

Key Bus Routes Improvement Program



Summary

The Operations Department will initiate a comprehensive service improvement program for the Key Bus Route network effective with the start of the winter rating that begins on December 30, 2006. This program extends an initiative that began with the Route 111 Improvement Project in the Fall 2006. The Key Bus Route Network was designed to complement the MBTA's light and heavy rail system and to ensure that all high-demand corridors have access to frequent transit service seven days a week.

The program will include service improvements to 13 of the 16 key routes and operational improvements to all of the 16 key routes. These routes represent some of the heaviest routes in the MBTA bus, trackless trolley, and bus rapid transit system. Ridership on these routes represents 41% of the ridership on all rubber-tired modes. Furthermore, a number of regular bus routes share ridership with key bus routes along major corridors in the MBTA system and will benefit from improvements made within the Key Bus Route corridors. Service and operational changes will be made on routes 15, 23, 28, 32, 57, 66, 71, 73, 77, 111, 116/117 and Silver Line Waterfront service. In addition, the remainder of the key routes, 1, 22 and 39 will benefit from operational enhancements. The program will also introduce a new bus route, Route 25. This route will operate along Warren Street between Franklin Park and Dudley Station, supplementing service on the most crowded portion of Routes 14, 19, 23 and 28.

The primary goals of the Key Bus Route Improvement Program are to reduce crowding, improve service reliability and in general, to improve a customer's experience when using our system (including updated schedules at bus stops and new shelters). Based on ridership counts, field observations and customer complaints, service levels will be increased and running times adjusted during strategic time periods as warranted. In addition, with the hiring of new supervisory personnel, Bus Operations will strategically implement enhanced field management strategies to improve overall operations to ensure the highest degree of service reliability.

In November, Bus senior managers will present the new Route Management program to supervisory personnel and operators throughout Bus districts. Training will be initiated to further promote this coordinated team approach to operations management. A special order will be issued clearly defining roles and responsibilities.

Finally, Bus Operations will continue to work with the MBTA Transit Police, Intergovernmental Affairs and with municipalities to address bus stop issues that impact route performance.

Customers should experience immediate improvements on their bus route from this program.

Silver Line Waterfront: South Station – Logan, BMIP, City Point

Silver Line Waterfront carries 11,000 passengers on a typical weekday making it the 7th busiest bus route (including all branches). Its peak-hour ridership is heavier than all other bus routes (30% higher than Route 39 which is the next busiest peak hour route), and even busier than the E branch on the Green Line. Virtually every rider passes through the peak load point.



To meet this demand we increased peak-period service this fall. The schedule was changed to run 2-minute headways in the trunk in both the AM and PM peaks. The following changes will improve the reliability of the route in the peak periods to further enhance service in the peaks and ensure that we are able to maintain a steady headway. On a line that needs to carry 24 people per minute in the peak 45 minutes of the peak, maintaining even headways is critical.

The following changes will be made in the winter 2007 rating.

1. Schedule improvements

One bus will be added in both the AM and PM peaks. This will allow for a needed increase in the amount of running and recovery time in order to increase schedule reliability. In addition, the route will be scheduled so that an operator will run on one route only for the whole peak, making the schedule more consistent.

The SL1 will continue to run from the airport every 10 minutes.

2. Operational Actions

Officials will be stationed at City Point in South Boston, Silver Line Way and South Station to use bus route headway sheets to make schedule adjustments. Officials communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

In the future, staff will monitor schedule adherence and run times using the AVL equipment.

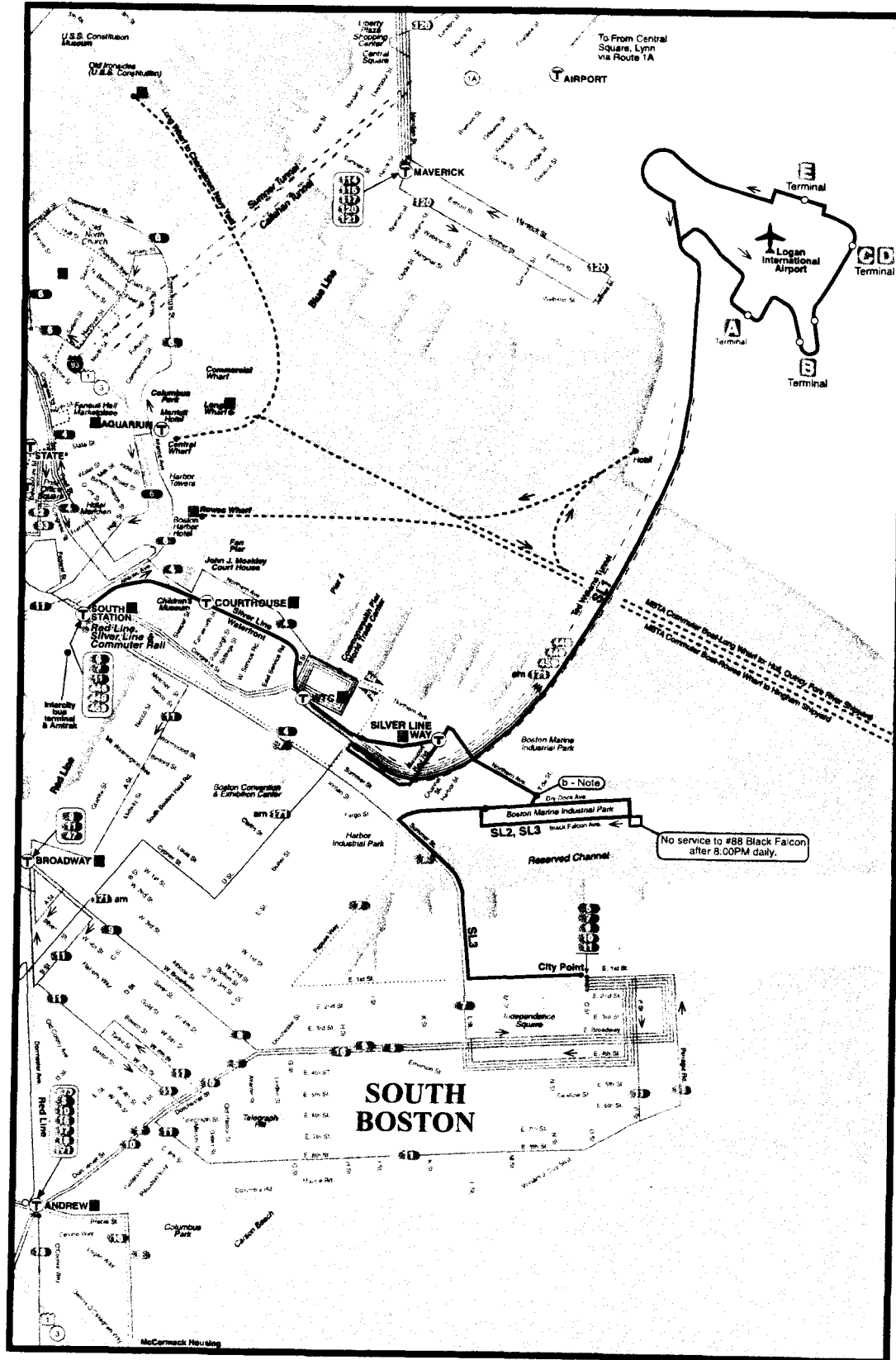
4. Customer Information

Operations Support will install new bus stop signs, monopanel, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanel.

Comparison of Spring 06 and Winter 07 Trips and Headways Routes SL1, SL2, SL3 and 746

| Day, direction | Time period | Additional service hours | Improved Frequency | | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding | Run-time adj. to improve on-time perf. |
|----------------|-------------|--------------------------|--------------------|------------|-------------------------|-----------------------|----------------|-----------------------|-----|-------------------------|----------------------------------------|
| | | | (headway) | | % Frequency Improvement | (avg. max load /trip) | | Winter '07 | | | |
| | | | Spr '06 | Winter '07 | | | | | | | |
| Weekday IB | 7:00-8:59 | 4 | 2.5 | 2 | 20% | 1 | 5.9 | 4.7 | 20% | ✓ | |
| | 4:00-6:29 | 5 | 2.5 | 2 | 20% | 1 | 37.8 | 30.2 | 20% | ✓ | |
| Weekday OB | 7:00-8:59 | 4 | 2.5 | 2 | 20% | 1 | 39.1 | 31.3 | 20% | ✓ | |
| | 4:00-6:29 | 5 | 2.5 | 2 | 20% | 1 | 3.0 | 2.4 | 20% | ✓ | |

T Silver Line Waterfront



Route 15: Kane Square or Fields Corner Station – Ruggles Station via Uphams Corner

Route 15 is the 13th highest ridership bus route, the 10th busiest Southside route and had 6,936 weekday boardings on the most recent ridership count.

Reports from operations and customer service personnel have identified crowding during the PM peak. The following actions will be initiated in the winter 2006 to enhance overall route performance:



1. Schedule Improvements:

- A bus will be added in the afternoon from 3:00 pm - 8:30 pm. This will improve the headway from 10 minutes to 9 minutes before 6pm and from 15 minutes to 12 minutes after 6pm.

2. Operational Actions

- Position an Official at Kane Square in Roxbury to monitor operations and make service adjustments based on the bus route headway sheet. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.
- CTPS will conduct pointchecks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

4. Customer Information

- Operations Support will install new bus stop signs, monopanels, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanels.

