Charleston, South Carolina

PENINSULA MOBILITY REPORT

Gabe Klein

November 2014

SPONSORED BY

CITY OF CHARLESTON

HISTORIC CHARLESTON FOUNDATION

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I. OVERVIEW

A. STRATEGIC OBJECTIVES

There are several actions which would help to maintain the character of Charleston: 1) creating more viable alternatives to driving, 2) Offering more ways for visitors to enter the historic districts by means other than the automobile, and 3) following a strategic parking plan that includes more remote parking and facilitates public transit.

Sustainable growth and economic development of the Charleston Peninsula will require transportation alternatives to be developed over the next ten years. Charleston must decrease driving and parking while increasing use of public transit, cycling and walking.

The high volume of visitor trips to the Peninsula should be used as a catalyst to develop transportation options which most cities this size cannot. King Street is a good example, with a high quality and variety of retailers and restaurants not typical of a city Charleston's size.

Mode Split Goals

In keeping with these objectives, Charleston should establish goals for mobility distribution among all modes of transportation. Due to Charleston's compact, urban downtown and walkable streets, current estimates of resident mode split are relatively impressive. Over 67% of Charleston residents have less than a 20 minute commute to work, however 63.5% drove (vs. 31.4% took public transit, walked or bikes) Nevertheless, given the constraints of Peninsular Charleston, it is necessary to achieve an extraordinary urban split among modes in order to maintain quality of life and enable economic development in the 8.45 sq miles. Below are the recommended proportions among primary trip types:

	2009	2012	3 yr. Difference	2024	10 yr. Difference
Personal vehicle	66.9%	63.5%	-5.1%	46%	-27.1%
Public/common transit (with trolley)	7.5%	6.6%	-12.0%	12%	81.8%
Bike	4.4%	7.1%	61.4%	12%	69.0%
Walk	15.7%	17.7%	12.7%	23%	29.9%
Other	0.8%	0.9%	12.5%	0.9%	0.0%
Worked at Home	4.7%	4.2%	-10.6%	6%	38.1%
	100.0%	100.0%		100.0%	

City of Charleston Census Commute Data

Census Block Groups on the Peninsula

5-Year Data Period	2008-2012		2007-2011		2006-2010		2005-2009	
Total Population								
Total Population	35,778		35,908		34,909		34,351	
Population Density (per sq. mile)								
Total Population	35,778		35,908		34,909		34,351	
Population Density (per sq. mile)	4,235.6		4,251.0		4,132.7		3,934.5	
Area (Land)	8.45		8.45		8.45		8.73	
Means Of Transportation To Work For Workers 16 Years And Over								
Workers 16 Years and over:	15,535		15,507		15,587		15,187	
Car, truck, or van	9,859	63.5%	9,969	64.3%	10,215	65.5%	10,158	66.9%
Drove Alone	8,734	56.2%	8,915	57.5%	9,005	57.8%	8,897	58.6%
Carpooled	1,125	7.2%	1,054	6.8%	1,210	7.8%	1,261	8.3%
Public transportation (Includes Taxicab)	1,023	6.6%	1,243	8.0%	1,273	8.2%	1,136	7.5%
Motorcycle	57	0.4%	3	0.0%	0	0.0%	0	0.0%
Bicycle	1,107	7.1%	911	5.9%	849	5.5%	668	4.4%
Walked	2,753	17.7%	2,531	16.3%	2,498	16.0%	2,380	15.7%
Other means	86	0.6%	137	0.9%	133	0.9%	135	0.9%
Worked at home	650	4.2%	713	4.6%	619	4.0%	710	4.7%
Travel Time To Work For Workers 16 Years And Over								
Workers 16 Years and over:	15,535		15,507		15,587		15,187	
Did not work at home:	14,885	95.8%	14,794	95.4%	14,968	96.0%	14,477	95.3%
Less than 10 minutes	3,813	24.5%	3,824	24.7%	3,702	23.8%	3,901	25.7%
10 to 19 minutes	6,640	42.7%	6,219	40.1%	6,298	40.4%	5,937	39.1%
20 to 29 minutes	2,500	16.1%	2,682	17.3%	2,769	17.8%	2,769	18.2%
30 to 39 minutes	1,054	6.8%	1,143	7.4%	1,275	8.2%	1,055	7.0%
40 to 59 minutes	434	2.8%	394	2.5%	432	2.8%	374	2.5%
60 to 89 minutes	159	1.0%	193	1.2%	185	1.2%	132	0.9%
90 or More minutes	285	1.8%	339	2.2%	307	2.0%	309	2.0%
Worked at home	650	4.2%	713	4.6%	619	4.0%	710	4.7%

ACS (5-Year Estimates), U.S. Census Bureau

B. BACKGROUND

Several of Charleston's community leaders, including Charleston Mayor Joseph P. Riley, Jr., Tim Keane, Director of Planning, Preservation and Sustainability, and The Historic Charleston Foundation have come together to address the pressing current mobility issues, and to put together a vision for the next 10 years for The Peninsula, which is roughly 1/3 of the 128,000 population of the City of Charleston. The Peninsula is the physical and cultural center of the Charleston region, the historical center of the state, the intermodal center of the region, and the tourist draw for the Charleston area. The southern portion of the peninsula houses the College of Charleston, the historic district, the Medical University of South Carolina campus and much of the retail commerce in the area. The south side of the Peninsula has particularly narrow streets (24-32 feet) with Meeting Street the widest at 42 feet. This limits the throughput for motor vehicle traffic as well as options for transit and bicycle facilities on-street. Pedestrian facilities are relatively robust and public space is utilized well for business and park space. The northern peninsula, particularly the eastern side, is ripe for high density, mixed-use development, and affordable housing. This is the perfect environment to encourage workers to live on the Peninsula vs. commuting, and is also a premium transit link to bridge the gap between north and south.

Advantages: Charleston, and the Peninsula in particular as the core, is seeing a renaissance, with skyrocketing housing values, booming tourism, and a robust technology incubator which began a decade ago. Additionally, the quality of life in the Peninsula in Charleston is very high with cultural venues, historic architecture that's second to none, and a nationally renowned food and drink scene. Located on the water, it has

nearby beaches, and is temperate 9 months out of the year. The walking and biking numbers are solid and attributable to the fact that the Peninsula is flat and manageable, which is a solid base to build upon. The region also benefits from SC's Right to Work laws, major employers like BMW and Boeing to located nearby, as well as the 2 Peninsula ports and nearby airport. Mayor Riley is a nationally renowned Mayor, founder of the Mayor's Institute on City Design (MICD), and a revered figure on the national scene known for balancing the needs of residents, tourists, business, and particularly high quality of life.

Disadvantages: The mobility options have not kept up with the growth in all areas. This is particularly apparent with the tension between residents and the growth in tourism. While many of the amenities that have made the Peninsula such a destination for both groups are due to tourism, many feel that the tourists are lowering the quality of life and are the primary cause of vehicular congestion. Ironically, there are 35,000 residents now compared to 70,000 in 1940. However in that era the streetcars still ran and the majority of people did not drive cars.

C. THE PRESCRIPTION:

There is a general awareness of the congestion problem, but like many car-focused regions, there is no understanding of the underlying causes nor what it will take to alleviate the congestion. Growing cities have successfully reduced congestion by offering more mobility options (both public and private) and increasing infill development and density.

This is counter-intuitive to many on the surface, but proven out consistently with data. With proper vision and strategy, communication and education, as well as presentation of attractive options, Charleston can successfully reduce traffic congestion while maintaining its present quality of life. In other words, I believe we can communicate a win-win-win strategy for residents, businesses, and tourism, that is also very achievable. To accomplish this, Charleston leadership will need to do the following:

1. Lay out an overarching vision for the Peninsula that goes beyond "congestion and parking" but rather focuses on economic growth, health, livability, and public safety. This can either tie into a larger vision or stand on its own.

2. Have short-term, medium, and long-term strategies for implementation.

a. Short-term: This is intended to show progress and physical changes on the street. To test the concept, inexpensive pilot programs could be used to innovate, letting the public know that these are trials that they are invited to participate in and also to give valuable feedback. Examples would be bike facilities, parklets, pay-by-phone parking etc.

b. Medium-term: Public-private projects like bike share, private bus service and overhauling the parking system can be done relatively quickly, ideally in the next 12 months. Planning for larger projects can also kickoff.

c. Long-term: These projects may have multiple phases, like a trolley, circulator bus routes or a light rail system.

