The Road Less Travelled:
America's Roadways in the 21st Century

By

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While certainly not a poetry aficionado, I've always liked *The Road Not Taken* by Robert Frost. My fondness may lay in the idea of self-determination, of being in control of one's fate – albeit ironically by making a leap of faith.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I--
I took the one less traveled by,
And that has made all the difference

The engineer in me may always question why someone would choose a path different from that which so many others have taken. Indeed there would be a great deal of anecdotal evidence about their journeys that could help me while very little about the alternative.

Nonetheless, the poem has always spoken to me on some level. It was not until rather recently, however, that I have found some clarity in the inspiration of these words, for they so elegantly frame a debate that has been simmering for years in our country over the basic purpose of our roadways. Urban planners and likeminded advocates argue that many of our roadways are too wide and that traffic moves too quickly to properly serve a community's interests. Traffic engineers respond that additional lanes have been needed to keep up with increased traffic demand in order to stave off perpetual gridlock.

While this argument is decades old I truly believe that we have reached Frost's divergence in the woods, surveying each possible path and, perhaps unknowingly, deciding the fate of America's roadways in the 21st century. In doing so, I believe our decision will play a significant role in the fate of America's cities.

We are evaluating nothing less than the fundamental purpose of our roadway corridors. Do we continue along the road we've taken, meaning that we continue to design and operate our roadways for near exclusive use by vehicles? Conversely we could try the road less travelled, thereby dramatically shifting the emphasis to include pedestrians and cyclists, or more to the point, focusing on people instead of steel.

Our decision must speak to safety, but must also address economic development and general quality of life. This is because the condition of our roadway corridors impact more than traffic flow, but rather the very vitality of our communities. Roadways, like it or not, are a significant portion of a community's public space and therefore say a great deal about what that community holds dear.

It is important to note prior to continuing that I am an informed--though not objective--participant in this debate. As a professional engineer with a master's degree in transportation, I have overseen the planning and design of hundreds of infrastructure projects in the last 17 years,

most of them within the urban realm. I have also spent the last eight years as an advocate for non-motorized transportation improvements, highlighted by overseeing the preparation of the City of Detroit's Urban Non-motorized Transportation Master Plan.

My advocacy is not based on any anti-automobile bias or **ü**ber-environmental zeal. I am not, for instance, suggesting that you sell your cars and that we convert all roadways to pedestrian plazas or urban farms. My family, like most of us in Detroit, is deeply rooted in the auto industry and I am a vocal supporter of the American-owned auto companies.

My reason for working towards this fundamental change in the way we view and design our roadways is based solely on the fact that we deserve better. We have allowed, rather unwittingly, the tail of traffic engineering to wag the dog of roadway construction for too long. We have allowed a continued minimization of the needs of the pedestrian and the cyclist in the pursuit of vehicular level-of-service. In doing so, we have also missed out on huge opportunities to improve the economic vitality of our communities while simultaneously improving overall quality of life.

On the Road

Like most of my generation, I've moved around a lot because of life experiences, including work, school and marriage. My choices have always revolved around communities with strong downtowns, however small, that have a walk-able quality to them.

Principal shopping district in Birmingham, Michigan

My home for the last decade has been the city of Birmingham, Michigan, located about 10 miles north of Detroit. This town is a fantastic example of a suburban community that feels nothing like one. A strong downtown, filled with commercial activity and outdoor dining, is a short walk from my house. It is as urban a city as any, yet provides all of the "suburban" amenities and a high standard of living, despite the economic issues of the last few years.

As I sit in a local coffee shop, I can see hundreds of fellow residents and visitors walking and biking through our downtown, enjoying all of the things I love about Birmingham: pedestrian scale, walkability, strong retail, restaurants, etc. I tend to take these characteristics for granted, though the professional engineer in me knows that they are inherently and continually at risk.