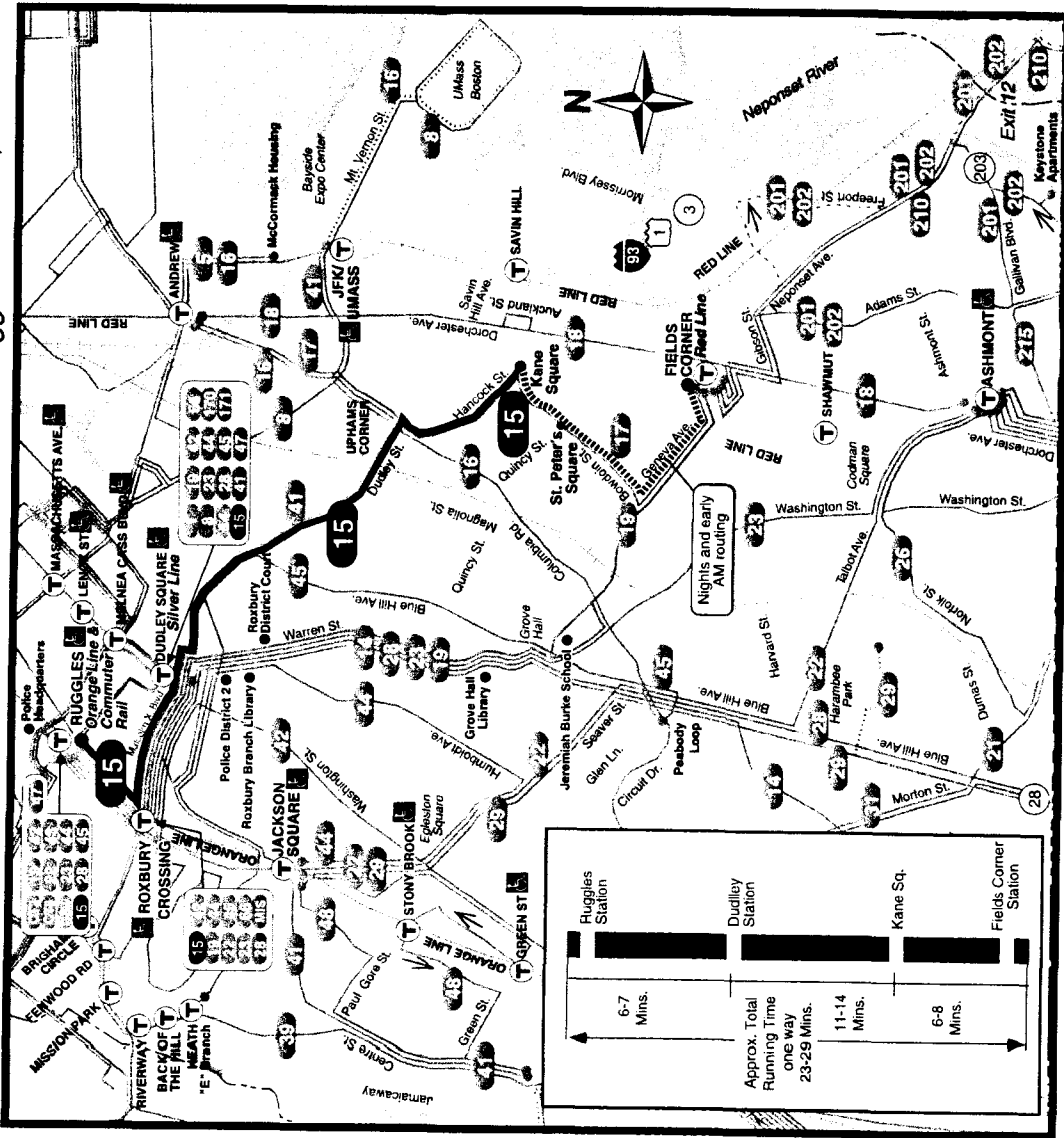
5. Other Customer Amenities:

- WALL USA, under contract with the City, is planning to construct additional bus patron waiting shelters along this route. New shelters should be in place by Spring 2007.

Route 15: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding | Run-time adj. to improve on-time perf. |
|----------------|-------------|--------------------------|--------------------|------------|-------------------------|-----------------------|----------------|-----------------------|------------|-------------------------|----------------------------------------|
| | | | (headway) | | % Frequency Improvement | (avg. max load /trip) | | | | | |
| | | | Fall '06 | Winter '07 | | | | Winter '05 | Winter '07 | | |
| Weekday IB | 6:58a-7:29a | 0.5 | 5 | 4.4 | 12% | 1 | 42.6 | 35.5 | 17% | ✓ | |
| | 3:00p-3:59p | 1 | 10 | 9 | 10% | 1 | 17.3 | 15.6 | 10% | ✓ | |
| | 4:00p-4:59p | 1 | 10 | 9 | 10% | 1 | 20.8 | 18.8 | 10% | ✓ | |
| | 5:00p-5:59p | 1 | 10 | 9 | 10% | 1 | 25.2 | 22.7 | 10% | ✓ | |
| | 6:00p-6:59p | 1 | 15 | 12 | 20% | 1 | 12.8 | 10.2 | 20% | ✓ | |
| | 7:00p-7:59p | 1 | 15 | 12 | 20% | 1 | 9 | 7.2 | 20% | ✓ | |
| | 8:00p-8:29p | 0.5 | 20 | 12 | 40% | 1 | 13.5 | 8.1 | 40% | ✓ | |
| | | | | | | | | | | | |
| Weekday OB | 3:00p-3:59p | 1 | 10 | 9 | 10% | 1 | 33.3 | 29.9 | 10% | ✓ | |
| | 4:00p-4:59p | 1 | 10 | 9 | 10% | 1 | 40 | 36 | 10% | ✓ | |
| | 5:00p-5:59p | 1 | 10 | 9 | 10% | 1 | 48.7 | 43.8 | 10% | ✓ | |
| | 6:00p-6:59p | 1 | 15 | 12 | 20% | 1 | 34.5 | 27.6 | 20% | ✓ | |
| | 7:00p-7:59p | 1 | 15 | 12 | 20% | 1 | 26.8 | 21.4 | 20% | ✓ | |
| | 8:00p-8:29p | 0.5 | 20 | 12 | 40% | 1 | 30.5 | 18.3 | 40% | ✓ | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

T Route 15 Kane Square or Fields Corner Sta. - Ruggles Sta. via Uphams Corner



Route 23: Ashmont Station – Ruggles Station via Washington Street



Route 23 is the 3rd highest ridership bus route, the 3rd busiest southside route, and had 12,910 weekday boardings on the most recent ridership count.

Ridership checks conducted this fall indicate that the average load in the morning rush hour remained fairly stable since the previous full count in Winter 2001. However, the most recent observations showed a need for improved reliability.

Reports from operations personnel and customer service channels have identified crowding during the late morning.

The following actions will be initiated in the winter 2006 to enhance overall route performance and better accommodate passenger demand:

1. Schedule Improvements:

- A bus will be added in the midday from 9:00am - 1:00pm to improve service frequency from every 14 minutes to every 12 minutes.
- A new route, Route 25, will be established to operate from Franklin Park to Dudley in the AM peak to supplement existing services along Warren St. This new route will operate over the core corridor of the route and will improve service frequency for customers using Routes 14, 19, 23, and 28. Approximately 1,500 inbound riders who board within this corridor will experience an improvement in service. This new route will operate every 10 minutes from 6:00 AM to 9:00 AM.

2. Operational Actions

- Position Officials at Grove Hall in Roxbury will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.
- CTPS will conduct pointchecks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

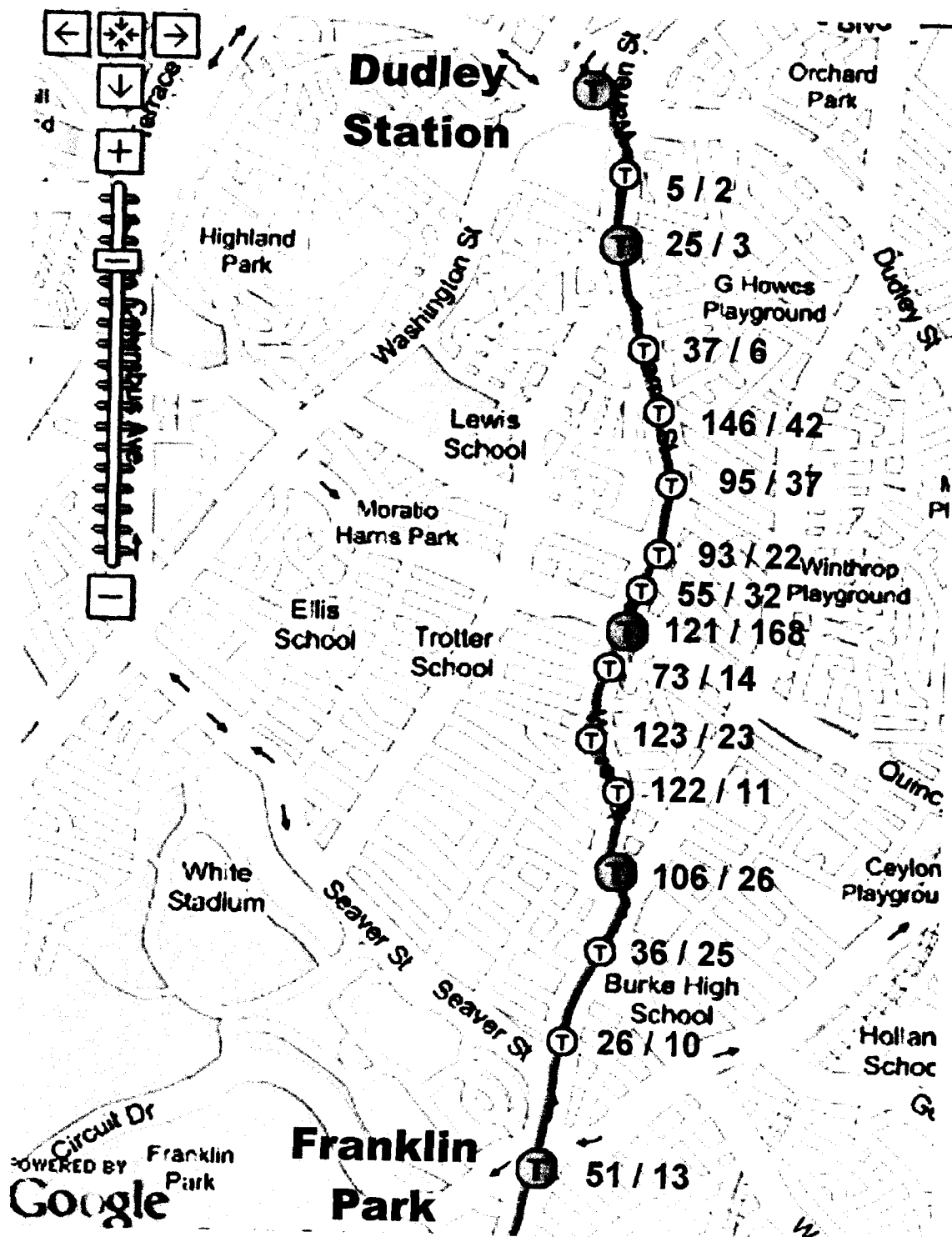
4. Customer Information

- Operations Support will install new bus stop signs, monopanels, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanels.