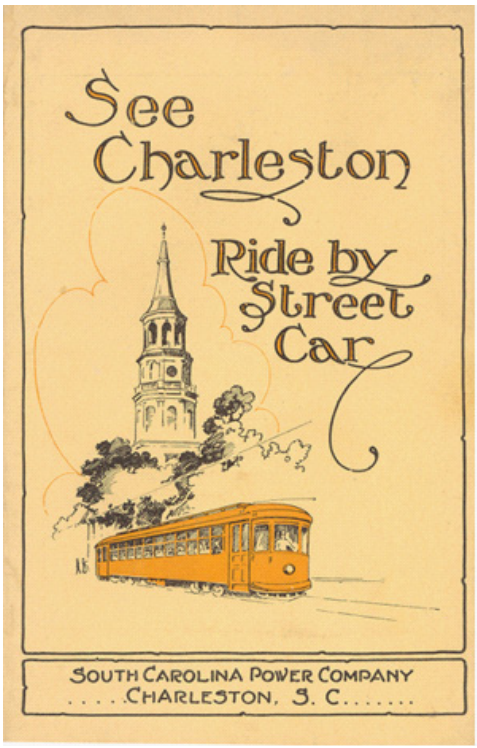
II. 2-10 YEAR RECOMMENDATIONS

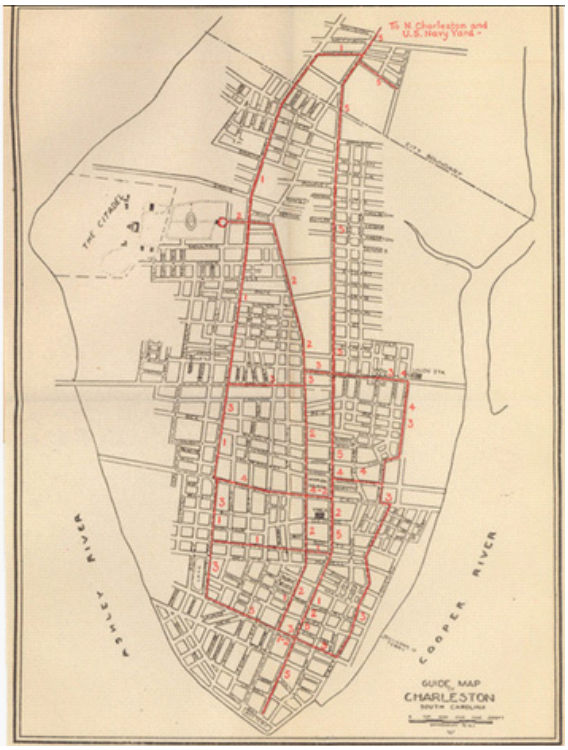
A. TRANSIT AND TOURISM

To be successful over the next 20 years, Charleston will need to move towards providing increased transit services, the core services that that only government might invest in, which will stimulate development and allow feeder type services to then piggyback onto them. Beyond the backbone, many cities will move to public private partnerships for secondary and soft services like local bus, bikeshare, rideshare etc. Right now Charleston does not really have this backbone service and is in the same boat as many cities in the south, and at its scale (Nashville, Charlotte, Austin etc.). There is existing DASH bus service running from 9am-6pm every 15 minutes on the Peninsula but it is used primarily by tourists, although more locals are using it since the service became free a few years ago. There are also regional busses that serve people daily coming to jobs in the Peninsula, however, much more are needed.

1. Bring Back the Trolley System

The Charleston Peninsula had a reasonably robust streetcar/trolley system up to the 1940's, providing residents and visitors car-free access to the Peninsula. Rutledge, King, Meeting all provided North/South access. Calhoun, Broad and many other East/West streets had streetcars and it should be noted that Meeting extended South of Broad. The port was also served by the "3" and the "4" line.





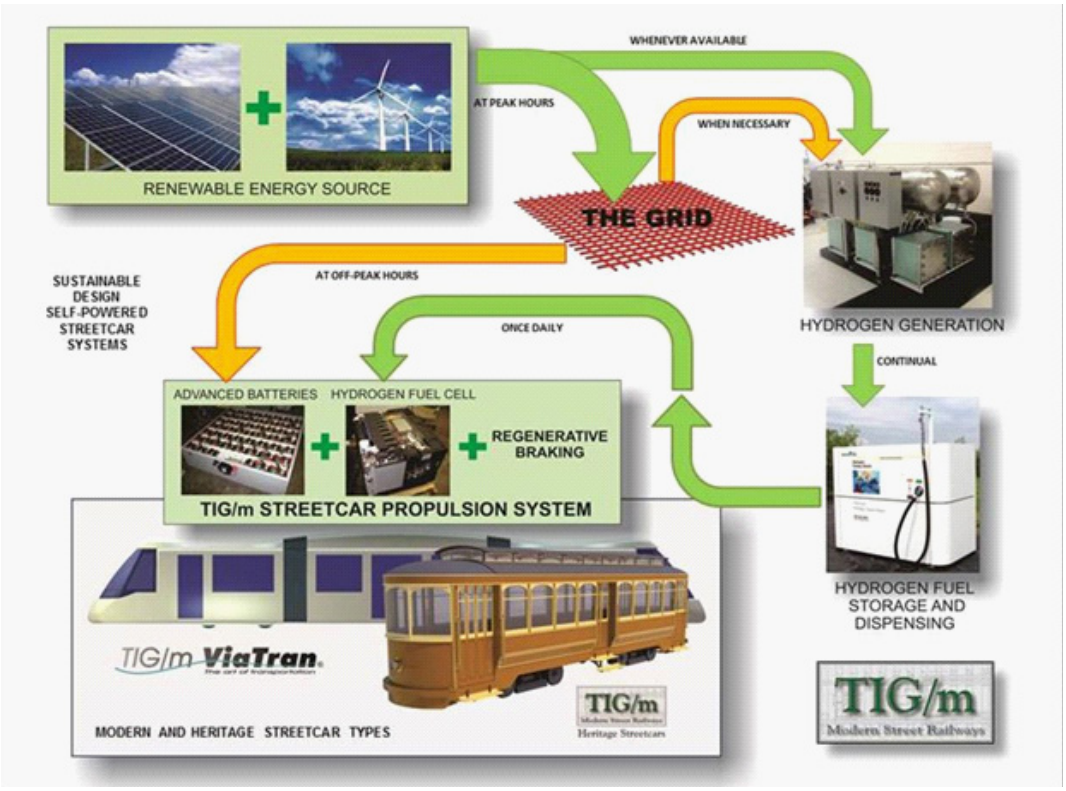
Reference: http://lcdl.library.cofc.edu/lcdl/catalog/lcdl:26568

Bringing a trolley/streetcar system back to the Peninsula could provide the basic backbone that is sorely needed, and would also celebrate the historical aspects of the city.

With modern technology, expensive substations and overhead catenary wiring would likely not be necessary.

1. Utilize the Railroad Right of Way: There is an abandoned rail and associated right of way that appeared to be in excellent condition extending from Mt. Pleasant down to Spring Street. It is owned by Norfolk Southern and abandoned so future use would need to be negotiated This ROW could serve Mt. Pleasant Street to the John Street. The southern terminus is at the current site of the Visitor Center, which is, ironically, a small trolley museum. Once at John Street, a phase-2 line could extend down King or Meeting on-street as it did originally.

