Translating SomerVision to Union Square

Union Square and Boynton Yard's Contribution to City-Wide Goals

SomerVision provides us with a policy framwork that captures our thinking about diversity, community, economy, accessibility, sustainability, and innovation to guide future decisions made in neighborhood planning and capital projects. During the development of SomerVision, a series of public workshops helped the community articulate its shared values (see page 34). All of these values are important, but three are of particular value in planning the future of Union Square and Boynton Yards.

The first is to foster the unique character of the neighborhood to ensure that Union Square continues to be itself as changes occur over time. This begins with placing a high value on the people, history, culture, and way of life. The second is to invest in and grow a resilient and diverse economy that leverages all the benefits that new access to transit will provide. To achieve fiscal self sufficiency Somerville needs to attract and retain businesses that can start here, grow here, and stay here while also investing in the talents, skills, and education of residents to increase access to employment opportunities. Third, is to fully embrace public transportation so that the redesign of the public realm is safe and inviting for all means of travel while at the same time improving environmental quality and economic stability by reducing dependance on automobiles.

To achieve all of these aspirations, SomerVision calls for design-based neighborhood plans to guide future development in a way that improves our quality of life. Special priority is given to neighborhoods with existing or future transit because they serve as important economic engines for the city, focal points of community identity, and areas that must adapt and change over time.

PLANNING FOR TRANSIT-ORIENTED DEVELOPMENT

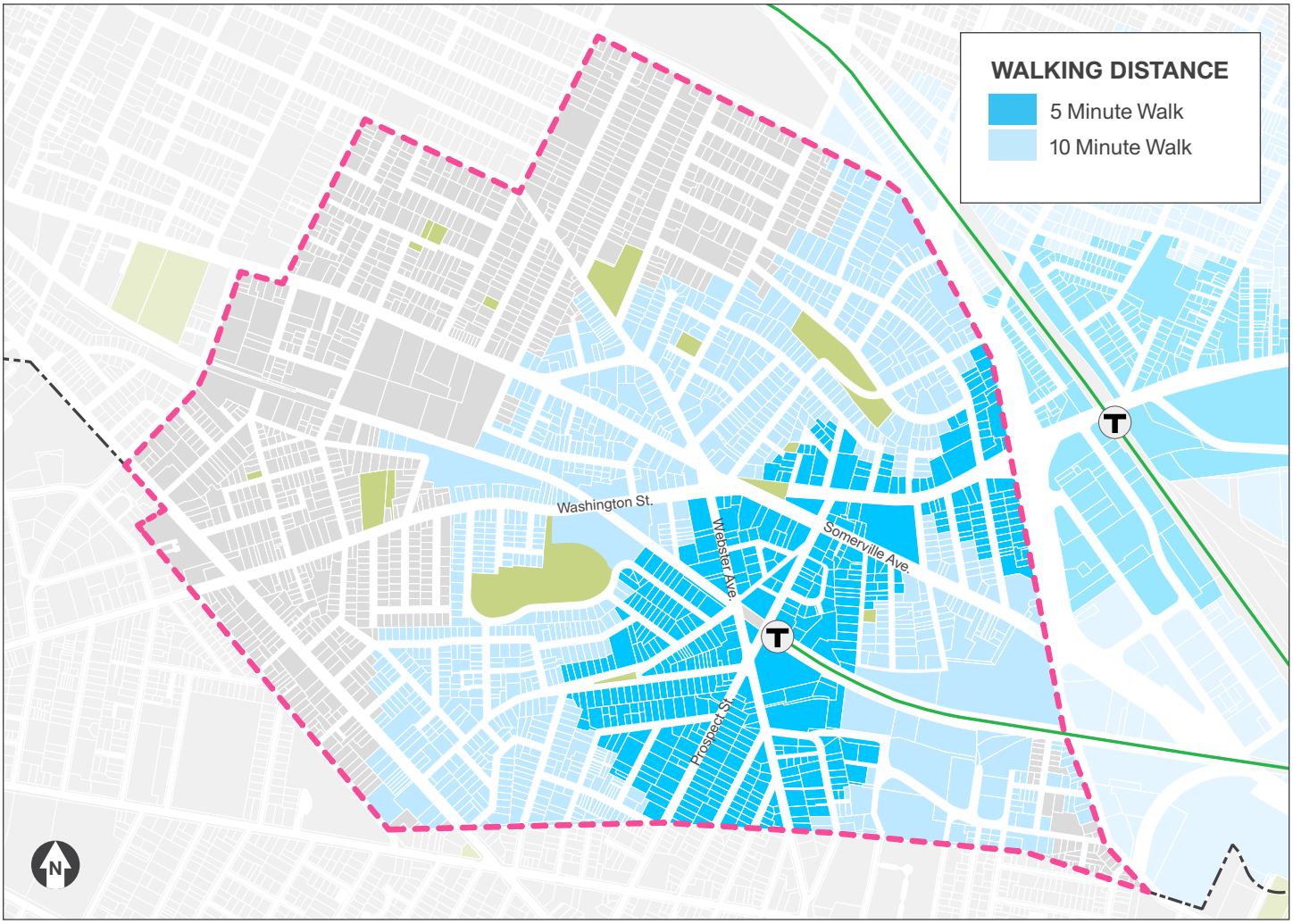
The daily commute is a fact of life for the majority of Somerville residents. The city's vibrant squares capture most trips necessary to meet daily and weekly needs, but with only 20,000 jobs and 45,000 workers, most people travel outside of Somerville to go to work and many of those people drive. For some, this work trip is short and the 'down time' can even be rewarding, but for others the commute is long and causes financial, emotional, and physical stress. Private automobile ownership provides freedom and flexibility, but also includes significant societal costs in terms of environmental impact, infrastructure costs, accidents and injuries, and the financial burden brought on by parking, gasoline, and annual maintenance.

A number of SomerVision's top-level goals focus directly on transit-oriented development (TOD). This term refers to new development that uses specific planning and design techniques to support investments made in public transportation infrastructure and produce neighborhoods that are compact, mixed-use, highly walkable, and equitable for people of all ages and incomes. Although every neighborhood should have these traits, TOD planning leverages public transit as an asset for community development.

