Don't Count on It:
A Study of Weekend Service Diversions

Results of the New York City Transit Riders Council
Weekend Subway Service Diversion Study

New York City Transit Riders Council
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Introduction

New Yorkers rely on transit more heavily than residents of any other American city. While ridership in many other places is concentrated around weekday morning and evening commutes, New York's subways are busy through the midday hours, late into the evenings, and through the weekends. Because of the volume of ridership, even changes in service patterns implemented in off-peak hours have a serious impact on residents' ability to move throughout the City and frequently lead to uncertainty and frustration among subway riders. It is fair to say that periodic weekend subway service changes are a major source of anxiety for New York City Transit riders.

Although the impacts of service changes on riders are undesirable, temporary modifications to subway service patterns are clearly necessary. The New York City subway system operates twenty-four hours a day, seven days a week. As a result NYC Transit is not able to perform necessary maintenance and repair work during time periods when the system is not operating, as is possible in most other American rail transit systems where all or some lines do not operate during overnight hours. To accommodate the necessary repair and maintenance work, NYC Transit relies upon a series of planned service changes occurring during off peak hours and weekend to provide workers access to track areas.

The members of the New York City Transit Riders Council (NYCTRC) recognize that weekend subway service changes will continue to be a necessary part of subway service, but are troubled by the variability and unpredictability of the service that is provided. The Council regularly hears from riders about infrequent and irregular weekend service in the subways when temporary service changes are implemented. We often receive reports of weekend subway riders waiting fifteen minutes or more for a train, when even accounting for any service changes the scheduled headways, or periods of time between trains, remain at eight to ten minutes.

In order to test the perception that weekend subway service affected by system maintenance, repair, and construction projects is significantly less frequent and more variable than schedules and service advisories indicate, the NYCTRC, in late October through mid-November 2009, conducted a limited survey of service on lines where NYC Transit was implementing temporary weekend service changes.

In undertaking this project, the Council wanted to specifically examine the trains that are being affected by weekend service changes. While on-time performance statistics capture elements of the performance of lines where weekend service changes have been implemented, they reflect timing only at terminal stations and may also reflect trips not impacted by service changes. The Council does not have the resources to perform a comprehensive inventory of this service, but it

believes that a limited survey is useful in assessing the nature and scale of issues surrounding weekend subway service changes.

Methodology

The results discussed in this report are derived from a field survey of MTA New York City Transit B division subway lines on the weekends of October 24-25, October 31-November 1, November 8-9, and November 15-16 2009. The survey was conducted by members of the Council, who were provided with a monitoring assignment, instructions, and data collection forms. These instructions and forms are shown in the appendices to this report.

The B division lines are popularly referred to as the “lettered“ lines and were selected because, in contrast to the A division, or “numbered“ lines, they are not included in the NYC Transit’s Automated Train Supervision (ATS) system. The ATS system provides a continual flow of information about the location of trains on routes where this technology is installed. This detailed information on train location cannot be gathered remotely for B division trains, with the exception of the L line, where the position of trains is monitored by a separate Communication Based Train Control system that is used to operate the line. There were no weekend service changes on the L line included in the survey.

Another consideration in the decision to focus on the B division is that the installation of customer information screens, or "countdown clocks ," in B division stations, other than those on the L line, will lag substantially behind the installation of this technology in A division stations. While information about the arrival of the next train does not in itself improve service, it does increase the rider’s sense of control and improve the experience of using the subway system. The unavailability of real time information about train arrivals increases the importance of having an adequate quantity of regularly spaced service at these stations.

In preparation for the project, a list of scheduled weekend service changes announced for the B division by NYC Transit was compiled for the period of the survey. The General Orders governing the flow of train traffic applicable to these service changes were also collected. Where the general orders referenced the use of supplement schedules on the lines to be surveyed, these schedules were also collected. Supplement schedules represent modifications to timetables normally in effect and may be made necessary by service changes. By referencing these materials, we were able to determine the amount and frequency of service that should have been provided for lines affected by service changes in the periods that they were monitored by the surveyors.

Each surveyor was assigned to monitor a specific weekend service change for a period of ninety minutes during the hours in which and within the portion of the route over which the service change was in effect. Surveyors, in consultation

with NYCTRC staff, selected a location within the affected portion of the route from which to monitor trains affected by the assigned service change. The surveyors also collected information on trains of other lines visible at that location where the lines' operation could reasonably be affected by the service change; for example, if E trains were routed on the F line, surveyors monitored arrivals of both E and F trains.