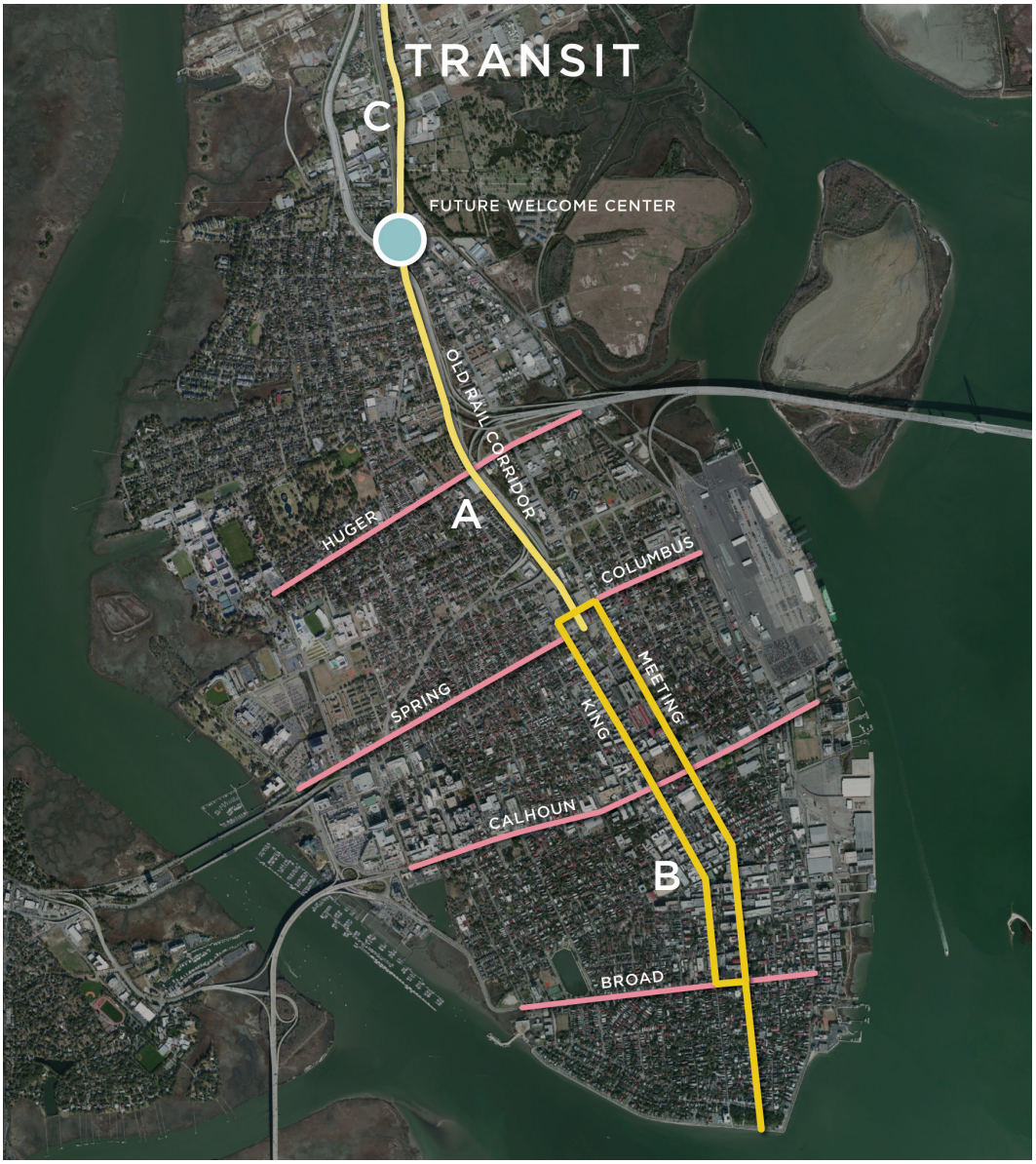
2. Technology: There is a company named Tig/M that is now building solar powered, modern or heritage vehicle, streetcar systems that can run on any standard rail. This dramatically lowers the cost of a system and can speed up implementation time dramatically. Aruba has employed one of these systems. Additional technology to be explored would be traffic signal prioritization for the streetcar at signalized intersections, giving priority to transit



Scope and Phases

A preliminary investigation has been conducted with an expert from NY who has designed a like system in Aruba, which is built and fully operational. He visited Charleston and his early assessment is that it is very plausible and a good fit for the city. A feasibility analysis for the project could be developed into a larger mobility plan for the city. The streetcar project may entail 3 or 4 phases itself, while tangential projects around the Tourism center and satellite parking could be put into place independently. Mixed traffic vs. dedicated right of way: The original Charleston streetcar system oper-

ated in mixed traffic, but of course there was not a lot of vehicular traffic in the early part of the 20th century. There are several options, but obviously dedicated lanes are considerably more efficient in terms of travel times. This is a combination of having the right of way exclusively for the streetcar's vehicle use, and not being blocked in by illegally parked vehicles etc.

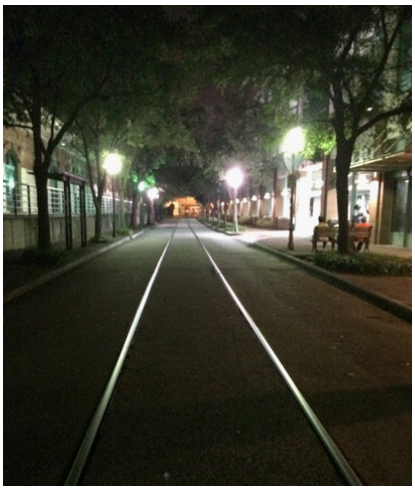


Phase A streetcar line would utilize the existing heavy-rail ROW from Mt Pleasant to Spring Street.

Phase B would likely be an extension and possibly a loop on Meeting or King Street down to the border of the historic District. If a one way loop is utilized, less right of way will be needed (even though it could operate in mixed traffic, and would likely use King and Meeting Streets from Spring Street (or maybe Columbus) to Broad Street.

Phase C would run on the boulevard system to the airport, likely in shared lanes, but they could be dedicated alternatively. These trains would run at 50+ mph and cut traffic dramatically from the airport to the city.

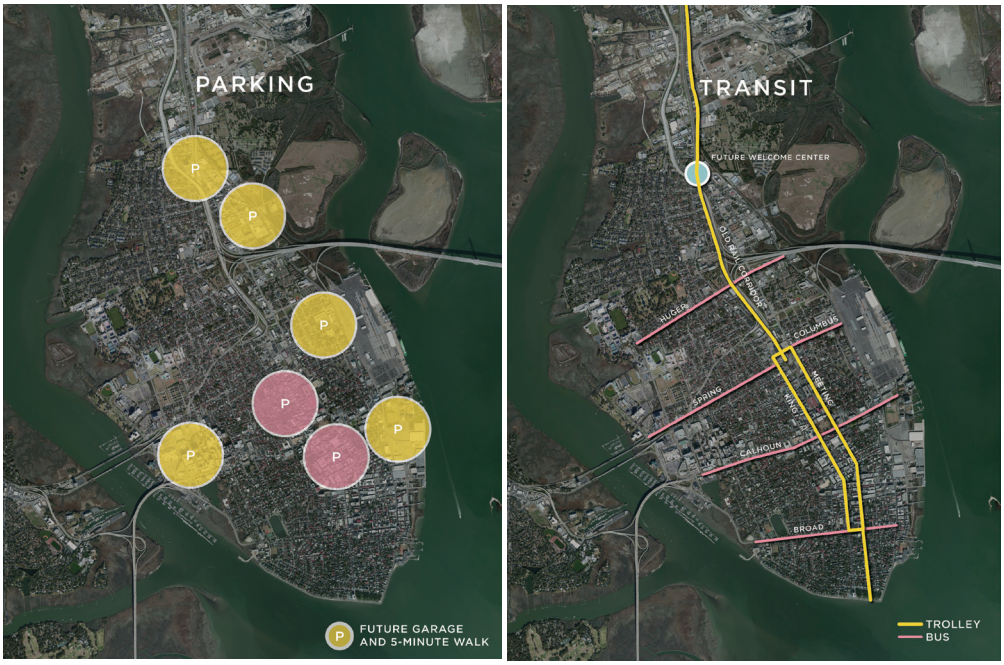
Above: The existing rail line north of Line Street



Above: The existing rail line north of Line Street

2. Tourism/Welcome Center

The city has a nice tourism center that at one time was at the edge of much of the development in the Peninsula. As time has passed, as in most cities, development has spread, and the tourism center is now at what will likely be the future center of the city instead of the edge. It would be beneficial to redevelop the current site of the tourism center, which is prime real estate, using the proceeds to fund a good portion of a new tourism center and parking facility. This would allow people to leave their cars and transfer to other modes of mobility when they visit. The ideal site for this new center would be near the I-26 & Morrison Drive intersection. This is the edge of the historic city and a location with substantial opportunity for redevelopment. Additionally, if tourists are encouraged to leave their cars, and until the streetcar runs to the airport, it would be convenient to have the tourism center and satellite parking facility at the confluence of, and exit from the major highways.



