

Ulster County

Transit System Development Plan

Technical Memo 4: Recommended Service Improvements

June 2012



Table of Contents

	Page
Chapter 1. Introduction	1-1
Chapter 2. Transit Service Principles and Long-Range Vision.....	2-1
Chapter 3. Short and Medium-Range Service Improvements.....	3-1

Table of Figures

	Page
Figure 1-1 Existing Transit Network	1-1
Figure 2-1 Long-Range Vision for Ulster County.....	2-2
Figure 2-2 Long-Range Vision for Kingston	2-3
Figure 3-1 Citibus Passenger Schedule	3-1
Figure 3-2 UCAT Passenger Schedule	3-2
Figure 3-3 Interlines on Passenger Schedule	3-2
Figure 3-4 Proposed M Route Changes.....	3-4
Figure 3-5 Proposed S Route Changes	3-6
Figure 3-6 Proposed K Route Changes	3-7
Figure 3-7 Proposed NPL Route Changes.....	3-8
Figure 3-8 Proposed Kingston Citibus Changes	3-10
Figure 3-9 Colonial Gardens Location.....	3-11
Figure 3-10 Proposed E Route Changes	3-12
Figure 3-11 Proposed U Route Changes	3-13
Figure 3-12 Proposed F Route Changes	3-14
Figure 3-13 Proposed G Route Changes.....	3-15
Figure 3-14 Proposed W Route Changes	3-16
Figure 3-15 UCAT Rural Route Schedule	3-17
Figure 3-16 Proposed R Route Changes	3-19
Figure 3-17 Proposed X Route Changes	3-21
Figure 3-18 Proposed UPL Route Changes.....	3-22
Figure 3-19 Proposed N Route Changes	3-23
Figure 3-20 Proposed Weekday UCAT Changes.....	3-24
Figure 3-21 Proposed Saturday UCAT Changes	3-25
Figure 3-22 Weekday Service Statistics.....	3-27

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

Figure 3-23 Saturday Service Statistics3-28
Figure 3-24 Sunday Service Statistics3-28
Figure 3-25 Comparison.....3-29

Chapter 1. Introduction

Ulster County and Ulster County Transportation Council (UCTC) retained Nelson\Nygaard Consultant Associates, along with Fitzgerald & Halliday, Inc. (FHI) to evaluate existing transit services and determine how service can be improved for county residents over the next decade. The study will identify service needs and opportunities, review existing service performance and productivity, and use this information to lay out a strategic plan to address gaps and opportunities with the goal of improving service delivery over a ten-year planning period. The analysis and resulting recommendations are intended to include the full spectrum of service delivery spanning organizational, communication, capital, and service structures.

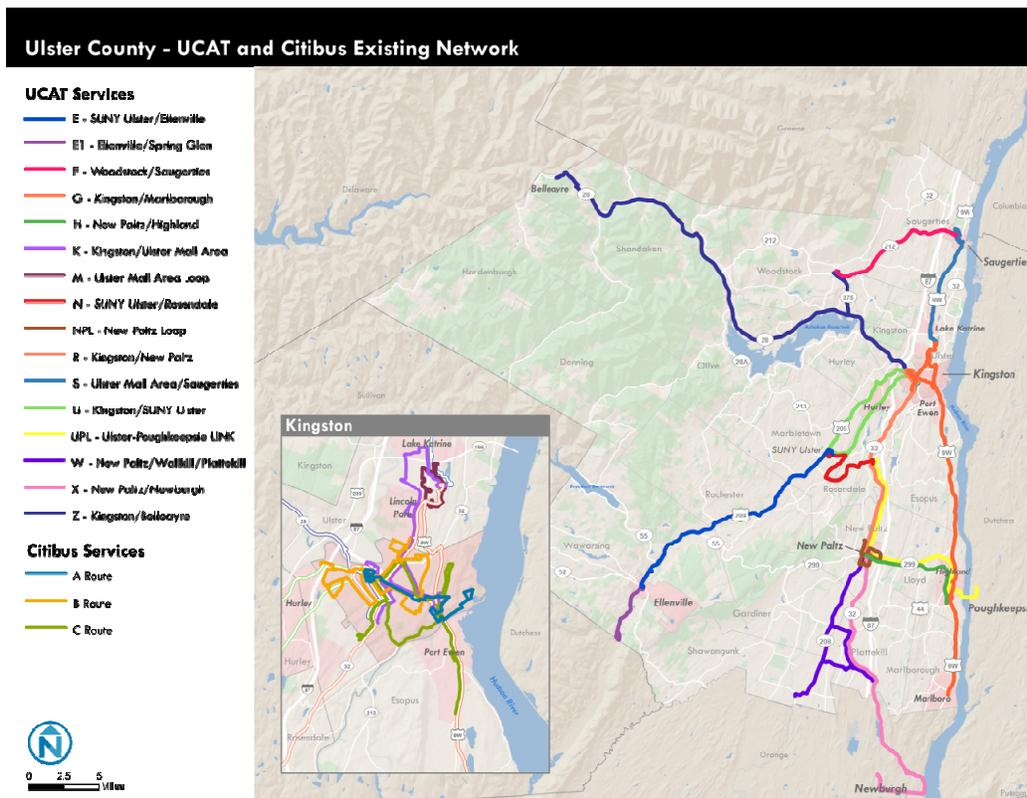
This memo, Technical Memo 4: Recommended Service Improvements, is organized into two chapters immediately following this introduction:

- **Chapter 2: Transit Service Principles and Long-Range Vision** – a guide to general transit service principles that can improve the passenger experience and how these may be applied in Ulster County.
- **Chapter 3: Short and Medium-Range Service Improvements** – proposed service changes that can be implemented immediately or in the near-future to address specific issues in each service corridor and to generally improve ridership and productivity.

Technical Memo 4 is the fourth memo in a series and is intended as a working paper. All findings and recommendations should be considered preliminary.

For reference purposes, the current UCAT and Citibus transit networks are shown below.

Figure 1-1 Existing Transit Network



Chapter 2. Transit Service Principles and Long-Range Vision

Ulster County's public transportation providers strive to serve as many of county's residents, workers, and visitors as possible with the budget and resources that are available to them. As with most transit systems, this often means balancing the competing demands of a wide variety of riders. For example, most riders want fast service, but many also want stops located very frequently to minimize the distances that they have to walk, and frequent stops makes service slower. Thus, service elements that will attract one type of rider to transit can drive other riders away. However, there are certain service design principles that will improve service for nearly all riders:

Service Should Be Simple

First and foremost, for people to use transit, service should be designed so that it is easy to use and intuitive to understand. This applies not only to the routing and scheduling of service, but also to the information presented to customers at the stop and on passenger information materials.

Service Should Operate at Regular Intervals

In general, people can easily remember repeating patterns, but have difficulty remembering irregular sequences. For this reason, routes should operate at regular frequencies to the extent possible.

Routes Should Operate Along a Direct Path

The fewer directional changes a route makes, the easier it is to understand. Conversely, circuitous alignments are disorienting and difficult to remember. Routes should not deviate from the most direct alignment unless there is a compelling reason, such as to provide service to a major ridership generator. In such cases, the benefits of operating the route off of the main route must be weighed against the inconvenience caused to passengers already on board.

Routes Should be Symmetrical

Routes should operate along the same alignment in both directions to make it easy for riders to know how to get back to where they came from. In cases where such operation is not possible due to one-way streets or turn restrictions, routes should be designed so that the opposite directions parallel each other as closely as possible.

Routes Should Serve Well Defined Markets

To make service easy to understand and to eliminate service duplication, routes should be developed to serve clearly defined markets. Ideally, major corridors should be served by only one route unless the routes are complementary, such as providing greater over-all service frequency, or serve different functions, such as local vs. regional trips.

Service Should be Well Coordinated

At major transfer locations, schedules should be coordinated to the greatest extent possible to minimize connection times for the predominant transfer flows. In corridors with multiple routes, schedules should be strategically staggered to avoid bunching and to maximize the over-all service frequency in the corridor. Coordination can also include fare policies and reciprocal fare agreements, allowing passengers to seamlessly transfer between multiple operators.

Applying these principals to Ulster County, it is possible to form a long-range vision for improved transit service in the county. The map below (Figure 2-1 and 2-2) helps illustrate what such a system might look like.