The risk I speak of comes from various sources. It comes from transportation officials and traffic engineers who view non-motorized transportation the way the most of us view an annoying neighbor or coworker; it is to be tolerated, but never allowed to get in the way of the important things.

Surprisingly, or not, depending on your experience with the implementation of roadway projects, we also are exposed to this risk by a portion of the very same group that enjoy the benefits of a thriving downtown. I'm referring to a small but loud group of citizens that, for one reason or another, view any change to our roadways as tantamount to a rewrite of the constitution. Slowing traffic or, heaven forbid, reducing roadway capacity will "kill my business" or "flood my neighborhood with traffic."

Furthermore, while my community already supports our flourishing downtown, I know that things can improve dramatically. Traffic still is moving too quickly on certain streets and a large number of vehicles are cutting through the heart of my community on their daily commutes. We have no bike lanes even though there is room on our existing streets and, just as importantly, we have a large cycling and pedestrian base that would actually use such features. Lastly, our sidewalks are not always wide enough for the commercial center that we have become, even more so with the rapid increase in outdoor dining that we've experienced since we began allowing bistros several years ago.

Having moved to the second story of one of Michigan's many microbreweries in Detroit's neighboring city of Ferndale, I am able to view one of Michigan's iconic roadways. Named after Augustus Woodward, Woodard Avenue is Michigan's main street, stretching nearly 22 miles from the banks of the river in downtown Detroit outward into the suburbs. Woodward was named a National Scenic Byway several years ago, a designation that is overseen by a local non-profit group (Woodward Avenue Action Association) that has since dubbed Woodward the "All American Roadway."

In most respects, for good and for bad, this is an accurate depiction as Woodward is in many ways a poster child for how many American roads have evolved. Mostly a boulevard, Woodward Avenue has ballooned in the suburbs over the last 100 years, where it now "boasts" eight lanes of traffic (not counting the added turn lanes). And while it does possess a wide median, budget cuts have reduced it to a grassy strip with a smattering of trees reflecting any number of old streetscape or charitable endeavors that have occurred over the years. Sidewalks are present, but that is the nicest thing to be said for the pedestrian experience in many areas.

Woodward's pedestrian "experience" leaves much to be desired.

Ferndale has managed to tame the roadway somewhat, enforcing a 35 mph speed limit (compared to the 45 mph my community must endure). Ferndale has also maintained parallel on-street parking within its borders, which acts as an additional calming mechanism. Parking in the remainder of the suburban portion of the corridor remains separated from through traffic by concrete islands, thus preserving traffic flow and maximizing roadway efficiency. *(Writer's note: sarcasm intended.)*

But even with the many positive things the City of Ferndale and the Woodward Avenue Action Association have been able to accomplish on Woodward, the roadway is still far from inviting to

pedestrians or all but the bravest of cyclist. This despite the fact that traffic counts would indicate that there is excess capacity on Woodward during the a.m. and p.m. peak periods.

This excess capacity during the so-called "rush hours" may explain the issue during the other 22 hours of the day. If Woodward can operate at near free-flow conditions during rush hour, imagine how it operates with much lower volumes of traffic. Vehicles tend to drive faster than the 45 mph speed limit because they can; there is enough excess capacity that every driver can drive nearly undeterred by fellow motorists. It is an all too common characteristics of many American roadways.

A Road by Any other Name

A potential solution for Woodward, and indeed for most streets, is to incorporate the philosophies of Complete Streets into roadway design and operation. Complete Streets is a movement to design and operate roadway corridors in a manner that promotes safe access for all users, regardless of age and ability. Roadway corridors should therefore be designed holistically and should strive to accommodate vehicles, transit, bicyclists and pedestrians of all physical abilities.

Parking configuration and excess capacity from past road widening projects have significant impacts on Woodward.

