Transit Strategic Plan

Interim Report
January 2014

http://cambridgema.gov/transit

Credits

- **Richard C. Rossi, *City Manager***
- Lisa C. Peterson, *Deputy City Manager*
- Brian P. Murphy, *Assistant City Manager for Community Development*

Interdepartmental Staff Working Group

- **Project manager: Jeff Rosenblum, *Environmental & Transportation Planning***
- Sue Clippinger, *Director, Traffic, Parking & Transportation Department*
- Stuart Dash, *Director of Community Planning Division*
- Bill Deignan, *Environmental & Transportation Planning*
- Stephanie Groll, *Parking & Transportation Demand Management Officer*
- Jennifer Lawrence, *Environmental & Transportation Planning*
- Michael Muehe, *Director, Commission for Persons with Disabilities*
- Susanne Rasmussen, *Director of Environmental & Transportation Planning*
- Adam Shulman, *Traffic, Parking & Transportation Department*
- Cleo Stoughton, *Intern, Environmental & Transportation Planning*
- Kathy Watkins, *Department of Public Works*

Cambridge Transit Advisory Committee

- **Staffed by: Jeff Rosenblum & Adam Shulman, *City of Cambridge***
- John Attanucci, *MIT, Transit Research Group*
- Joseph Beggan, *Harvard University*
- Kelley Brown, *MIT/Kendall Square Association*
- Miriam Cooper, *Commission for Persons with Disabilities*
- Brian Dacey, *Cambridge Innovation Center*
- John DiGiovanni, *Harvard Square Business Association*
- Jacqueline Douglas, *LivableStreets Alliance*
- Charles Fineman, *Resident, East Cambridge*
- Robert Fitzgerald, *Resident, Mid-Cambridge*
- Jim Gascoigne, *Charles River TMA/Kendall Square Association*
- Randa Ghattas, *Resident, Area-4*
- Eric Hoke, *Resident, Neighborhood 9*
- Jeffrey Lockwood, *Novartis/Kendall Square Association*
- Doug Manz, *HYM Investment Group*
- George Metzger, *Central Square Business Association*
- Susan Pacheco, *Cambridge Council on Aging*
- Katherine Rafferty, *Mount Auburn Hospital*
- Simon Shapiro, *Cambridge Local First*
- Zachary Spitz, *Cambridge Youth Involvement Subcommittee*
- Rev. Leslie K. Sterling, *St. Bartholomew's Episcopal Church*
- Saul Tannenbaum, *Resident, Cambridgeport*
- Ritesh Warade, *Resident, Cambridge Highlands*
- Unfilled, *Low-income Housing Representative*
- Ex-officio: Erik Scheier & Todd Blake, *MBTA*

The Transit Advisory Committee is composed of residents from all parts of the city, representatives of major institutions, and a cross section of stakeholder groups (e.g., commuters, persons with disabilities, low income, elderly, youth, advocates), and large and small businesses.

Introduction

"The MBTA transit system is a regional asset and critical piece of economic development infrastructure that anchors regional efforts to increase housing production, create jobs, grow smart and embrace diversity and inclusion." — ON THE RIGHT TRACK, 2006

Better public transportation is critical for our city to meet our economic development, livability, social equity, and environmental objectives. Yet with $9 billion of debt and $3 billion in unfunded but necessary maintenance, the MBTA is struggling to operate the current system, let alone expand.

The City of Cambridge has limited influence over the MBTA, which is a state agency governed by MassDOT and their Board of Directors. Because Cambridge contributes about $8 million per year in usage assessments (MBTA's overall operating budget is $1.4 billion plus $450,000 in debt service), we are a voting member of the MBTA Advisory Board. Under the 2009 Transportation Reform legislation, though, this board lost authority to approve the MBTA budget.

In January 2013, we launched a 2-year public transit strategic planning process focusing on the City of Cambridge. The purpose is to develop an action plan for how Cambridge will take a stronger leadership role to improve quality and expand capacity of our transit system. A timeline for this initiative is shown in Figure 1.

The process is led jointly by the Community Development Department and the Traffic, Parking & Transportation Department. The city has formed an internal inter-departmental working group and an external stakeholder advisory committee.

Through monthly meetings with these groups over the past year, a significant amount of input was gathered and synthesized into a set of seven overarching goals, outlined later in this report.

For each goal, this report highlights key projects and initiatives already underway by the city.

The purpose of this interim report is to summarize the work of the strategic planning process to date.

Next Steps

Over the next year, the city will specify more detailed objectives for each goal. We will then create an implementation plan that will contain a prioritized set of projects and initiatives. This should be completed by the end of 2014.

Figure 1

Cambridge Transit Strategic Planning Process Timeline

Regional Context

"The scale and complexity of the region's challenges make it clear: making a Greater Boston Region requires a transformative plan, a sustainable plan that will improve equity among our residents, strengthen the economy, protect the environment, and improve our quality of life." — METROFUTURE, 2008

Presently, over 73% of the Massachusetts population lives within the MBTA service district, and takes over 1.3 million trips each day.

Based on historic trends in birth rates, mortality, and migration, we expect approximately half of a million new residents in our region by 2030, an increase of about 13%. It is projected that about 300,000 new jobs will be added in greater Boston by 2030, and the need for an equal number of new housing units.