Figure 2-1 Long-Range Vision for Ulster County

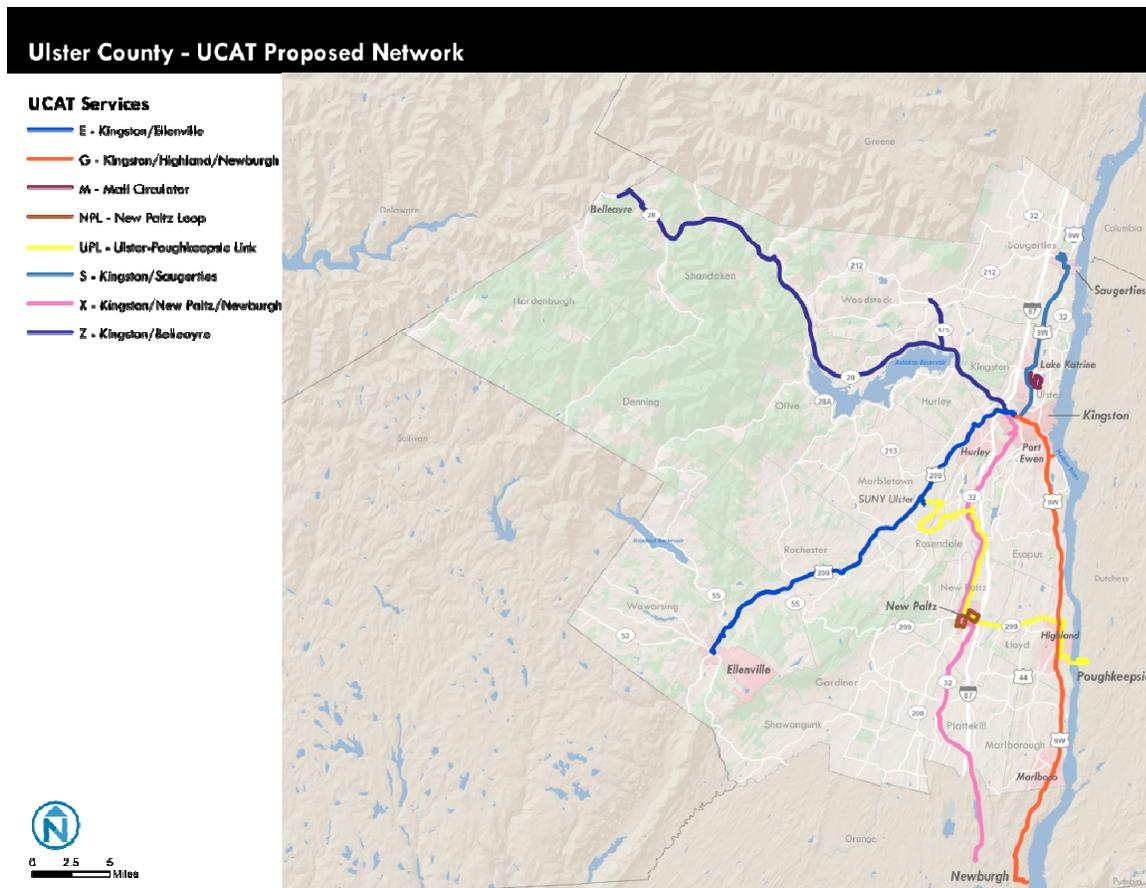
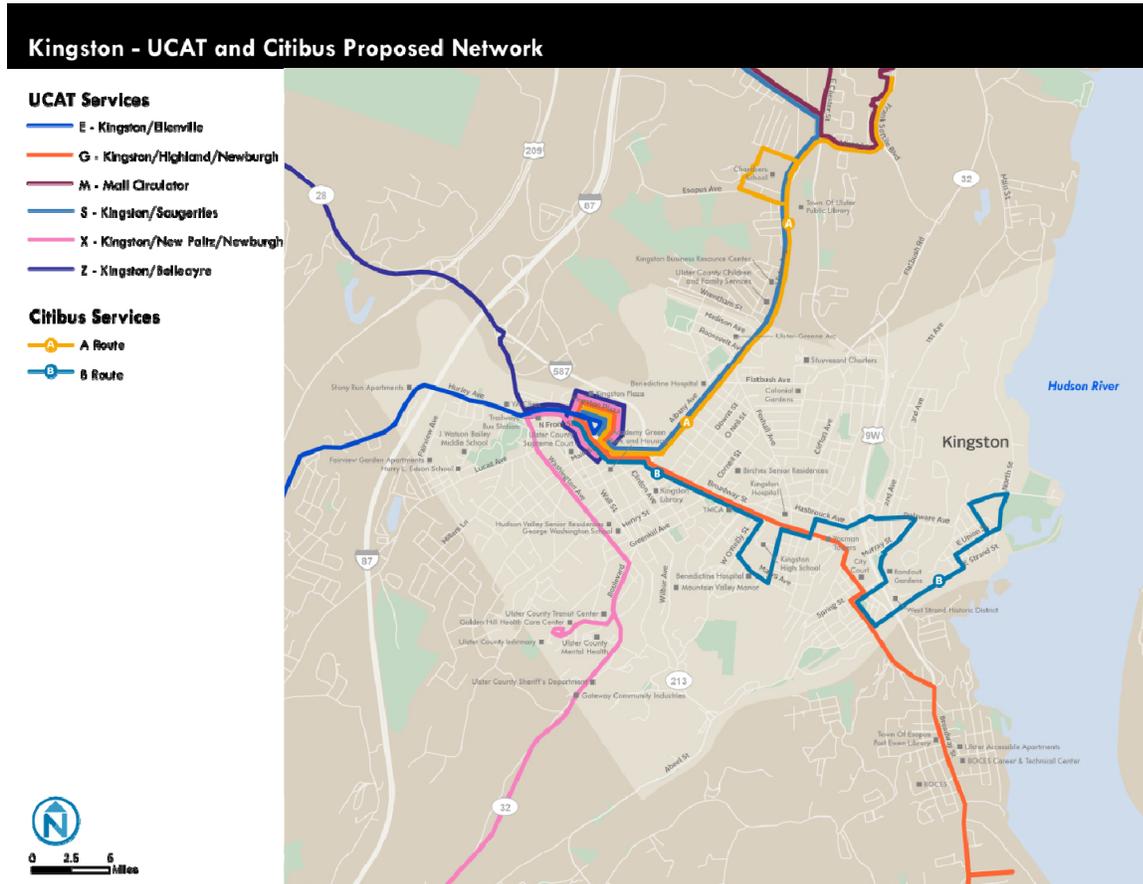