You may think that most roads, particularly those located within urban areas, are already complete because most have sidewalks and curb ramps for those with physical limitations. Simply providing sidewalks and curb ramps (even if designed properly) is not enough, however. Are the sidewalks appropriately sized for adjacent land uses, such as commercial activity or outdoor dining? Is the pedestrian experience pleasing or scary? Have you accommodated cyclists (both advanced and novice)?

No, "Complete Streets" is not simply a toolbox of amenities or a checklist to be followed, but rather a philosophical statement about what a community believes in. It is a concrete (and sometimes asphalt) reflection of a community's values in much more real terms than any mission statement about walk-ability.

Any discussion of Complete Streets must first include a discussion of bicycles due to their impact, both realized and potential, on vehicle and pedestrian operation and safety. Most states have codified the rights of cyclists in legislation. The Michigan Vehicle Code, for instance, indicates that cyclists are legal users of the road and must operate under the law the same as any other vehicle. It further states that cyclists choosing to use the sidewalk are defacto pedestrians, and must act as such at all intersections.

Cyclists riding on sidewalks are significantly more likely to be involved in an accident.

Dr. William Moritz of the University of Washington performed a statistical analysis of accidents involving

bicycles and derived what he calls the "bicycle danger index." Based on real world data, Dr. Moritz found that a cyclist riding on a sidewalk was five times more likely to be involved in an accident than they were if riding on the street, even if no bike lanes were provided. When compared to a roadway where bike lanes had been installed, sidewalk cyclists were 10 times more likely to get into an accident.

Since it would appear safer for bicycles to operate on the street, which they are legally allowed to do in most states, it would seem obvious that most cyclists would do so. Unfortunately, despite the law and the data, it is not uncommon to see many cyclists riding on sidewalks. It is partly reflective of the different types of cyclists and their corresponding skill level. It is also a direct response to the limited travel options currently presented to them.

Cyclists are generally grouped into one of three categories. Type A cyclists are advanced riders that will tend to ride legally on the street with traffic regardless of the roadway. Type B cyclists are novice users who may ride on the street under certain conditions, but will quickly jump to a sidewalk when confronted by increased traffic volumes and speeds. Type C cyclists are either very casual users or beginners (i.e. children) who will not, or perhaps should not, ride on the street with traffic.

Woodward in Ferndale as it exists (above) and how it could be a "complete street" (below). A bike lane and wider walks to reflect the commercial intensity of the area greatly enhance safety and appeal.

Complete Streets can assist in this regard by providing space on city streets for bicycles. In some cases, such as quiet residential streets, this can be accomplished with signs. In other cases, limited pavement markings may also be productive. Known as "sharrows," these simple markings are intended to remind drivers that bicycles are legally afforded the same rights as motorized vehicles.

It is on larger streets, particularly when vehicle volume and/or speeds start to increase, that more defined measures are needed. Dedicated on-street bike lanes, sometimes buffered from traffic via additional striping, not only provide a space for cyclists but separate them from vehicular travel. In more difficult locations it may be appropriate to segregate cyclists further by means of a physical barrier. In these instances, the installation of a cycle track may be in order.

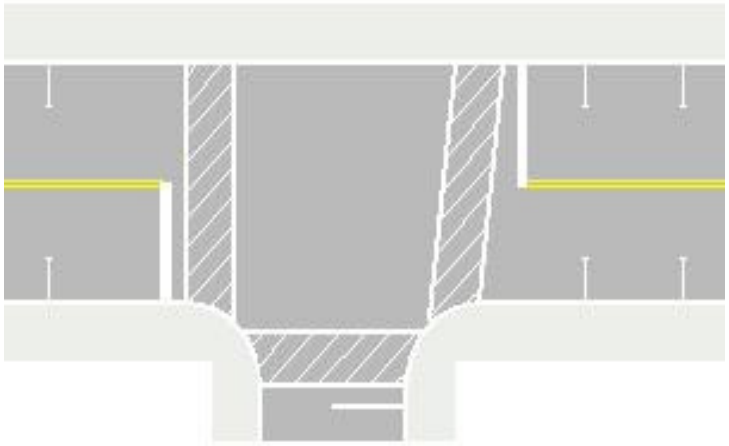
Regardless of the configuration, a complete street would be designed so that most bicyclists (the Type A and Bs) would ride safely within the roadway. This would also translate into enhanced pedestrian safety on its own, though a complete street would not stop there.

