Reimagining Rhode Island Public Transportation

A Strategy for Economic Growth

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Throughout history, American cities have been shaped by transportation. In the 18th century, it was by water transport, followed by canals and railroads in the 19th, and since World War II they have been shaped more by the automobile than by any other force in history.

Providence is the poster child for the impact of transportation on cities. In 1800, Providence was an active port and one of the ten largest cities in America, but by 1900, after the great western migration, it was barely in the top 20. In the early 20th century, fueled by growth in manufacturing and railroads, Providence grew from 175,000 to 253,000 in just 30 years, but that growth came to a halt during the Great Depression. Starting in 1940, the combination of suburban migration and the loss of manufacturing jobs led to its great decline; over the next 60 years Providence lost nearly 80,000 residents, while its surrounding municipalities gained over 115,000. By the end of the 20th century, the Providence metropolitan area (as defined below) was over half a million people, but Providence itself was smaller than it was a hundred years earlier, despite the dramatic growth from the Providence Renaissance in the 90's.

The Providence metropolitan area continues to be driven by transportation. The rerouting of I-195 is reshaping the city. T.F. Green is the third largest airport and Providence station is the third largest Amtrak in New England.[i] With shorter travel times and more reliable service, rail traffic between New York and Boston now exceeds air traffic, compared to just 20% of total rail and air traffic in 2001. A comprehensive, thoughtful transportation strategy is key to capitalizing on the region's transportation gains.

RIPTA

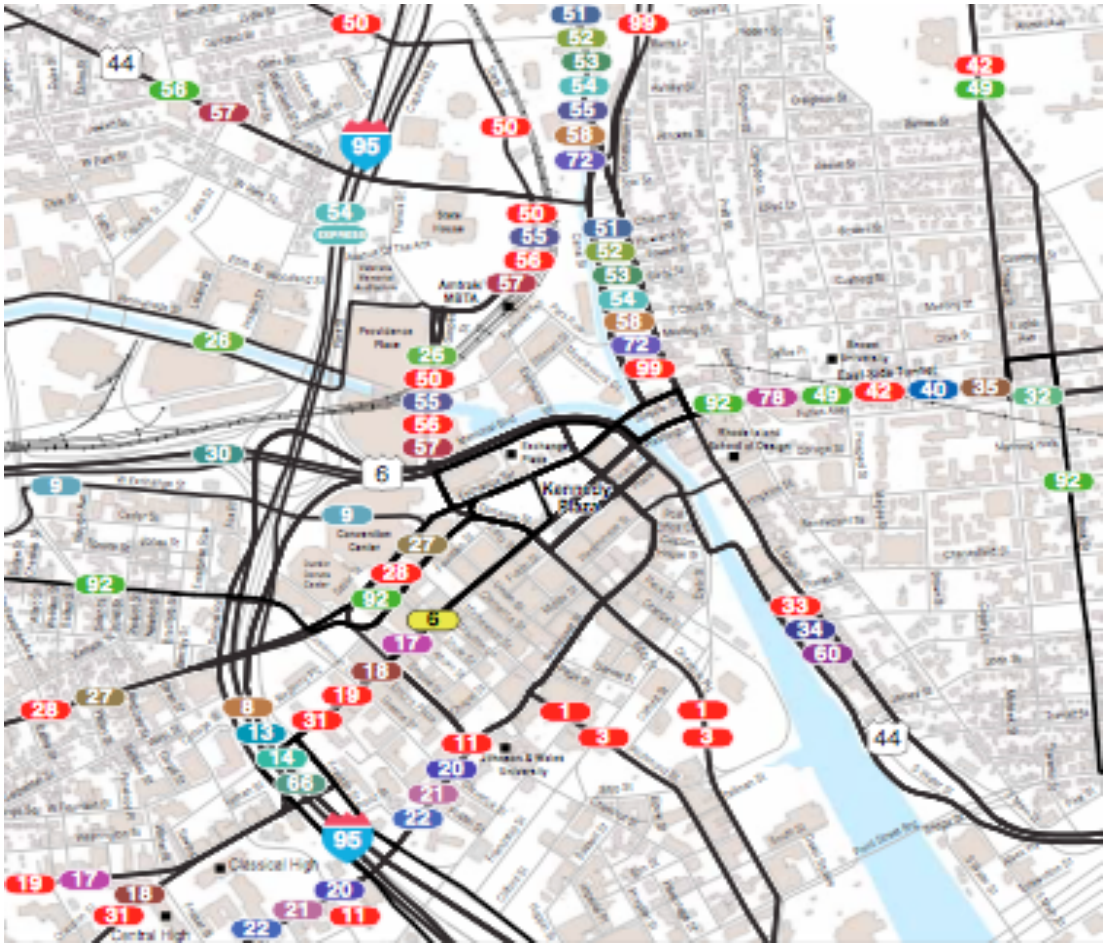
Public transportation in Rhode Island falls under the Rhode Island Public Transit Authority (RIPTA), a state agency funded principally by federal funds, a share of the state gasoline tax, and operating revenue. It manages a regional network of bus routes serving nearly all the communities across the state, the bulk of which terminate at Kennedy Plaza in downtown Providence.

As the State's "mobility manager" RIPTA is responsible for coordinating and integrating all public transportation, but its primary focus has been on bus and paratransit. It provides some level of service to nearly all areas of the state, and has been particularly successful at providing access to public transit for people who do not have cars.

RIPTA's bus-based design has significantly reduced the capital costs for infrastructure, but it is inherently limiting in many ways. It is not scalable, it adds

to congestion, particularly in downtown Providence, and it is highly dependent on carbon-based fuels. In addition, RIPTA's single-hub design has produced a spaghetti-bowl of bus routes to and from Kennedy Plaza, which makes it nearly impossible to use public transportation to travel from anywhere in northern Rhode Island to anywhere else without passing through Kennedy Plaza.

RIPTA Service Map – Downtown Detail



Metro Transit Study

In December 2009, a blue-ribbon working group published the *Providence Metro Transit Enhancement Study* (the "2009 Study"), which recommended potential transit improvements to better serve the Providence metropolitan area. It built on a 2006 study entitled *Transit 2020*, commissioned by the city of Providence, *Land Use 2025: Rhode Island's State Guide for Land Use*, and *Transportation 2030*, a federally mandated analysis of long-term transportation needs. The 2009 Study acknowledges the growing recognition of the importance of transit in promoting mobility, environmental stewardship and economic vitality.

The 2009 Study defined the Providence metropolitan area as Central Falls, Pawtucket, Providence, North Providence, East Providence, and portions of Warwick and Cranston east of I-295, which covers about half of the population of the State. It identified the following goals and objectives:

- Gauge transit need, encourage use, and improve system and service quality
- Increase cooperation between public and private entities
- Channel development within an "urban services boundary" and support land use goals
- Develop seamless connections between transit modes
- Coordinate with Amtrak's planned infrastructure expansion
- Develop an adequate, sustainable funding model
- Expand the mission of RIPTA

Specific recommendations of the 2009 Study included:

- Reinvent Kennedy Plaza
- Introduce new transit hubs
- Expand Park and Ride options
- Initiate rapid bus service
- Build a Providence streetcar network
- Strengthen intermodal connections
- Expand programs for commuters
- Encourage transit-oriented development

The capital cost of the recommendations in the 2009 Study was $127 million (nearly 60% of which was for a Providence streetcar network), with incremental annual operating costs of $19 million, and a projected 35% increase in ridership. About 80% of the capital cost would be paid for with federal funds, with the balance coming largely from State GO bond proceeds. Several new revenue streams were discussed to make RIPTA more viable in the long term, but the only one to be implemented as of the date of the 2009 Study was a larger allocation of gasoline tax revenue.