3. Traffic Management and Satellite Parking

As much as possible, municipal off-street parking can be consolidated into a number of facilities that then provide 5 min +/- walking to the majority of high-traffic destinations on the Peninsula. The Planning Department has been working on this for a while. Municipal parking should be used strategically to further economic development and growth in the Upper Peninsula.

4. Airport Options

The airport is many people's first interaction with Charleston. In the longer term, we hope to provide transit service from the airport, but in the shorter term there are ways to promote alternatives to driving in, and to provide better service options. Recommendations:

- Physically place transit, shuttles, and even shared taxi on equal footing with car rental and parking vs, placing transit outdoors with a "hut" and a sidewalk to sit on. This sends a clear message of priority.
- Shuttle services & transit should be promoted on the existing tourism website and the future TDM website. The majority of tourists now preplan trips on the web.
- The visitors website has a "getting here" tab which could be better promoted. http://www.charlestoncvb.com/visitors/tripplanner/travel_support~4/getting_here~40/
- Private shuttle services operate in Charleston like MP Shuttle that can also be promoted in the above venues.
- Shared taxi apps, or facilitation at the airport should be adopted.

Existing Bus Pickup

5. Historic Charleston

Historic Charleston is a national treasure and is beautiful to behold. Restoring the trolley to the historic district south of Broad Street, and considering a ban on motorized through traffic except for residents and workers in the area could help restore the historic character of this city that was not built for the car in the first place. An alternative could be a compromise limiting vehicles in the core vs. perimeter of the Historic section. This would all be subject to the local residents supporting the idea.

Once again people could walk and bike in the streets, children could play. Speed limits could be set to 15 mph to assure safety for all users of the space. The trolley, horse drawn carriage, bikeshare, and walking would be the modes of choice for visitors.

B. PARKING AND TRANSPORTATION MANAGEMENT

1. TDM: Transportation Demand Management

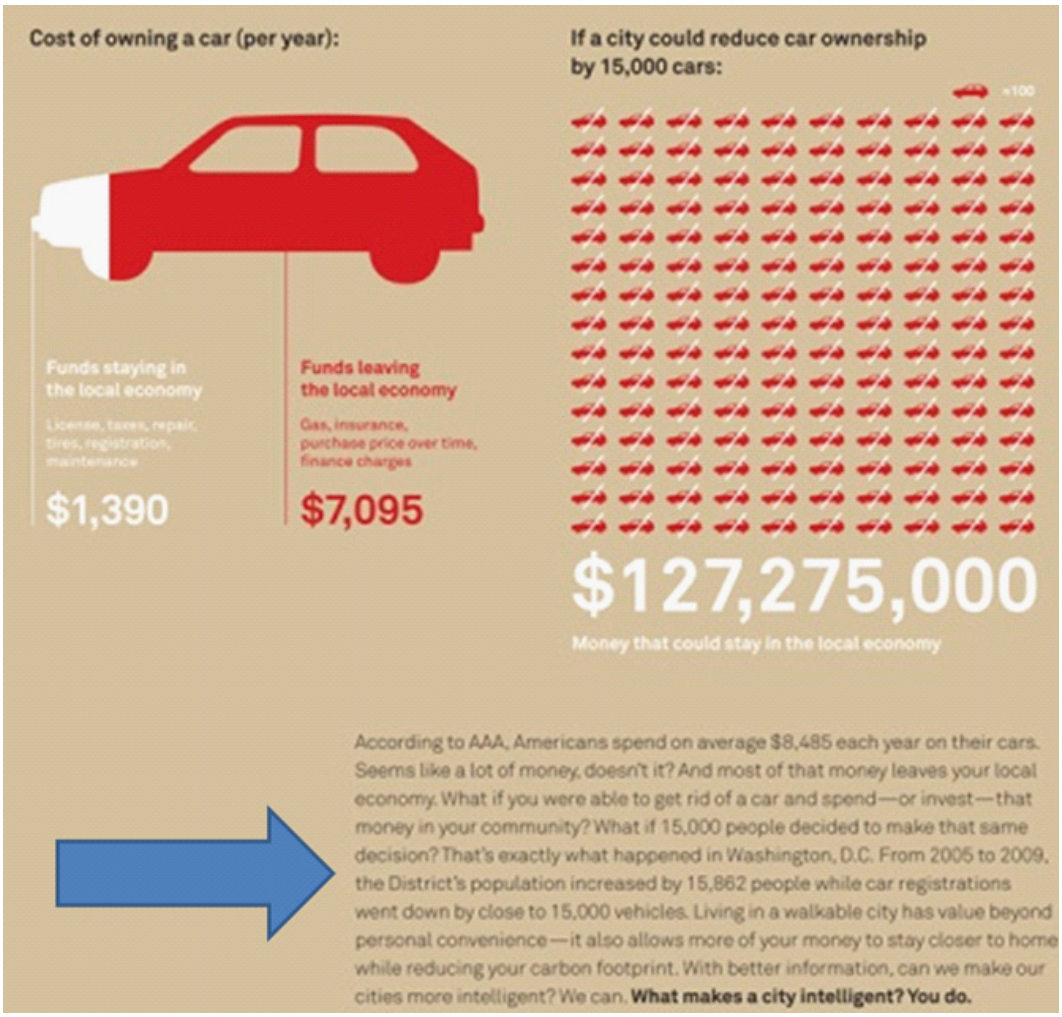
Charleston will need a marketing and outreach program as new options are rolling out. Also, a long term strategy for cities of all sizes should be to promote alternatives to single occupancy car use. Some models for these services would be Arlington County Virginia http://www.arlingtontransportationpartners.com/ which has been a national leader over the last 20+ years. With a family of services, websites, policies and regulations that have resulted in Arlington increasing population and office space dramatically, and cutting congestion 15%-30%, Arlington is a great example of how effective policy planning and implementation can be. This article tells the story: http://www.salon.com/2014/07/06/the_suburb_of_the_future_is_here/

Washington DC co-opted their services with the www.godcgo.com program and it has been very successful as part of a strategy to provide as many “layers” of services to the public and educate them as to the who, what, where, why, and when to use them, as well as how the different modal options mesh together. Promoting public and private options, and providing residents, businesses, tourists and freight companies information is absolutely key in today’s environment.

When bikesharing comes to the Peninsula, a Transportation Demand Management (TDM) team can be responsible for marketing the service to all users.

TDM is also important as a policy focused arm, as another set of eyes looking at zoning policy, credits developer incentives and so on. Expectations for developers to limit parking, provide parking for carsharing, purchase bikeshare stations, and to spend money on pedestrian improvements around their projects are all important aspects of TDM.

In Washington D.C. the success has been through a combination of expanded options, land-use density and many different marketing and TDM efforts which has resulted in increased population and decreased automobile registrations and use:



2. Parking

There are many different aspects of the parking situation to look at, particularly tourist satellite parking, residential parking, visitor paid parking, bus and oversize vehicle parking, and institutional parking. There needs to be an understanding that the more parking that gets built, the more congestion will be created. For some people, this is counter-intuitive, believing that if you don't build parking you will flood the streets with circling cars. This is not what happens, as policies that provide other options, and discourage car use will themselves bring about the desired change.. For example in many cities there are agreements with the universities that underclassmen are not allowed to bring cars to campus. This is a simple policy that discourages congestion, competition amongst students for the "coolest car," drunk driving by underage students, and gives these new residents to Charleston the experience of living, working, playing on the Peninsula without a car. A car sharing company like Zipcar will be happy to come to Charleston and fill the gap with 10-20 shared-use cars for students who want to pack in a SUV and go grocery shopping, go to Ikea, or an occasional off-the-peninsula date. Not surprisingly, most of them never get a car.

The Hospitals

The hospitals are expanding and additional parking will be needed, but alternatives to parking on the Peninsula should be considered. A shuttle connecting off Peninsula parking to the medical center or a new dedicated bus system partially financed by the hospitals are possible options.

Residential Parking

Residential parking is complex, but the City has a long-standing customized residential parking program. A progressive registration fee, or excise tax on additional vehicles to one address has proven to work well. For example, the first registration is $100 and the 2nd is $300, and the 3rd is $700. People should be allowed to have vehicles, but in a tight space, hoarding vehicles, and parking them on the street should be discouraged ideally. In the Historic District, South-of-Broad, there have been requests for "resident only" parking. The difficulty in achieving this lies in the existing lack of alternative parking and transportation. Resident only parking could be considered as a viable option once better alternatives are in place. In the meantime, shorter parking durations for non-residents should be considered.