5. Other Customer Amenities:

- WALL USA, under contract with the City, is planning to construct additional bus patron waiting shelters along this route. New shelters should be in place by Spring 2007.

**Existing Ridership in New Route 25 Corridor:
Based on 14, 19, 23, 28 Inbound Ons & Outbound Offs
for Weekday 6:00 am – 9:00 am Time Period**



Total existing corridor ridership: 1,114 inbound ons, 440 outbound offs, 1,554 total. These counts include passengers who continue beyond Dudley to Ruggles and points west.

Route 28: Mattapan Station – Ruggles Station via Dudley Station

Route 28 is the 5th highest ridership bus route, the 5th busiest southside route, and had 12,041 weekday boardings on the most recent ridership count.

Ridership checks conducted this fall indicate that the average load in the morning rush hour increased by 5.8% since the previous full count in Spring 2001. Furthermore, the most recent observations showed a need for reliability improvements.

The following actions will be initiated in the winter 2006 to enhance overall route performance and better accommodate passenger demand:



1. Schedule Improvements:

- Service will be improved on weekday evenings from 6:00pm - 9:00pm to every 13 minutes from every 16 minutes to address crowding and reliability complaints.
- Service will be improved on Saturday evenings from 7:30pm - 12:30pm. This will improve the headway to 16 minutes from 22, will address crowding and reliability complaints, and will help the route pass the Key Route Frequency Standard.
- A new route, Route 25, will be established to operate from Franklin Park to Dudley in the AM peak to supplement existing services along Warren St. This new route will operate over the core corridor of the route and will improve service frequency for customers using Routes 14, 19, 23, and 28. Approximately 1,500 riders inbound riders who board within this corridor will experience an improvement in service. This new route will operate every 10 minutes from 6:00 AM to 9:00 AM.

2. Operational Actions

- Position Officials at Grove Hall in Roxbury will use bus route headway sheets to make schedule adjustments. This official will also monitor the new route 25 to ensure proper spreading of all the routes using the common corridor. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.
- CTPS will conduct pointchecks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

4. Customer Information

- Operations Support will install new bus stop signs, monopanels, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanels.

5. Bike Racks and Other Customer Amenities:

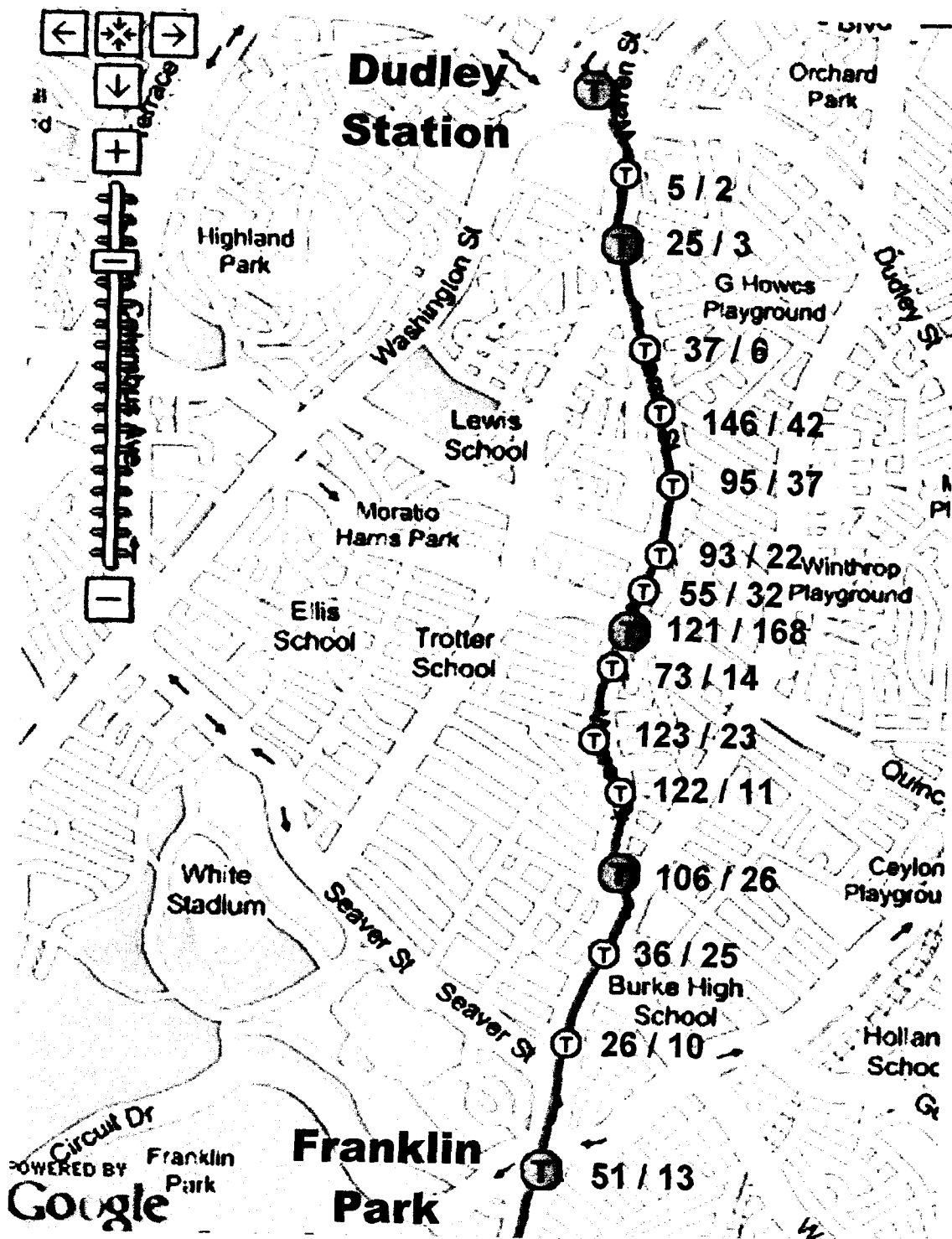
- WALL USA, under contract with the City, is planning to construct additional bus patron waiting shelters along this route. New shelters should be in place by Spring 2007

Route 28: Comparison of Fall 06 and Winter 07 Trips and Headways

Comparison of Fall '06 and Winter '07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency (headway) | | % Frequency Improvement | Vehicles added | Reduction in Crowding | | % Reduction in crowding | Run-time adj. to improve on-time perf. |
|-------------------|---------------|--------------------------------|---------------------------------|-------------|----------------------------|-------------------|-----------------------|----------------|----------------------------|----------------------------------------------|
| | | | Fall '06 | Winter '07 | | | (avg. max load /trip) | F'06/S'99/S'01 | | |
| | | | Weekday IB | 6:00a-6:59a | 2.25 | 6 | 4.3 | 28.3% | 3 | 46.6 |
| 7:00a-7:59a | 3 | 7.5 | | 5 | 33.3% | 3 | 38.6 | 25.8 | 33.2% | |
| 8:00a-8:59a | 0.95 | 8.6 | | 5.5 | 36.0% | 3 | 35 | 22.3 | 36.3% | |
| 8:00p-8:59p | 1 | 12 | | 13 | -8.3% | 1 | 21.3 | 19.7 | 7.5% | |
| Saturday IB | 8:00p-8:59p | 1 | 21 | 16 | 23.8% | 1 | 18.7 | 14.2 | 24.1% | ✓ |
| | 9:00p-9:59p | 1 | 22 | 16 | 27.3% | 1 | 15.3 | 11.2 | 26.8% | ✓ |
| | 10:00p-10:59p | 1 | 22 | 16 | 27.3% | 1 | 13 | 9.5 | 26.9% | ✓ |
| | 11:00p-11:59p | 1 | 22 | 16 | 27.3% | 1 | 14.3 | 10.4 | 27.3% | ✓ |
| | 12:00a-12:59a | 0.5 | 30 | 20 | 33.3% | 1 | 10.5 | 7 | 33.3% | ✓ |
| | | | | | | | | | | |
| Weekday OB | 6:00a-6:59a | 2.25 | 10 | 6.7 | 33.0% | 3 | 21 | 14 | 33.3% | |
| | 7:00a-7:59a | 3 | 7.5 | 5 | 33.3% | 3 | 18 | 12 | 33.3% | |
| | 8:00a-8:59a | 0.95 | 7.5 | 5.5 | 26.7% | 3 | 17.9 | 13 | 27.4% | |
| | 8:00p-8:59p | 1 | 20 | 15 | 25.0% | 1 | 37.7 | 28.3 | 24.9% | |
| Saturday OB | 7:00p-7:59p | 0.5 | 14 | 13.5 | 3.6% | 1 | 18.6 | 17.9 | 3.8% | ✓ |
| | 8:00p-8:59p | 1 | 22 | 16 | 27.3% | 1 | 29 | 21.1 | 27.2% | ✓ |
| | 9:00p-9:59p | 1 | 22 | 16 | 27.3% | 1 | 22.7 | 16.5 | 27.3% | ✓ |
| | 10:00p-10:59p | 1 | 22 | 16 | 27.3% | 1 | 17 | 12.4 | 27.1% | ✓ |
| | 11:00p-11:59p | 1 | 22 | 16 | 27.3% | 1 | 17.3 | 12.6 | 27.2% | ✓ |
| | 12:00a-12:59a | 0.5 | 30 | 20 | 33.3% | 1 | 13.3 | 8.9 | 33.1% | ✓ |

**Existing Ridership in New Route 25 Corridor:
Based on 14, 19, 23, 28 Inbound Ons & Outbound Offs
for Weekday 6:00 am – 9:00 am Time Period**



Total existing corridor ridership: 1,114 inbound ons, 440 outbound offs, 1,554 total. These counts include passengers who continue beyond Dudley to Ruggles and points west.