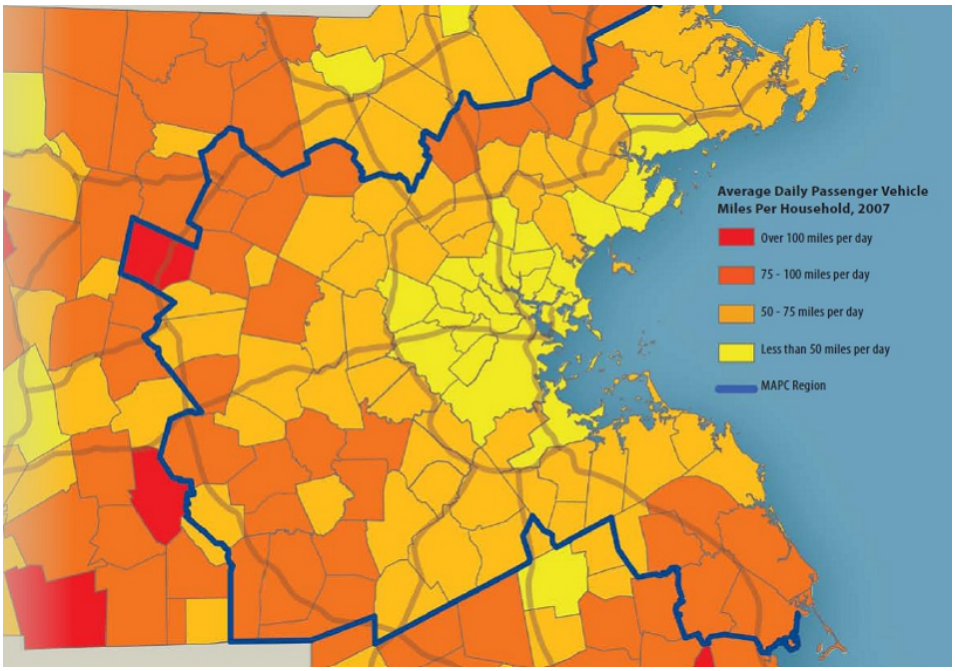
MetroFuture is a comprehensive, regional, long-range land use plan published in 2008 by the Metropolitan Area Planning Council (MAPC). It projects that by the year 2035 there will be a 7% increase in demand for our roadways and a 30% increase in demand for transit service in the Boston region— levels that will require increased transit capacity.

Despite this, decades of underfunding the MBTA have resulted in neglect of the ongoing maintenance needed to keep the system working reliably and safely. Without investment to expand the capacity of our system, we will be unable to meet the projected mobility needs in the future.

While current fiscal challenges make it difficult to consider increasing the capacity of our system, it is critical that we confront the need for investment in an expanded transit system order to keep up with growing demand.

Figure 2

Municipalities Comprising the Boston Region



A key element of the MetroFuture plan is that population and job growth would be concentrated in municipalities already well served by infrastructure, with slower growth in less developed areas where infrastructure is more limited.

This "smart growth" would be a more sustainable form of development because of compact development patterns that are readily served by transit. Roughly half of all new homes would be located in urban communities. Cambridge will need to be even better served by transit than it is today.

As the Baby Boomers move into their 60s and beyond, 20% of Cambridge residents are expected to be 55 or older by 2030.

Our region is expected to become more racially diverse in the coming years. Black, Hispanic, Asian, and other non-White populations are

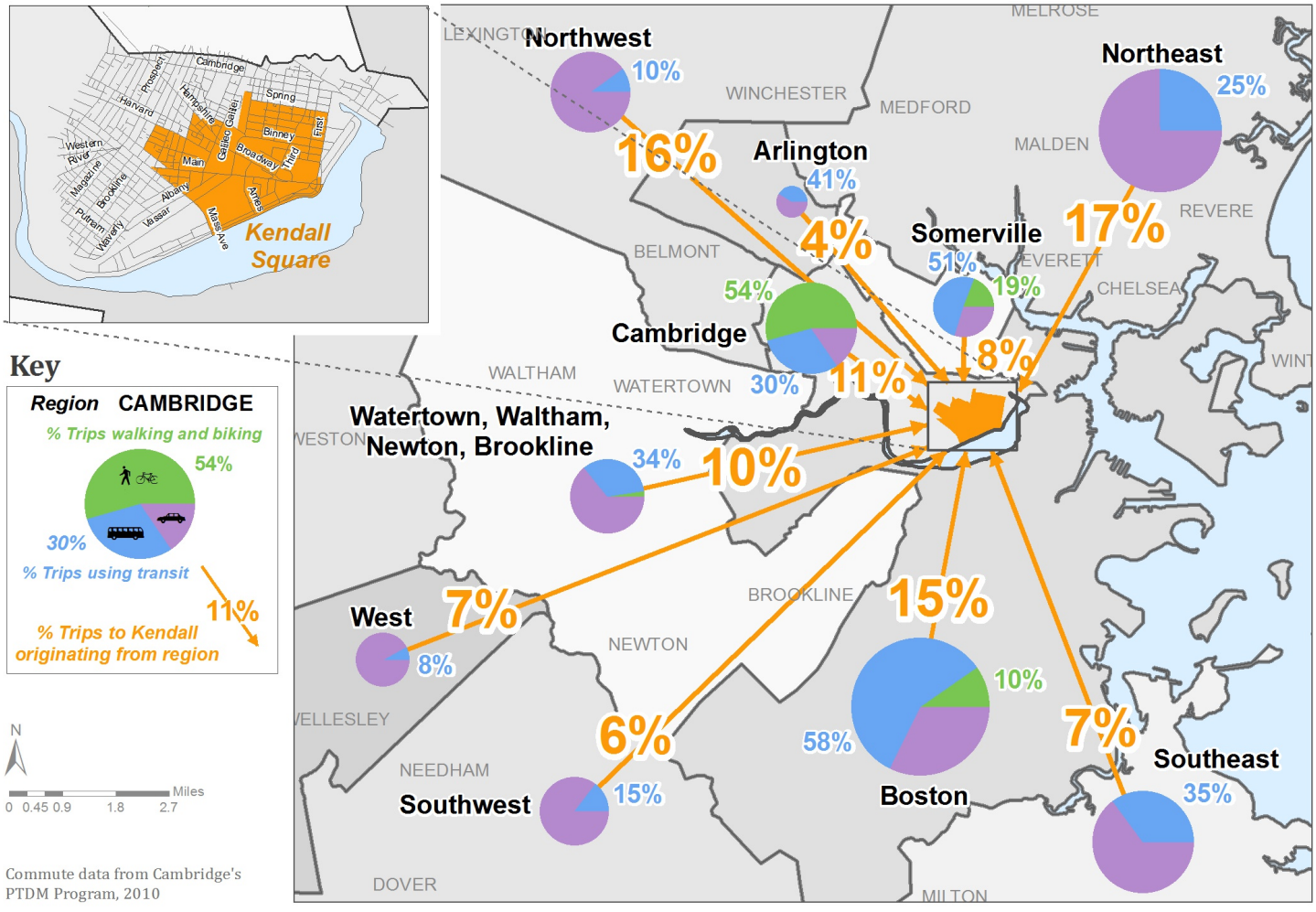
projected to increase from 18% in 2000 to 31% in 2030.