Public transit and transit-oriented development will play a defining role in achieving many of SomerVision's goals. It reduces congestion by giving some people an alternative to driving. It reduces the emission of pollutants and greenhouse gases that would have otherwise been generated by transit riders if they had driven cars instead. It decreases the amount of money that riders must spend on gasoline and other costs of operating private vehicles, and may even allow them to reduce the number of vehicles they need to own. It frees up time by allowing riders to work, read, sleep, or otherwise relax on a train or bus instead of having to pay attention to the road. It gives employers located near transit hubs greater access to a more dispersed workforce. In general, it creates efficiencies and reduces the per-capita impact of the transportation system by allowing multiple travelers to share the ride.

Public transit and transit-oriented development will play a defining role in achieving many of SomerVision's goals

Extension of the Green Line to Union Square will facilitate beneficial transit-oriented development in two different, but related, ways. First, new transit service will provide existing residents with a more direct link into the regional public transportation system with less transfers while increasing access to thousands of employment opportunities and reducing costs associated with traveling to work. Secondly, Somerville is well recognized as the densest municipality in New England and Union Square's share of that population along with its vibrant local culture, close proximity to universities, and a number of ideal and available development sites, positions the neighborhood to attract employers looking to tap into the talent pool of existing residents.



DEFINING WALKING DISTANCE

In neighborhoods with a well designed and walkable street network, the proximity of origins and destinations to a transit station has a direct association with transit ridership. Studies from around the country routinely find that the closer housing and jobs are to transit the higher probability residents and employees will use the service. People are generally willing to walk further to higher capacity, more frequent service and will typically walk further to rail than they will to the bus.

As a 'rule of thumb,' researchers study walking distances to transit in intervals such as one-half mile, one-quarter mile, or one-eighth mile. In a 2013 study of 1,450 transit stations across the United States, researchers found that ¼ mile is the distance people are willing to walk when traveling to or from work and ½ mile is the distance people are willing to walk when traveling to or from home. In fact, transit use drops significantly for households located beyond a half mile from the nearest transit stop. Climate and topography are typically thought to influence walking in general, but multiple studies have found that local topography has little to no effect on walking to transit. Only the chance of rain influences the choice to walk or not to public transportation.

The Last Quarter Mile

The use of public transportation when commuting to work is critically dependent on a riders' ability to reach their final destination once they arrive and find themselves on foot. Locating destinations close to transit is even more essential than locating points of origin near transit. Although it is well established that households located within walking distance to a transit station are five to six times more likely to commute by transit than those living elsewhere, studies have shown commuters are willing to walk further distances to their homes than they are to their place of employment. This is why locating commercial uses within a quarter mile of a transit station is so important - so that commuters can easily walk that last short distance on foot. Trips to work represent a large share of the total travel during the Monday-Friday work week, and the decision employees make about how to commute to work will have a significant impact on the livability and sustainability of Union Square. Locating jobs close to transit will encourage employees to leave their cars at home, reducing traffic and improving air quality where the new jobs are created.

DECREASING HOW MUCH WE DRIVE

Living or working within a close walking distance to transit has been found to corollate with substantially higher rates of transit use. However, it is necessary to promote the physical conditions and supporting policies that will to discourage residents and employees from driving. Increased development intensity in close proximity to transit stations can unlock immense benefits (see page 42). However, when development is simply transit adjacent, with significant parking, or built without supporting policies that induce transit-oriented behavior, it can also invite automobile traffic and congestion. This will undo all of the benefit transit can provide – especially at the local level.

In 2006, a study by Dr. Robert Cervero of UC Berkeley found that office workers are most likely to use transit if frequent feeder bus or shuttle service is available at one or both ends of the trip, if employers help cover the cost of taking transit, and if parking supply at the workplace is restricted. Providing all three of these requires coordination between off-street parking requirements in zoning, workplace transportation demand management programs, and complimentary private shuttle services.

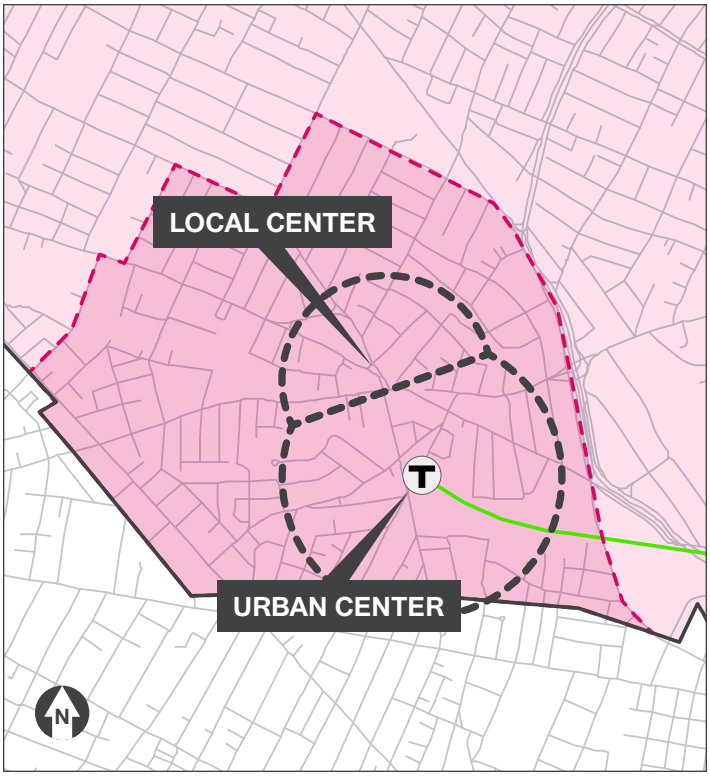
More recently, two studies out of New York City and northern New Jersey, some of the most transit-oriented urban areas in the United States, uncovered a stunning relationship between automobile ownership and use and the availability of off-street parking. In a 2012 study of neighborhoods in the Bronx, Queens, and Brooklyn boroughs of New York City, Dr. Rachel Weinberger, a Principal & Director of Research and Policy at Nelson\Nygaard Consulting Associates, found a clear relationship between the availability of parking at home and higher rates of driving to jobs in the core of Manhattan, even when both the home and workplace were well served by transit. When off-street parking is relatively scarce, competition for on-street parking increases the frustration of finding a parking spot and the effort needed to walk from the parking spot to home or other destinations. When a guaranteed, off-street parking space is available, the ownership and use of an automobile becomes a much more attractive option - regardless of the availability of transit, highway access, or demographics. Therefore, providing more parking induces more driving trips and more local congestion.