The surveyors were assigned to collect two kinds of information. Upon arriving at the station to complete their assignment, surveyors were to record whether they observed service notice posters for their assigned service change on the street level, at mezzanine level, and at the platform level, as applicable to the station. They were instructed not to expend extraordinary effort to look for service notice posters, but to note posters that an observant rider would see in the normal course of traveling to the platform to board a train.

The second type of information that the surveyors were to collect is information about the arrivals of trains involved in and affected by their assigned service change. Surveyors collected the arrival time of each train passing their observation point. If trains passed the observation point on more than one track, the surveyor also recorded the track on which a train operated and, where a line was observed in both directions, its direction. Surveyors were also instructed to note cases where a train was held in the station or where announcements of service delays or changes in operation were made.

Information was collected on the following service changes:

Table 1 – Service Changes Monitored

Lines	Survey Location
E on F line (Queens bound)	Lexington Avenue/63rd Street
A operating local (Queens bound)	14th Street
D on N line (Coney Island bound)	86th Street (Brooklyn)
E on F line (Queens bound)	57th Street
A on F line (Queens bound)	Broadway/Lafayette
A operating local (Queens bound)	Utica Avenue
F on E line (Brooklyn bound)	Lexington Av/53rd Street
E operating express (Manhattan bound)	Queens Plaza
R operating express (Brooklyn bound)	Queens Plaza
C operating express (Brooklyn bound)	72nd Street
D operating local (Bronx bound)	145th Street
D operating local (Brooklyn bound)	72nd Street
D train on N line (Bronx bound)	36th Street (Brooklyn)
N operating local (Queens bound)	36th Street (Brooklyn)
Q operating local (both directions)	8th Street

Findings

Service Change Notices

In terms of the availability of conspicuously posted information about service changes, we found a mixed picture. Our surveyors observed accurate service change notices that provided information on the changes that they were to monitor in only two-thirds of the stations that they visited. This result does not mean that no relevant service change notices were posted in these stations, but that our members, entering their assigned stations in the manner of a normal, observant rider, saw at least one of these notices on only two out of three visits.

The surveyors most often encountered service notices in station mezzanines or intermediate levels between the street and the platform. In the mezzanine areas of three quarters of the stations that they visited, surveyors noted service change notices referencing the service that they were observing. This is a higher percentage than that recorded for all stations, but not all stations have a mezzanine level. Unfortunately, at the platform level surveyors found notices for the service that they were to observe less than one-half of the time; only 42 percent of surveys completed indicated that service change notices were seen posted at the platform level. Surveyors also noted few service change notices at street level; they were observed in only 22 percent of the survey assignments. This is a cause for concern, as the NYCTRC has long taken the position that service change information should be available to passengers before they ascend or descend into a subway station.

Amount and Regularity of Service

In terms of the service itself, we analyzed the surveyors' observations to evaluate the amount of service being provided and the regularity of that service in comparison to the schedules in effect. We used as our measure of the amount of service provided the number of trains of each line passing the observation point during the median hour[1] of each survey shift. We then compared this number with the number of trains that were scheduled for that hour, determined by consulting published and supplementary schedules in effect for each line. Even though each individual hour of observation may be affected by variation in arrival times, if service is being provided as planned we would expect the average number of trains observed to closely match the number of trains that were scheduled.

In the median hours of our surveyors' shifts, the schedules for the lines surveyed indicate that a total of 168 trains should have passed the observation points. During this time, we recorded a total of 149 trains passing the observation points, or about 89 percent of the scheduled service. While our observations represent snapshots of service and our sample size is small, this result is consistent with

[1] From 15 minutes after the start to 15 minutes before the end of each 90 minute survey period.

the experience of many riders and with past statements of NYC Transit officials, who have acknowledged that during weekend periods they are sometimes unable to provide the level of service that is scheduled. This appears to be a routine practice, and the NYCTRC finds it unacceptable. If the amount of service provided must be reduced, we believe that NYC Transit management must acknowledge this fact to the rider.

In terms of the regularity of service, we found a similar situation. In measuring regularity of service, we started with the scheduled headways during the survey period for each line monitored, as obtained from published or supplement schedules. A headway is the time interval between the arrival of an initial train and the next train serving the same route. We then compared the headways that we observed with the scheduled headways and calculated the difference between actual and scheduled headways. In most cases, scheduled headways did not vary through the course of a survey shift, but when they did change, we compared the observed headway with the headway between scheduled trains that most closely matched the observed trains in time.