An expanded transit system would provide better service to both urban and suburban areas, link more homes and jobs, and serve more areas than it does today.

The lack of transit along the corridor from Sullivan to Kendall and to Longwood Medical Area is of major concern and should be prioritized to ensure interconnectivity between business districts and access to jobs. The proposed Urban Ring circumferential bus rapid transit project would serve this corridor with an expected 13,000 passengers getting on this service at Kendall Square every day.

A 2007 study assessed future scenarios for transit funding in the Chicago region and found that increasing investment in public transportation by $2½ billion per year would lead to regional economic growth of about $4 billion per year and add 22,000 jobs.

Figure 3
Travel to Kendall



Sustainable Mobility in Cambridge

High quality public transportation is critical for Cambridge to address our sustainability goals.

Economically Viable

Mixed-use development has occurred in the greater Kendall Square area over the past decade. An additional 4 million square feet of mixed-use development has occurred over the past decade providing a significant increase in jobs and housing without an increase in traffic. In a large part, this is due to the availability of transit.

But the total development projected for our region will not be possible without additional transit capacity: $7 billion in development investment is currently planned for transit-connected areas in Greater Boston's Urban Core, $2 billion of which is planned for Cambridge, focused on Northpoint and Kendall Square areas.

Significant investment in transit is critical to the future of economic growth in Cambridge and the region.

Cambridge's Parking and Transportation Demand Management ordinance contains stringent and enforceable mode-share requirements linked to development that have successfully limited the number of single-occupancy-vehicle trips.

Transportation is the second largest expense for most households after housing. On average, Cambridge residents spend 32% of their income on housing and 10% on transportation. Housing that is located closer to employment,

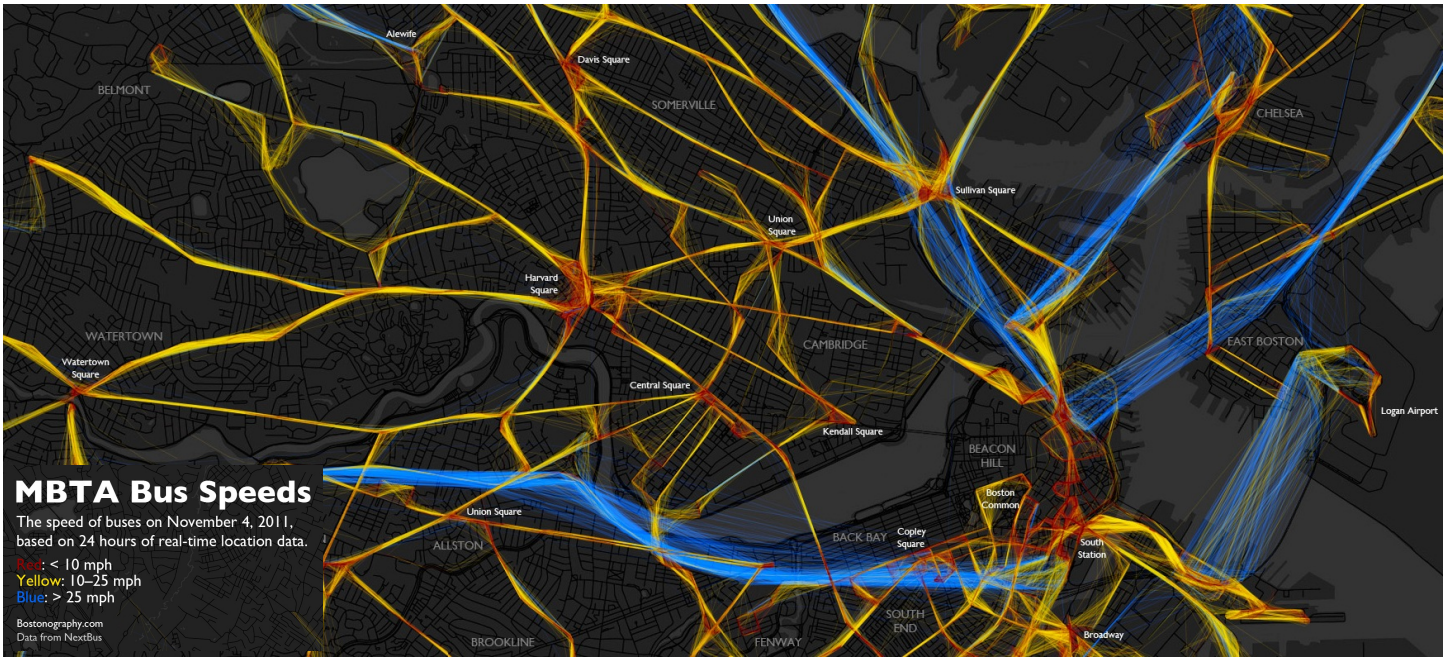
shopping, restaurants and other amenities can significantly reduce household transportation costs.

Livable and Equitable

Cities with good transit networks have vibrant urban spaces that are more walkable and bikeable because less space is needed for driving and parking automobiles. Public

Figure 4

Average Speed of MBTA Buses



transportation supports increased foot traffic, street-level retail, and mixed land uses that enable a shift from driving to walking and biking. Every world-class bicycling city also has world-class transit.