Route 32: Wolcott Square or Cleary Square – Forest Hills Station via Hyde Park Avenue



Route 32 has the 11th highest ridership systemwide and is the 9th busiest southside route. There were 8,218 weekday boardings on the most recent full ridership counts (Winter 2001).

CTPS conducted point checks during September 2006, which showed severe weekday crowding on the Wolcott Square trips. The average load for all trips (Wolcott & Cleary) was 54.5 between 6:00 AM and 7:00 AM, and 52 between 7:00 AM and 8:00 AM. Between 6:14 AM and 7:52 AM 65% of the trips observed had loads of 54 or greater and 40% had loads of 60 or more.

The following steps will be taken to improve Route 32 in the Winter 07 rating:

1. Schedule Improvements

- The Wolcott Square trips will operate with 60' articulated vehicles rather than with 40' buses in order to increase capacity and reduce crowding. The Cleary Square trips will continue to use the 40' buses on weekdays, and on weekday evenings and weekends all trips will use the 40' buses. This Route will be moved from the Arborway Garage to the Southampton Garage to allow for the use of 60' buses on this route.

2. Operational Actions

- Position Official at Cleary Square in Hyde Park who will use bus route headway sheets to make schedule adjustments. Officials at Forest Hills and Cleary Square will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.
- CTPS will conduct point checks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

4. Customer Information

- Operations Support will install new bus stop signs, monopanel, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanel.

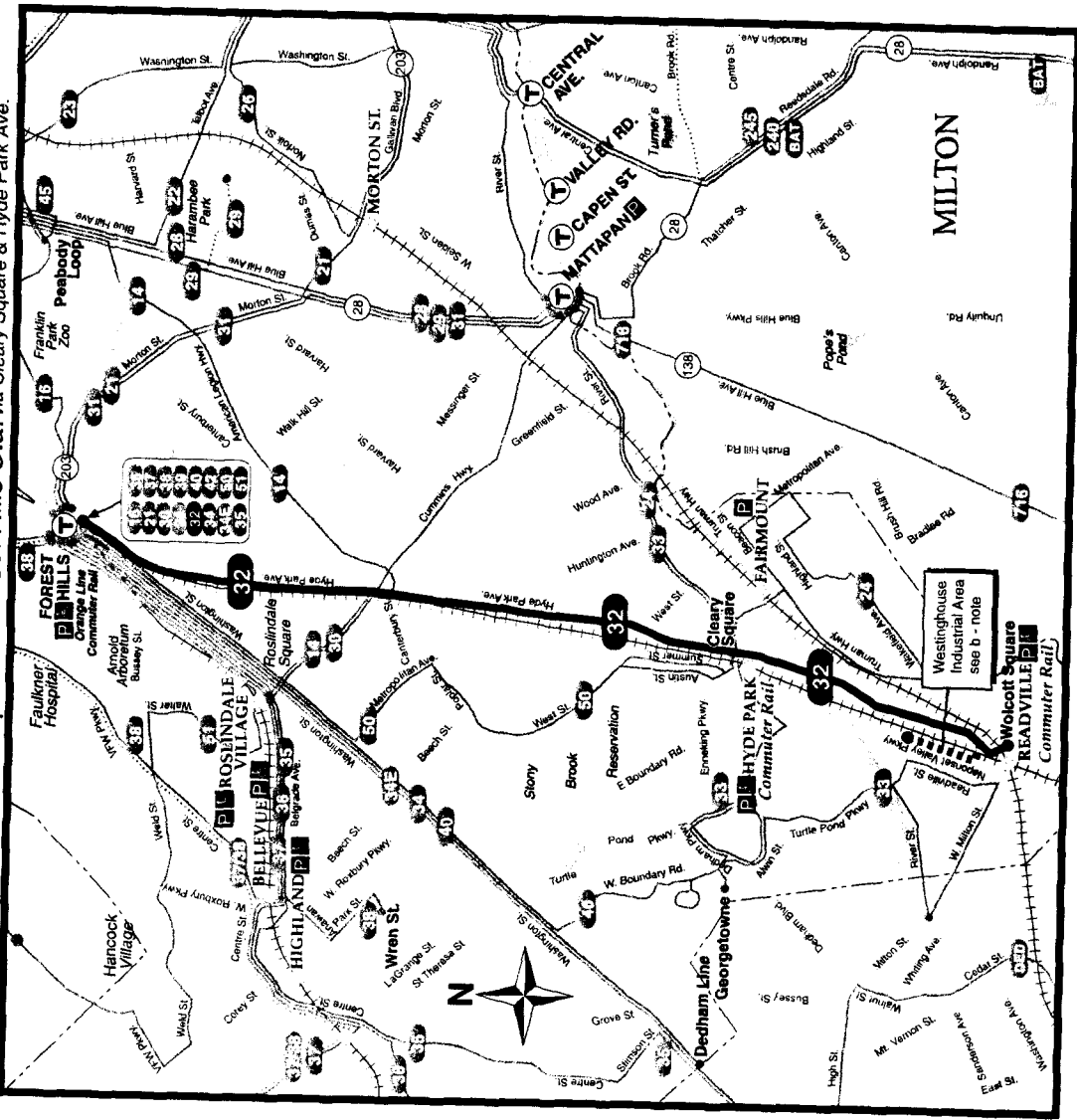
5. Other Customer Amenities

- WALL USA, under contract with the City, is planning to construct additional bus patron waiting shelters along this route. New shelters should be in place by Spring 2007

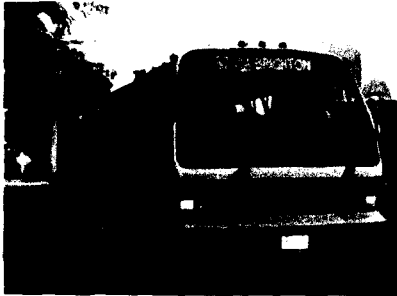
Route 32: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding (due to 60' buses) |
|----------------|-------------|--------------------------|--------------------|------------|-------------------------|----------------|-----------------------|------------|--------------------------------------------|
| | | | (headway) | | % Frequency Improvement | | (avg. max load /trip) | Winter '07 | |
| | | | Fall '06 | Winter '07 | | | | | |
| Weekday IB | 6:14a-8:23a | 0 | 10 | 10 | 0.0% | 0 | 53 | 53* | 21% |
| Weekday OB | 6:14a-8:23a | 0 | 10 | 10 | 0.0% | 0 | 25 | 25* | 21% |

T Route 32 Wolcott Square - Forest Hills Sta. via Cleary Square & Hyde Park Ave.



Route 57: Watertown Yard – Kenmore Square via Newton Corner & Brighton Center



Route 57 is the 7th highest ridership bus route and the 7th busiest of the southside routes. It had 8,879 weekday boardings as of the most recent ridership count.

Ridership checks conducted this fall indicate that the average load in the morning rush hour increased by 10.8% since the previous counts had been collected in fall 2000. Ridership checks from this fall also indicated that some changes should be made to improve reliability.

The following actions will be initiated in the winter 2006 to enhance overall route performance and better accommodate passenger demand:

1. Schedule Improvements:

- Service frequency during the AM peak will be improved to every 6/7 minutes rather than every 7/7/8 minutes, and extra recovery will be added to improve reliability during this time period.
- The limited-service restriction will be lifted outbound between Kenmore and Packard's Corner so that riders can board and alight anywhere along the route. This will make the route easier to understand for new and existing customers and will provide a service alternative for outbound Green Line customers within this corridor.

2. Operational Actions

- Position Officials at Watertown and Kenmore will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- Staff will monitor schedule adherence and run times using the AVL equipment, and will recommend further schedule adjustments for the Spring Rating.
- CTPS will conduct pointchecks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

4. Customer Information

- Operations Support will install new bus stop signs, monopanels, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanels.

5. Other Customer Amenities:

- Both CEMUSA and WALL USA are planning to construct additional bus patron waiting shelters along this route. New shelters should be in place by Spring 2007.

Route 57: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding | Run-time adj. to improve on-time perf. |
|----------------|-------------|--------------------------|--------------------|------------|-------------------------|-----------------------|----------------|-----------------------|-----------|-------------------------|----------------------------------------|
| | | | (headway) | | % Frequency Improvement | (avg. max load /trip) | | Winter '07 | | | |
| | | | Fall '06 | Winter '07 | | | | | | | |
| | | | | | | | | | F'06/F'00 | | |
| Weekday IB | 7:00a-7:59a | 1 | 7.5 | 6.7 | 10.7% | 1 | 41.4 | 36.8 | 11.1% | ✓ | |
| | 8:00a-8:59a | 1 | 7.5 | 6 | 20.0% | 1 | 40.5 | 32.4 | 20.0% | ✓ | |
| Weekday OB | 7:00a-7:59a | 1 | 7.5 | 6 | 20.0% | 1 | 24.6 | 19.7 | 19.9% | ✓ | |

[illegible]

Route 66: Dudley Station – Harvard Square via Allston & Brookline Village

Route 66 is the 6th highest ridership bus route and the 6th busiest of the southside routes. It had 11,088 weekday boardings on the most recent ridership count.