It would not be reasonable to expect actual headways to precisely match scheduled headways, but it is reasonable for riders to expect them to be close. NYC Transit compiles a statistic known as "wait assessment" that measures the percentage of time intervals between buses and trains of a given route that do not exceed scheduled headways plus a tolerance factor. For subway operations in off peak hours, this tolerance factor is four minutes, and in our analysis we used four minutes as a reasonable limit that that acceptable actual headways could differ from scheduled headways.

Our treatment of headways differs conceptually from wait analysis in one important aspect, however. While wait analysis considers a headway to be problematic only if it exceeds the schedule by more than a given tolerance factor, we consider actual headways to be problematic if they either significantly overrun or underrun the scheduled headway.

Our reasoning is that, assuming that the volume of service is not increased above scheduled levels, headways smaller than those scheduled can occur only because other headways on the line are larger than scheduled. In addition, resources are not used efficiently when when one train runs closely behind another. Those of us who ride the system frequently have all seen examples of "bunching" where a crowded train has a nearly empty train following closely behind. In these cases, the trailing underutilized train contributes little to the quality of service provided to riders.

The observations that our members made allowed us to calculate 214 actual headways for trains affected by service changes. Of these 59, or 28 percent of the total, differed by greater than 4 minutes from the scheduled headways for the time period. This observation corresponds to the perception of many riders that

there is significant variation in the spacing between trains on weekends when many lines are affected by service changes made necessary by system maintenance, repair, or improvement. In addition, where trains of different lines arrive on the same track, variation in headways leads to confusion if the normal pattern of a train of one line arriving followed by a train of another is disrupted. Riders who expect an F train to follow each E train, for example, may question whether the F is operating at all after seeing several E trains in a row. A summary of the surveyors' observations is contained in Table 2, below.

Table 2 – Summary of Service Monitored

Line	Date Observed	Core Hour Trains Observed/Scheduled	Headway Differing from Schedule Over 4 Minutes Off Schedule/Total Observed
A	10-31-09	7/8	2/10
A	11-1-09	6/5	2/7
A	11-8-09	6/6	0/9
C	11-14-09	6/6	1/8
D	10-31-09	5/7	3/7
D	10-31-09	5/7	5/7
D	11-14-09	5/7	3/8
D	11-14-09	5/7	4/7
D	11-14-09	5/8	2/8
D	11-14-09	6/6	3/7
E	10-25-09	5/6	3/6
E	10-31-09	5/6	2/7
E	11-7-09	8/8	3/12
E	11-8-09	8/6	3/11
F	10-25-09	5/6	4/7
F	10-31-09	6/6	3/6
F	10-31-09	6/7	3/8
F	11-7-09	5/7	3/6
F	11-8-09	4/6	1/8
N	10-31-09	5/7	5/8
N	11-14-09	7/8	1/10
N	11-15-09	6/7	1/9
N	11-15-09	8/7	1/9
Q	11-15-09	7/7	0/10
Q	11-15-09	8/7	1/11
R	11-8-09	5/6	2/8
TOTAL		149/168	61/214

Conclusions

In the riders' ideal world, there would be no need for weekend service changes. With New York's aging subway system generating a constant demand for track access for maintenance, repair, and improvement to the system, however, this is not a realistic vision. There will continue to be changes in weekend subway service to accommodate necessary work within the system, and riders will have to live with some level of inconvenience from these changes.

The key for subway riders is that the inconvenience produced by these changes be kept to a minimum. We believe that this can be done through increasing the availability of information to subway users and by providing service according to a realistic schedule that can maintained even in the face of major changes to the pattern of service throughout the system. Through these actions, we can minimize the inconvenience to riders that now occurs when service is not provided as promised.

NYC Transit has made significant strides in disseminating service change information to its customers over the past several years. The MTA website and email and text alert services have dramatically increased the amount and quality of information available to riders, enabling them to plan for possible delays, consider alternative routings, and allow additional travel time accordingly. With real-time information still years in the future on most of the B division, Transit must maintain this momentum. NYC Transit should continue to encourage riders to consult the MTA website for service information and to sign up for email and text alert services that the agency provides.