Sidewalk width and configurations should be reviewed on the basis of adjacent land use. While a standard 5 foot wide sidewalk may be acceptable on a residential street, it would certainly not work within a busy commercial area. This is even more important when outdoor dining or sales

are anticipated. Indeed the pedestrian space, and by default the entire roadway cross-section, must be programmed to properly respond to the activities and needs of a community.

Pedestrian safety would be furthered through enhancements to roadway crossings. Installing barrier free ramps compliant with the Americans with Disabilities Act is an obvious first step, but other enhancements are needed. Providing adequate landing areas for those waiting to cross the street provides a feeling of safety for pedestrians. Striped crosswalks using the continental style pattern have been proven to increase driver visibility, further enhancing safety.

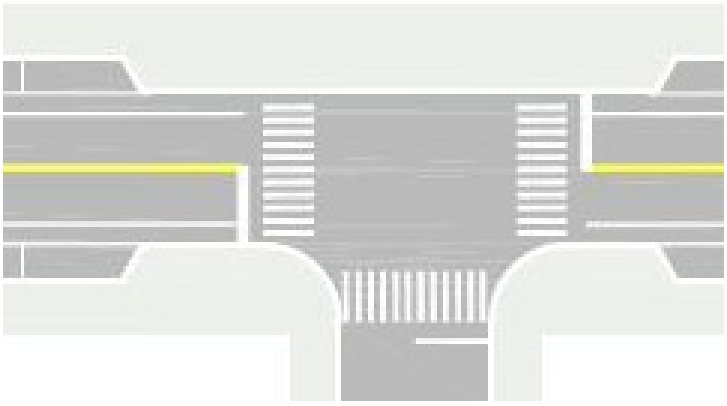
Pedestrian signals further enhance overall intersection safety. Not simply warning pedestrians of impending traffic signal changes, newer models include countdown timers to afford a better understanding of how the intersection will operate. Furthermore, a complete street will incorporate pedestrian signals that are accessible to those with physical limitations. Chirping or talking signals are becoming standard for those with vision impairments, and should be considered in any design.



On larger streets, such as the eight- to 10-lane boulevards that are speckled throughout southeast Michigan, we must consider curb extensions to protect parking lanes or full road diets in order to reduce the distance that pedestrians must travel to cross the road. This is of utmost importance when you consider the increasingly aged population of America. Along with these physical improvements, we must also consider longer pedestrian phases for crossing.

The existing intersection shown above is a rather typical condition in urban commercial areas. Narrow sidewalk and skewed crosswalks place vehicular movements above those of pedestrians.

One possible modification to the intersection, as shown to the right, changes this focus. Curb extensions reduce the pedestrian crossing distance by more than 30% while increasing vehicular sight distance while significantly added to pedestrian spaces.



Transit itself is not necessarily a key tenant of Complete Streets, but nonetheless is a consideration. More specifically, transit stop locations and their physical conditions should enhance access to the transit system. That means providing barrier free stops that also provide bicycle parking.

This is not to say that vehicles should be forgotten. Indeed due to the multi-modal nature of our future American roadways, we must be more concerned about vehicles. Clear and reasonable pavement markings and signage must be maintained in order to allow drivers to concentrate on the task at hand. We must also rethink the frequency of signage and the messages that it sends. For instance in Michigan, it is a rather standard operating procedure to place "no parking" signs on every block (as close as every 200 feet or so) while speed limits signs are placed every ¼ to ½ mile. What does this spacing say is more important, vehicular mobility or speed enforcement?