The 2009 Study provides an excellent summary of RIPTA's current operations, the economic challenges facing Rhode Island,[ii] and the need to develop a sustainable revenue model to support public transportation. Unfortunately, the recommendations fall short in several ways:

- The 2009 Study simply built upon the existing transit model, leading to further congestion, limited scalability, a linear increase in costs, a larger carbon footprint.
- Perpetuating the current hub-and-spoke network of bus lines would continue to make it almost impossible to travel to anywhere in northern Rhode Island without passing through Kennedy Plaza.
- The recommendations would not channel future growth to high priority development sites, such as the I-195 corridor, Allens Avenue, or downtown Pawtucket, or help achieve land use goals.

- It would do little to encourage transit-oriented development, contained no ideas for public-private partnerships, and did nothing to attract "discretionary riders."
- The only intermodal connection is a bus stop at the Amtrak, which would do almost nothing to expand programs for commuters.
- It did not solve the problem of a more sustainable revenue model.
- It did not expand RIPTA's mission.

A New Mission for RIPTA

A regional approach to public transportation makes much more sense than for each community to go its own way. RIPTA already is an effective regional service provider, but its current ridership falls far below national averages for transit use, despite the fact that Rhode Island is one of the most densely populated states in the nation.[iii] To significantly increase ridership, it needs to think beyond buses as its only mode of transportation. It should also look for new ways to reduce both congestion and pollution, to stimulate and support targeted development, make the region more competitive for jobs, and improve the quality of life for all residents.

Until now, RIPTA has relied entirely on buses for its transportation network, which is inherently limiting. If it is to expand its mission, it needs to seriously consider a number of other transit options.

Light Rail. The conventional wisdom is that light rail would not be appropriate for RIPTA because there is not adequate density to justify the high up-front cost, and even the most heavily traveled RIPTA bus lines could not justify the high operating cost. However, light rail has numerous advantages over buses in areas where transit demand is high.

- Lower operating cost per passenger mile – While it costs nearly twice as much per hour to operate light rail vs. a bus (National Averages are $233 vs. $122[iv]), a three-car light rail train can carry four to five times as many passengers as one bus. With sufficient demand, the significantly larger passenger capacity makes them much cheaper per passenger mile.
- Positive land use impact – Bus routes lack permanence. As a result, developers are far more likely to locate along light rail lines vs. bus routes, resulting in greater ridership and higher property values.
- Less noise and air pollution - Light rail is most often powered by electricity vs. diesel-powered buses.
- Higher ridership – Nationally, light rail attracts higher discretionary demand than buses, which has a significant positive impact on congestion.
- Greater comfort and reliability – More space per passenger and a smoother, quieter ride leads to greater customer satisfaction, even with no pickup in travel times. Operating on dedicated rail lines, there are no traffic delays.

- Reduces highway congestion – While buses reduce congestion compared to automobiles, they still operate on the same highways and city streets as other traffic, which is particularly problematic in congested downtown areas.

BRT. Bus Rapid Transit (BRT) is a bus-based rapid transit system that combines some combination of dedicated rights of way, off-board fare collection, level boarding, and signal priority, all of which are intended to increase capacity, avoid delays, and shorten travel times. They attempt to combine the greater speed and capacity of light rail with the flexibility and lower cost of buses. A GAO study in 2000 found that the average capital cost for BRT was $13.5 million per mile vs. $34.8 million for light rail. Operating costs tend to be slightly lower because of lower vehicle and construction costs. The overwhelming majority of BRT systems are outside the US.

In the US, BRT has been used in highly congested areas, such as Hudson River crossings into New York City where HOV lanes are common, or in inner cities like Cleveland, where it operates more like a streetcar. However, BRT requires a lot of space to operate. Transit stations are needed for raised platforms and off-board fare collection, and dedicated bus lanes compete for space on existing roadways.

The 2009 Study recommended rapid bus service for two bus routes that would use intelligent transit system technology[v], but did not contemplate BRT with specialized buses, raised boarding platforms, off-board fare collection or dedicated bus lanes. More recently, BRT is under active consideration as part of the 6-10 Corridor project to speed transit from Olneyville to downtown Providence.

Streetcars. The city of Providence has seriously considered the development of a new, 1.6-mile streetcar line from the Amtrak station to the Providence Hospital by way of Kennedy Plaza at a cost of about $100 million, or $63 million per mile, to be financed in part by tax increment bonds issued by the City. Its goal was to provide greater mobility in the downtown area, and stimulate economic development.

Streetcars are nearly as expensive as light rail, but travel at slower speeds and make more frequent stops. They generally take one of two forms: Nodal - to connect two or more walkable districts, or linear - to enhance or extend a walkable corridor. Streetcars are pedestrian accelerators, not pedestrian creators: they need heavy pedestrian activity to work, and they need to connect to a larger transit network.

Streetcars work best in high-density neighborhoods, i.e., at least 30 residential units per acre, between centers with dense commercial activity, or to extend development into new areas when more desirable potential development sites

are no longer available, which do not fit the city's proposed plan. However, based on its plans to use tax increment bonds to fund nearly 60% of the capital cost,[vi] the streetcar project was a clear acknowledgment by the city that an investment in the right kind of public transit can provide a significant lift in economic development.

A Hybrid Approach

No single approach can meet all of RIPTA's future needs, including its current all-bus network. However, a hybrid approach would enable RIPTA to combine the flexibility and low initial cost of bus service with the efficiency, service levels and capacity of light rail. A light rail "transit backbone" would enable RIPTA to reroute up to two thirds of its current bus routes into a more ordered and efficient network, and improve intermodal connections. It would significantly reduce RIPTA's carbon footprint and reduce congestion, particularly around Kennedy Plaza. It would channel future economic growth into economic development zones that can support increased density, and offer significant opportunities for public-private partnerships.

A new, 14-mile transit backbone would originate in downtown Pawtucket, pass through the Providence Amtrak station and Kennedy Plaza, and terminate at the Inter Link at T.F. Green Airport (for sake of discussion, the "Green Way"[vii]). About 70% to 90% of the bus routes that currently terminate at Kennedy Plaza today could instead terminate at major transit hubs along the Green Way, including the Amtrak station. In addition to connecting to the MBTA Stoughton line and the Amtrak Northeast Corridor in Providence, The Green Way would also link with the commuter line at the Inter Link.

The Green Way would also have station stops in the I-195 corridor near the Garrahy Courthouse, and in the Jewelry District along Eddy Street in addition to Kennedy Plaza, providing a downtown circulation route that would significantly reduce the need for multiple bus transit hubs in the downtown area.