Weekday running times have increased by approximately 15% between the Fall 2005 and Fall 2006 ratings due to a combination of factors including E Line reconstruction along Huntington Avenue, roadway construction near Harvard Square, and customers adjusting to the new fareboxes. There have been many operator and customer reports of reliability problems during the peaks, school period, and evenings on weekdays, as well as on Sunday afternoons.



The following actions will be initiated in the winter 2006 to enhance overall route performance and better accommodate passenger demand:

1. Schedule Improvements:

- Service will be added from 6:00am – 9:00am and from 4:00pm - 7:00pm. This would be used exclusively to improve reliability, and would not be increase the total number of scheduled trips.
- One "Run As Directed (RAD)" trip will operate in both the AM and PM peak periods to further assist in service reliability.
- On Sundays, service will be added from 12:00pm - 4:00pm and from 8:00pm - 11:00pm. This will improve the reliability, and will help the route pass the frequency standard by improving the headway to every 20 minutes rather than every 22-23.

2. Operational Actions

- Position officials at Dawes Island and Union Square Allston during the morning (7a to 9a) and afternoon (4p to 6p) peak periods. Officials will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.
- CTPS will conduct pointchecks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

4. Customer Information

- Operations Support will install new bus stop signs, monopanel, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanel.

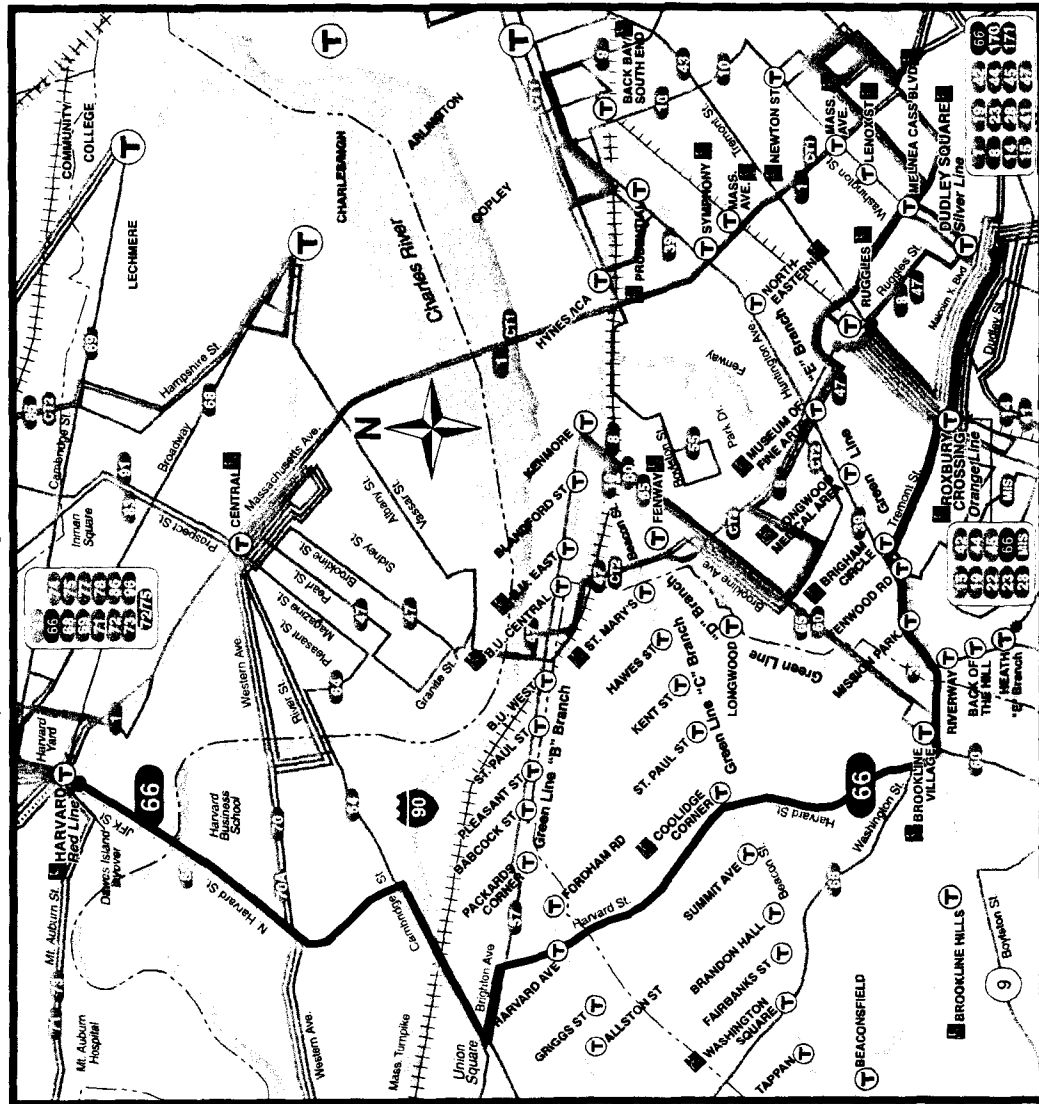
5. Other Customer Amenities:

- Both CEMUSA and WALL USA are planning to construct additional bus patron waiting shelters along this route. New shelters should be in place by Spring 2007.

Route 66: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding | Run-time adj. to improve on-time perf. |
|----------------|---------------|--------------------------|--------------------|------------|-------------------------|----------------|-----------------------|------------|-------------------------|----------------------------------------|
| | | | (headway) | | % Frequency Improvement | | (avg. max load /trip) | | | |
| | | | Fall '06 | Winter '07 | | | | S'04, F'00 | | |
| Weekday IB | 6:00a-6:59a | 2 | 10.0 | 8.0 | 20.0% | 2 | 37.3 | 29.9 | 20.0% | ✓ |
| | 7:00a-7:59a | 2 | 9.0 | 7.3 | 18.4% | 2 | 31.7 | 25.9 | 18.4% | ✓ |
| | 8:00a-8:59a | 2 | 9.0 | 7.3 | 18.4% | 2 | 37.7 | 30.7 | 18.4% | ✓ |
| | 4:00p-4:59p | 2 | 8.6 | 7.1 | 17.6% | 2 | 32.1 | 26.5 | 17.6% | ✓ |
| | 5:00p-5:59p | 2 | 10.0 | 8.0 | 20.0% | 2 | 39.3 | 31.5 | 20.0% | ✓ |
| | 6:00p-6:59p | 2 | 10.0 | 8.0 | 20.0% | 2 | 32.8 | 26.3 | 20.0% | ✓ |
| | 12:00p-1:59p | 2 | 22 | 20 | 9.1% | 1 | 28.5 | 25.9 | 9.2% | ✓ |
| | 2:00p-3:59p | 2 | 22 | 20 | 9.1% | 1 | 24.7 | 22.4 | 9.0% | ✓ |
| | 8:00p-8:59p | 1 | 22 | 20 | 9.1% | 1 | 43.5 | 39.5 | 9.2% | ✓ |
| | 9:00p-9:59p | 1 | 23 | 20 | 13.0% | 1 | 27 | 23.5 | 13.0% | ✓ |
| Sunday IB | 10:00p-10:59p | 1 | 23 | 20 | 13.0% | 1 | 22.5 | 19.6 | 12.9% | ✓ |
| | 6:00a-6:59a | 2 | 7.5 | 6.3 | 15.8% | 2 | 34.6 | 34.6 | 15.8% | ✓ |
| | 7:00a-7:59a | 2 | 9.0 | 7.3 | 18.4% | 2 | 44.3 | 44.3 | 18.4% | ✓ |
| | 8:00a-8:59a | 2 | 9.0 | 7.3 | 18.4% | 2 | 41.0 | 41.0 | 18.4% | ✓ |
| | 4:00p-4:59p | 2 | 8.6 | 7.1 | 17.6% | 2 | 31.1 | 25.6 | 17.6% | ✓ |
| | 5:00p-5:59p | 2 | 10.0 | 8.0 | 20.0% | 2 | 31.0 | 24.8 | 20.0% | ✓ |
| | 6:00p-6:59p | 2 | 10.0 | 8.0 | 20.0% | 2 | 28.5 | 22.8 | 20.0% | ✓ |
| | 12:00p-1:59p | 2 | 22 | 20 | 9.1% | 1 | 37.8 | 35.0 | 9.1% | ✓ |
| | 2:00p-3:59p | 2 | 22 | 20 | 9.1% | 1 | 37.3 | 38.6 | 9.2% | ✓ |
| | 8:00p-9:59p | 2 | 20 | 20 | 0.0% | 1 | 13.0 | 13.0 | 0.0% | ✓ |
| Sunday OB | 10:00p-10:59p | 1 | 23 | 20 | 13.0% | 1 | 12 | 10.4 | 13.3% | ✓ |

T Route 66 Harvard Square - Dudley Station via Allston & Brookline Village



Route 71: Watertown Square – Harvard Station via Mt. Auburn Street

Route 71 is the 15th highest ridership bus route and the 5th busiest among northside routes, carrying 5,200 passengers on a typical weekday.

Ridecheck data shows disproportionately heavy usage of trips just after the PM peak, between 6:30pm and 7:29pm (including the highest-ridership trip of the day).



The following actions will be initiated in the winter 2006 to enhance overall route performance:

1. Schedule Improvements:

- One bus will be added in to service from 6:30pm to 7:29pm. This will decrease the headway between 6:30 and 7:29 from 13-15 minutes to 10-11 minutes. This will significantly reduce standees during the 6:30pm to 7:29pm time period.

2. Operational Actions

- Official at Harvard will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.

4. Customer Information

- Operations Support will install new bus stop signs, monopanel, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanel.