Streets in Cambridge are designed to encourage walking, with short blocks, frequent and well-marked crosswalks, and traffic signal timing that favors pedestrians. European-style bicycle lanes that are separated from traffic are a focus for installation to create more low-stress bicycling environments.

Transit systems that are robust and interconnected with biking and walking have proven to affect behavior change and positively impact a community's health and wellbeing. Public transit users take an average of 30% more steps per day, decreasing the likelihood of pervasive chronic diseases such as obesity and diabetes.

Households living close to public transportation tend to own fewer cars on average. Car ownership has been declining in Cambridge over the last decade, in large part because the availability of car sharing provides households with use of an extra car when needed.

A reduced number of cars per household tends to lead to reduced car use, and driving may cease to be the habitual choice for every trip.

Providing mobility for our most vulnerable populations is of utmost importance. Transit is the only way to get around for longer trips when driving is not an option for financial or other reasons. Persons with disabilities, elderly, low-income, and students are often particularly reliant on transit.

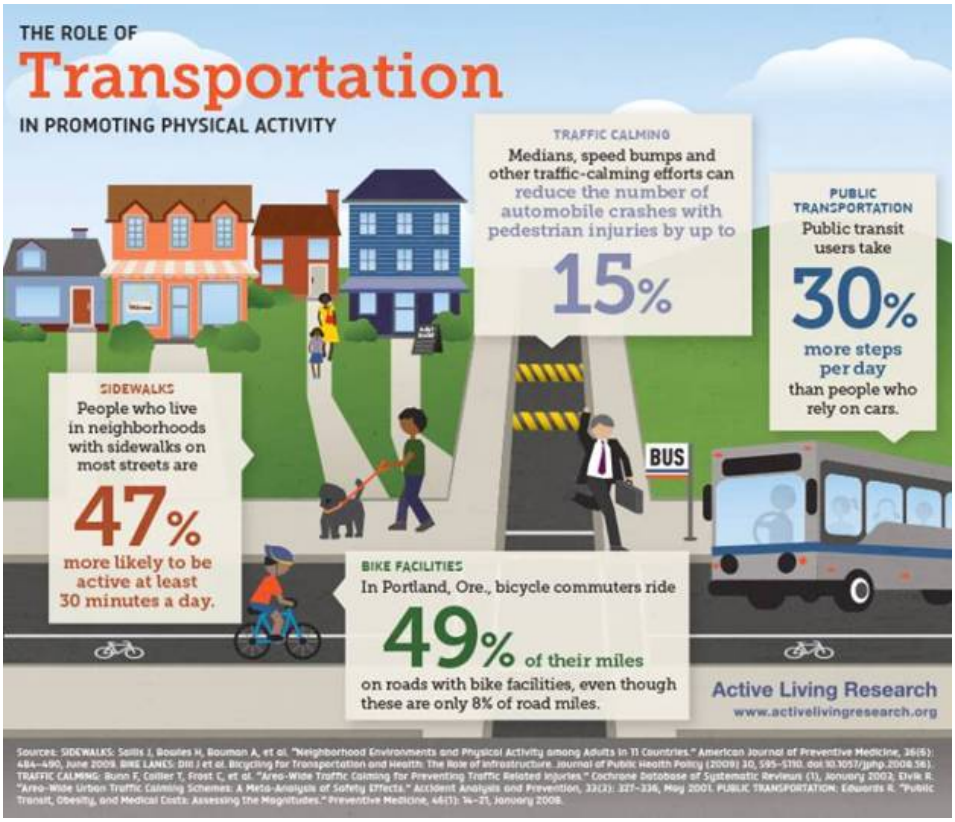
Reduced Environmental Footprint

The transportation sector directly accounts for about one-third of all greenhouse gas emissions in the US.

Reducing greenhouse gas emissions from transportation requires a broad range of strategies, including increasing vehicle efficiency, lowering the carbon content of fuels, and reducing vehicle miles of travel. Public transportation is an important component of the solution.

Switching to public transportation is one of the most effective actions individuals can take to reduce their carbon footprint. Taking transit instead of driving for a daily commute of 10 miles each way reduces one's carbon footprint by 8%.

Public transportation reduces emissions by facilitating higher density development, which conserves land and decreases the distances people need to travel to reach destinations. In many cases, higher density development would be more difficult without the existence of public transportation because more land would need to be devoted to parking and travel lanes.



Policy Linkages

"For too long, federal policy has actually encouraged sprawl, congestion and pollution, rather than quality public transportation and smart, sustainable development. We've been keeping communities isolated when we should have been bringing them together." — PRESIDENT BARACK OBAMA, 2009

Cambridge Policies

Vehicle Trip Reduction Ordinance (VTRO), 1992. Make more efficient use of mass transit, bicycling, walking, and other alternatives to drive-alone trips.

Growth Policy Document, 1993 & 1997. Undertake reasonable measures to improve the functioning of the city's street network, without increasing through capacity, to reduce congestion and noise and facilitate bus and other non-automobile circulation.

Parking and Transportation Demand Management Ordinance (PTDM), 1998. Reduce vehicle trips and traffic congestion within the City, thereby promoting public health, safety, and welfare and protecting the environment.

Cambridge Climate Protection Action Committee, Draft Roadmap, 2013. Reduce vehicle miles traveled by vehicles registered in Cambridge 5 percent below 2010 levels by 2020.

Department of Public Works 5-Year Plan. Reconstruct streets and sidewalks with an emphasis on a Complete Streets approach: designing streets for all users.

Food and Fitness Policy Council. Promotes health through improving access for all residents to healthy foods and physical activity.

Community Compact for a Sustainable Future, 2013. Leveraging the intellectual and entrepreneurial capacity of the business, non-profit, education, and municipal sectors in Cambridge to contribute to a healthy, livable and sustainable future.