Figure 2-2 Long-Range Vision for Kingston



The main features of such a system (which are not all visible in the maps alone) are:

- Simplified routing – most corridors are served by a single route (i.e. E Route in the US 209 corridor). This makes it very easy for passengers to interpret system maps and navigate the system.
- Bi-directional service – to the extent possible, routes run in both directions in every route segment
- Streamlined routing – to increase their appeal to “choice riders” routes such as the M, NPL, and UPL routes are streamlined to provide faster travel times and more-frequent service.
- Cross Corridor connection – an extended UPL Route serves to connect three corridors allowing passengers to transfer from one corridor to another without the need to travel to Kingston. Kingston passengers have more departure and routing options to access the UPL.
- Simplified schedules – schedules are in increments of 30 minutes (i.e. every 30, 60, 90, or 120 minutes) to make them easier for passengers to remember.

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

- Strategic staggering – where multiple routes operate in a corridor, schedules are staggered to maximize utility for passengers (i.e. A Route and S Route provide a combined 30-minute frequency along Albany Avenue in Kingston).
- Less out-of-county local service – while the G Route and X Route both serve Newburgh, in Orange County, they each serve one prominent destination in Newburgh and do not transport passengers from one end of the city to the other.
- Branded service – to help project a higher frequency of service, the Citibus brand can be applied to routes serving high-density transit corridors in Kingston and New Paltz. A unique mall-themed livery can help attract TechCity employees who would otherwise not consider transit.
- Match service to demand – providing daily service to certain very rural communities may not be needed. Instead, resources can be concentrated to provide additional service in high-demand corridors.
- Innovative demand-responsive services – expanded use of Rural Route and anchored flex service where appropriate (i.e. to serve the Colonial Gardens apartments in Kingston).