Major transit hubs along the Green Way would be located at the Inter Link, in Cranston where Route 12 crosses the rail line, at Allens Avenue, and in downtown Pawtucket. Bus routes that currently run north-south to Kennedy Plaza along city streets and I-95 would instead make much shorter east-west routes to these hubs. A significant number of the remaining routes terminating at Kennedy Plaza could be rerouted to the Amtrak station.

The Green Way would not only connect the districts with the greatest development potential to the airport and the Amtrak station, but it could also stop at the Providence Place mall, the Rhode Island Convention Center and the Roger Williams Park Zoo. Future stops could be added on the north side of Federal Hill, southern Smith Hill, and along the Allens Avenue/I-95 corridor to accommodate future development when justified, but developers, not RIPTA, would pay much of the cost of these stops (the same would be true for

Providence Place mall). Since all RIPTA bus routes in the Providence metropolitan area would terminate at some point along the Green Way, ALL area bus routes would have efficient, "two-seat" transit connections to ALL stops on the Green Way.

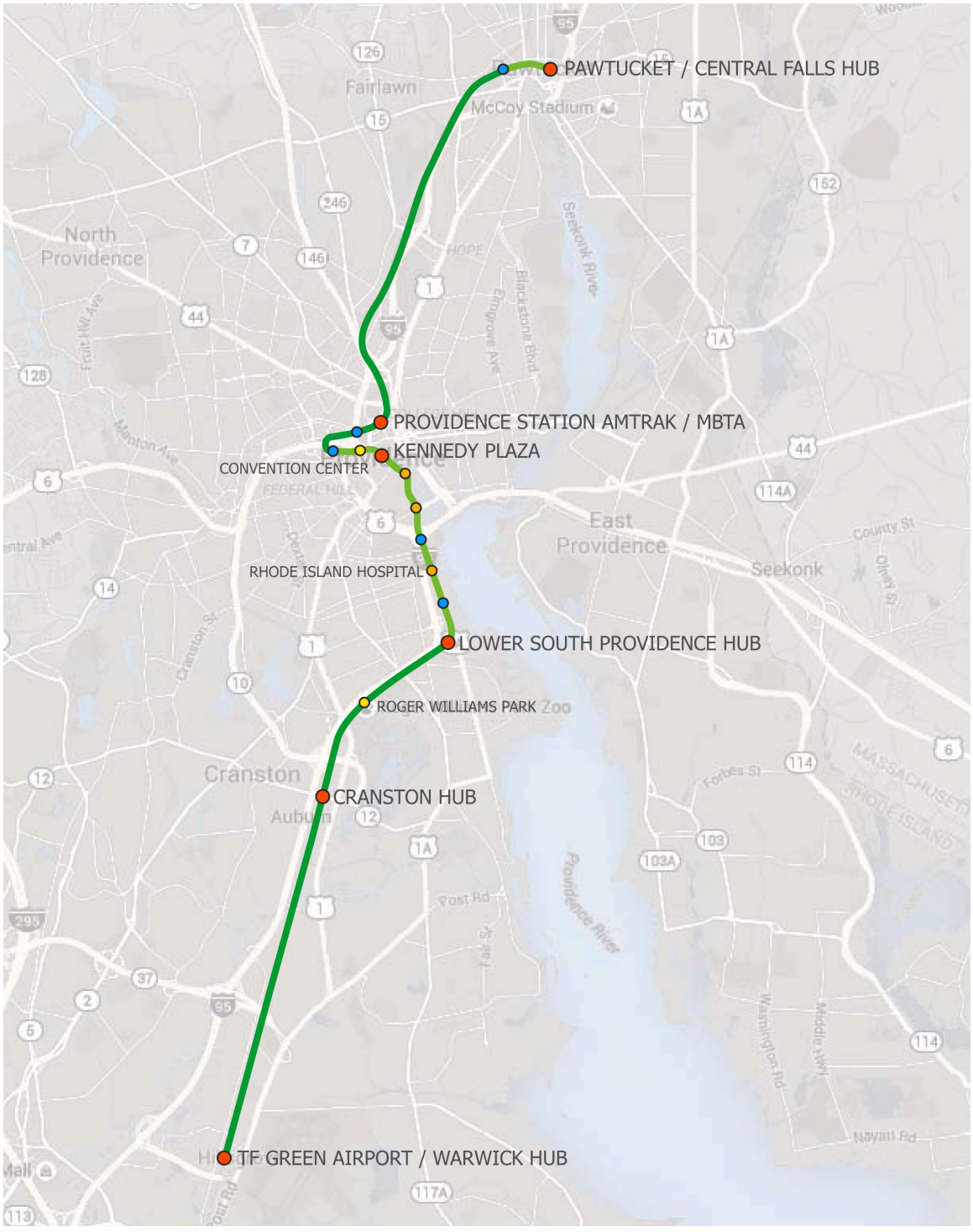
Hopefully, RIPTA could utilize the existing Amtrak and Conrail rights of way from Pawtucket to the Providence Amtrak station, and from the Inter Link to Allens Avenue, although new rail bed would have to be built. The Green Way would operate as a light rail/streetcar hybrid on city streets in downtown Providence and Pawtucket, potentially allowing for more frequent stops. The most complex section of the rail line would run from the Amtrak station to Kennedy Plaza.

The redirecting of bus routes to transit hubs along the Green Way would enable RIPTA to significantly reduce its footprint in Kennedy Plaza, creating the opportunity for alternative land uses. In addition to increasing property values for adjacent sites, it would restore Kennedy Plaza as the true center of downtown Providence.

Greater ridership requires a highly rider-centric approach, including GPS on bus and rail cars and countdown clocks that are also accessible on smart phones; Wifi on rail cars and in stations; security cameras on rail cars and in stations, and a police presence during off hours; off-hours waiting areas; and smart cards for all transportation options. Green Way stations should retain a strong "sense of place," with open space, safe, pleasant indoor and outdoor waiting areas, and shops for the things one would normally pick up during a typical commute. At minimum, there should be a "Starbucks-like" coffee shop near every station stop.

If 70% of RIPTA's current bus traffic could be redirected to the Green Way for some part of its route, together with a relatively small increase in ridership, ***the Green Way would be one of the ten largest light rail systems in the country by ridership, and one of only two or three with over one million passengers per mile.***[viii]

The Green Way



Red Circles: Major Bus Transit Hubs

Orange Circles: Major Non-Hub Stops

Yellow Circles: High Value Amenities

Blue Circles: Public-Private Partnerships

Financials

Capital Costs. A detailed cost analysis of the Green Way is beyond the scope of this paper, but based on very rough estimates of construction costs and on national averages for systems of similar size, the total cost of the Green Way could be as high as $750 to $850 million,[ix] roughly in line with the cost of the I-195 relocation and the proposed 6-10 Corridor project. However, if the proposed Green Way were given serious consideration, an important first step would be for RIDOT to prepare a preliminary route feasibility study and an analysis of capital costs.