In a 2013 study of households living within two miles of New Jersey transit stations, Dr. Daniel Chatman of UC-Berkeley confirmed the results from New York in another location when he found that availability of off-street parking was actually the single most important variable in determining automobile ownership and commuting to work, regardless of accessibility to a rail transit station. When looking only at households within walking distance to a transit station, households with both low on and off-street parking commute by automobile 60% less than households with easy access to parking. These results confirm other studies that warn minimum parking requirements likely induce driving by oversupplying parking at home. Chatman suggests allowing developers to provide less off-street parking, while also pricing, managing, and permitting on-street parking in order to mitigate spillover effects.

~~DIFFERENT STATIONS, DIFFERENT FUNCTIONS~~

~~The Center for Transit-Oriented Development (CTOD), a non-profit funded by the U.S. Government to promote best practices in transit-oriented development, identifies at least seven types of transit-oriented station areas. These TOD place types were created to help simplify the complex decisions that surround planning for TOD projects and station areas at different scales and in different places. The system provides a common language to compare station areas and helps governments establish development targets to ensure that investments made in transit are as efficient as possible by focusing growth around transit nodes.~~

~~Not all TOD is necessarily equal. Some transit station areas may be well suited to a particular type of development but not as well suited to others. For instance, some station areas~~



might lend themselves to hosting large concentrations of employment; others may be more appropriate for primarily a mix of high-density housing and retail; still others may sit at strategic locations on the highway network and thus be well-positioned to intercept car-commuters by functioning as park-&-ride stations. Because of this, promoting TOD is not necessarily a one-size fits-all approach; the unique characteristics of each individual station area inform decisions about the type of appropriate development.

Within the scope of COTD's station area types, the Union Square plan area today can be classified as what CTOD calls a local *Transit Town Center*. This station area type functions as a local serving center of economic and community activity. Like other locally serving centers, Union Square's existing transit service is primarily made up of bus lines that feed riders into the regional rail system at Sullivan Station, Lechmere Station, and Kendall Square or, to a lesser degree, high-frequency regional bus and limited stop bus rapid transit (BRT) that cross through Brookline and Boston on their way to Dudley and Ruggles Stations. Also like other local centers, Union Square has an existing mix of both multi-unit and single-unit housing, as well as retail, smaller to medium-scale employment, and civic uses.

With the arrival of the Green Line and both public and private investments in redevelopment, the eastern portions of Union Square and Boynton Yards could evolve into an *Urban Center* focused primarily on employment. CTOD defines Urban Centers as a station area with a dense mix of employment, residential, retail, and entertainment uses and destinations that attract residents from surrounding neighborhoods. Once Union Square station is built and light rail service begins, Union Square and Boynton Yards will include a full suite of transit options, like other Urban Centers around the country, and be positioned to attract employers seeking to benefit from locating their business within this type of station area.

PLANNING AN URBAN EMPLOYMENT CENTER

Union Square and Boynton Yards have an opportunity to develop into a employment focused urban center with a mix of diverse and high-quality jobs. Union Square and Boynton Yards, along with Assembly Square, are well positioned to serve as the primary economic engines of Somerville. Together, they can help provide the commercial tax base that will reduce Somerville's dependence on state aid and residential taxes and fees.

Somerville's financial self-determination is perhaps the most difficult of the SomerVision goals to nail down as a quantitative goal because property valuations are dynamic - changing every year. However, we are already beginning to see the benefits that new businesses can bring to rebalancing the City's finances. Commercial development at Assembly Row has already started to reduce residential tax increases, although commercial development across the city as not yet creating tax decreases (see *Reducing the Residential Tax Burden* on page 46).

Commercial development at Assembly Row has already started to reduce residential tax increases.

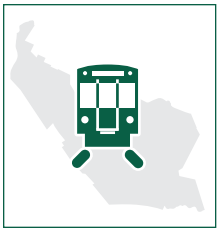
CTOD recommends using the following development criteria when planning for an employment focused urban center station area. Following these guidelines will help to ensure that Union Square and Boynton Yards evolve according to expectations.

Urban Employment Center Station Area	
Total Square Footage	7 to 10 million sf
Station Area Total Employment	15,000 to 30,000
Station Area Total Housing	5,000 to 10,000
Use Mix Ratio (Com/Res)	60%/40%
Commercial Floor Area Ratio (min)	2.0
Jobs to Housing Ratio (min)	6 to 1
Residential Density (max)	50 DU/Ac

- **Total Square Footage** is a range of built square footage that helps to determine the ultimate scale and intensity of development in the station area.
- **Station Area Total Employment** is a range of employment that identifies an appropriately scaled concentration of jobs in the station area and can inform the balance between various uses of floor space.
- **Station Area Total Housing** is a range of dwelling units that identifies the appropriate amount of housing in the station area and can inform the mix and variety of housing types permitted for new development.
- **Use Mix Ratio** identifies an appropriate proportion of commercial and residential floor space in the station area and can inform various policy tools to achieve the desired mix.
- **Commercial Floor Area Ratio** identifies a baseline amount of commercial floor space is produced for office, lab, retail, hotel and creative enterprises to make an urban employment center possible. However, not every site in the urban center will be appropriate for commercial buildings.
- **Jobs to Housing Ratio** maintains a proper balance

A Vision for Mobility

Embracing a Future with Transit



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This section explores a vision for mobility (how we get around) and how the transportation network in the Union Square plan area should function. First, we review SomerVision's various objectives for transportation improvements along with its guidance on how people should travel. Next we cover recommendations to embrace advanced mobility planning, a plan for returning Union Square's main streets to two-way traffic, completing the streets for all travel modes, street-calming, connecting Union Square to new places, improving public transportation, and managing parking.