This question leads me right to the most important, and perhaps most controversial, point to be made. In order to successfully implement Complete Streets, a community must make two monumental shifts in how it maintains the roadway network.

First of all, a community must greatly reduce the significance of vehicular demand and instead focus on the roadway capacity it is willing to provide. Think of it as supply side economics for the transportation world. Instead of continually widening roadways in a futile attempt to satisfy traffic demands, a community must decide how much vehicular capacity it is willing to provide in order to support its overall goals. Only then will that community be able to balance the needs of vehicles, pedestrians and cyclists to create a "complete" street.

Secondly, a community must be allowed to enforce traffic controls within its borders and must do so in alignment with its vision. States like Michigan must therefore repeal aspects of the vehicle code that require roadway speed limits to change based on the actual speeds of drivers. A speed limit of 45 mph through a community's commercial district is simply not conducive to the economic vitality of those commercial entities. By freeing communities of this shackle, the state would allow communities to set speed limits that fit within the context of the adjacent land use.

Now, this is not to say that all roadway corridors are created equally. Freeways, for instance, serve a valuable purpose in America by providing highly efficient mobility over great distances. It would be foolish to suggest that we reduce lanes of travel on I-75 in order to add a sidewalk or bike lanes. (Though it may not be foolish to do so in order to add high-speed rail lines, but I digress.) The interstate freeway system plays an invaluable role in our daily lives but must be part of a diverse network of roadways that are context sensitive.

Bike lanes in urban areas can coexist with parking and vehicular travel.

There's Not To Reason Why

Why are transportation officials and some residents against changes that would improve pedestrian and cyclist safety while also improving the aesthetics of the community? How can a community like mine, with so much going for it, not go "all in" when it comes to these types of improvements?

Some of the complaints from residents can simply be translated into "it will take me longer to get to the dry cleaner." Most, however, are based upon a misperception of how drivers actually react to road conditions. Ironically, traffic has evolved so fully into a demonic entity that those

decrying the amount of traffic on a city street will call for a road widening or signal retiming in order to increase capacity to match the demand, not realizing that these improvements will likely draw more traffic to the route.

The reluctance of transportation officials is another story. Most, if not all, of the debate from transportation officials is based upon the fact that the prevailing paradigm of traffic engineering has, for the better part of a century, placed an extremely high importance on the notion of mobility. Mobility and access are key characteristics of traffic engineering that help explain both why our road network developed the way it did and why it is so difficult to change.

Mobility, as used in traffic engineering, relates to the movement of people or goods. It is a measure of the ability to get from one place to another as efficiently as possible. The best example of a roadway designed and operated for mobility is an interstate expressway. Multiple lanes are designed for higher speeds and higher volumes in order to reduce travel times over longer distances.

Access, on the other hand, is a measure of the ability to reach desired destinations. It is therefore more concerned about connectivity to destinations than the speed or efficiency of the trip. The best example of a roadway designed and operated for access is a residential street. One lane in each direction and numerous driveway openings allows for slow, safe and regular access to adjacent properties.

In the context of mobility, any increase in movement is viewed as a positive force in the community regardless of the impacts on adjacent land use. Access inherently supports an integrated view of transportation, where land use plays a significant role in determining the operational characteristics of the roadway itself.

Mobility and access work against each other in practical operation; their relationship is what engineers refer to as "inversely proportional." This means that as mobility is increased, access is correspondingly decreased, and vise versa. For example, the interstate expressway exhibits high levels of mobility because, in part, access is limited to on-ramps located every mile or so. On the other hand, the numerous driveway openings on residential streets significantly increase access to adjacent properties while simultaneously reducing the mobility of through traffic.

This is an important distinction to make because in one sentence we can explain the justification for every road-widening project ever constructed. *Traffic engineering principals favor mobility over access.* Indeed, every debate from the installation of a bike lane or the construction of curb extensions, to the implementation of a road diet, is viewed by traffic engineers through this lens. This bias is most notably revealed by the main factor used in nearly all traffic impact reports to express how well an intersection is operating: level-of-service.