A New Paradigm for Funding

The Federal government generally funds about 50% of the cost new transit systems, compared to 80% for roads and bridges. However, given that the Green Way would reduce congestion on I-95, and would increase access to T.F. Green Airport, other Federal funds may also be available. In addition, the Federal Transit Administration's New Starts Program could also be source of funding for locally planned and operated "guideway" transit systems, including BRT and light rail. Assuming RIPTA were able to achieve 80% Federal funding for the Green Way, 20%, or about $160 million at an assumed cost of $800 million, would have to come from State and local funding.

One striking element of RIPTA's funding structure is that it receives no support form the municipalities it serves. Presumably, this is because the current RIPTA model does not raise property values or provide other economic benefits. If public transportation can serve as a catalyst for economic growth, then it makes sense that the municipalities that receive the greatest economic benefit should contribute to some of the cost. Providence appears to have already bought in to this principle with its approach for funding its proposed streetcar line with tax increment bonds. Municipalities in other areas of the US commonly provide some sort of support for regional public transit through such vehicles as local sales taxes.

Providence, Pawtucket, Central Falls, Cranston and Warwick should be prepared to invest in some portion of the capital cost of the Green Way, and potentially some of the operating costs as well, in return for the benefits they receive. They would all be able to earn back their investment from increased tax revenues, particularly from real estate development close to station stops. In these areas, zoning should allow for greater density (for example, from lower parking requirements because of the proximity to the rail line), which in turn would lend further support light rail. For Providence, the investment would be a fraction of the tax increment bond issue that was proposed for streetcars, and the State's contribution would be no more than what Providence had requested for the same project. The following is a representative example of how the project might be financed.

Project Funding	Share (Pct.)	Share ($MM)
Federal Funding		***$676.0***
Federal Transportation Funds	80.0%	$640.0
FTA New Starts	4.5%	36.0
State Funding		***$88.0***
State	3.0%	24.0
RIPTA	8.0%	64.0
Local Funding		***$36.0***
Providence	2.75%	22.0
Pawtucket/Central Falls	0.75%	6.0
Warwick	0.5%	4.0
Cranston	0.5%	4.0
Total	**100.00%**	**$800.0**

The total funding cost to the State and RIPTA, $88 million, is about ***$39 million less*** than the funding called for in the 2009 Study (some portion of which would have been funded by the federal government). Total funding by Providence is ***$38 million less,*** than would have been required for the proposed streetcar.

Operating Costs. RIPTA's 2014 operating budget was just under $100 million, of which 63% was for bus operations, and maintenance. By shortening or terminating as many as two thirds of existing bus routes, costs for bus operations would go down significantly, helping to offset increased costs for debt service, and the operation and maintenance of the Green Way. While detailed estimates of these costs is beyond the scope of this analysis, a $20 million annual expense for light rail operations[x] would result in roughly a 10% increase in RIPTA's operating budget, a portion of which would be offset by an increase in ridership.

	Base Case	Pro Forma	
Operating Costs	**($,000)**	**(Pct. Change)**	**($,000)**
Bus Operations	***$62,300***		***$45,810***
Fuel	6,500	-25%	4,875
Salaries and Benefits	37,500	-25%	28,125
Repairs & Maintenance	18,300	-30%	12,810
Paratransit Operations	***10,250***	***+10%***	***10,762***
Green Way Operations	***0***		***20,000***
Administration	***26,450***		***29,470***
Finance & Rate Admin.	10,000	+5%	10,500
IT, Marketing & Graphics	1,950	+50%	2,925
Safety & Risk Mgt.	4,100	+25%	5,125
General Admin.	10,400	+5%	10,920
Debt Service*	***0***		***3,559***
Total	**$99,000**		**$109,600**

* Assumes a $64 million bond issue with 30-year maturity and 4% average interest rate.

The increase in operating expense is ***$9 million less*** than what was proposed in the 2009 Study.

Operating Revenue. Currently, fare box and other operating revenue represents about 32% of RIPTA's budget, which is in line with national averages[xi], although an increase in ridership would increase operating revenue. RIPTA's share of the state gas tax is roughly 42% of its budget, but state gasoline sales have been dropping, so revenue from this source will probably decline over time without an increase in the tax. Federal funding is about 21%. Clearly, other revenue streams are needed to make RIPTA viable.

If RIPTA can become a viable transportation alternative for discretionary drivers, then another source of revenue might be a parking tax. This has the twin benefit of raising incremental revenue, and discouraging driving in favor of public transit.

The following is an estimate of what RIPTA's budget might look like with the Green Way, assuming incremental revenue from something like a parking tax, and limited support from the cities along the Green Way.

	Base Case	**Pro Forma**	
Operating Revenue	**($,000)**	**(Pct. Change)**	**($,000)**
Fare Box Revenue	24,000	+20%	28,800
Paratransit	8,200	+10%	9,020
Federal Funds	21,000	+20%	25,200
Gasoline Tax	41,500	-2%	40,670
Other Operating Revenue	4,400	+10%	4,840
Parking Tax	0		750
Local Funding			
Providence	0		500
Pawtucket/Central Falls	0		250
Cranston	0		200
Warwick	0		200
Total Revenue	**$99,100**		**$110,430**

If the proposed Green Way were given serious consideration, another important step would be for RIPTA to do a detailed analysis of how its current bus routes could be restructured to capitalize on the Green Way concept.

A Targeted Approach to Development

Clearly, the cities along the Green Way would not be willing to pay a portion of the capital and operating costs if they felt that there was no economic benefit for doing so. However, even a relatively small increase in assessed values would more than justify the cost. Based on current property tax rates, the following incremental development would be needed to break even on its investment in public transit.

City	Debt (MM)	Debt Service (1)	Annual Expense	Tax Rate	B/E A V (MM)
Providence	$25.0	$1,223	$500	$19.25	$89.5
Pawtucket/Central Falls	$7.5	$334	$250	$25.16	$23.2
Cranston	$5.0	$222	$200	$22.84	$18.5
Warwick	$5.0	$222	$200	$20.06	$21.1
Total	**$42.5**	**$2,002**	**$1,150**		**$152.3**

(1) Assumes bond issues with 30-year maturity and 4% average interest rate, in thousands.

Each major Green Way stop would have to generate an average of less than $20 million in development for all five cities to break even, or ***$582 million less*** than what had been projected from the economic impact in downtown Providence from its 1.6-mile streetcar line.

Financing. It would be impractical to expect that each municipality would sell tax increment bonds to finance its share of the capital costs. Alternatively, the State or an authority backed by the State could issue bonds to finance the entire project, and enter into separate agreements with RIPTA and each municipality for the payment of their respective share of debt service. The payments from municipalities would come from the incremental tax revenues resulting from development around each of the major transit hubs.

Special Development Districts. In the 1980's, the Providence Capital Center District was transformed under the guidance of the Capital Center Commission, which developed a truly visionary master plan for development. Providence grew by 13,500 people in the 90's after its extensive downtown redevelopment, and even in the decade that followed, it grew by an additional 4,200. In marked contrast, growth for the rest of the metropolitan area has been flat since 1990, and actually declined by 5,500 in the last decade.[xii]

The success of the Capital Center District underscores the effectiveness of targeted, focused development based on a master plan. The Providence Foundation has recommended that cities designate "ombudsmen" to shepherd projects through the approval process, which would be directly applicable to targeted development along the Green Way. Each municipality should consider establishing a similar mechanism that follows this highly successful model to target development, encourage greater density and promote public-private partnerships.