Massachusetts Policies

Massachusetts GreenDOT Policy Initiative. Reduce greenhouse gas emissions; promote the healthy transportation options of walking, bicycling, and public transit; and, support smart growth development.

Mode Shift Initiative. MassDOT has established a statewide goal of tripling the share of travel by bicycling, transit and walking and reducing driving trips.

Boston MPO's Long-range Transportation Plan, "Paths to a Sustainable Region," 2011. Increase transit and other healthy transportation mode share.

MAPC's MetroFuture Vision, 2008. An expanded transit system will provide better service to both urban and suburban areas, linking more homes and jobs; more people will use transit for work and personal services.

Healthy Transportation Compact. Requires state-level transportation decisions to balance the needs of all transportation users.

Healthy Transportation Policy Directive. This policy directive requires that all MassDOT projects not only accommodate, but actively promote healthy transportation modes.

Global Warming Solutions Act (GWSA). The Clean Energy and Climate Plan sets the statewide greenhouse gas emissions limit for 2020 at 25 percent below 1990 levels, the maximum authorized.

Design Guide standards on Complete Streets. Complete Streets is the comprehensive multi-modal philosophy in MassDOT's Project Development and Design Guide that requires safe and appropriate accommodation for all roadway users. Consideration should be made through all phases of a project so that even the most vulnerable (e.g., children and the elderly) can feel and be safe within the public right of way.

National Policies

USDOT Livability Policy Initiative. "Livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or Post Office, go out to dinner and a movie, and play with your kids at the park – all without having to get in your car." (Ray LaHood, former US Secretary of Transportation)

Transit in Cambridge

"A competitive economy, a healthy public, a healthy environment, and our quality of life in the Commonwealth depend upon a functioning and financially stable transportation system."

— CAMBRIDGE CITY COUNCIL, POLICY ORDER RESOLUTION, 2012

25% of people who live or work in Cambridge rely on transit (see Figure 6). Many more use transit as a secondary means to get to work and use it regularly for non-commuting purposes. By comparison, only 6% of those who live or work in the greater Boston area rely on transit. Cambridge has a high live-work population—about half of all employed residents of Cambridge also work in Cambridge. 32% of Cambridge households do not own a car.

Figure 5

1/4 Million Daily Transit Trips Start or End in Cambridge

Red Line

The MBTA Red Line carries 250,000 riders per typical weekday, with 140,000 of them starting or ending their trip at one of Cambridge's five stops.

October 2013 saw record ridership, an increase of about 15% over the past 5 years. The continued growth in ridership is certainly welcome, but is increasing strain on the system.

Running perfectly, the Red Line has the theoretical capacity to handle present-day demand. Boston-bound trains during morning rush hour experience the worst overcrowding of trains in Cambridge. Figure 7 shows that on average over the peak hour, each train leaves Central Square station with 800 passengers. The maximum capacity of each train is 1000 passengers, including those who must stand.

But as we have all experienced, there is often such overcrowding that people are left behind on the platform. This is the result of persistent vehicle and track switching system breakdowns causing significant delays.

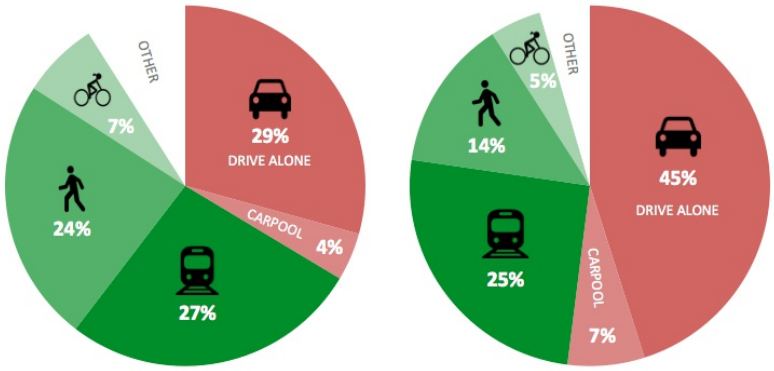
Red Line trains should come exactly 4 ½ minutes apart during rush hour. Figure 8 shows that only 12% of Red Line trains are within 1 minute of being on time. 35% are late by more than 1 minute, some over 10 minutes late. The remaining 53% arrive on the heels of a late train which means they are either picking up passengers left behind or simply running empty. In either case, we classify these as ineffective for our analysis.

All of the Red and Orange Line trains have exceeded their useful lifespan or require significant overhaul. On some mornings, the MBTA does not operate with the maximum number of train-sets possible.

Even if the Red Line system were operating at peak capacity, it could not meet the mobility needs from the planned growth that is expected in Cambridge and our region over the next 30 years.

Figure 6

Current Cambridge Mode Share



How Cambridge residents commute to work

How employees commute to Cambridge

Therefore, increased capacity is needed either by increasing the capacity of the Red Line or by adding new subway or bus service. A modern "Communications-Based Train Control" system has the potential to double the capacity of the Red Line by allowing trains to come twice as frequently, as has been successfully implemented in London. In addition, new trains that allow passage between cars allow for a better distribution of passengers during peak time, as in several European metro systems.

Green Line

On a typical weekday, about 13,000 passengers get on or off the Green Line at Lechmere Station. Trains run every 6 minutes during rush hour. The Green Line Extension project will allow trains to continue to Union Square and Medford, resulting in an additional 5,000 people getting on or off at Lechmere Station.

Buses

33 bus routes pick up or drop off 85,000 riders in Cambridge per typical weekday. Of the 10 bus routes with highest ridership in the entire MBTA system, four of them are in Cambridge (routes 66, 1, 77, and 70).

Four of the bus routes operating in Cambridge fail the MBTA's "vehicle load standard," meaning there is excessive crowding during peak times (routes 1, 47, 66, and 71).

