other big cities tilt the results. A light rail train packed with passengers indeed generates lower emissions and consumes less energy per traveler than the cars on a nearby freeway, but the train is not always full. Two extra passengers in a car and it's greener than the average train. The environmental impacts of trains very much depend on the actual achieved passenger loads; that is, how many people make the choice to ride. Transit-oriented development – motivating dense clustering – is intended to help fill the trains and make them achieve their green potential.

Achieving the higher densities of transit-oriented development takes time. So does recovering from the environmental deficit caused by construction of fixed-guideway transit, especially if subway tunnels are required. The environmental Record of Decision for the planned North Link six-mile light rail subway extension in Seattle reports that cumulative GHG emission in the first 45 years of its life, including emissions from construction, will exceed the cumulative GHG savings from people riding on the train up to that point. Is that good enough?

Perhaps as a solution for lower density urban environments, vanpools reveal themselves to be the best of all the commuting modes in terms of energy consumed per passenger mile, less than half the energy consumption of trains.

Another consideration is the role of economics in shaping transportation choices.

The combined public and private economic cost of automobility and the roads that move rubber-tire vehicles, including environmental degradation, is very high--about \$10,000 annually per capita in one study, meaning ten thousand for each and every man, woman, and child, not just licensed drivers. However, the visibility of the incremental public cost of providing the opportunity to choose riding on a new light rail train is also perceived as significant, in the range of \$100 annually per household.

The issue of *opportunity cost* arises when mass transit is not embraced sufficiently by enough commuters to justify the investment. Trains can move large numbers of people in a single corridor, but can we find ways to move even more people sustainably in many corridors at a lower cost for each? With mass transit, there are first the capital costs of building and

equipping a system, then the operating costs of running and maintaining the system, and then within a few decades, the cost of capital facility refurbishment and equipment replacement.

Thinking ahead, could the stream of tax dollars be better spent on alternatives, such as ridesharing and marketing of existing empty bus seats? Road vehicles are evolving over time toward new fuels and lower carbon emissions. Can exploiting smaller scale technology provide higher and quicker environmental benefit per invested dollar than massive people-moving solutions?

What about shaping the travel choices people make with prices, like movie theaters try to do with bargain matinees? A rising idea across America is charging road user fees to collect money to pay for infrastructure and operations management, and to shape behavior away from travel in the busiest periods of the day. If road fees are lower during off-peak periods, some travelers are motivated to stay out of the slower, congested flows in peak. Available public transit might look better than ever with the \$6.85 round trip tolls being contemplated for crossing the new Lake Washington bridge in Seattle.

Human understanding, perception, and cognition are further issues in choice.

The Washington State Chapter of Sierra Club proclaims, *"By making smart energy and transportation choices, we can reduce greenhouse gas emissions, increase mobility choices, save money for people and for government, reduce air and water pollution, and improve the health of our citizens and our communities."*

How do we get people to choose smart instead of easy?

We sometimes misjudge the willingness of people to make new choices even when offered the opportunity. Habits die hard. Making new choices in how to travel takes time and attention, the scarcest resource in some lives.

For many people, an automobile journey between a free parking space at home and another one at the work place is very convenient and comfortable compared to the additional steps needed for getting to and from public transit stops. A vast number of commuting trips by automobile, especially on the way home in the afternoon, include stops for shopping or non-work activities. A bag of goods or goodies is more easily transported in a car than on a bus. People may want to go green, but often they choose what's easiest.

Free parking makes using a car seem easier. Being forced to pay for parking and having an employer-provided transit pass makes taking the bus or train seem easier, as well as cheaper, which suggests the utility of incentives as tools to tilt the balance.

How and what people choose reminds us that human values come into play as well.

Some people, especially in the Pacific Northwest, have a relationship with the planet that leads them as a matter of central ethics to try to lower their physical impact on the environment. This relationship to Earth can be taught and learned. Attitudes shape how quickly people are able to learn to change.

Some people value privacy and personal space much more than others. Traveling alone in a car has very high value for some, compared to riding in a public place with others. Sometimes this is for practical reasons, and sometimes just preference. Sometimes this is based on fears that are unreasonable to some, but not to the fearful person.

What about those who value big houses and more yard space for the kids and dog? What about people who value living in the country, because they only need to come into the city once a week? Or because this location provides the dream house they can afford?

Achieving social equity is an important value in our society and to many people, though not to all.

There is a public service value in mass transit, beginning with providing mobility for people who don't have a car for any number of reasons, including being too old or too young or too poor.

Mass transit can bring us face to face with equity. When an obviously homeless person carrying all his belongings climbs aboard a bus, how do the other passengers feel? What about the presence of people on the bus with companion dogs, or noisy children? What of fellow transit riders lacking the social savvy to restrain themselves from unwelcome conversation with strangers?

Returning to economic considerations, note that choices expand for people with more wealth, including the ability to ignore public policy attempts to shape behavior with higher prices on using roads or driving. Raising the transit fare to cut the operating deficit covered by taxpayers is not noticeable to some. Road tolls are less of a problem the more money a traveler has. Higher parking prices are easy if you make a high salary, or have a job where you are reimbursed. Economics collides with equity issues in using prices to shape behavior, since some people are more price-sensitive than others, and for some it's not their choice whether to bear the cost of a higher fee.

When should society force travel mode choices that the wealthy cannot buy their way out of? When and where should cars be banned and not merely priced off particular roadways? When should transit connecting the lower income parts of town be funded by all the taxpayers in a generally wealthy community?

Finally, the role of technology, the process of innovation in technology applications, and marketing to expand the use of new products and services has a vital role in creating new choices for higher transport sustainability, and in shaping the choices used by the mass consumer market.

Would more people use buses if every pre-paid bus pass were actually a little computerized card having a display screen like on an LCD wristwatch counting down the minutes until the next bus arrived? Would ridership increase if the bus pass with an embedded computer chip and wireless connection to your iPod told you exactly which two buses you would need to take to get to any destination you spoke into a little microphone? It is doable.

Are road user fees going to be more acceptable when the money collected is used to manage roads via active traffic management techniques that optimize flows, clear accidents and breakdowns quickly, and support transit mobility that is nearly as fast as driving, but at a fraction of the tolled price of driving solo?

When holographic video communications and document sharing comes along that is so fast and easy that the combination can be accurately called tele-presence, plus we have breakfast-time traffic forecasts you can really depend on, will tele-commuting through the morning hours until the peak period passes become the really big thing?

Moreover, what about two-person small cars that don't require liquid fuels, that have wireless, automated data communications keeping them from colliding with others, and that drive to specified destinations without human steering? Serious people are working on creating cars like this. Would this technology change the definition of mass transit?

Or should we bet that investing in the readily available, easy-to-understand horizontal elevators called electric trains and streetcars is the way to go for the next 50 years?

Sustainable transport means providing more choices of how to move, but also working on how to expand the kinds of choices available, to include those that are more effective and efficient than the ones already on our list.

There are multiple paths to the future. (Let us find them together!)

## About the Author

John S. Niles is owner and president of [Global Telematics](#), a policy research and management-consulting firm based in Seattle and a senior fellow at Discovery Institute. He works with innovators from business and government on regional telecommunications strategy, public transportation revitalization, and economic development planning. His work in transportation focuses on developing, explaining, and implementing readily available analytical techniques that seek the highest productivity investments, including those that exploit foreseeable technology-based service innovation such as Bus Rapid Transit. Niles has conducted research and development on instant carpooling, the effect of new urban light rail stations on transit market share, travel value pricing, and measurement of local delivery trucking impacts on congestion. He is also assisting in the production of Meeting of the Minds in Portland.