SomerVision's Mobility Targets

SomerVision includes a set of aspirational targets for economic development, housing construction, and open space improvement, along with guidance on how people should travel and where development should occur within the city. The primary mobility objective is for at least 50% of all new trips to made be by public transportation, walking, or bicycling. SomerVision also seeks to improve our shared environmental quality, reduce pollution, and decrease traffic & congestion through the use of transportation modes other than the private automobile. These include expanding walking and bicycling; building complete streets that are balanced for all modes of travel; promoting Mobility Management best practices; managing the supply of parking, supporting car sharing and bike sharing services; reducing parking requirements for transit oriented development, seniors, and residents in affordable housing; and permitting shared parking.

Complete the Streets for All Users

The Somerville Complete Streets Ordinance, the first of its kind in Massachusetts, states: "Complete Streets are designed and implemented to assure safety and accessibility for all the users of our streets, paths and transit systems, including pedestrians, bicyclists, transit riders, motorists, commercial vehicles, emergency vehicles and for people of all ages and of all abilities". By adopting this ordinance, the City is committed to incorporating Complete Streets planning and design "into public transportation projects in order to provide appropriate accommodation for bicyclists, pedestrians, transit users and persons of all abilities, while promoting safe operation for all users, in comprehensive and connected networks, in a manner consistent with, and supportive of, the surrounding community."

ESTABLISH MODE PRIORITIES

To implement the City's Complete Streets policy, the City is advancing a pedestrian-first modal hierarchy. All transportation projects and programs, from scoping to maintenance, will favor pedestrians first, then transit riders, cyclists, and motor vehicles. This implementation approach will rebalance Somerville's streets to make them more 'complete,' reversing generations of automobile-focused planning and design at the expense of all other transportation modes. This pedestrian-first modal hierarchy resets the default premise for transportation projects in Somerville by acknowledging that every trip begins and ends as a pedestrian.

Recommendations

- Prioritize pedestrians first modal hierarchy for all transportation projects and programs, from scoping to maintenance.

A GREEN LIGHT FOR 2-WAY STREETS

Streets are an existing, flexible framework that serve as the foundation for building a strong community. When the 'traffic' function of our streets is prioritized over of the 'civic' function, it limits the ability of our streets to support the local economy and community to their fullest.

During the Union Square neighborhood planning process, community members voiced their strong desire for the City to finally fix the traffic and congestion problems in Union Square. At the same time, they wanted more than just an engineering based solution for moving traffic through. From complete streets advocates to everyday residents, the public desires to rethink the role streets play in the culture of the neighborhood.

Providing for vehicular travel is just one the many roles that streets play in community development. They can also contribute to a sense of place and support economic development efforts when they

are easy to navigate and more connected whether you are walking, biking, taking transit, or driving. Placemaking efforts that go hand in hand with redevelopment typically focus on the redesign of streets because the planning and design of streets over recent decades has been automobile-focused at the expense of all other transportation modes. We can't expect new investment along streets that simply don't work properly - for vehicles or people.

Today, Union Square's street network is designed as a multi-lane one-way 'bow tie' at the core of the neighborhood. Somerville Avenue, Washington Street, Webster Avenue, and Prospect Street all restrict travel in a single direction. One-way streets are thought to provide higher vehicular capacity by increasing the number of lanes in a single direction. They also make it easier to coordinate a series of traffic lights into what is known as a 'green wave,' which allows a continuous traffic flow over several intersections. Green waves are not harmful in and of themselves (they can reduce emissions and fuel consumption), but when combined with one-way streets the result prioritizes vehicles driving through the square to get to other places rather than supporting the vibrancy of the square itself.

The design of Union Square's one-way street network is based on the idea that they move traffic better than two-way streets. However, the negatives of the system outweigh the positives. One way streets frequently increase vehicular speeds, and there is some evidence that drivers are less attentive because there are no cars heading in the other direction to watch out for. Vehicles stop less often on one-way streets, which makes things harder for cyclists trying to turn and pedestrians trying to cross the street. Taking public transit becomes more difficult on one-way streets because bus stops are not located on the opposite side of the street from one another. A trip in the other direction requires you to find a stop on an entirely different street. Furthermore, one-way streets have an impact on the local economy because they reduce visibility of retail and restaurants because they route trips to and from work onto different streets.

Dr. Vikash Gayah, a Civil Engineering Professor from Penn State University, questioned the conventional wisdom of one-way streets in a study from 2012. Vehicular traffic is normally measured as the number of cars flowing past a specific spot. The more cars, the better the traffic flow. But measuring efficiency this way doesn't account for the fact that driving on a one-way street system frequently means traveling in a circular route to your destination, which adds distance to every trip. By considering both the flow and the extra travel distance created by a one-way street network, the true 'trip-serving capacity' of a street can be measured. When put to the test, Dr. Gayah found that two-ways streets perform about the same or even better than one-way streets, especially if they control left turns in an economical way.

In 2016, the City will return Prospect Street and Webster Street, from Somerville Avenue to their crossing, to two-way traffic for the first time in decades. By re-striping the streets and installing new traffic signals on an interim basis, the City will test the removal of unnecessary traffic movements to inform a more formal and permanent design to alleviate congestion and improve traffic flow in the future. Somerville Avenue should be next.

Recommendations

- Convert Somerville Avenue, Prospect Street, and Webster Street to two-way traffic flow.

EMBRACE PROTECTED BIKEWAYS

In 2005, the Transportation Department for the City of Portland, OR was the first to classify the different types of cyclists that exist within a population: the Strong and Fearless (<1%), Enthused and Confident (7%), Interested but Concerned (60%), and No Way, No How (33%).

No matter the category, surveys have found that the number one reason that many people do not consider bicycling as a valid means of transportation is because they are afraid to be on the same roadway as automobiles. Achieving SomerVision's goal for 50% of trips to be via transit, cycling, or walking will require making our streets, wherever we can, as safe and comfortable for the Interested but Concerned

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group of the population. To tap into this largest group of potential cyclists, Somerville will need to make transformative investments in bicycle infrastructure and on creating a fully connected grid of protected bikeways on busy streets and bicycle boulevards through quiet neighborhoods. This policy could be further enhanced by empowering the community to create Neighborways, Playborhoods, or PlayStreets on our neighborhood streets.

Protected bikeways are a category of bicycle facility that separates bicyclists from motorists. They can be at road or sidewalk level and separation can be created in a variety of ways including parked cars, plastic posts, raised curbs, or even planters. The means separation can even change along a route depending on the width available and the design of intersections.