Level-of-service is an evaluation of movements through an intersection. Like in school, a grade of A is better than a C and so forth down to an F. The letter grades represent a range of delay (measured in seconds) that a driver will experience when attempting to travel through an intersection during the study conditions (usually AM or PM peak hour traffic). An "A" grade

means that a driver experiences less than 10 seconds of delay, while a "C" grade is 20 to 30 seconds and an "F" comes with delays greater than 80 seconds.

Level-of-service grades are used to justify modifications to roadways or traffic controls. A road widening or changes in traffic signal timing is deemed necessary should the service decrease to an unacceptable level in the mind of the transportation official. In most urban communities, transportation officials will "tolerate" level-of-service grades of C or even D without the need for some form of mitigation. Since level-of-service decreases when vehicular mobility is reduced, and a reduction in mobility is accompanied by an increase in access, it is therefore clear that the current paradigm of traffic engineering favors mobility over access.

Unfortunately, level-of-service is not an objective measure in that the analysis is framed upon a number of decisions that have already been made. For instance, level-of-service is calculated for the peak hour traffic conditions, already deciding that a roadway should be built for the worst-case vehicular scenario rather than a more common occurrence. It also excludes pedestrian, cyclist and transit impacts by focusing exclusively on vehicular delay, thereby deciding that vehicular traffic is more important than other modes. And speaking of objectivity, one has to question why 10 seconds of delay was deemed "grade A" while 11 seconds is not.

Level-of-service can also be misleading if not properly understood. Most traffic studies ultimately make recommendations based on a projected future year level-of-service (usually 20 years from now). That means the needs of today are being outweighed by the *projected* needs of tomorrow. Traffic reports to the general public that indicate significant traffic degradation are therefore potentially overstating the immediate impact.

Finally, since the level-of-service grades represent ranges in delay times, a "slip" from one grade to a lower one may not represent a significant change in real terms. In other words, take the example of an intersection that operates with a delay of 9 seconds, resulting in a level-of-service "A." If a lane of traffic was eliminated from the roadway in order to install a bike lane or widen the sidewalk, for instance, and the resulting delay increased to 13 seconds, then the level-of-service drops to a "B."

One could argue that most drivers would not even notice a 4 second increase in delay, but they will certainly notice their city council approving a "downgrade" in the capacity of their roadway from an "A" to a "B." Now consider a similar scenario where the initial delay was 11 seconds resulting in a level-of-service "B" but modifications will increase that delay to 19 seconds. Even though this situation results in an increased delay of 8 seconds (or double my initial example) the level-of-service associated with the modified roadway remains a "B." Which scenario represents the bigger change?

The Road We've Taken

From the window of my 12th floor office in downtown Detroit, Woodward Avenue is in perhaps its purest form: four lanes of traffic with on-street parallel parking in the middle of the central business district, lined with tall buildings that represent the closest thing Detroit has to Manhattan.

Yet a short ¼ mile away, in the heart of a burgeoning neighborhood known locally as Midtown, mobility is up to its old tricks, as Woodward grows to six lanes of travel with a center turn lane. The impact, even visually from the 12th floor, is astounding. How did the current paradigm develop?

The reason that mobility has ruled supreme is not, despite what some advocates may think, because traffic engineers and transportation officials are mean people or that they simply "don't get it." The main reason that traffic engineering favors mobility is that people, and American people in particular, have told them to do so.

Don't believe me? Consider if you've ever yelled in frustration when you were stuck at a traffic light for a mere 30 seconds. Consider if you've ever heard anyone complain about the car in front of them driving only 35 mph when everyone else was doing 45. (Now remember that the posted speed limit on that road was likely 35.) Yes, believe it or not, Americans (myself included) have in one way or another told our transportation officials that mobility is more important than access.