Despite its impressive gains since 1990, downtown areas continue to be blighted with poorly maintained properties, vacant retail space and acres of parking lots. Without highly targeted development, any future gains, if spread over too large an area, will have limited impact. There is more than enough potential development potential within a 2-minute walk of each Green Way station stop to produce an impressive return on investment. (See maps on pages 16-20.)

Next Steps

Two key steps are needed to validate the ideas set forth in this paper: (i) RIDOT should conduct a preliminary feasibility study of the route, and develop a more precise estimate of capital costs; and (ii) RIPTA should analyze the potential impact of the Green Way on its ridership and bus operations.

A number of other projects are already under way that could be materially impacted by the Green Way if it were to move forward. These include the ongoing redesign of Kennedy Plaza, the relocation of the Pawtucket transportation hub, the creation of new transportation hubs at both the Amtrak station and Garrahy Courthouse, BRT service along the 6-10 corridor, and a new commuter rail station in Pawtucket.

- Multiple transit hubs along the Green Way would dramatically reduce the number of bus routes terminating at Kennedy Plaza, enabling RIPTA to reimagine space use
- The relocation of the Pawtucket Transit hub should clearly be linked to the Green Way
- The Green Way could significantly reduce bus traffic in downtown Providence, and eliminate the need for an additional bus hub by the Garrahy Courthouse
- It may make sense to scale back on the scope of the BRT line along the 6-10 corridor to free up funds for the Green Way
- A 3-5 minute light rail link from downtown Pawtucket to the Providence Amtrak station could eliminate the need for a Pawtucket-Central Falls MBTA station stop, potentially shortening MBTA run times and freeing up additional funds for the Green Way.

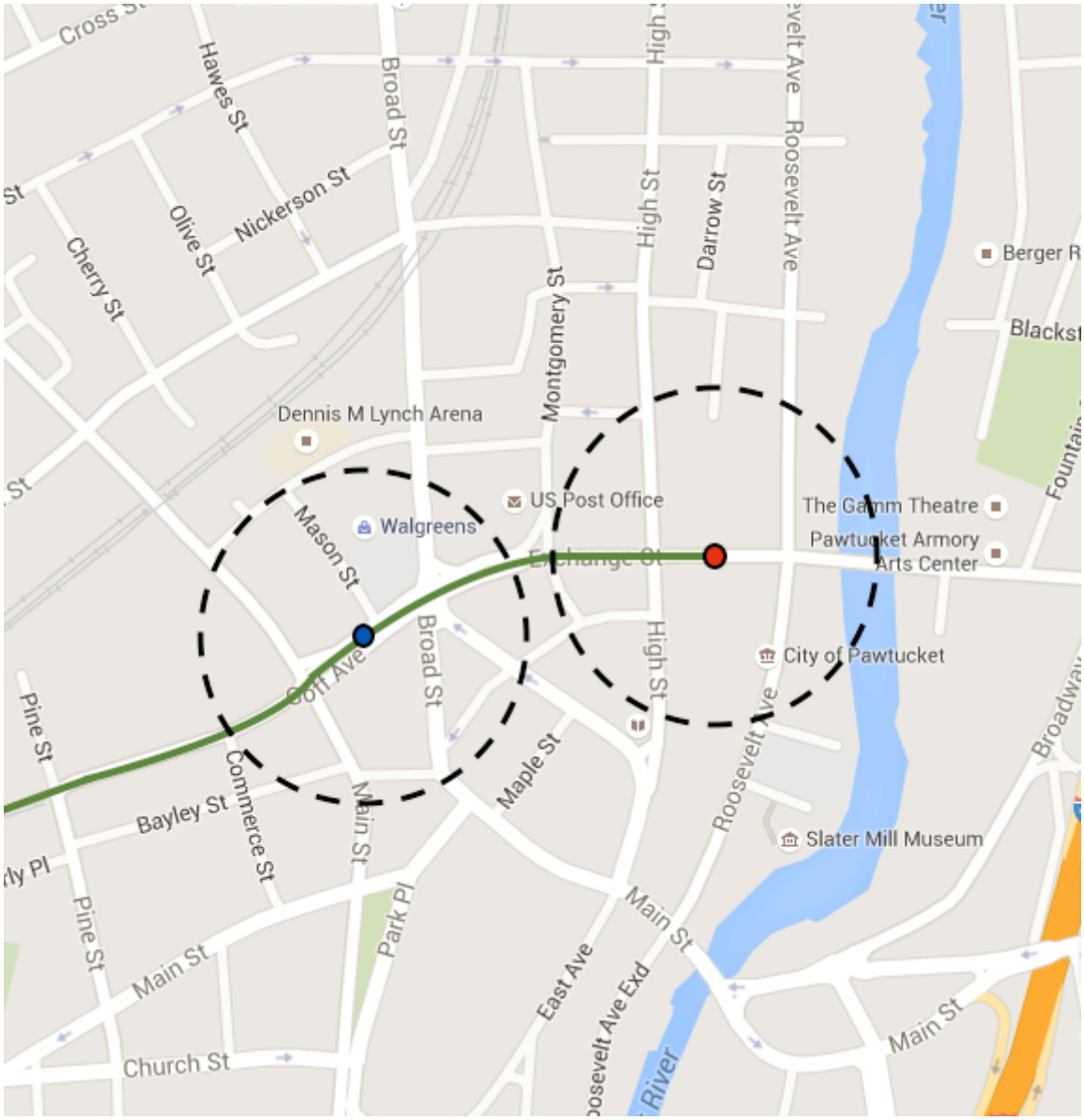
A go/no-go decision should be made about the Green Way before plans for these other projects are finalized.

Key Takeaways

- The Providence metropolitan area is the economic engine of Rhode Island, and the downtown area is its heart.
- A cogent transportation strategy is a critical element for economic growth in the region. A regional approach makes the most sense.
- RIPTA is the obvious choice to lead a regional transit network, but it needs to expand its current mission with greater focus on economic development, and greater financial support from the communities it serves.
- There is no one-size-fits-all approach to public transit; develop an integrated strategy that offers the best of each option. Even with a greater investment in bus, it is unlikely that ridership will rise to anywhere near the national average for public transit use.
- Light rail will increase ridership and attract development beyond anything achievable with bus service, even BRT.
- Use transit as both a catalyst for economic growth and a way to make cities more livable and sustainable. A quick, frequent, reliable rail link from areas like downtown Pawtucket and the I-195 corridor to the airport and Amtrak station is a game-changer for economic development.
- Maximize the use of federal funding to keep projects affordable. Many federal funding sources are unavailable for bus or streetcar.
- A targeted approach to development is key to maximizing the benefits of growth. The success of the Capital Center District is a classic example.