Research has found that protected bikeways reduce the risk of injury by up to 90% when compared to standard, unprotected bike lanes. By removing or reducing the sense of fear involved with sharing a travel lane with an automobile, research shows that within the first year after installation, a protected bikeway facility increases bicycle ridership by 75% on average.

Not every street in Somerville is wide enough for a protected bikeway, but sharrows and even bike lanes will not encourage riders afraid of riding alongside automobiles to change their travel behavior.

Recommendations

- Prioritize the construction of protected bikeways on major streets when feasible within the right-of-way.
- Implement Bicycle Boulevards in neighborhoods where appropriate.
- Establish a formal process for residents to establish a Neighborway, Playborhood, or PlayStreet.

Calming the Streets

During the Union Square Neighborhood planning process the following streets were all identified by community members as having issues with either cut through traffic or fast moving vehicles: Vinal Ave, Perry St , Concord Ave, Dane Ave, Properzi Way, Calvin St, Boston St, Summit Ave, and Walnut Street. Each of these streets deserves to be closely looked at to determine what happening and measures that can be take to ensure safety for all users.

The Human Eye and Street Design

The physiology of the human eye has many implications for urban design. The retina of our eye functions similar to film in a camera, interpreting what we are looking at, and plays an important role in how we perceive the world around us.

The central part of our retina is called the fovea. This area is densely packed with over 25,000 cells that detect light and color. Each cell is individually connected to a nerve fiber. These cells provide us with very high resolution vision for tasks such as threading a needle.

Surrounding the fovea is another area of color detecting cells called the macula. Macular vision is very clear, but not as sharp as with the fovea because the cells are further apart from one another. As you move away from the center of the retina the nature of our vision fundamentally changes. Cells that detect color become scattered and cells designed for seeing at night become more prominent.

Outside of the macula is the peripheral retina, with cells designed more for night vision and where up to 200 or more cells are connected to a single nerve fiber. When more than one cell is connected to a nerve fiber, resolution decreases and the perception of motion is increased. This is why moving objects are easily caught 'out of the corner' of our eye, but everything is out of focus.

When we ourselves are moving, objects seen in our peripheral vision exaggerate the speed our brain thinks we are traveling. This means that streets lined with on-street parking and street trees provide a natural 'visual friction' that slows down drivers because they think they are moving faster than they actually are. As a result, streets with on-street parking and street trees are naturally safer streets for pedestrians than streets without.

INTRODUCE VISUAL FRICTION

The most effective way to slow vehicular traffic on urban streets is to create 'visual friction' that impacts a driver's perception of safety. When travel lanes have appropriate widths, streets with two-way traffic flows are generally observed to have slower speeds than one-way streets because drivers are careful not to sideswipe each other. Vehicular speed decreases even further when features like on-street parking and street trees are provided on both sides of the street (causing more 'visual friction'). This happens because objects seen out of our peripheral vision make drivers feel like they are moving faster than they really are, due to the way our eyes see and interpret our surroundings.

The safest type of neighborhood street for pedestrians is one featuring a shared travel lane 14-16 feet wide with no center stripe and parking lanes on both sides. This type of street is called a "yield street" because cars passing each other are forced to slow down and in many cases one car is even required to pull over slightly to make enough room for the other to pass. Yield streets significantly reduce travel speeds and promote safety for all modes because of the 'visual friction' they provide.

Recommendations

- Install, monitor, and evaluate the effectiveness of interim traffic calming techniques on problematic neighborhood streets in the Union Square plan area.
- Conduct a physical survey of problematic neighborhood streets in the Union Square plan area to accurately map curb cuts, existing street trees, and existing on street parking.
- Opportunistically convert problematic neighborhood streets in the Union Square plan area into 'yield streets' when possible.

PRIORITIZE SAFE ROUTES TO SCHOOL

In 1969, about half of all U.S. children walked or biked to school, with approximately 87% of children who lived within one mile of school walking or bicycling. Today, less than 15% of children walk or bike to school. As a result, kids today are less active, less independent, and less healthy. Safe Routes to School (SRTS) programs are designed to reverse this trend by getting more children walking and bicycling to schools on a daily basis.

In July 2005, Congress passed federal legislation that established a National Safe Routes to School program to improve safety on walking and bicycling routes to school and to encourage children and families to travel between home and school using these modes.

Currently, the Argenziano School maintains a safe routes to school map that identifies ideal routes for children to walk or bike to the school. The City's safe routes to school are included as priority repairs, as the Neighborhood Street Reconstruction Program continues to improve existing sidewalks and curb ramps so that they more accessible to all users, regardless of ability. At the same time, special attention should be paid to safe route streets in the Union Square plan area so that additional improvements can be made to promote walking and cycling for children.

Recommendations

- Prioritize streetscape and street design improvements for safe routes to school in the Union Square plan area.

ADOPT A 20 IS PLENTY CAMPAIGN

Neighborhood Slow Zones are a program to reduce traffic speed from the standard unposted speed on neighborhood streets from 30 mph to 20 mph. This reduction in speeds by 10 MPH represents the critical difference between life and death, with a demonstrated 42% reduction in pedestrian casualties. The establishment of Slow Zones should be investigated throughout the Union Square plan area, with gateway signage and markings put in place to indicate to drivers that they are using neighborhood streets within a slow zone.

Recommendations

- Petition the legislature to allow a reduction of the speed limit to 20 miles per hour.

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Embrace Transit-Orientation

Public transit and Transit-Oriented Development will play a defining role in achieving many of SomerVision's goals (see page 34). Transit use reduces congestion by giving people an alternative to driving. It reduces the emission of pollutants and greenhouse gases that would have otherwise been generated by transit riders if they had driven cars instead. It decreases the amount of money that riders must spend on gasoline and other costs of operating private vehicles, and may even allow them to reduce the number of vehicles they need to own. It frees up time by allowing riders to work, read, sleep, or otherwise relax on a train or bus instead of having to pay attention to the road. It gives employers located near transit hubs greater access to a more dispersed workforce.

In addition to these broad benefits, extension of the Green Line to Union Square will provide existing residents with a more direct link into the regional public transportation system, increasing their access to thousands of employment opportunities and reducing costs associated with traveling to work. Additionally, it attracts employers to the neighborhood that are looking to tap into the talent pool of the densest municipality in New England.