In order to truly understand where this directive comes from we must take a brief look at the history of transportation in the United States. It is particularly important to see how 19th century changes in our culture have had lasting implications on engineering policies that impact us today.

Pre-1840 or so, communities were separated by what were then considered to be great distances. Only small groups traveled between communities, mostly on horseback (the original design vehicle I suppose) and were heavily dependant upon the Native American trail network. The larger percentages of trips were taken within a community, placing a premium on access to the amenities a town or village had to offer.

This began to change through the colonial era, with European-style coaches becoming more common. One could argue that the preponderance of coaches resulted in America's first road widening projects.

The Louisiana Purchase in 1803 catapulted this change in attitude to the national stage as shouts of "manifest destiny" and "taming the frontier" became louder. In 1804, President Jefferson sent Lewis and Clark to explore the new territory. Their famous journey began in St. Louis and ended on the Oregon coast some 30 months later.

The final piece bit of momentum propelling mobility into the limelight during this era was money. Commerce and trade was greatly limited by distance, as horse-drawn carts could only carry so much, so far. The continued development of the frontier opened up waterways for carrying goods to a larger market, but the boats could only carry a limited amount of weight on these routes. This changed with the advent of the steam ships that raced up and down the Mississippi by 1840. These ships were monstrously large in comparison to the rafts and small riverboats of earlier days. Their steam-powered engines could also carry significantly more cargo than their earlier counterparts. The money available through shipping along the Mississippi greatly advanced the cause of mobility.

The period between 1840 and the turn of the century saw technology continue to play a significant role in transportation. The Gold Rush in northern California in 1848 caused many Americans (and immigrants alike) to head west. Wagon trains pulled by multiple horses across wider and better-known trails greatly reduced travel time. Whereas it took Lewis and Clark nearly 30 months to make the trip from St. Louis to the West Coast, gold rushers in 1848 took only six months. Just 12 years later in 1860, thanks to the power of the locomotive, this same trip took eight days. Clearly, mobility had found a following.

At the same time, cities and towns continued to grow and the increase in traffic was taking its toll on local roads. The early 20th century saw the first major road improvement projects, such as the first mile of concrete pavement in America on Woodward Avenue. The smoother pavements meant a more comfortable ride and faster speeds in the new horseless carriages that Henry Ford began to make at an astonishing pace. (In 1900 there were 8,000 automobiles in the entire United States, but by 1930 there were 23 million.)

The increase in population of American cities, particularly in the North due to the Great Migration and a massive influx of European immigrants, added to the stress on the local road network. These factors led to the birth of traffic controls and marked a seminal moment for our cities. For perhaps the first time, people were actively controlling the flow of vehicles within our cities. It is worth noting that it was during this time period that many of our streets were converted from two-way operation to one-way operation in order to "maximize vehicular efficiency." Mobility had changed from a characteristic defining the connections between our cities to a powerful force *within* our cities.

With the end of World War II, America of the late 1940s and early 1950s shifted into peace and mobility made its final move. The United States had enacted several highway acts at the federal level since the turn of the century, but the Federal Highway Act of 1956 had the most significant impact.

Interstate freeways play an invaluable role in our daily lives but must be properly included in a diverse roadway system that is context sensitive.

As Supreme Allied Commander during World War II, Dwight D. Eisenhower had overseen the invasion of France on D-Day. Upon later seeing Germany's road system, particularly the Autobahn, Eisenhower realized the tactical advantage it gave the German military in their efforts to move troops and supplies in times of war. Soon to become president, Eisenhower believed that America was inherently in danger from a lack of such a network.

The Federal Highway Act of 1956, backed by President Eisenhower, resulted in the creation of the modern American interstate highway system, which has greatly enhanced mobility across the country. The legislation also required uniform design standards to ensure drivers of a consistent and safe ride.