In addition, more must be done to allow riders to access information in multiple formats that meet their individual needs. The MTA has made a large step toward an open data environment by providing schedule information to developers and other users in the General Transit Feed Specification format. Providing this information opens the way for scores of software developers to create applications that display this information to riders in the format most useful to them. Third party developers should also be seen as a promising resource for disseminating information about planned service changes. We encourage the MTA and NYC Transit to discuss with the developer community the most effective ways of making this information available for use by third party software applications.

Transit also must ensure that information about service changes is available to riders once they reach affected stations. Because it is likely to be some time before real time train arrival information will be available in most B division stations, it is important that riders receive effective general information about the character of service that they should expect at the station.

The NYCTRC has for many years been concerned with the presentation of information on service change posters. At present, the large volume of service change posters in stations often combine to form a confusing mass of information near the station booth. The Council believes that information about service changes needs to be given to riders before they enter the station and has long advocated the use of a display frame or similar arrangement to inform riders that the service that they want may not be available at a point before they ascend or decend into the station.

NYCTRC also believes that some order must be brought to the existing jumble of service change posters and recommends that NYC Transit find methods of targeting posted service change information to the service that is available at the station, either through the use of posters customized to sets of stations or through imposing greater structure on the arrangement of service change posters. If posters were arranged in a hierarchy, with the most immediately relevant changes placed in the most prominent positions, a great deal of searching through a sea of posters to locate relevant information could be avoided.

In terms of service, the Council believes that NYC Transit should operate the highest level of subway service that is both justified by the ridership of a line and is consistent with maintaining an acceptable regularity of service. It is widely acknowledged that the amount of service actually provided during diversions is not the level of service that NYC Transit has stated that it will provide. Our observations bear out this assessment of the situation, and the NYCTRC finds it unacceptable for actual service to routinely fall short of what is being promised to the rider.

Realistic appraisals of what can be effectively provided are necessary, and Transit must make every effort to inform riders when work in the system will make service less frequent or regular than would ordinarily be expected. Subway riders in New York are generally resilient and able to take advantage of alternative service to travel where they need to go, but they need to know when allowances will need to be made. It is the least that those who operate the system can do for the riders.

Appendix A
Survey Instructions

New York City Transit Riders Council
"B" Division Service Diversion Survey
October-November 2009

Instructions

You will be keeping a record of the trains passing the platform to which you are assigned. You will use the survey form that has been provided to record the track on which the train arrives, the time it arrives, and the line that it is serving.

First, fill out the top section of the form. You are the surveyor. The service diversion is the description of the change that you were emailed. The date is the date that you observed. The station and line is the station at which you collected observations and the lines passing your observation point. The start and end times are times you started and ended surveying. Also record whether you observed service notice posters on the street level, at mezzanine level, and at the platform level. You should not expend special effort to look for the posters.

When you get to the platform, you can enter observations on the bottom section of the form. If your platform serves two tracks, record trains on each, taking care to indicate whether the track being used is "express" or "local". If your station has only one track in each direction, designate it "local" on your form. You should record the arrival time of each train passing your platform and the line that it serves. If a train is held in the station, or if announcements of delays or other changes in operation (e.g.: stations to be skipped) are made, please note this in the "comments" section. Also note anything else out of the ordinary (other than the planned diversion) in the "comments section.

Here is an example of a form:

New York City Transit Riders Council
"B" Division Service Diversion Survey
October-November 2009

Surveyor Bill Henderson Service Diversion: Q Train, Both Directions , Local 57th St to Canal St.

Date 11/14/09 Station/Line(s) 14th St./Union Sq. N,R,Q

Start Time 12:30 p.m. End Time 2:00 p.m.

Service Notice Posters on Street Level ((Y) / N / NA) Service Notice Posters on Mezzanine Level ((Y) / N / NA) Service Notice Posters on Platform ((Y) / N / NA)

Track (local/express)	Time Arriving	Line	Comments
Local	12:31	Q	On-board announcement – we are being held by the train's dispatcher
Local	12:34	R	
Local	12:38	N	
Local	12:43	R	

Appendix B
Survey Form

New York City Transit Riders Council
"B" Division Service Diversion Survey
October-November 2009

Surveyor_____ Service Diversion_____

Date_____ Station/Line(s)_____

Start Time_____ End Time_____

Service Notice Posters on Street Level (Y / N / NA) Service Notice Posters on Mezzanine Level (Y / N / NA) Service Notice Posters on Platform (Y / N / NA)

Track (local/express)	Time Arriving	Line	Comments