Living or working within a close walking distance to transit has been found to corollate with substantially higher rates of transit use. However, it is necessary to promote the physical conditions and supporting policies that will discourage residents and employees from driving. Increased development intensity in close proximity to transit stations can unlock immense benefits (see page 42). However, when development is simply transit adjacent, with significant parking, or built without supporting policies that induce transit-oriented behavior, it can also invite automobile traffic and congestion. This will undo all of the benefit transit can provide – especially at the local level.

IMPLEMENT MOBILITY MANAGEMENT

SomerVision includes 12 goals, policies, or actions related to Mobility Management. Sometimes called the more tedious 'transportation demand management' (TDM), mobility management is a program of services, information, and incentives to help people know about and use all of the transportation services that are available. It is specifically designed to counter balance many of the existing incentives that encourage people to drive, such as free parking. Mobility management promotes the efficient use of our transportation system as a cost effective alternative to increasing parking supply or roadway capacity while also improving overall accessibility and sustainability.

In 2015, the Mayor's Office of Strategic Planning and Community Development proposed mobility management standards for the Somerville Zoning Ordinance overhaul that would require new commercial and multi-tenant residential development of a certain size to implement mobility management practices. Measures that support mobility management cover a broad range of low cost programs, policies, and services. These frequently include providing information about transit services in the neighborhood, unbundling the price of parking from the cost to rent a dwelling unit or commercial space, participating in the State's guaranteed ride home program, providing preferential parking for car-poolers, flexible work schedules to reduce peak time travel, allowing employees to use pre-tax dollars to purchase transit passes, and even subsidizing the cost of transit, car-share, or bike-share passes for employees.

Recommendations

- Establish requirements for new commercial and multi-tenant residential development to implement Mobility Management policies and programs in the Somerville Zoning Ordinance.
- Create a Transportation Management Association for Union Square and Boynton Yards to efficiently manage and market mobility programs and services for members.

Adopt Smart Parking Policy

The most valuable use of above ground floor space for new development in Union Square and Boynton Yards is as commercial or residential uses, not parked cars. Parking is a commodity, and as such, should be dictated by market demand and not by parking standards that are unresponsive to changes in cultural attitudes about how we travel

and routinely overestimate actual need.

Parking should be regulated in an entirely different way in transit-accessible neighborhoods than it is for areas of the city outside of walking distance to a transit station. Studies have found a clear relationship between the availability of parking at home and higher rates of driving to work, even when both the home and workplace were well served by transit. When looking only at households within walking distance to a transit station, households with both low on- and off-street parking commute by automobile 60% less than households with easy access to parking. Locating jobs close to transit encourages employees to leave their cars at home, reducing traffic and improving air quality. However, when a guaranteed, off-street parking space is available, the ownership and use of an automobile becomes a much more attractive option. Together this research highlights that providing parking in and of itself likely induces more driving trips and leads to more local congestion.

ADOPT TRANSIT ORIENTED PARKING STANDARDS

There are four different approaches to setting parking standards for new development. They range from conventional minimum parking requirements to policies that both levy parking maximums, and some of them actually hinder transit-oriented development.

One option is to custom tailor parking requirements to reflect lower vehicle ownership rates close to transit. Another option is to have no parking requirement altogether and let developers determine the most appropriate amount of parking to provide based on the market. This avoids oversupplying parking to the point where many spaces sit empty. However, these first two policies simply try to better match parking supply to demand, instead of actively working to induce transit ridership. A third option, involves limiting the amount of parking that developers are allowed to supply. The type of parking policy chosen for new development will determine whether or not it is transit-oriented, helping to achieve the goals of SomerVision, or transit adjacent, with a lack of policies that support transit use and parking that encourages automobile traffic and congestion in the very locations most served by transit.

New parking standards should be adopted in zoning that fully support the transit-oriented development that SomerVision calls for. This likely means establishing parking maximums for residential uses within 1/2 miles and commercial uses within 1/4 mile of the new Union Square station of the Green Line (see page 43 for more information). This decision also has the ability to

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How Parking Standards Impact Other Goals

	Conventional Minimum Parking Requirements	Tailored Minimum Parking Requirements	No Parking Requirements	Maximum Parking Requirements
Typical Tools	- Requirement > average demand - Hides all parking costs	Adjust for: - density - transit - mixed use - on-street spaces …etc.	- Market decides - Garages funded by parking revenues - Manage on-street parking - Residential parking permits allowed by vote	- Limit parking based on road capacity or transit goals - Manage on-street parking - Market rate fees encouraged/ required
Traffic	**High** ←			→ **Low**
Housing Costs	**High** ←			→ **Low**
Transit Ridership	**Low** ←			→ **High**

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be customized at different scales. For example, when applied to individual development projects, a maximum function is to limit the amount of parking than can be built by each. Another more flexible way to accomplish the same goal is to apply a maximum at a district scale. This would permit early phases of development to build parking that counts against an upper cap of total parking allowed. Once that threshold is achieved, no more parking would be permitted to be built for subsequent projects.

Recommendations

- Adopt new parking standards in the Somerville Zoning Ordinance for transit oriented properties in the Union Square plan area.

ENCOURAGE SHARED PARKING

Traditional parking requirements maintain that individual land uses should have dedicated parking supplies. However, walkable mixed-use (and soon to be transit-oriented) neighborhoods like Union Square can allow for parking to be shared. Visitors can park once and walk to multiple destinations; employees can park once for the day and walk to run errands. Each land use does not need its own dedicated supply of parking, yet that is exactly what standard analysis and zoning indicate is needed.

In reality, real parking demand is rarely constant; it changes over time. For example, an office may have a high demand until 5pm, and a restaurant open for dinner may have a high demand only after 5pm.