Oversized Vehicles

Tour busses and other oversized vehicles can be necessary, but due to the generally narrow streets of downtown Charleston, this is therefore a safety issue for pedestrians, cyclists and drivers. The trend which large cities are now employing for areas such as this is very large delivery trucks (more than 2 axles) in a downtown being limited to off-peak hours, typically 3am-7am and possibly late morning or early afternoon where bars are present. Tour busses ideally would drop visitors at the edge of the central core and allow them to walk, bike to see attractions (see Visitors Center section). In this situation they would likely never go south of Calhoun. Tour busses should also pay a fee to travel in the Peninsula and the same goes for oversize or overweight vehicles. These permits would typically be paid for online.

New Parking Facilities

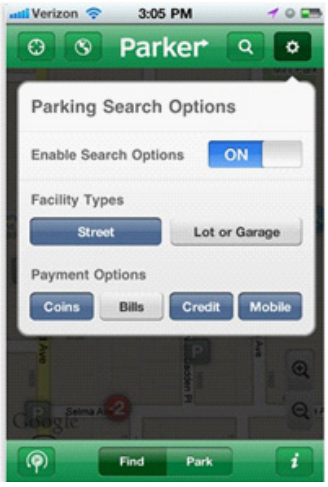
It is time to address the new normal of parking garages. New modes transportation would effectively cause parking garages to be very lightly utilized with the exponential changes we are seeing in technology over the next few years; with autonomous vehicles coming to market this decade reducing parking need by up to 80% over the next 10-15 years, and the rapid re-urbanization and density of cities, and Millennial trends away from car ownership to sharing if they use a car at all. Developers know that providing parking is costly and would welcome city imposed parking maximums that limit required parking spaces. Considering the trends and the need to reduce street congestion, forward thinking policies mandating parking maximums instead of minimums could be highly effective.

Existing Parking Garages and Curbside Parking

Based on research and observation, metered parking seems to be $1 per hour and maxes out at $16/day. Inexpensive parking sends a clear message to the public and visitors to "drive your car." Parking is one of the key "congestion pricing" drivers that cities have in their arsenal to encourage alternate modes. To be honest, even taking it to $2 is not likely going to discourage parking, but it will bring in more revenue to the coffers to fund projects. Later on you can further increase rates in an effort to discourage driving

when we have other alternatives like trolley service, private bus or point to point car share for instance. What will need to happen prior to raising rates is to improve the technology used curbside, and ideally in garages too. My recommendations are: Once alternative transportation has been introduced , several parking payment measures could be implimented:

- A pay by phone system turned on citywide for all users.
- New meter stock in the core, either multi-space, or IPS replacement (or like meters.
- The systems should "talk" to each other in real time.
- Outside of the core, consider just pay by phone vs. street infrastructure, i.e. sensors that allow tracking of spaces, utilization and data collection.
- Much of this qualifies for CMAQ funding as congestion mitigation.



Above: Street sensor
Right: Parking App

Above left: Existing parking meters
Above center and right: New solar, networked "smart" head

C. PEDESTRIAN AND BICYCLE IMPROVEMENTS

1. Pedestrian Improvements

Overall, the feel on the Peninsula is relatively pedestrian friendly. Good continental crosswalks, pretty slate, and relatively wide berths in many areas mirror the way the city was laid out hundreds of years ago. Allowing bikes on the sidewalks is not ideal, and from an ADA standpoint there are some issues with the uneven slate panels etc. but overall, it is sufficient.. However, when you leave downtown, the sidewalk network can use improvement.

There are some intersections that are very high traffic, like St. Phillip and Calhoun, Coming and Calhoun that could be ideal candidates for a "Barnes Dance", or modified all-red signal pattern. This would allow pedestrians to cross in all directions including diagonally and flush the intersection so that cars don't conflict as much. Eliminating right on red at these intersections would also make them more pedestrian friendly. The Southside of Market Street could be shut to car traffic at particular times, something also know as "Flex Streets."

Traffic calming is another important strategy to make a place not just feel safe, but to actually be safer. Speed bumps are just one of many kinds of traffic calming methods that can be effectively and easily employed. There are over 20 standard types which range from traffic circles to "bump outs" to bollards. Here is an example guide from San Jose, CA on the Federal DOT website: http://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa09028/resources/Traffic%20Calming%20Toolkit%20San%20Jose.pdf

Chicago became very passionate about "visual/variable messaging signage" or "VMS" which could communicate with citizens their speed in real-time (speed indicator signage) based on radar embedded in the sign, flash at them like a camera at certain speeds, and even dish up specific messaging based on their speed. These signs are being deployed around parks and schools to extend the reach of the automated enforcement system (speed and red-light) which is also another example of traffic calming. They are solar powered, cloud-based and can be installed and maintained by a contractor in a fixed or mobile format. These can be networked and remotely changed in a moment for an amber alert, emergency, or change in traffic patterns for an accident or major event. Additionally they can provide real-time "way finding" for motorists and visiting motorists in particular. "Multifunctional" and "networked," make these signs highly functional.

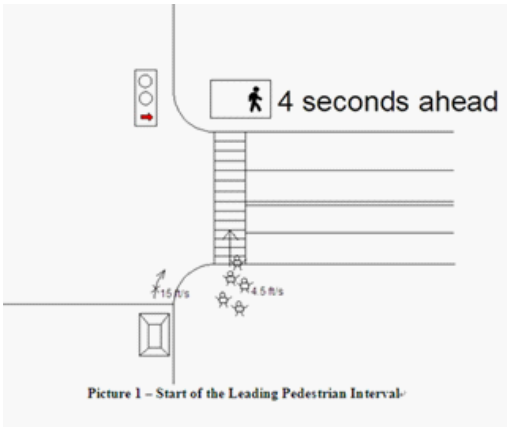
Data Collection

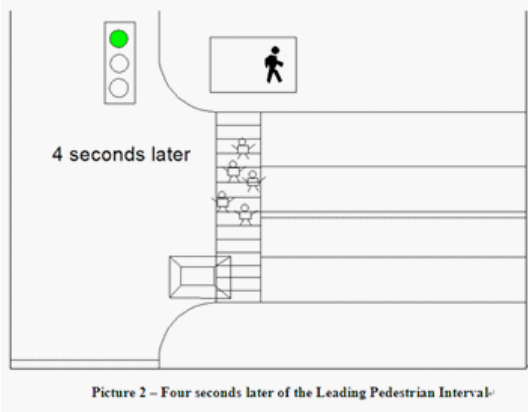
The other great feature of the newest generation of signage is that it can constantly be gathering data on average daily traffic counts via radar. This is helpful in planning for road improvements, tracking average speeds for safety, and even breaking down how many large trucks vs. automobiles are on the routes.

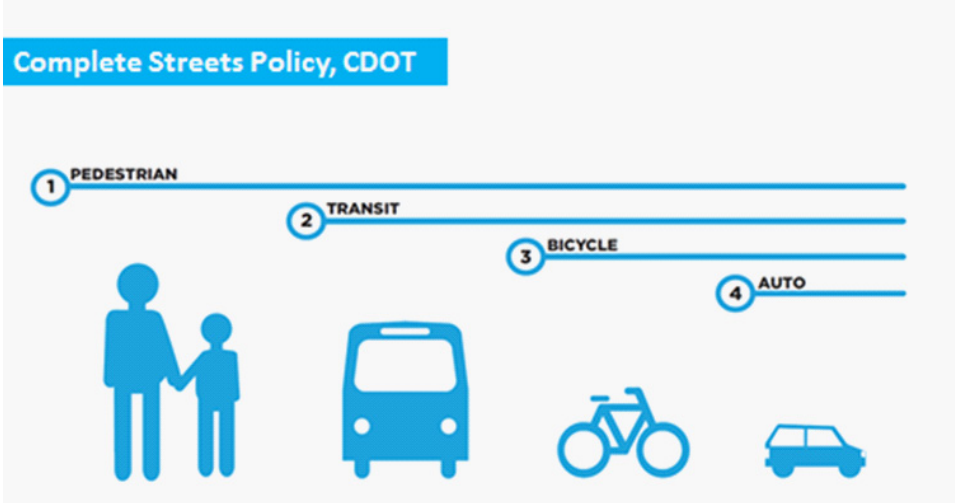
Short term, Rapid/Pilot improvements:

In-street signage are very inexpensive (<$300) and high impact at uncontrolled cross-walks. They also are very visual yet unobtrusive, and send a clear message to drivers that pedestrians have the right of way. They have been very effective in reducing speeds and encouraging compliance with pedestrian priority in DC and Chicago during post-placement.