The MBTA is completing implementation of the Key Bus Route Improvement Program, which includes routes 1, 66, 71, 73, and 77 in Cambridge. The program improves bus service reliability and reduces overall trip times by consolidating stops. It also provides better passenger amenities at stops such as shelters, benches, signage, and trash barrels.

Figure 7

AM Red Line Train Toward Ashmont/Braintree

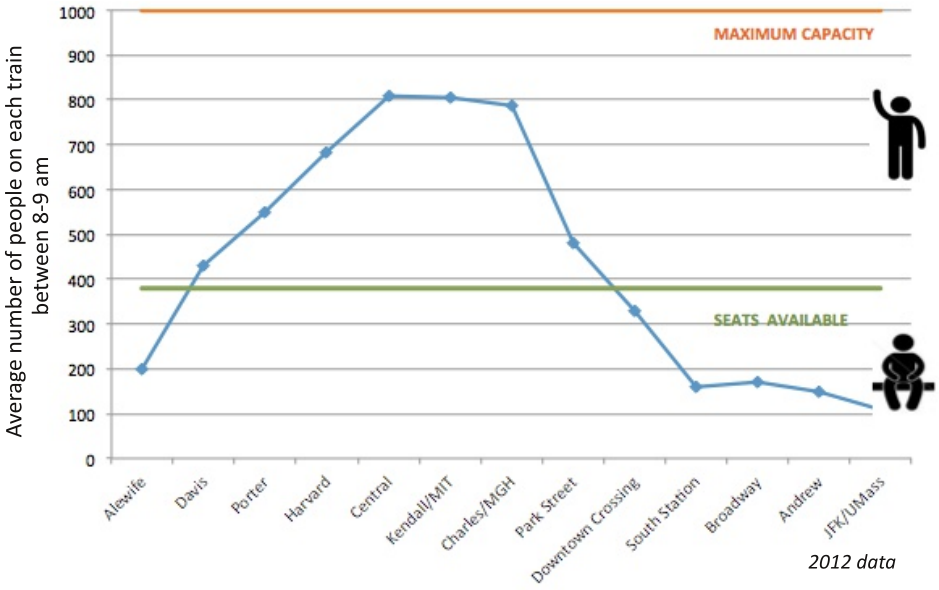
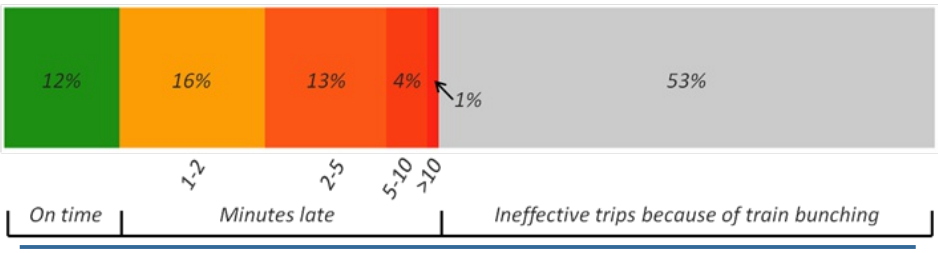


Figure 8

Red Line Train Delays



Cambridge also has another public bus service, run by the Charles River Transportation Management Association, which operates the EZRide Shuttle, helping to connect transit and worksites for commuters to Kendall Square, East Cambridge, MIT, and Cambridgeport. Launched in 2002, the EZRide now carries about 2,500 passengers per day .

Given the current fiscal reality that funding is currently not available for new subway lines beyond the Green Line Extension, MassDOT and municipalities must consider low-cost transit improvements that increase capacity in the short term.

For example, extending existing bus routes, such as from Central Square to Kendall Square, can relieve congestion on the Red Line at relatively low cost. Prioritization of buses can also be achieved by strategically adding queue-jump priority lanes and implementing traffic signals that prioritize buses.

One of the limiting factors to significantly increase peak bus service is the need for constructing additional bus garages to house additions to the fleet.