Shared parking encourages use of large centralized parking facilities and discourages the development of many small facilities. This results in more efficient traffic flow because there are fewer curb cuts, and turning opportunities on main thoroughfares. This has the added benefit of reducing accidents and reducing emissions from idling vehicles stuck in traffic. Additionally, shared

parking can reduce the burden placed on adaptive developments in historic buildings by allowing a change of use without requiring incongruent surface or structured shared parking on the site. Municipalities may encourage shared parking in a number of ways, including:

- **District Based Sharing:** Different uses in a defined district share parking (Montgomery County, MD)
- **Free Range Sharing:** Individuals create parking partnerships, and shared parking is allowed in zoning. (Long Beach, CA)
- **Land Use:** Some specific shared parking minimums exist for certain land use types. (Waltham, MA)
- **Minimum Provision:** A certain amount of parking for each use must be shared (Cambridge, MA)

An example of free range shared parking similar to what could happen in Union Square is a mixed-use building in South Boston called The Residences at 50 Broadway (shown at left). This building is one block from the Broadway Station of the Red Line, but when it was constructed an oversupply of parking was included. Today, new infill buildings in the neighborhood are leasing spaces from 50 Broadway because it has an excess of parking beyond what the residents and ground floor businesses actually need, primarily due to the nearby transit service.

Recommendations

- Permit shared parking between uses and buildings in the Union Square plan area

Manage Parking as a Resource

Parking management includes a number of strategies that encourage a more efficient use of on- or off-street parking, improve the quality of service provided to the users of parking facilities, and improve the overall design of parking lots and structures. Managing parking includes a broad range of possible strategies including metering parking for short term turn over, residential parking permits, demand based pricing of on-street parking, and parking management districts.

METERING PARKING FOR TURNOVER

Parking spillover by employees is not a concern in most downtowns because curb parking is typically metered for short term turnover rather than all-day use. If employers provide employees the option to cash out their use of an off-street parking space as part of a mobility management program, there need not be a fear that they will take their cash and park on the street. This barrier to spillover allows cities like Boston and new districts like North Point to cap the total number of parking spaces in new development without worrying about spillover.

Recommendations

- Consider limits on the length of stay for metered parking spaces to induce short term turnover.
- Consider varying metered parking rates based on the length of stay to induce short term turnover (1st hour = $1, 2nd hour = $2, etc)

RESIDENTIAL PARKING PERMITS (RPP'S)

Somerville currently has more than 11,600 registered vehicles per square mile; roughly 7,600 more cars per square mile than Boston and almost 3,600 more than Cambridge. This means there is one vehicle to every 1.6 Somerville residents. In the Union Square plan area there are 5,202 registered vehicles and 5,175 off-street parking permits issued to residents.

Somerville's Residential Parking Permit program offers on-street parking passes to residents with a personal vehicle registered with the city for $40/year. This equates to about $0.62 per day. The Resident Permit Parking program has largely been successful in achieving its original purpose to mitigating spillover impacts from residents of other towns and cities parking on neighborhood streets.

The City's Department of Traffic and Parking does not currently cross reference the number of permits issued per household with the actual number of curb parking spaces available on a block, street, or neighborhood. Somerville residents with an on-street permit are also permitted to park on any street across the city. This is an advantage enjoyed by many residents,

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but these two characteristics of the City's residential parking program can lead to a situation where on-street parking in residential areas becomes seriously congested because the program facilitates both intra-city commuting and over use of the on-street parking capacity of neighborhood streets.

Low cost access to on street parking for residents of new transit-oriented development can undo all of the benefit transit can provide. Traditional regulatory and pricing tools work well in busy mixed-use areas, but nearby residential areas are often the sources of the greatest complaints from residents concerned about the impact of new development.

Recommendations

- Consider restricting the availability of on-street parking permits for residents of new transit-oriented development.
- Consider whether it is still appropriate for on-street parking permits to be used city-wide.

DEMAND BASED PRICING

Demand based pricing of on street parking in commercial areas uses smart meters, sensors, and demand-responsive pricing to open up parking spaces and reduce circling and double-parking. Demand-responsive pricing adjusts parking rates by the time of day, day of the week, and even block within the city. The idea is to charge the lowest possible hourly rate to achieve the right level of parking availability. In areas and at times when it is difficult to find a parking space, rates are incrementally increased in an effort to ensure that at least one space is always available per block. On a block where parking spaces are plentiful, rates are decreased to attract drivers to the available spaces in the neighborhood. Meters typically allow payment with coins, debit/credit cards, or local parking cards and typically interact with a smart phone app to alert drivers in real time about parking availability.

Recommendations

- Conduct a curbside parking management study to determine the logictics and costs necessary to implement demand based pricing for on street parking in Union Square

PARKING MANAGEMENT DISTRICTS

Finally, a number of possibilities exist for a parking management district in the Union Square plan area. A parking management district can be managed by the City, a parking management authority, a business improvement district, or a transportation management association. How each parking management district functions is always unique to each place, but in essence all of them provide public parking at a price and reinvest the revenue directly into improving parking and transportation in the neighborhood.

Montgomery County, MD offers a compelling example for Union Square. Montgomery County's Parking Lot District (PLD) program is financed though an enterprise fund. These funds generally mandate that developers in a certain district pay fees to a dedicated financing program in lieu of fulfilling minimum requirements for municipal parking. Through the enterprise fund, Montgomery County builds and operates government-owned parking structures. Enterprise funds are typically supported by a combination of ad valorem taxes, parking services fees, and

The Future of Technology & Mobility

In 2015, the National League of Cities published a report called *City of the Future* that explores existing trends and potential future developments in mobility technology with the specific purpose to help cities in mobility planning. "Creating a transportation network – a platform for commerce and human interaction – is one of the oldest and most important functions of government." Government must adapt to quickly changing preferences and technologies. Take a moment from reading this and think of something transportation related that is now obsolete because of advancement in technology (printing directions from MapQuest!).

There are four contributing factors to changing mobility: demographic and workforce trends, infrastructure finance, the growth of public and private mobility systems, and the availability of new modes of transportation. By 2020, all of the baby boomers will have reached pre- and early-retirement stages making millennials the largest segment of the workforce. Millennials have already shown a preference for non-automobile transportation. There is also a larger shift in how workers occupy workspace. Workbar has demonstrated success in Union Square because of this shift in non-traditional work patterns.

The growth of public and private mobility systems focuses on the increase in public transit options (rail and bus lines), an adjustment to the efficiency of these systems to reach the maximum amount of users, and an increase in Transportation Network Companies (TNC). The most popular TNC's are Uber and Lyft (you know them, the cars with pink mustaches). They, and possibly new players, will continue in popularity and broaden their services into related fields such as freight. Uber started with UberBlack only 5 years ago and has expanded into UberTaxi, UberX, and Uberpool.