5. Other Customer Amenities

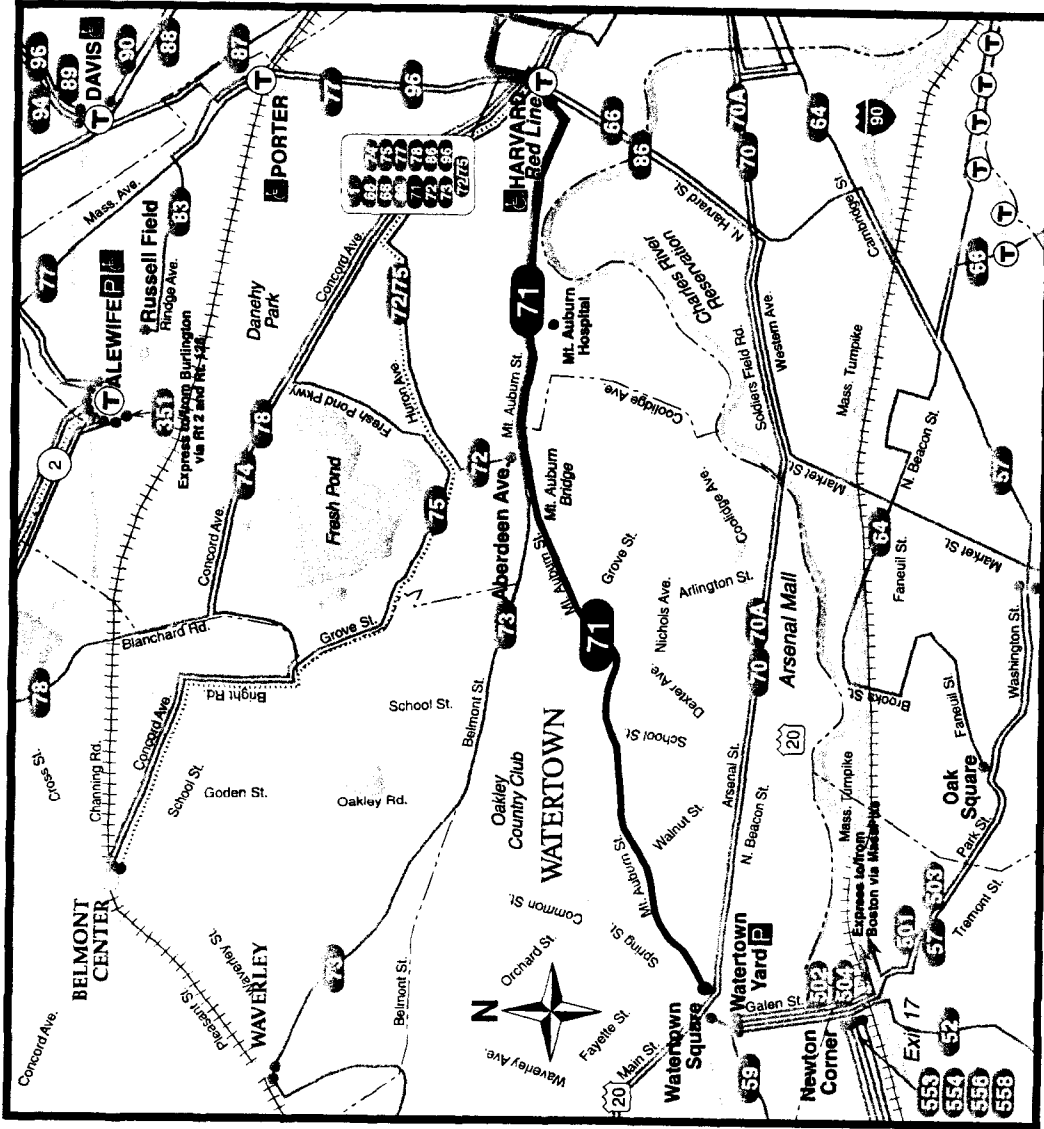
- A bus shelter installation program is currently underway in Watertown and Cambridge by CEMUSA. We anticipate that a significant number of bus stops along this route will have shelters by Spring 2007.

Route 71: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | Reduction in Crowding | | % Reduction in crowding |
|----------------|-------------|--------------------------|--------------------|------------|-------------------------|-----------------------|-----------------------|-------------------------|
| | | | (headway) | | % Frequency Improvement | Vehicles added | (avg. max load /trip) | |
| | | | Fall '06 | Winter '07 | | | Fall '06* | Winter '07 |
| Weekday IB | 7:00-7:59 | 1 | 12 | 10 | 16.7% | 1 | 13 | 11 |
| | | | | | | | | 15.4% |
| Weekday OB | 6:30-7:29pm | 1 | 14 | 10.5 | 25.0% | 1 | 41 | 29 |
| | | | | | | | | 29.3% |

* Extrapolated from current headways and fall '05 ridecheck data.

T Route 71 Watertown Square - Harvard Station via Mt. Auburn Street



Route 73: Waverly Square – Harvard Station via Mt. Auburn Street

Route 73 is the 13th-highest ridership bus route and the 3rd-busiest among northside routes, carrying 6,700 passengers on a typical weekday. Ridecheck data and rider comments indicate that the ridership on the route has a later PM peak than the schedule does. Between 4:00PM and 4:59PM, when service is every 4-5 minutes, the service is underutilized with an average max load of just 23 passengers. Between 6:30PM and 7:29PM, when ridership for the day is the highest, service operates every 10 minutes, averaging 56 passengers per trip.

The following actions will be initiated in the winter 2006 to enhance overall route performance:

1. Schedule Improvements:

Between 6:30pm and 7:29pm, the frequency of service will change from 10 minutes to 7. Two buses will be added to the route. The average load should drop from 56 passengers per bus (25 standees) to 39 (8 standees.)



To help facilitate this change, one bus will be removed from service between 4:00pm and 4:59pm. Frequency of service will change from 4/5 to 5 minutes. The average load for the hour should increase from 23 passengers to 26.

This will mean a net increase of one hour and one trip. It also means a shift of one hour of service from peak to off-peak, which results in an associated cost savings.

2. Operational Actions

Official at Harvard will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

In the future, staff will monitor schedule adherence and run times using the AVL equipment.

4. Customer Information

Operations Support will install new bus stop signs, monopanels, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanels.

5. Other Customer Amenities

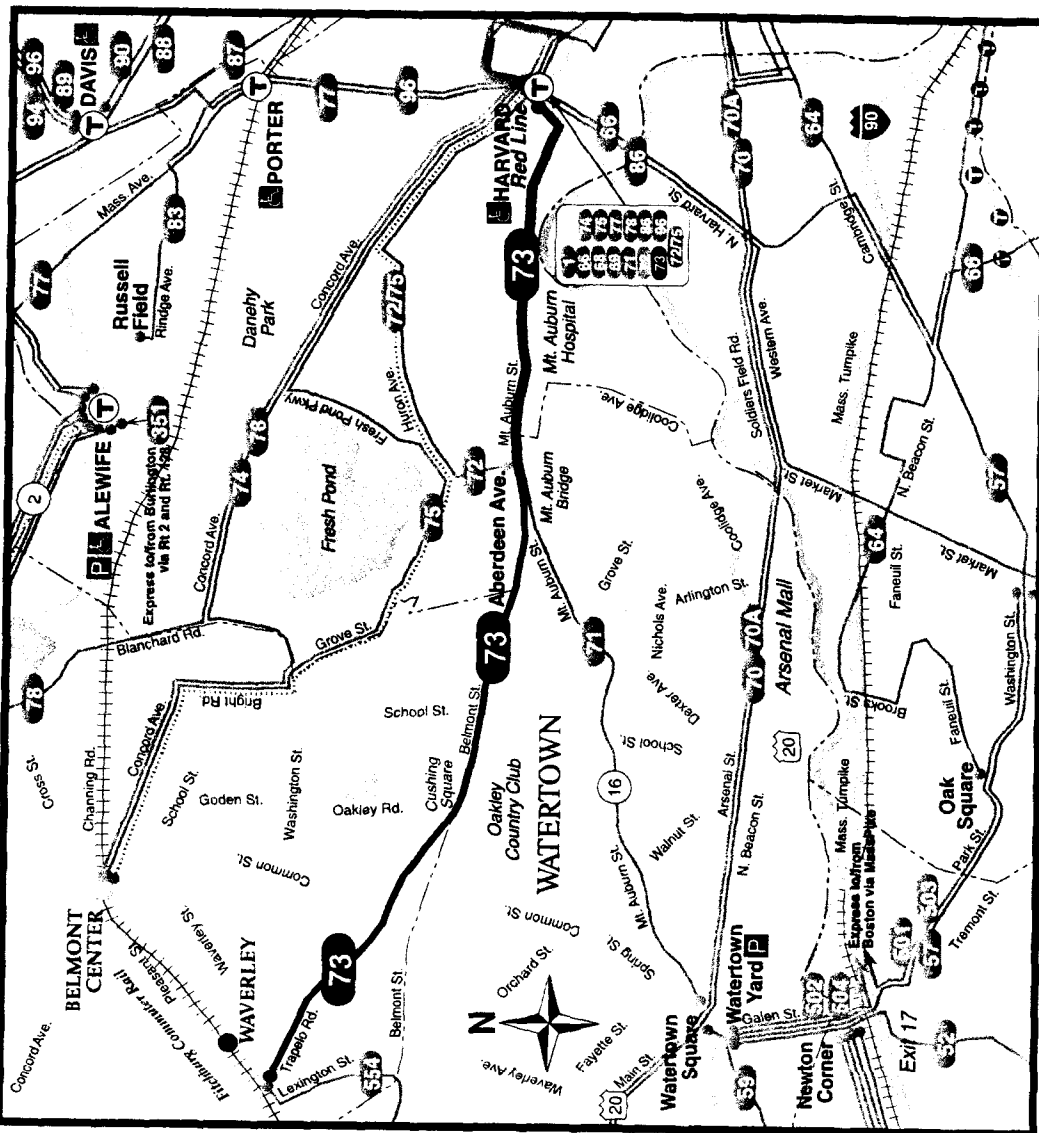
A bus shelter installation program is currently underway in Cambridge by CEMUSA. We continue to investigate feasibility of installing additional shelters in Belmont as well. We anticipate that a significant number of bus stops along this route will have shelters by Spring 2007.