Most importantly for our discussion, it required that the interstates accommodate future projected traffic of 1975. (This requirement was later modified to a 20-year future projection.) This requirement, perhaps more so than the advent of traffic controls, marks the birth of the modern paradigm of traffic engineering as well as the two main problems that it presents.

The first issue is the self-fulfilling nature of the concept of building roadways to accommodate future traffic demands. Projecting traffic volumes into the future almost always works within a biased opinion that traffic will increase. (This is despite the fact that data from the Southeast Michigan Council of Governments show a 7% *decrease* in traffic on parts of Woodward in the last 10 years.) Following this logic implies that a roadway will continually need to increase capacity, which is impossible due to space constraints and construction costs. It is equivalent to a dog chasing his tail, expecting to achieve its goal when the observer knows it can never happen.

The second issue, which is more important in some ways to this discussion, is that this methodology of transportation planning moved quickly from the realm of the interstate freeway to local surface streets. This was likely inevitable given that the state transportation departments in charge of the interstate system began as agencies overseeing important surface roadways. (It's interesting to note that this is a jurisdiction that many DOTs refuse to give up to this day. Woodward Avenue, for instance, is mostly under the jurisdiction of the Michigan Department of Transportation.)

As a result, surface streets that run directly through downtown areas are programmed and designed in much the same manner as our interstate freeway system. Is it any wonder that roadways like Woodward Avenue grew into eight-lane boulevards with additional turn lanes even though they are lined with small-scale commercial developments? In many ways, the Federal Highway Act of 1956 began the rapid erosion of personal accessibility within our communities, all for the sake of added mobility between them.

Through these developments, American citizens reaped the benefits of enhanced mobility, including the construction of new subdivisions further and further from the center of traditional towns. We did so, I propose, because freedom is part of being American.

American historian Frederick Jackson Turner, in delivering his paper "The Significance of the Frontier in American History" at the Chicago World Fair of 1892, asserted that American democracy derived from its frontier experiences and not from its European inheritance. He believed that the spirit and success of the nation was derived directly from our westward expansion, which forged a unique and rugged American identity.

While it may be a stretch, one could argue that this unique identity or outlook related to freedom has had significant impact on American transportation planning of the last 100 years. The emphasis on freedom, expansion and taming the wild has a nearly visceral connection to mobility. It is, in many ways, reflected in our culture at many turns. From the iconic Route 66, to Kerouac's "On the Road" or the film "Easy Rider," to the car culture that follows auto shows or classic car gatherings such as the annual Woodward Dream Cruise in Michigan, freedom and mobility have been inexplicably linked.

With the explosive growth of suburban America, spawned from projects like Levittown, people moved away from cities. With this new migration, more and more emphasis was placed on mobility in order to handle a new phenomenon known as the daily commute.

Nine lane roads, like this one shown above during the morning commute, offer countless opportunities to implement complete streets improvements.

It is ironic in some respects that this cycle of migration away from cities has actually placed us in a position to make positive changes to our roadway network in older urban centers. With significant population losses in cities such as Detroit, a city of nearly 2 million people in 1950 but less than 750,000 in 2010, there is less traffic volume on surface streets. These surface streets, designed under the rules of the old paradigm, were widened to accommodate growing traffic of the time and are therefore grossly oversized for the needs of today. Changing these roadways would be easy, but changing them in what way?

The Road Less Travelled

Back in the woods, that divergence of paths requires us to make a choice. Which road will we choose for the future of America's transportation infrastructure: one that accommodates multiple users or focuses on just one?

Transportation engineers and officials could say no to the idea of Complete Streets by clinging to the paradigms of the 19th and 20th centuries. However, much of the public we are intending to serve would be ignored and major opportunities missed.

To them I plead that this is a singular opportunity to dismantle outdated paradigms and demonstrate how proper engineering can protect public safety *and* improve overall quality of life. It is what engineers are supposed to do, and is the promise of Complete Streets.

We need to choose between the way we've gone before and the road less travelled. I chose the latter, and hope you do too. It may just make all the difference.