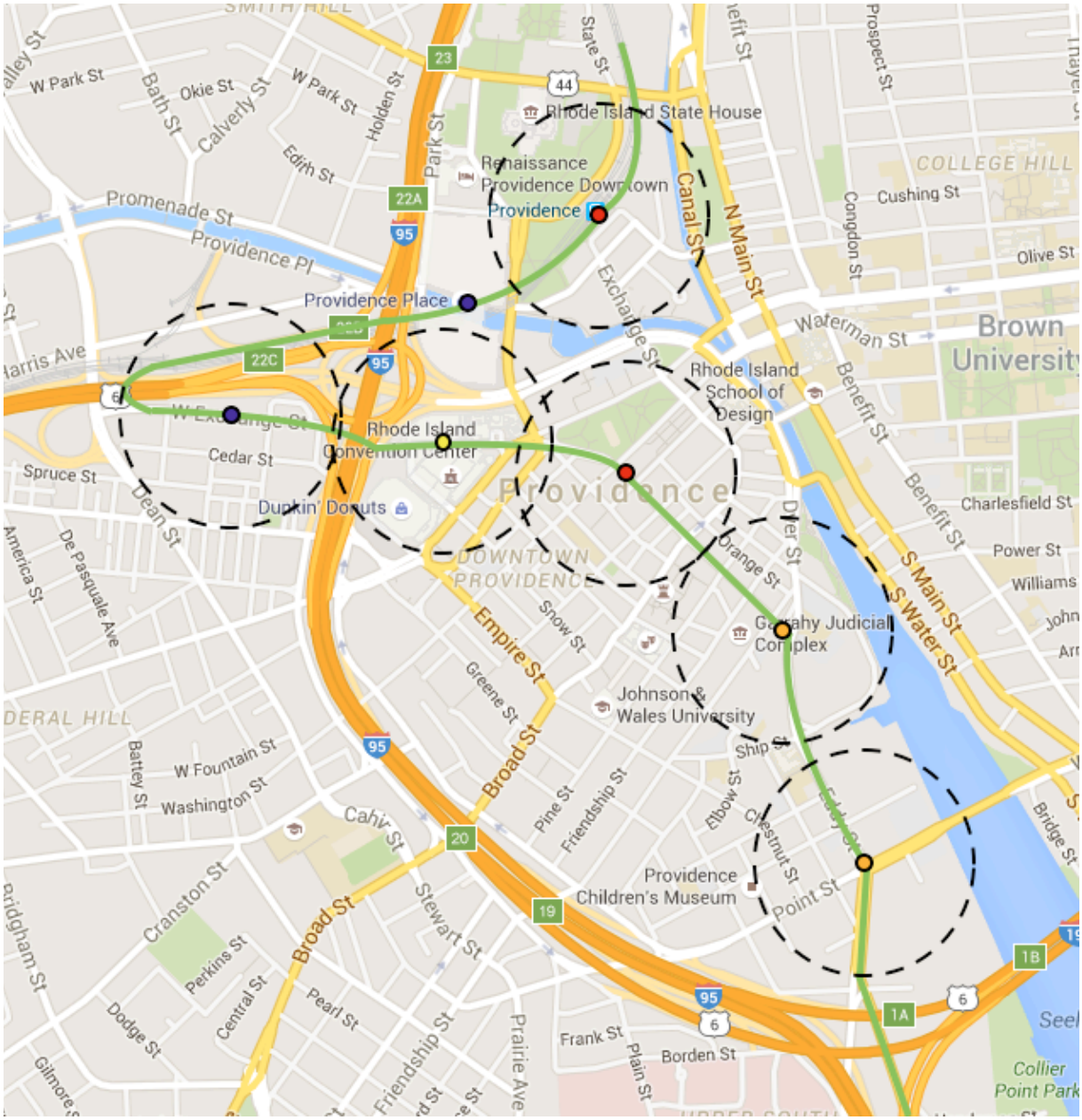
Potential Pawtucket Downtown Development Districts

- Green line represents the Green Way route
- Red circle represents a major bus transit hub
- Blue circle represents a potential site for a second stop to be developed as a public-private partnership
- Dotted circles represent target areas for development - 1/8 of a mile (2-3 minute walk) from transit stop
- Breakeven Development: $23 million



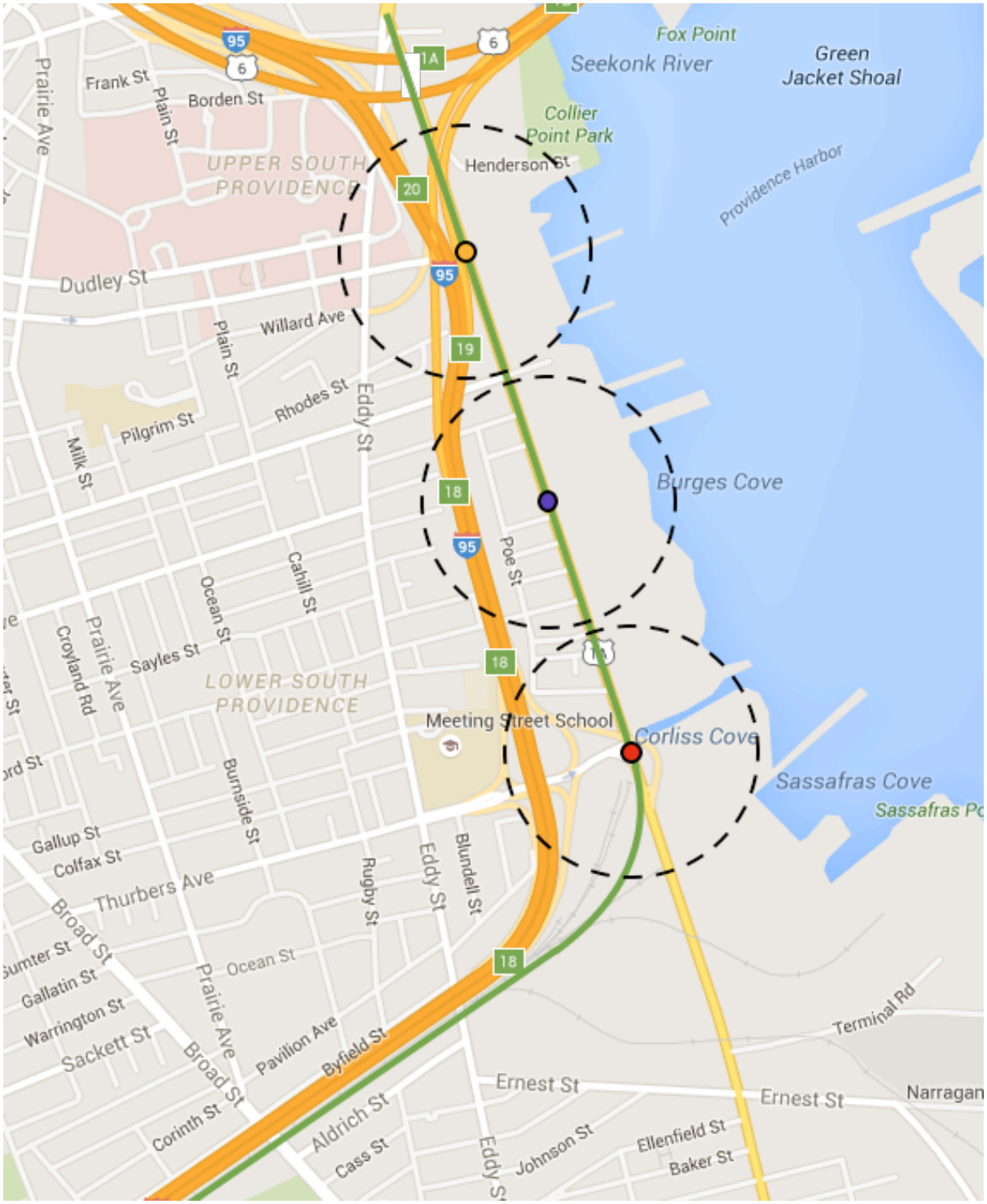
Providence Downtown Development Districts