Route 73: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding |
|----------------|-------------|--------------------------|--------------------|------------|-------------------------|-----------------------|----------------|-----------------------|--------|-------------------------|
| | | | (headway) | | % Frequency Improvement | (avg. max load /trip) | | | | |
| | | | Fall '06 | Winter '07 | | Fall '06* | | Winter '07 | | |
| | | | | | | | | | | |
| Weekday IB | 4:30-5:29 | -1 | 4.5 | 5 | -11.1% | -1 | 17 | 19 | -11.8% | |
| | 7:00-7:59 | 2 | 10 | 7 | 30.0% | 2 | 10 | 7 | 30.0% | |
| Weekday OB | 4:00-4:59pm | -1 | 4.5 | 5 | -11.1% | -1 | 23 | 26 | -13.0% | |
| | 6:30-7:29pm | 2 | 10 | 7 | 30.0% | 2 | 56 | 39 | 30.4% | |

* Extrapolated from current headways and fall '05 ridecheck data.

T Route 73 Waverley Square - Harvard Station via Trapelo Road



Route 77: Arlington Heights – Harvard Station via Massachusetts Avenue

Route 77 is the 12th highest ridership bus route and the 3rd-busiest among northside routes, carrying 7,600 passengers on a typical weekday. The following actions will improve AM peak reliability through schedule adjustments, and increase the frequency of service through much of the day, in order to better meet the high demand for this route.



The following actions will be initiated in the winter 2006 to enhance overall route performance:

1. Schedule Improvements:

- Service will be added to route 77 for most of the weekday, adding a total of 10 round trips. Buses will be added to the route and service

frequency will be improved starting at 4:45am and continuing throughout the day in almost all time periods until 6:30pm.

- In addition, during the AM peak additional running time will be added to the route to improve schedule adherence and reliability. Point checks performed on October 2nd and 3rd, in addition to running time data collected from the TransitMaster system in the month of September, indicate that service would benefit from this change.

2. Operational Actions

- Position official at Arlington Heights during the morning (7a to 9a) and afternoon (4p to 6p) peak periods. Official will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.

4. Customer Information

- Operations Support will install new bus stop signs, monopanel, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanel.

5. Other Customer Amenities

- All buses serving this route are equipped with Bike racks.

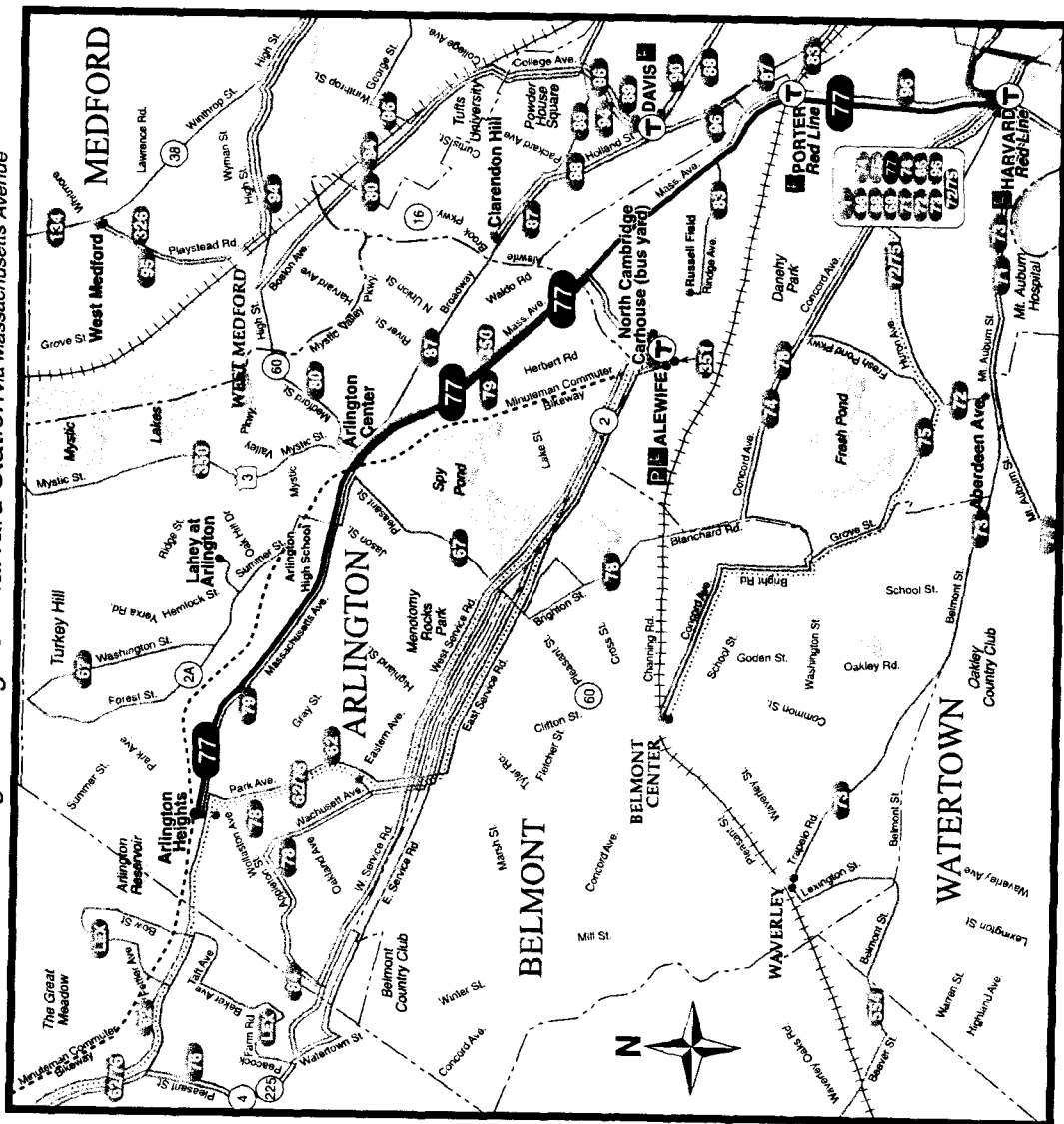
- A bus shelter installation program is currently underway in Cambridge. We continue to investigate the feasibility of initiating a program in Arlington as well. We anticipate that a significant number of bus stops along this route will have shelters by Spring 2007

Route 77: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding | Run-time adj. to improve on-time perf. |
|----------------|-------------|--------------------------|--------------------|-------------------------|------------|----------------|-----------------------|-------------------------|-------------------------|----------------------------------------|
| | | | (headway) | % Frequency Improvement | | | (avg. max load /trip) | % Reduction in crowding | | |
| | | | | Fall '06 | Winter '07 | | | | | |
| | | | | | | | | | | |
| Weekday IB | 4:45-5:59 | 1.25 | 16 | 12 | 25.0% | 1 | 16 | 12 | 25.0% | ✓ |
| | 7:00-8:59 | 4 | 8 | 7 | 12.5% | 2 | 50 | 44 | 12.0% | |
| | 10:30-1:29 | 3 | 13 | 12 | 7.7% | 1 | 34 | 31 | 8.8% | |
| | 1:30-3:29 | 2 | 9 | 8 | 11.1% | 1 | 28 | 25 | 10.7% | |
| | 4:00-6:29 | 2.5 | 8 | 7 | 12.5% | 1 | 20 | 17 | 15.0% | |
| Weekday OB | 5:15-6:29 | 1.25 | 16 | 12 | 25.0% | 1 | 9 | 7 | 22.2% | ✓ |
| | 7:30-9:29 | 4 | 8 | 7 | 12.5% | 2 | 13 | 11 | 15.4% | |
| | 11:00-1:59 | 3 | 13 | 12 | 7.7% | 1 | 26 | 24 | 7.7% | |
| | 2:00-3:59 | 2 | 9 | 8 | 11.1% | 1 | 22 | 19 | 13.6% | |
| | 4:00-6:29 | 2.5 | 8 | 7 | 12.5% | 1 | 42 | 37 | 11.9% | |

* Extrapolated from current headways and fall '02 ridecheck data.

T Route 77 Arlington Heights - Harvard Station via Massachusetts Avenue



Route 111: Woodlawn or Broadway & Park Ave – Haymarket Station via Tobin Bridge

Route 111 is the 8th highest ridership bus route systemwide (1st among all northside routes) with 8,692 weekday boardings. A number of actions were initiated in the Fall 2006 to reduce crowding and enhance overall route performance. These improvements included the addition of 24 trips throughout the weekday, primarily during the AM and PM peak periods.



CTPS gathered Route 111 point check data during September 2006 after the Fall improvements were implemented. Based on these observations, additional service will be added in the Winter 07 at targeted times to better accommodate passenger demand.

As part of the Fall 06 changes, service in the outer portion of the route beyond Woodlawn was discontinued until approximately 10:30PM due to low ridership. Alternate service via the Route 110 was available in this corridor. Subsequent to the change, many customer requests were received for the MBTA to restore at least some of the service to Broadway and Park.

The following steps will be taken to further enhance Route 111 in the Winter 07 rating:

1. Schedule Improvements

- One bus will be added from 9:00 AM – 2:00 PM, shortening the headway from 15 minutes to 12 minutes. In addition, a bus will be added from 2:00 PM – 3:00 PM and from 10:25 PM – 11:22 PM on weekdays improving the headways from 10 to 8/9 minutes and from 14 to 11 minutes respectively.
- Saturday service will be improved by adding one trip at the beginning of the service day (5:00 AM), adding a vehicle from 5:00 AM - 9:00 AM to improve headways from 15 to 12 minutes, and adding a vehicle from Noon - 5:00 PM to improve headway from 12 to 10 minutes.
- On Sunday, two trips will be added at the beginning of the service day, and a vehicle will be added from 10:00 AM – Noon to improve headways from 16 to 12 minutes
- Weekday service between Woodlawn and Broadway & Park will be restored starting at 7:10 PM through the end of service (Currently Route 111 serves this area only between 10:30 PM and the end of the service day). Because Route 110 also operates between Woodlawn and Broadway & Park, passengers traveling to Revere can transfer from Route 111 to Route 110. However, after 7:10 PM the frequency of service on Route 110 decreases to one bus per hour.