Leading pedestrian intervals: A 3-5 second lead for the pedestrians on the traffic light indicator is helpful particularly for older and very young pedestrians. Also, additional signal heads can be utilized and a bike-indicator can be created so that cyclists benefit from the same LPI.







Always prioritize the pedestrian, the most vulnerable user of the system

2. Bicycle Improvements

Bicycles are an important component for reducing car congestion on the Peninsula. The City could implement bicycle promotion strategies to both tourists and College of Charleston students, as well as local residents. Bike-friendly traffic policies combined with a robust bike-share program and Charleston's natural temperate weather should increase bicycle ridership substantially.

Mode share Goal

The goal to increase mode share should begin on the Peninsula and expand outward as popularity increases. Charleston is currently at 3.0% and ranks 208th in the world for bicycle mode share (based on only one year of counting – 2010). While this might seem low, this is very respectable for a U.S. city with limited infrastructure and no bike share system as of yet. To put this in perspective, it is on par with Paris, France. This means that there is a rich market for cycling as transportation in Charleston. Source: http://www.cityclock.org/urban-cycling-mode-share/

On the Peninsula, with the right changes, we could hit high single digits to 10% mode share for over the next 10 years. Goals should be incremental and supported. For instance, if the City wants to increase bicycle ridership near the Medical Center, more bike racks should be installed there, with the size relative to the amount of desired increase. Sponsorship of both the bike racks and the bike share program could be introduced, and the City should take advantage of the Federal program which covers up to 80% of capital investment.

Recommendations

I have the following: Bikeshare is coming to the Peninsula which is wonderful. It needs to be much bigger or it will be viewed by locals as a "tourist thing." We want it to be a university thing, a locals thing, a white and a black thing, and for young and old. To do that we need to put it in everyone's neighborhood, and origin and destination. So if you want it to be used for work commutes then put it by people's homes, where it is most dense. Want people to take it to the Medical Center? Then put a large rack there. It's ok to phase the launch. 20 in Spring, 20 more stations in Fall, 20 more next Spring, but have it planned out and ordered by priority. Keep the excitement building by making a living, growing system. Also, at a bigger scale you will get more revenue as well as sponsors and advertisers if you are bigger. Federal funds can cover up to 80% of the capital investment and its dirt cheap compared to any other form of transit.

Bike Lanes

There needs to be some aggressive, safe and separated facilities put in on the major ingress/egress from the Peninsula. Ideally one should be able to commute by bike inter, or intra-Peninsula. It is also a big statement to put in a protected facility on a major thoroughfare for existing and new residents and businesses. It says "Charleston is progressive, open for business, open to younger people and their needs." Also, it tells empty-nesters looking to move to a safe, simple place that the city looks out for slower moving folks safety. Last, it's a signal to families that you are looking out for their children and their safety. Businesses need to understand that enhanced bike safety and improved public spaces are good for business!

3. Public Space Innovation

Charleston has quaint small streets, the market district, & alleys that showcase the historic architecture, and nooks & crannies that make an old city so fascinating. The City needs to encourage pedestrian and bicycle traffic by creating as much walkable, car-free/ light space as possible. Here are a few examples:

Above: Pedestrian spaces in Union Square, NYC

Above: The Make Way for People program in Chicago empowers the private sector to improve public spaces

Above: Here is an amazing little beach right on the Peninsula.. There is not access, or a way for people to enjoy it. Could this be an amenity if sand was trucked in and access was enabled?

4. Wayfinding

Wayfinding can be simple, fun, reflective of the culture of a place. The easier we make it for visitors to get around, the more they will feel comfortable leaving their car at the hotel or the visitors center. There is also Heritage or Cultural Trail designations that encourage people to take walking tours of various parts of a city and learn as they see it at human scale. The Visitor's Center could be a key promoter, but promotion should be continued on the Peninsula as well.

http://www.culturaltourismdc.org/portal/neighborhood-heritage-trails

D. ADDITIONAL RECOMMENDATIONS

1. Financing

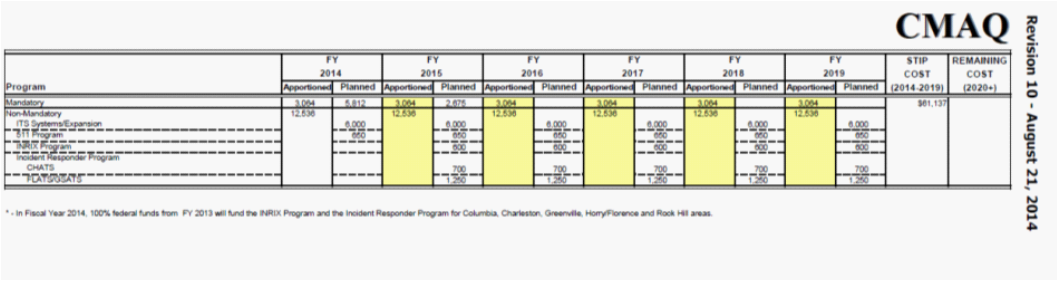
The City, and the Transportation Department have assets that can be converted to cash for higher and better uses. Please read the article "The Easy Way to Fix Your Transportation System" following this report to get a sense of how and why this technique should be employed. Another source of revenue to be considered are the current parking rates. With a change in parking rates, additional revenue can help finance some of the recommended changes.

Bus Shelters are another asset that along with the bus system needs improvement, and sponsorship can greatly help defer the costs. Washington and Chicago have very large contracts with major companies, Clear Channel is one that currently operates here in the Lowcountry, that provide the cities yearly payments with balloon payments at certain milestones. These are typically 10-15 year contracts. If you go beyond the Peninsula and look to contract the entire city, upgrade the shelters dramatically and expand service, there is potential for revenue that could help to provide the upgraded service.

CMAQ

Currently, South Carolina is not utilizing the CMAQ apportionment allocated by the Federal government. These are Federal funds that require a 20% match. CMAQ has been successfully used in Chicago and Washington DC for many projects including bikesharing programs, pedestrian improvements, signalization upgrades and bridge improvements for transit, cycling and walking. The State Improvement Program details can be found here:
http://www.dot.state.sc.us/inside/pdfs/stip/stip.pdf

For the 6 years ending 2019, they have $64,020,000 planned for spending vs. $93,600,000 apportioned. The program appears to have $9.2m as a placeholder for the out years, starting in 2016. Charleston qualifies for CMAQ along with a few other jurisdictions in SC. This is a competitive source of capital that the regional metropolitan planning organization can allocate. If Charleston clearly demonstrates the need for additional funds, they may be allocated. The state has a placeholder for $6,000,000 allocated to ITS, or intelligent transportation systems; which is generally signal upgrades and back office tech improvements. It can also include digital signage as outlined previously. According to the information found here: http://www.scdot.org/inside/pdfs/PublicHearings/SC160_handout.pdf, there is $3,200,000 allocated to mandatory programs. Chicago and Washington DC used these funds for transit, bike and pedestrian improvements generally. Page 151 shows the breakdown of spending for the state There is potential for Charleston to receive additional funds from this program.



CMAQ

Program	FY 2014		FY 2015		FY 2016		FY 2017		FY 2018		FY 2019		STIP COST (2014-2019)	REMAINING COST (2020+)
	Apportioned	Planned	Apportioned	Planned	Apportioned	Planned	Apportioned	Planned	Apportioned	Planned	Apportioned	Planned		
Mandatory	3,094	5,812	3,094	2,875	3,094		3,094		3,094		3,094		981,137	
Non-Mandatory	12,536		12,536		12,536		12,536		12,536		12,536			
ITS Systems/Expansion		6,000		6,000		6,000		6,000		6,000		6,000		
SIT Program		650		650		650		650		650		650		
INRIX Program		600		600		600		600		600		600		
Incident Responder Program														
CHATS		700		700		700		700		700		700		
*CAT/GUSATS		1,250		1,250		1,250		1,250		1,250		1,250		

* - In Fiscal Year 2014, 100% federal funds from FY 2013 will fund the INRIX Program and the Incident Responder Program for Columbia, Charleston, Greenville, Horry/Florence and Rock Hill areas.