- Red circles represent major transit hubs
- Orange circles represent major non-hub station stops
- Yellow circle represents stop at the Convention Center
- Blue circles represent potential public-private partnerships
- Circles represent target areas for development - 1/8 of a mile (2-3 minute walk) from transit stop
- Breakeven Development: $89.5 million, including Allens Avenue



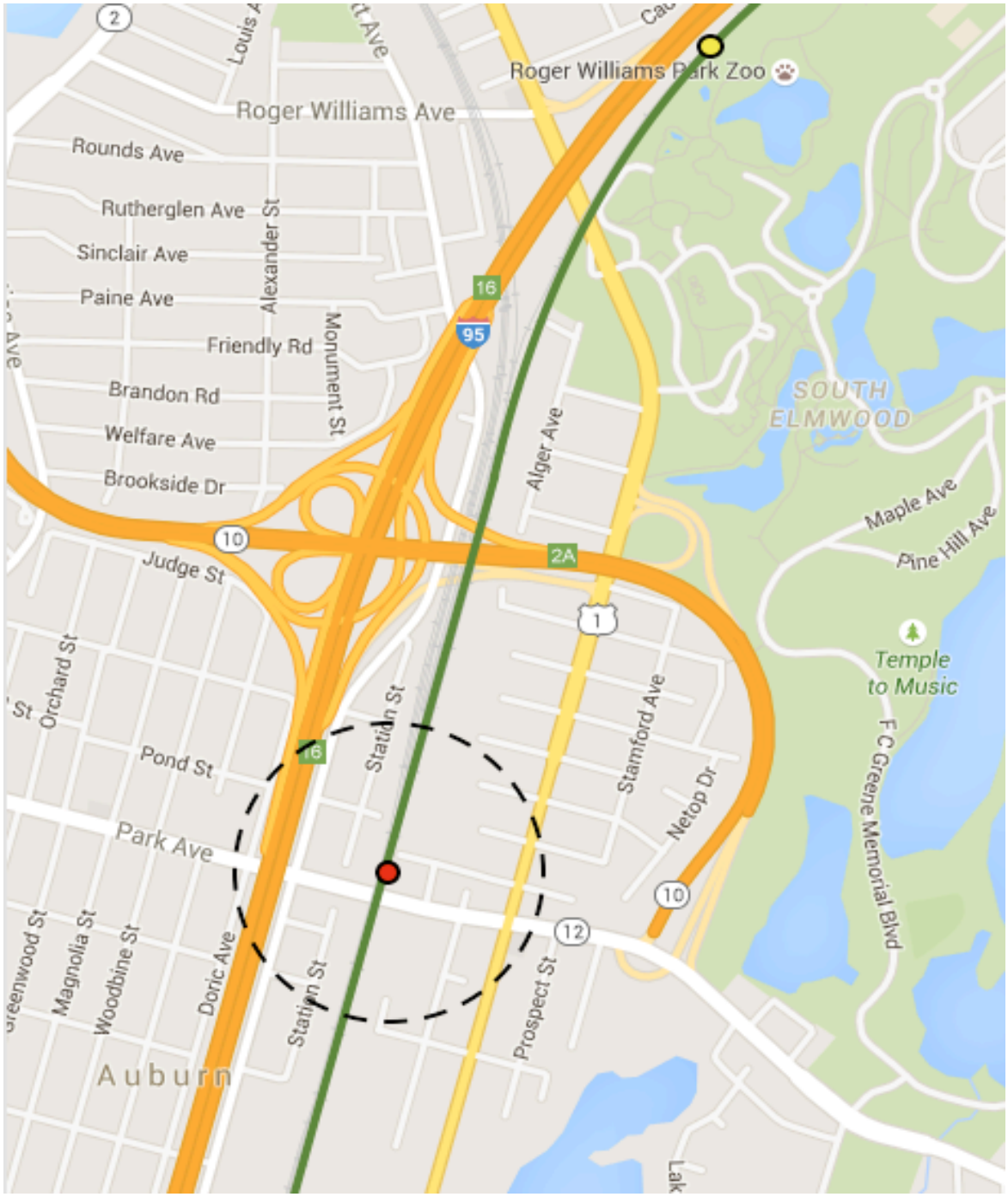
Providence Hospital and Allens Avenue

- Red circle represents major transit hub
- Orange circle represents major non-hub station stop
- Blue circle represents potential public-private partnership
- Circles represent target areas for development - 1/8 of a mile (2-3 minute walk) from transit stop