Therefore, to better accommodate the needs of customers, service to Broadway & Park will begin at 7:10 PM and operate until the end of the service day.

2. Operational Actions

- Position officials at Bellingham Square and Woodlawn Loop during the morning (7a to 9a) and afternoon (4p to 6p) peak periods. Officials will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment.
- CTPS will conduct point checks during time intervals where significant changes have been implemented or where crowding continues to receive complaints.

4. Customer Information

- Operations Support will install new bus stop signs, monopanel, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanel.

5. Other Customer Amenities

- All Route 111 buses are now equipped with bike racks.
Additional waiting shelters for bus patrons will be constructed at 4-5 stops by the end of the year.

Route 111: Comparison of Fall 06 and Winter 07 Trips and Headways

| Day, direction | Time period | Additional service hours | Improved Frequency | | | Vehicles added | Reduction in Crowding | | % Reduction in crowding |
|----------------|---------------|--------------------------|--------------------|------------|-------------------------|----------------|-----------------------|----|-------------------------|
| | | | (headway) | | % Frequency Improvement | | (avg. max load /trip) | | |
| | | | Fall '06 | Winter '07 | | | | | |
| Weekday IB | 9:00a-2:00p | 5 | 15 | 12 | 20.0% | 1 | 37 | 31 | 16.2% |
| | 2:00p-3:00p | 1 | 10 | 8.5 | 15.0% | 1 | 25 | 22 | 12.0% |
| | 7:10p10:30p | 4 | 10 | 10 | 0.0% | 1 | 8* | 7 | 12.5% |
| | 10:25-11:22p | 1 | 14 | 10 | 28.6% | 1 | 5 | 4 | 20.0% |
| Saturday IB | 5:00a-9:00a | 4 | 15 | 12 | 20.0% | 1 | 4 | 32 | -700.0% |
| | 12:00p-5:00p | 5 | 12 | 10 | 16.7% | 1 | 38 | 32 | 15.8% |
| Sunday IB | 10:00a-12:00p | 2 | 16 | 12.5 | 21.9% | 1 | 42 | 32 | 23.8% |
| | 5:30a-6:00a | 0.6 | No service | 19 | N/A | 2 | No Service | 25 | N/A |
| Weekday OB | 9:00a-2:00p | 5 | 15 | 12 | 20.0% | 1 | 30 | 16 | 46.7% |
| | 2:00p-3:00p | 1 | 10 | 8.5 | 15.0% | 1 | 42 | 37 | 11.9% |
| | 7:10p10:30p | 4 | 10 | 10 | 0.0% | 1 | 41 | 42 | -2.4% |
| | 10:25-11:22p | 1 | 14 | 10 | 28.6% | 1 | 58 | 46 | 20.7% |
| Saturday OB | 5:00a-9:00a | 4 | 15 | 12 | 20.0% | 1 | 15 | 12 | 20.0% |
| | 12:00p-5:00p | 5 | 12 | 10 | 16.7% | 1 | 37 | 31 | 16.2% |
| Sunday OB | 10:00a-12:00p | 2 | 16 | 12.5 | 21.9% | 1 | 15 | 11 | 26.7% |
| | 5:30a-6:00a | 1 | No Service | 16 | N/A | 2 | No Service | 7 | N/A |

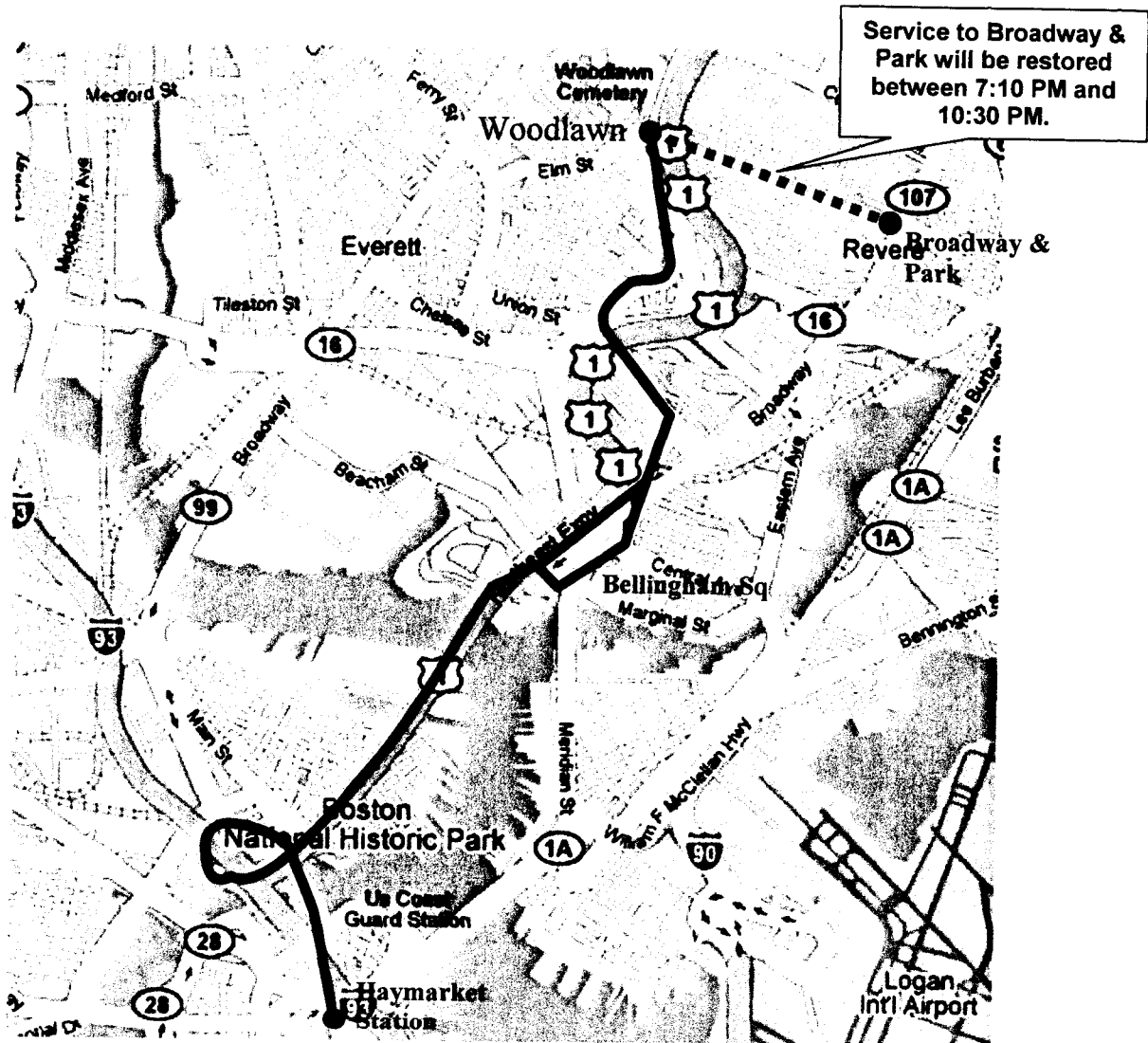
*Data is for 111.8; no data for 111.5 for this time period



Bus Route 111: Five Point Improvement Program

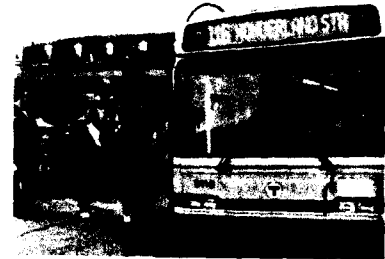
Winter 2007 Service Improvement Plan

Route 111: Broadway & Park or Woodlawn – Haymarket Station



Route 116/117: Wonderland Station – Maverick Station via Revere Street or Beach Street

Combined Route 116/117 has the 10th highest ridership systemwide and is the 2nd busiest northside route. It had 8,446 weekday boardings on the most recent ridership counts.



During the AM Peak (6:30 - 9:00 AM), Route 116/117 is currently scheduled to drop-off, but not pick-up passengers inbound between Bellingham Square and Maverick Station. This "limited stop" service was instituted to shift ridership to Route 114. However, this has resulted in fewer service options for Route 116 and 117 riders. Further, ridecheck data show that some operators do pick-up as well as drop-off, and customers prefer this to a bus not stopping.

The following steps will be taken to improve Route 116/117 in the Winter 07 rating:

1. Schedule Improvements

- The inbound 116/117 will no longer run as a "limited stop" service during the AM peak between Bellingham Square and Maverick Station—the portion of the route that is also served by Route 114. As a result, from 6:30 AM to 9:00 AM riders will benefit from an increase of 10 additional trips and the average combined inbound headway will improve from 10 minutes to 5 minutes.
- To better accommodate customer demand on Route 116/117, Route 114 service will be extended from 4:00 PM (when it currently ends) to 10:00 PM with a net addition of 10 trips.

2. Operational Actions

- Position officials at Maverick Square and Bellingham square during the morning (7a to 9a) and afternoon (4p to 6p) peak periods. Officials will use bus route headway sheets to make schedule adjustments. Officials will communicate with BCC and coordinate with other officials along the route corridor to ensure proper headways are maintained along the route.

3. Performance Monitoring

- In the future, staff will monitor schedule adherence and run times using the AVL equipment, and will recommend further schedule adjustments for the Spring Rating if necessary.

4. Customer Information

- Operations Support will install new bus stop signs, monopanels, and cubes, as required. Planning and Scheduling will generate schedule inserts for the cubes and monopanels.