Revision 10 - August 21, 2014

2. Bus Service

There is regional bus service, Charleston Area Regional Transportation Authority, that is well utilized to bring people to and from the Peninsula. CARTA also operates routes on the Peninsula and the free trolley service, Downtown Area Shuttle.

Although the DASH trolley does a good job of moving tourists around the Peninsula, most locals consider it for tourists only and do no use it. The City should develop expanded DASH routes and promote them to the residents, while at the same time, work with CARTA for more options based on population growth and destination trends. Since DASH service has become a free one more residents are walking longer distances to get the free service. The City and CARTA should now have one Peninsula-centric bus service for residents and visitors alike rather than having two services; one for tourists and one for residents.

3. Trip Studies

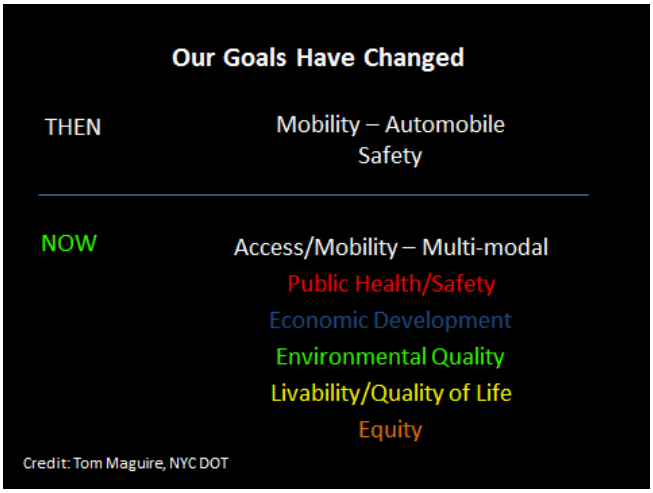
Charleston needs to develop a database on visitors, origin and destination to make intelligent decisions on any routing changes. If trip studies have not been done I suggest putting this in motion to be able to plan regionally and locally in the Peninsula.

4. Private Demand-Based Bus Service

An alternative to buses, trollies and taxis are private, next-generation transportation services. These use big-data and technology enabled applications to create a low-friction smart-bus system that is a cross between a taxi and a traditional fixed route bus. Utilizing smaller format Sprinter busses and charging somewhere around $4/trip, they provide a service to fill the gap between the higher cost, higher flexibility option of one's own car or taxi, and the low cost, lower flexibility of the traditional bus.

5. Reorganization of Transportation Services and Staffing

Transportation departments need to grow beyond a narrow focus of engineering and maintenance to address the future of mobility, in particular, the economy, public health, equity, quality of life and productivity. This reorganization should put the vision and planning function on equal or higher footing than the engineering and maintenance function.



6. Colleges and Medical Center Role

The College, Medical Centers and other large employers (The Port for instance), ideally need to be partners in the Peninsula mobility strategy. For example, it is commonplace in cities for universities to discourage or outright ban automobiles to be brought to school for underclassmen. This is for practical reasons: they don't have the parking facilities for all of the cars, want to encourage students to stay on campus free from distraction, keep newly free young people away from home safe from drinking and driving and so on. There is also the benefit of students spending money in their community vs. driving to big box retailers, and learning to walk, bike and take transit which could stay with them as a habit the rest of their lives. If we give people a car at 18, they will likely have one for a long time.

Using MUSC as an example, the Medical Center is an important facility regionally and needs adequate parking for visitors. If congestion is a concern, or additional parking costly to build, a strategy that looks at satellite parking off of the Peninsula and shuttle busses to the Medical Center could be considered. As part of a larger bus-system revamp this could be an incremental cost that could be borne by the Medical Center vs. bonding to build expensive parking. It would likely be considerably less expensive, provide excellent service for their customers and not risk building a structure that will be outmoded in less than 15 years as autonomous vehicles and service models (like Uber, Gett etc.) displace ownership, and driving.

Summary

Charleston is an amazing city attracting both visitors and new residents. The charm and quality of life which is so attractive also brings traffic and congestion which threaten its character. Providing transportation alternatives and reducing car traffic would help maintain the character while efficiently moving people onto, around and off of the densely-packed Peninsula. There is much to be considered, hopefully, this report will stimulate thought and conversation while providing practical solutions to the problem. Following are several articles which demonstrate the successful implementation of programs in other cities.

ADDENDUM: ARTICLES

Ok, so it's impossible to achieve a perfect commute, let alone build a perfect city mobility system. People in cities do not necessarily agree about what the perfect system would look like, nor do most citizens spend time thinking about what creating this system would actually entail. City residents also have very different mobility needs: they have reached different points in their lives, reflect different cultural backgrounds, live in neighborhoods with multiple street types and land use patterns, and take very different routes to work.

Yet as cities in the 21st century grow again (and are projected to grow at a much faster clip in the next 30 years), everyone from mayors to Department of Transportation commissioners to developers, entrepreneurs, advocates, and activists are trying to figure out the silver bullet to our transportation woes. Is it a streetcar line? A bus rapid transit system? More bike lanes? Allowing ridesharing services to proliferate?

The truth is there's no silver bullet. But cities can still do a better job providing mobility than they do now, and they can start by focusing on the "sticks" and "carrots" of transportation. That means improving alternative transportation options on one hand, and creating disincentives to driving alone on the other.

The Carrots

People often try to engage me in an argument as to whether streetcars or BRT systems are "better," because I pushed both in different cities. Part of me relishes these arguments, and I'll often participate to some degree, but I also find them futile. Cities are complex ecosystems with varying transportation needs that are context-sensitive. Neighborhood type, time of day peaks, age and physical ability of citizen population, mix of retail options available by distance, historical land-use patterns — all these and many other factors influence the urban travel network.

http://www.citylab.com/special-report/future-of-transportation/

I have spent my career thus far trying to provide people with layers of options to choose from, and to lower the friction and costs associated with using the options that "we" want them to use. (The options and the "we" have been slightly different depending on whether I was in the private or public sector, but the same rules apply.) This strategy is incredibly effective in the long-run. When people make their own change, it is more likely to stick, as it has in Washington, D.C., and I think will in time in Chicago.

Of course, like any living breathing organism or ecosystem of organisms, a transport network knows no stasis. By definition it is in constant flux. Did I mention that people generally don't embrace change, particularly when it is forced upon them? This is another reason to put the options in front of people, to entice them with the cost-benefit and ease of use approach, and to let them decide what is best for them at that moment in time. This is the carrot approach.

A great example is the Capital Bikeshare program, which we launched in 2010, overcoming a lot of obstacles including placement issues and funding challenges.

Capital Bikeshare. Image courtesy of Flickr user Elvert Barnes.

Someone has to go out on a limb and say "let's do this," and luckily I had an amazing mayor in Adrian Fenty and city administrator in Dan Tangherlini who embraced the challenge (they also launched the SmartBike DC bike-share pilot, which was a big help). The result was a form of super low-cost, fun, zero-emission, effortless bicycle transport that gives people another great transportation option.

The Sticks

With transportation, as in many facets of a person's life, you have to give people great carrots if you're also going to follow with the equally important behavioral inducement of a stick. I do believe in the importance of using disincentives to stem single-occupancy-vehicle use, but I often come at it from a different mindset than other officials. I like to ask: How can I provide a carrot that adds so much value that people don't mind the stick? Or, put another way, how can you meld the carrot with the stick so it's more palatable?

For example, when we wanted to raise rates and extend parking times in Washington, D.C., it was in the context of a massive upgrade to facilities. People were so sick of crappy 1970s meters, which were often jammed with paper clips and broken when you parked, but (to their chagrin) unjammed and accompanied with a parking ticket when you got back to your car. The DDOT team conducted pilots of eight different meter configurations, as well as street sensors and pay-by-phone systems, so we could see how they functioned in the real world and get public and DDOT employee feedback on how the different systems worked independently and as part of the unified city system. This "participatory government" approach is key to crowd-sourcing the solution and getting people to embrace the change. Also, by running a pilot and getting real-world feedback, we were able to realize a significant return-on-investment for taxpayers.