Many of these concepts will be described in more detail in the following chapters.

Chapter 3. Short and Medium-Range Service Improvements

While it may not be feasible to completely implement the system illustrated above over-night, there are several changes that can be made to the UCAT and Citibus service in the short to medium term to help increase ridership and improve service effectiveness. Operating cost estimates are provided for route and schedule change proposals. Capital costs will be provided in subsequent documents to match the set of short and medium-range operating changes supported by the Technical Advisory Committee.

Short-Range Changes

Short-range changes are changes that can be implemented almost immediately and with little to no impact on operating cost.

Improve passenger information – Three primary changes are recommended to make passenger information more intuitive and informative for transit users in Ulster County.

1. *Standardize format of passenger schedules for UCAT and Citibus routes.* Currently, Citibus schedules (Figure 3-1) and UCAT schedules are designed very differently. This requires passengers who utilize both systems for their commutes to constantly reorient themselves to interpret the varying information.

Figure 3-1 Citibus Passenger Schedule

LOCATION	HANNAFORD OLD AMES CLINTON & MAIN MAIN & FAIR	WALL STREET AND OLD DUTCH CHURCH JOHN STREET N. FRONT ST FAIR ST PEARL ACADAMEY GREEN	BROADWAY AND ST. JAMES LIBERTY VAN BUREN	BROADWAY AND HENRY (BANK) DUNKIN' DONUTS HOFFMAN ST W. ORIELLY ANDREW BREWSTER W. CHESTER ORCHARD DELAWARE AND LIVINGSTON, NEWKIRK JARROLD	MURRAY AND DELAWARE JARROLD ROUNDOUT GARDENS GARRAGHAN DRIVE BROADWAY AT FUNERAL HOME WURTS AND PIERPONT W. UNION	ABEEL AND- BROADWAY MARINERS HARBOR ROSITA'S RESTAURANT STRAND AND TOMPKINS SYCAMORE E. UNION AND GILL ABRUJ CRANE LINSLEY AND DELAWARE	NORTH AND DELAWARE E. UNION E. UNION AND LINSLEY CRANE ABYRUM AND GILL SYCAMORE STRAND ACROSS FROM ROSITA'S	A C R O S S FROM MARINERS HARBOR ABEEL & POST WURTS & W. PEIRPONT MCENTEE & BROADWAY GARRAGHAN DRIVE	ROUNDOUT GARDENS & MURRAY JARROLD DELAWARE DELAWARE & 3RD.1ST. & W. PEIRPONT HARBROUCK HARBROUCK PLACE	BROADWAY AT KING, BURGER KINGSTON HOSPITAL E. ORIELLY ST. ACROSS FROM YMCA CORNELL ST. SMITH AVE & B R I G H A M APTS DOWNS BROADWAY	BROADWAY & ELMENDORF, ST. JAMES, ALBANY CLINTON	
	AM	7:00	7:05	7:07	7:10	7:20	7:25	7:30	6:30	6:35	6:40	6:45
Service Break	8:00	8:05	8:07	8:10	8:20	8:25	8:30	8:35	8:35	8:40	8:45	8:50
Mon-Fri	9:00	9:05	9:07	9:10	9:20	9:25	9:30/9:30	9:35/9:35	9:30/9:30	9:40/9:40	9:45/9:45	9:50/9:50
10:00-11:00	10:00	10:05	10:07	10:10	10:20	10:25	10:30	10:35	10:30	10:40	10:45	10:50
SAT. 12-1	11:00/11:00	11:05/11:05	11:07/11:07	11:10/11:10	11:20/11:20	11:25/11:25	11:30/11:30	11:35/11:35	11:30/11:30	11:40/11:40	11:45/11:45	11:50/11:50
PM	12:00	12:05	12:07	12:10	12:20	12:25	12:30	12:35	12:30	12:40	12:45	12:50
Service Break	1:00/1:00	1:05/1:05	1:07/1:07	1:10/1:10	1:20/1:20	1:25/1:25	1:30/1:30	1:35/1:35	1:30/1:30	1:40/1:40	1:45/1:45	1:50/1:50
Mon-Fri	2:00	2:05	2:07	2:10	2:20	2:25	2:30	2:35	2:30	2:40	2:45	2:50
2:00-3:00	3:00/3:00	3:05/3:05	3:07/3:07	3:10/3:10	3:20/3:20	3:25/3:25	3:30/3:30	3:35/3:35	3:30/3:30	3:40/3:40	3:45/3:45	3:50/3:50
Service Break	4:00/4:00	4:05/4:05	4:07/4:07	4:10/4:10	4:20/4:20	4:25/4:25	4:30/4:30	4:35/4:35	4:30/4:30	4:40/4:40	4:45/4:45	4:50/4:50
Mon-Fri	5:00/5:00	5:05	5:07	5:10	5:20	5:25	5:30	5:35	5:30	5:40	5:45	5:50
Service Break	6:00	6:05	6:07	6:10	6:20	6:25	6:30	6:35	6:30	6:40	6:45	6:50
Mon-Fri	7:00	7:05	7:07	7:10								