Figure 9
RapidTransit Routes and Stops

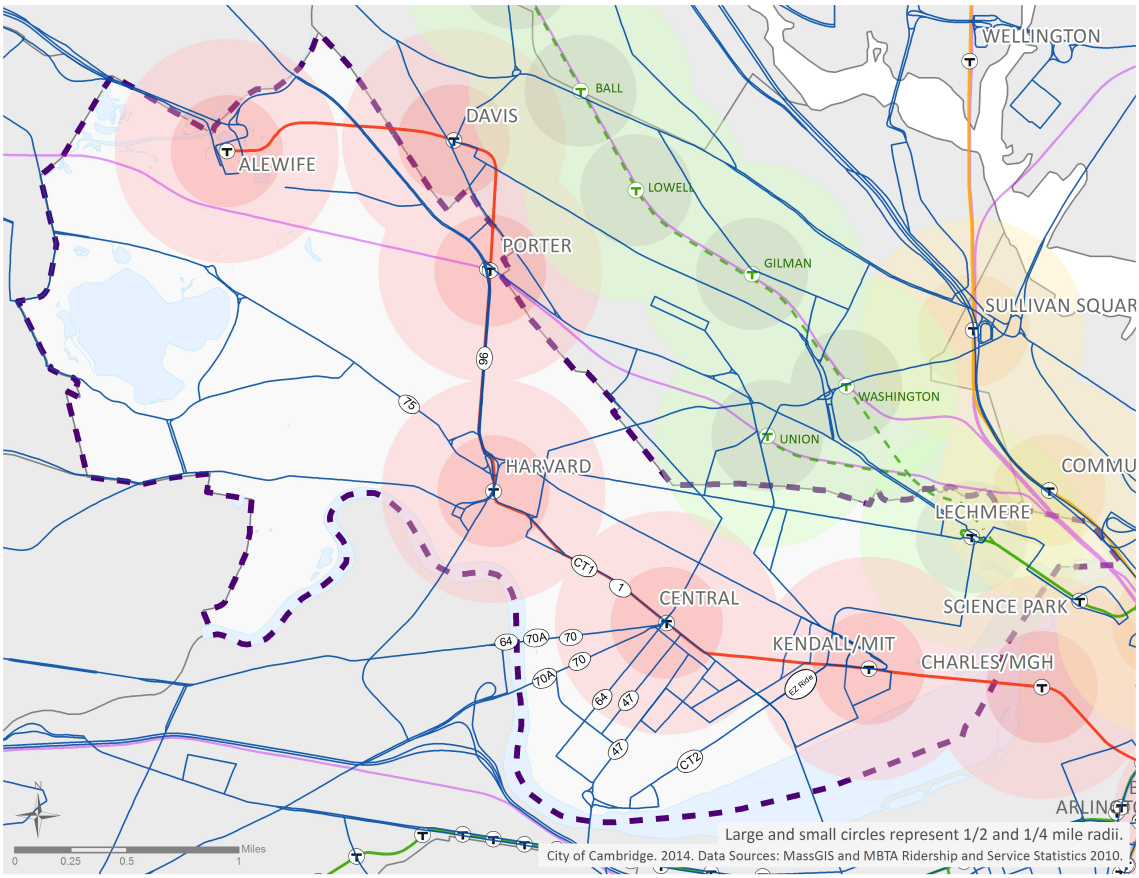
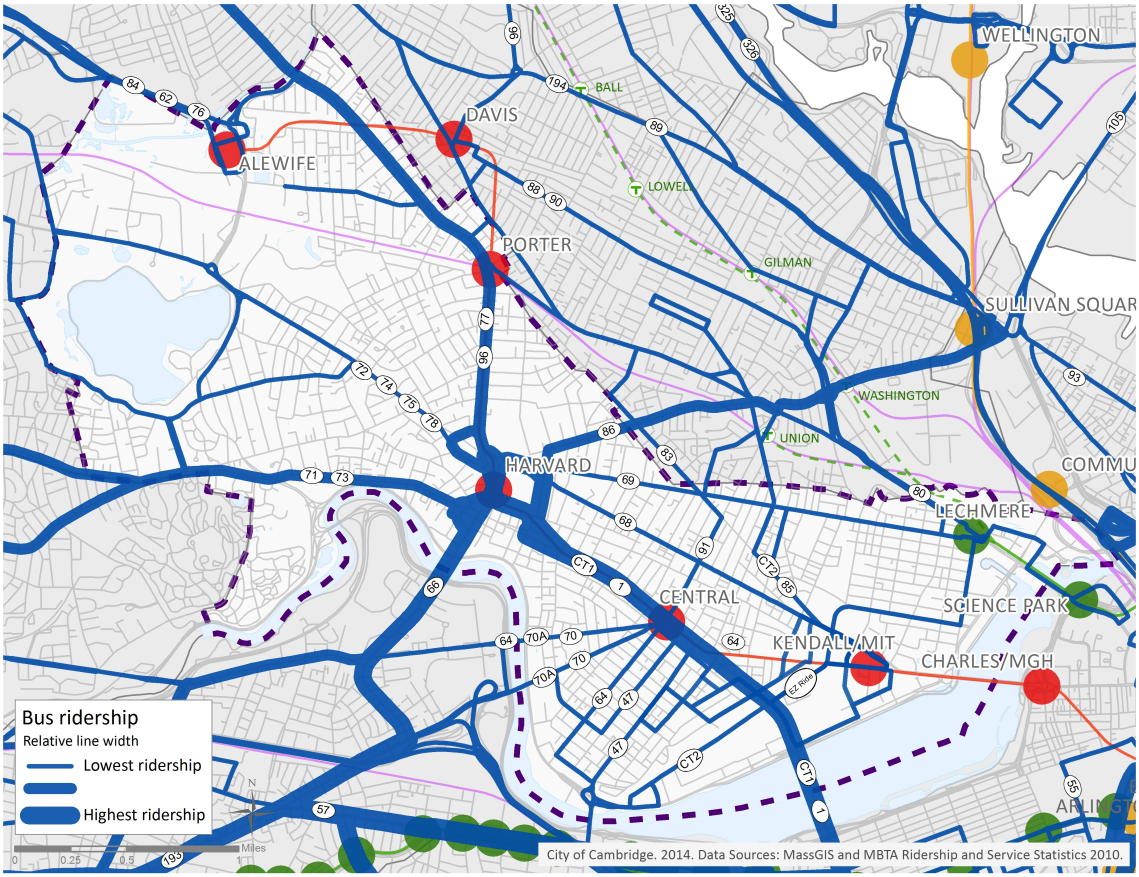


Figure 10
Bus Routes and Ridership



Goals

"The future success of Cambridge hinges on better public transportation. High quality transit, biking, and walking options make cities far better places to live and work." — RICHARD C. ROSSI, CAMBRIDGE CITY MANAGER

Input from the internal interdepartmental working group and the advisory committee was summarized as a set of seven overarching goals representing the outcomes that the city wishes to see result from our efforts.

Goal 1: Mobility

Ensure that the transit system provides for the mobility needs of Cambridge residents and visitors, including trips to work, school, shopping, and recreation. Our future transit needs resulting from regional growth and development, as well as changing demographics, must be understood.

Goal 2: Funding

Ensure that the legislature adequately funds our transit system, keeps it affordable, and has the regional common good at its core.

Goal 3: Efficiency and Reliability

Improve efficiency of transit trips such that travel times are equal to or less than equivalent driving times. Our system needs to be more dependable and reliable.

Goal 4: Expansion

Expand the capacity of rapid transit and bus service by increasing frequency, extending existing routes, and adding new routes.

Goal 5: Usability, Accessibility, and Safety

Improve system access for all users by emphasizing interconnectivity between transit and other modes (e.g., walking and biking), accessibility for persons with disabilities or mobility impairments. Safety, convenience, human-centered design, good wayfinding, and real-time service information are important elements of a world-class transit system.