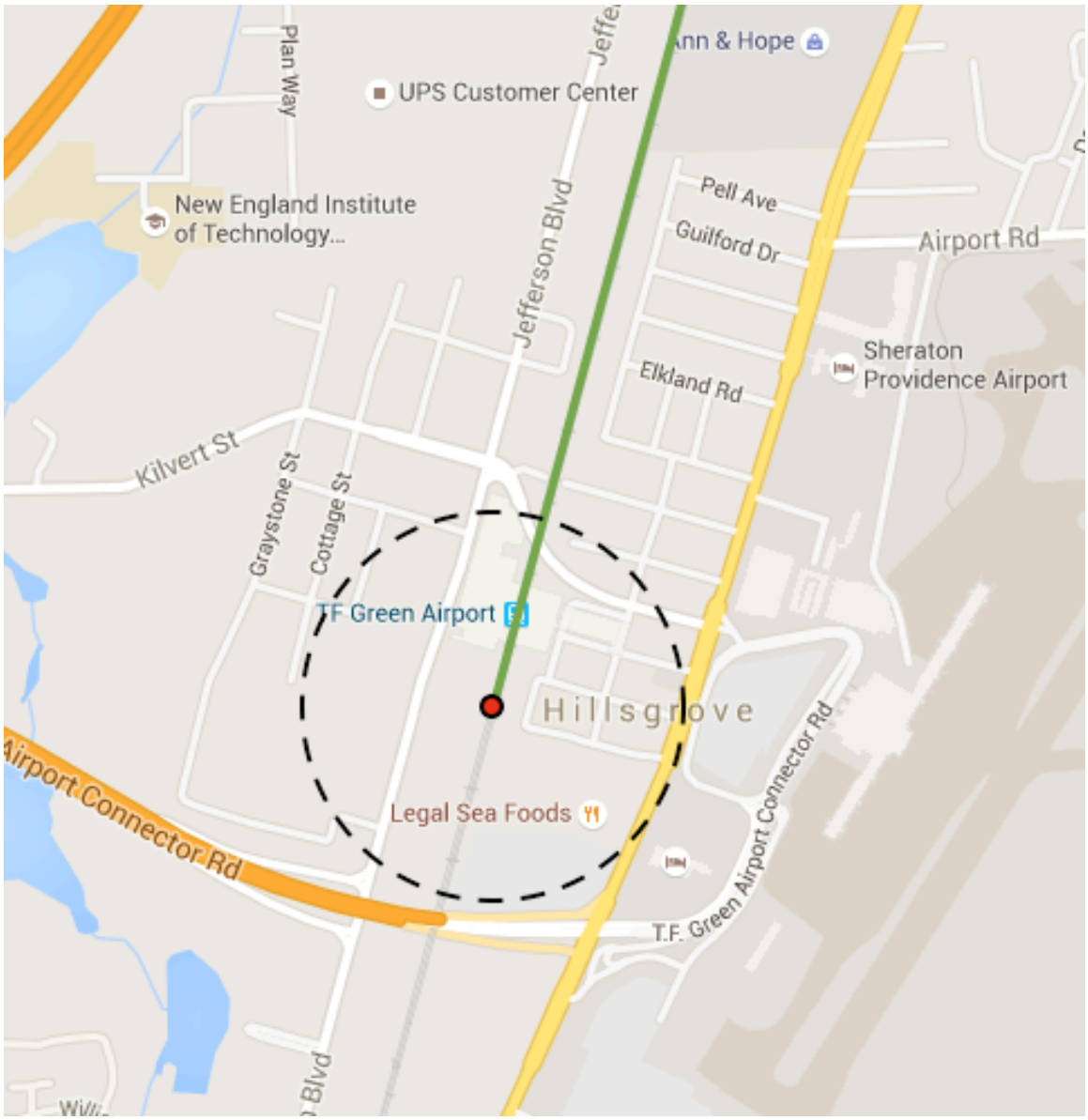
Cranston Transit Hub Development District

- Green line represents the Green Way route
- Red circle represents a major bus transit hub
- Yellow circle represents stop at Roger Williams Park/Zoo
- Circle represents target area for development - 1/8 of a mile (2-3 minute walk) from transit stop
- Breakeven Development: $18.5 million



Inter Link Development District

- Green line represents the Green Way route
- Red circle represents a major bus transit hub
- Circle represents target area for development - 1/8 of a mile (2-3 minute walk) from transit stop
- Breakeven Development: $21 million



Footnotes

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[i] The three busiest airports in New England are: Logan International, with 15.4 million annual passenger arrivals and departures; Bradley International, with 5.9 million; and T. F. Green, with 3.6 million. In 2005, Green's passenger traffic peaked at 5.7 million passengers. The three busiest Amtrak stations in New England are South Station, Boston, with 1.5 million passenger arrivals and departures; Union Station, New Haven, with 746,000; and Providence Station with 677,000.

[ii] In 2014, RI had the highest unemployment rate in New England, 7.1% vs. 5.8% for the region and the US, and the lowest per capita income growth, 1.0% vs. 2.1% for the region and 2.2% for the US. From 2003 to 2013, per capita GDP grew by 7.4% in RI v. 8.6% for the US.

[iii] According to Smart Growth RI, Rhode Island is the second most urbanized state in the nation. However, only 2.7% of Rhode Islanders use public transportation as a primary means of commuting, compared to a national average of 5%, despite the fact that 77% of the state's population lives within a 10 minute walk of a transit stop. According to the US Census Bureau, 8% of Providence workers use public transit, compared to 33% for Boston, 27% for Cambridge, 21% for Hartford, and 13% for New Haven.

[iv] Source: Federal National Transit Database

[v] Intelligent Transit Systems (ITS) is a general term for advanced applications used by different modes of transport, and include things like automated fare collection, traffic signal control systems, speed cameras, etc. While not clear what applications were contemplated in the 2009 Study, they probably included traffic signal overrides and GPS for countdown clocks.

[vi] Studies by the City of Providence estimate that the construction of the proposed streetcar line would generate 3.6 million square feet of new development and $734 million in taxable property value over the next 20 years.

[vii] The Green Way is sort of a double entendre; in addition to terminating at the T.F. Green Airport, the new light rail line's light carbon footprint is an environmentally friendly "green highway." It also pays homage to Boston's Green Line, one of the oldest and the most heavily utilized light rail system in the country.

[viii] RIPTA's fixed route ridership in FY 2014 was 20.5 million riders per year. If 70% of bus riders were redirected to light rail for some portion of their travel route, and the resulting service improvements led to a 20% increase in ridership, this would generate 17.2 million light rail riders per year, placing RIPTA in the top 10 nationally. Just a 60% share and a 10% increase in ridership would generate 13.6 million riders, placing RIPTA 14th nationally.

Boston's Green Line was the only light rail system in the country that had over 1 million riders per mile in 2014.

City	2014 Riders (000)	Average Weekday Boardings	Length (Mi.)	Riders per Mile
Boston	69,378	223,300	26.0	2,668
LA	63,890	200,800	70.3	909
San Francisco	56,713	128,500	71.5	793
San Diego	39,732	119,800	53.5	743
Portland	38,165	113,900	60.0	636
Philadelphia	31,482	111,900	68.4	460
Dallas	29,884	101,800	90.0	332
Denver	26,362	86,300	47.0	561
Salt Lake	19,868	68,500	44.8	443
St. Louis	17,182	49,900	46.0	374
RIPTA (see above)	**17,245**		**13.0**	**1,327**

[ix] A national survey of light rail systems in 2000 by the Federal government showed the following cost of comparably sized light rail lines:

City	Length (Mi.)	Cost (MM)	Cost per Mile
Dallas, TX	12.5	$517	$41.38
Denver, CO	19.0	$883	$46.45
Norfolk, VA	18.3	$525	$28.67
Orlando, FL	14.6	$600	$41.10
Minneapolis, MN	11.5	$549	$47.70
Portland, OR	12.0	$1,189	$98.83
Average	**14.7**	**$710**	**$50.69**
Green Way	**14.0**	**$750-$850**	**$53.57-$60.71**

[x] The current estimate of operating expenses for the 1.6 mile Providence streetcar line are $3.2 million in the first year.

[xi] In the US, fare box recovery ratios generally average between 25% and 35% of operating expense. BART in San Francisco is one of the highest at 66%, and Oklahoma City is one of the lowest at 11%.

[xii] Providence Metropolitan Area population from 1990 to 2010

				1990-2010	
City	1990	2000	2010	Change	Percent
Providence	**160,350**	**173,860**	**178,075**	**17,725**	**11%**
Central Falls	17,637	18,928	19,376	1,739	10%
Pawtucket	72,395	73,046	71,148	-1,247	-2%
North Providence	32,090	32,411	32,078	-12	0%
East Providence	50,380	48,688	47,037	-3,343	-7%
Cranston	75,043	79,269	80,387	5,344	7%
Warwick	85,427	85,808	82,672	-2,755	-3%
Total	**332,972**	**338,150**	**332,698**	**-274**	**-0%**