New modes of transit are the most intriguing factor to changing mobility. Drivers are most likely accustomed to a Level 1 Autonomy rating: cruise control, automatic braking, and lane keeping systems. A driver can take hands or feet off of the wheel/pedals but never both at the same time. Level 2 autonomy allows a driver to remove both hands and feet at the same time, self-park technology is an example. Level 4 is full self-driving automation where the driver has no responsibility for safe operation of the vehicle (are they still called a driver?). By 2020, Level 4 autonomy cars will be available for wealthy consumers and industries seeing a return on investment of service fleets. By 2025, these vehicles will be available for more mainstream consumers. By 2030, commuters will likely board driverless buses.

Due to the cost in changing our mobility infrastructure, the physical form will mostly stay the same. However, it will continue to be used in different ways by cyclists,

car sharing, public transit, and TNC's. In the US, a lack of safety is the largest barrier to cycling. A street, redistributed to offer safe and dedicated space for cyclists, will increase cycling rates. Electric assist technology on bikes will decrease physical effort, another barrier to cycling.

After 2030, the rollout of driverless technology in private vehicle ownership, TNC's, and trucking with the use of on-demand technology will start having an impact on land use decisions. On demand vehicles will reduce the need for both on- and off-street parking. Today there are over 6,000 public and private (excluding driveways) parking spaces in Union Square.

All the while, modes will begin to better coordinate into a system of options in a more fluid manner than the current system. Users have already changed to an "app-oriented mindset" and expect information at the touch of a button. Apps of the future will better coordinate information and present/recommend options.

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parking enforcement. Through this program, Montgomery County operates more than half of the public parking in three of its largest central business districts — Bethesda, Silver Spring, and Wheaton — as well as in the Montgomery Hills community. Combined, these districts provide for over 20,000 public parking spaces.

Recommendations

- Investigate the creation of parking management district and enterprise fund to finance the construction and operation of municipal parking structures in the Union Square plan area.
- Reinvest parking meter revenues for transportation improvements in the parking management district established for Union Square.

Establish New Connections

Union Square is a crossroads. Look at Union Square on a map and you'll see that the neighborhood is hub of crossing routes that lead to places like Harvard, MIT/Kendall, Porter Square, Sullivan Square, and Central Square in just under a mile. With some modes like cycling gaining popularity and with the anticipation of the Green Line Extension, investments in Union Square's connectivity will balance transit options for the plan area.

DELIVER THE GREEN LINE EXTENSION

In 2014 and 2015, the MBTA began bridge and track work for the extension of the 'D' and 'E' branches of the Green Line through Somerville. In early 2015, the MBTA and the federal government signed a full funding grant agreement to fund half, almost $1 billion, of the GLX project with a match from MassDOT. The project seemed well on its way to becoming a reality after so many years of advocacy and planning.

However, in the late summer of 2015, MassDOT announced that the price estimates for the Union Square spur and Washington Street stations were $400 million over budget. If that cost was extrapolated, that would make the entire GLX almost a billion dollars over budget when complete. Since that time, the City has been working with MassDOT to address the cost overrun and keep the Green Line Extension moving forward. MassDOT and its Board of Directors set a deadline of mid-May 2016 to reach a decision on continuing the MBTA Green Line Extension. A spring decision is needed to mitigate the risk of excessive construction cost inflation during delays. If the Commonwealth decides to continue the project, major construction activities would resume in 2017.

- Continue to work collaboratively with MassDOT and the MBTA to develop an appropriate solution to the current cost overruns.

INVEST IN BIKE SHARE

The denser the network of bike share stations will help to enhance cycling as an option for both short and medium length trips.

Recommendations

- Require development projects to provide and maintain service agreements for new Hubway stations strategically located throughout the Union Square plan area.
- Locate a Hubway station at or across the street from the Union Square station.

INVITE WORKER SHUTTLES

In 2006, a study by Dr. Robert Cervero of UC Berkeley found that office workers are most likely to use transit if frequent feeder bus or shuttle service is available at one or both ends of the trip, if employers help cover the cost of taking transit, and if parking supply at the workplace is restricted.

Employee shuttles can increase productivity and general wellbeing by providing employees time to prepare for the day ahead, whether that is a chance to rest and relax, check email, or catch up on the news. By linking to transit services, employee shuttles help replace single-passenger car trips and reduce vehicle miles traveled. Additionally, employees routinely look at shuttles as an added benefit because they save money on gas and vehicle costs. This helps companies to entice new hires and reducing turnover, but also provides a less expensive alternative to expensing

mileage or building infrastructure like a parking structure.

Recommendations

- Encourage private services such as Bridj to provide service to Union Square from other locations in the region
- Encourage employers to operate shuttle services to employment locations outside of 1/4 mile from the future Union Square station of the Green Line

ADVOCATE FOR THE "YELLOW LINE"

With the Green Line station in Union Square moving toward reality, the community has already begun to think about where other transit opportunities exist. Inter-urban connections, such as installing passenger rail on the existing Grand Junction Line (or the "Yellow Line") would provide additional benefits for Union Square by connecting the neighborhood directly to East Cambridge, Kendall Square, MIT, Allston, Boston University and, perhaps, even to North Station or Everett. Extending the Green Line from Union Square to Porter Square would further connect the MBTA system and provide easier access to points in Cambridge and communities along the Fitchburg rail line. In both cases, rail right-of-way already exists that is currently used for the Commuter Rail or moving trains between North and South Stations.

Somerville can take the lead in looking for additional opportunities to expand rail and enhance the economic opportunities in the transformational districts by using new rail to link future job centers to existing employment and institutional hubs.

Recommendations

- Collaborate with key stakeholders in the Greater Boston area to conduct a feasibility study for introducing passenger transit along the existing Grand Junction rail line as well as an off-street multi-modal path.
- Engage a value capture study along the Grand Junction line to determine the viability of privately funding the creation of the stations, passenger rolling stock, and ancillary facilities.
- Review future transit projects with the Department of Capital Projects to ensure that any infrastructure investment does not preclude transit expansion.

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