Goal 6: Public Participation, Support, and Outreach

Engage the public in the planning process, better inform them about the issues facing the future of Cambridge, and gain support from the public for implementing better transit service. Use marketing with a focus on "social marketing" to achieve mode shift in many demographics across Cambridge.

Goal 7: Resiliency

Ensure the transit system is resilient to the effects of climate change. Transit also plays a role in reducing transportation's contributions to climate change.

Current Activities to Date

This section contains a summary of activities and programs in which the city is currently engaged. Additional items will be identified through this strategic planning process.

Goal 1: Mobility

- Studying origin and destination patterns to Cambridge.
- Analyzing demographic data as it relates to transit ridership.
- Tracking trends in subway and bus ridership data.
- Developing transit use projections for the Kendall Square/Central Square planning process.
- Pushing transit use through the Parking and Transportation Demand Management program.
- Reviewing Traffic Impact Studies for large development projects.
- Participating in MBTA's bi-annual service planning process.

Goal 2: Funding

- Supporting transit funding in the State's proposed $12 billion 5-year capital investment plan.
- Collaborating with regional transportation stakeholders.
- Engaging with MassDOT in collaborative regional transit planning.
- Contribute funds toward EZ Ride to grow ridership by the general public.

Goal 3: Efficiency and Reliability

- Conducting a bus circulation study of Central Square.
- Pushing for communications-based train control for Red Line as part of new car procurement.
- Collaborating on MBTA's "key bus routes" improvement program.
- Exploring conceptual designs for bus priority pilot projects.
- Implementing signal progression to improve traffic and transit flow.

Goal 4: Expansion

- Develop proposal for expanded bus service from Sullivan Sq. to Kendall Sq.
- Participating in the regional "Bus Rapid Transit Study Group" hosted by the Barr Foundation.
- Advocate for Urban Ring circumferential transit project.
- Participating in Green Line Extension planning and implementation.
- Supporting transit in the state's long range transportation planning process.
- Working with Charles River TMA on potential EZ-ride expansion.
- Collaborative planning with Longwood Medical Area institutions.
- Supporting late-night T service.

Goal 5: Usability, Accessibility, and Safety

- Improving amenities at bus stops, through "Key Bus Routes" program.
- Expanding the bus shelter program.
- Developing best practices design guidelines for bus stop design.
- Increasing bicycle parking at rapid transit locations.
- Installing Hubway bike share stations at transit stations.
- Ensuring bus stops and transit stations are cleared of snow.
- Collaborating with the MBTA on elevator upgrades.
- Improving multi-use paths to access Alewife Station.
- Applying for a Mass In Motion Grant to help our aging population gain better access to transit.

Goal 6: Public Participation, Support, and Outreach

- Engaging stakeholders through the Advisory Committee and other public outreach programs.
- Encouraging transit use through CitySmart social marketing program.
- Encouraging development projects to include innovative transportation demand management plans and reduce parking.
- Collaborating on a Kendall Square "mobility pass" pilot with MIT funded by FHWA.
- Working with the Youth Engagement Subcommittee.
- Working with the Public Health Department on the community health improvement plan.

Goal 7: Resiliency

- Participating in Cambridge's Vulnerability Assessment to understand impacts of climate change on our transit system.
- Urging MassDOT and the MBTA to study system-wide vulnerabilities and develop a regional approach to increase resiliency.
- Participating in city and state preparedness planning efforts.

Next Steps

Develop Objectives
December 2013 – June 2014

The next step in the strategic planning process is to develop a set of objectives. These are more specific actions that support the attainment of overarching goals. Objectives should be tangible, measurable, and short term.

The city staff working group and the advisory committee each meet monthly to develop objectives for the goals. Following is the tentative schedule:

Goal 5: Usability, Accessibility, and Safety
December 2013

Goal 3: Efficiency and Reliability
January 2014

Goal 1: Mobility
February 2014

Goal 4: Expansion
March 2014

Goal 2: Funding
April 2014

Goal 6: Public Participation, Support, and Outreach
May 2014

Goal 7: Resiliency
June 2014

Develop Work Plan
July 2014 – December 2014

After developing objectives for each goal, we will prioritize the objectives that have been developed and integrate them into an implementation work plan.

This draft work plan will inform the Fiscal Year 2016 budget process.

City staff are engaged in many transit planning activities. These initiatives, and new ones, will continue to be acted upon throughout this strategic planning process.

Data Sources

Mode share data: 2010-12 American Community Survey "Journey to Work" data

Origin & destination data: Central Transportation Planning Staff (CTPS) Transportation Model

Bus and subway ridership, load, and delay data: MBTA Service Planning Department

Regional projections: Metropolitan Area Planning Council (MAPC) MetroFuture

http://www2.cambridgema.gov/cityClerk/policyOrder.cfm?item_id=39597

http://www.governing.com/blogs/bfc/col-massachusetts-bay-tranportation-authority-pension-information-secrecy.html

http://www.mbta.com/about_the_mbta/financials/?id=1054
http://www.mbta.com/uploadedfiles/documents/financials/born_broke.pdf

http://www.mbta.com/about_the_mbta/environment/

http://www.mapc.org/metrofuture/

http://www.edrgroup.com/pdf/timeismoney.pdf

http://www.fhwa.dot.gov/livability/fact_sheets/

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3407915/

http://www.fta.dot.gov/documents/PublicTransportationsRoleInRespondingToClimateChange2010.pdf

http://www.mapc.org/sites/default/files/MetroFuture_Goals_and_Objectives_1_Dec_2008.pdf

http://ctpp.transportation.org/Pages/5-Year-Data.aspx

http://www.mbta.com/uploadedfiles/documents/bluebook%202010.pdf

http://www.metro.us/boston/news/local/2013/12/02/mbta-ridership-soars-in-october/

City of Cambridge analysis based on boarding/alighting data from MBTA Service Planning

Charles River TMA Average Daily Boardings Report, 2013.