D.C.'s many broken parking tickets. Photos courtesy (left to right) of Flickr user Daniel Lobo,

After the pilots we replaced our outdated meter stock with low-cost solar powered meters that accepted credit cards and communicated with our servers when they were broken. We integrated a pay-by-phone option that triggered a green light on the meter via wireless for a seamless and effortless customer experience. We upgraded the devices for our traffic enforcement personnel so they would never issue a ticket to a user who had paid. Finally, with industry input, we reconfigured freight parking by lengthening and adjusting placement of loading zones. We also set the stage for next-generation mobile and prepayment via permit options for large companies like FedEx and UPS, which is going live this summer — thereby being useful and friendly to suppliers making deliveries which eliminated a lot of double parking citywide.

So when parking rates went up by 25 to 50 cents here and there and we extended payment hours in the business districts from 6:30 p.m. to 10:30 p.m., it was not so controversial. People were sick and tired of having to carry change, encountering broken meters, and getting unnecessary parking tickets. In some sense we made it both easier and harder to park in Washington, D.C. But parking revenue is up by approximately 60 percent since 2010, turnover is improved for retail, congestion is better, and motor vehicle registrations are down in the District by 6 percent, while the population is growing by 1,100 people per month. That's an example of a stick, enclosed in a carrot, that I consider a win.

The Lessons

So there are a few key lessons to take to heart. The first is that improving transport systems comes down to "change-management" — meaning the way you make the change is as important as the change itself if you want it to have permanence. Another is that in changing the way people move, transportation sticks and carrots should ideally work in harmony, and can often complement each other. Yet another is that services that add value to the city and the customer experience are a great way to bridge the carrot-stick divide, especially compared to just "raising prices," and can also result in much higher revenues. Last, encouraging and facilitating public participation in major transportation decisions via pilot projects is a great way to engage the community and get buy-in for a plan. This isn't a formula for a perfect transportation system, but it's certainly a recipe for a more perfect one than exists today.

This article is part of 'The Future of Transportation,' a CityLab series made possible with support from The Rockefeller Foundation.

Economic Impact & Land Use

HOME SEARCH

The New York Times

BUSINESS DAY

Washington Retail District's Future Rides on Streetcars

By EUGENE L. MEYER APRIL 15, 2014

WASHINGTON — The streetcars stopped running in 1949, replaced by buses. In the wake of the assassination of the Rev. Dr. Martin Luther King Jr. the 1968 riots devastated the commercial corridor. Only in recent years has revitalization occurred and gentrification taken hold.

This summer, if all goes as planned, the return of streetcars after 65 years will be another step forward for the former H Street NE shopping district in the nation's capital.

The return of the trolleys is being hailed by city officials, businesses and developers as a new generator of economic wealth that will more than pay for the first of eight planned and heavily subsidized streetcar lines, eventually extending

Workers tested a new streetcar that will run along the H Street commercial corridor in Washington and, city officials and others hope, drive development.

"District planners are projecting as much as $8 billion in new investment within 10 years of the lines' completion"

The New York Times

9/20/2014 To Lure Bostonians, New 'Pop-Up' Bus Service Learns Riders' Rhythms - NYTimes.com

http://nyti.ms/SvqM3H

U.S.

TO LURE BOSTONIANS, NEW 'POPUP' BUS SERVICE LEARNS RIDERS' RHYTHMS

By KATHARINE Q. SEELYE JUNE 4, 2014

BROOKLINE, Mass. — Katie Pasciucco, 34, an account manager at a software company, is a typical Boston commuter. Her door-to-door trip to work is just 4.5 miles but takes at least 50 maddening minutes.

With no predictable subway schedule available, she usually waits several minutes for a train. It makes numerous stops before she gets off, and then she still has to walk 20 minutes.

And so she leapt at the chance this week to travel a new way — by old fashioned bus.

This new-old method of transport has comfortable seats and Wi-Fi. But its real innovation is in its routing. It is a "pop up" bus service, with routes dictated by millions of bits of data that show where people are and where they need to go. The private service uses chartered buses and is run by a start-up technology company called Bridj.

Bridj enters the Boston market at a tumultuous time for transit services here, where a proliferation of options has intensified the competition for rider dollars. (Boston has the third-highest share of households without cars in the country, after New York and Washington.) Ride-sharing services like Uber, which allow customers to hail cars — and now, even water taxis — on their smartphones, have disrupted Boston's traditional taxi industry, which says that Uber has taken away 30 percent of its business.

Also in the mix is the Massachusetts Bay Transportation Authority, which operates the region's bus and subway system, known as the T. It has just started late-night T service on weekends to meet the growing demand of Boston's large college crowd, odd-hour technology workers and late-night service workers in bars and restaurants.

"It's like the Wild, Wild West right now," said Donna Blythe-Shaw, a spokeswoman for the Boston Taxi Drivers Association. "The T, taxis, Uber, Lyft — have smart app, will travel." She predicted that Bridj would have "some impact," but said it was too soon to say how much.

The transportation authority sees Bridj at this fledgling stage as a complement to the T. "This is not a competitive situation at all," said Joseph Pesaturo, the authority spokesman.

Yet he was quick to note that the city bus fare of $1.50 and subway fare of $2 are much less than Bridj's $6. And the city buses now have real-time smartphone apps that alert riders to arrival times.

But most of those who lined up on Monday for Bridj's first day of beta service, which was free, said that problems with the T had prompted them to try Bridj.

"I'm tired of getting crammed in like a sardine on the train," said J. P. Nahmias, a coworker of Ms. Pasciucco's.

Eva Zhou, a biotech worker, said, "There's never an easy ride on the T, and it's always crowded." As for Bridj's higher fare, she thought the service might qualify for her company's stipend for employees who use alternative transportation.

On Bridj's two maiden trips Monday morning, from Brookline to Boston's financial district and to Kendall Square in Cambridge, the nonstop buses arrived more quickly than the subway.

For Ms. Pasciucco, Bridj shaved 10 minutes off her door-to-door commute. But what she appreciated most was the predictable schedule, allowing her to waste less time and arrive feeling less frazzled.

The brainchild of Matthew George, a 23-year-old entrepreneur, Bridj uses algorithms to make the bus routes "smarter." As more people use it, it will adjust the routes accordingly.

Bridj collects millions of bits of data about people's commutes from Google Earth, Facebook, Foursquare, Twitter, LinkedIn, the census, municipal records and other sources.

"We crunch these millions and millions of data points through a number of algorithms that are existing, or that we're refining, to tell us where people are living and working," Mr. George said. "And through our special sauce, we're able to determine how a city moves."

The system will become so smart, he said, that eventually it will take more people closer to their destinations. He will then swap out the 54-seat motor coaches he now leases for more efficient, smaller vehicles as Bridj expands its routes. Someday, he said, those vans could use automated vehicle technology — becoming driverless vehicles that avoid collisions, get better fuel economy and speed up traffic flow. And this, he said, will help reduce traffic congestion and greenhouse gas emissions.

Although similar technology-driven systems are being tested elsewhere, Bridj claims to be able to apply its data faster to create new routes more quickly.

Mr. George, while a student at Middlebury College in Vermont, was part of a team that built what he says is the nation's largest network of pop-up bus services for college students going home on break. Called BreakShuttle, it has generated about $1 million a year in revenue by serving 15 colleges; it is scheduled to serve about 40 this fall.

His track record with BreakShuttle helped win investors for Bridj. His primary financial backer is Jill Preotle of Boston, an early investor in Zipcar, who said she was drawn to Bridj for its potential, like that of Zipcar, to reduce car ownership and therefore reduce traffic and pollution.

Mr. George is in talks to start Bridj in several other cities, which he declined to identify, by the end of summer. He is also preparing a plan to serve office parks on Route 128, the famous "technology highway" northwest of Boston, where thousands of commuters clog the roads in a bumper-tobumper standstill.

Glen Weisbrod, president of the Economic Development Research Group, a consulting firm in Boston that recently completed a study of traffic congestion in high-growth business clusters like Kendall Square and Route 128, applauded Mr. George for using technology and creativity to address transit issues.

But while Bridj can help incrementally, Mr. Weisbrod said, it cannot solve the fundamental transportation problems of big cities. "Buses can only do so much," he said. "They don't eliminate the need for public investment in large-scale transit systems."

A version of this article appears in print on June 5, 2014, on page A17 of the New York edition with the headline: To Lure Bostonians, New Bus Service Learns Riders' Rhythms.