Figure 3-2 UCAT Passenger Schedule

R KINGSTON - NEW PALTZ													
Monday - Friday Service													
SOUTHBOUND: Kingston to New Paltz							NORTHBOUND: New Paltz to Kingston						
Depart: UCAT: Golden Hill Drive at Rt 32	Kingston Plaza at Hannaford	UCAT: Golden Hill Drive at Rt 32	Bloomington: Rt 32 at Main St	Rosendale: Rt 32 at Park & Ride	New Paltz: Route 32 at Park & Ride	Arrive: New Paltz Bus Station: Main & Prospect Streets	Depart: New Paltz Bus Station: Main & Prospect Streets	New Paltz: Route 32 at Park & Ride	Rosendale: Route 32 at Park & Ride	Bloomington: Route 32 at Main St	UCAT: Golden Hill Drive at Rt 32	Kingston Plaza at Hannaford	Arrive: UCAT: Golden Hill Drive at Rt 32
1	2	1	3	4	5	6	6	5	4	3	1	2	1
5:00	-	5:00	5:05	5:15	5:20	5:25	-	-	-	-	-	-	-
6:05	6:15	6:20	6:25	6:35	6:45	-	7:00	7:03	7:10	7:15	7:20	7:30	-
6:20	6:30	6:35	6:40	6:45	6:53	7:00	-	7:48	7:55	8:00	8:05	8:15	-
7:10	-	7:15	7:20	7:25	7:30	-	-	-	-	-	-	-	-
-	7:30	7:35	7:40	7:45	7:52	8:00	8:00	8:03	8:10	-	-	-	-
-	-	-	-	8:50	8:58	9:00	9:45	9:47	9:55	10:00	10:05	10:15	10:30
-	-	-	-	12:20	12:28	12:30	11:30	11:32	11:40	-	-	-	-
12:30	-	12:30	12:35	12:45	12:53	1:00	3:00	3:02	3:10	3:15	3:20	-	3:20
2:05	2:15	2:20	2:25	2:30	2:30	2:45	3:30	3:32	3:40	-	-	-	-
-	-	-	-	4:30	4:35	4:40	4:45	4:47	4:55	5:00	5:05	-	5:05
5:15	5:25	5:30	5:32	5:40	5:50	-	6:50	6:57	7:02	7:07	7:17	7:20	-
-	-	-	-	-	-	-	8:31	8:34	8:40	8:44	8:47	8:50	9:00
-	-	-	-	-	-	-	9:35	10:00	10:08	10:12	10:15	-	10:15

PM Trips in Bold
All times approximate
Effective April 1, 2010

- Provide interline information on published passenger schedules. In many cases, UCAT provides a one-seat connection between important destinations, but this fact is not apparent to passengers based on published schedules. When a vehicle serving two destinations changes head-signs in the course of an interline, the two destinations end up shown on separate passenger schedules. An effective approach to sharing interline information with passengers is show in Figure 3-3 below. In this example from Rochester, NY, two columns are added to the beginning and end of the timetable to show which route the bus is coming from and going to before and after each trip.

Figure 3-3 Interlines on Passenger Schedule

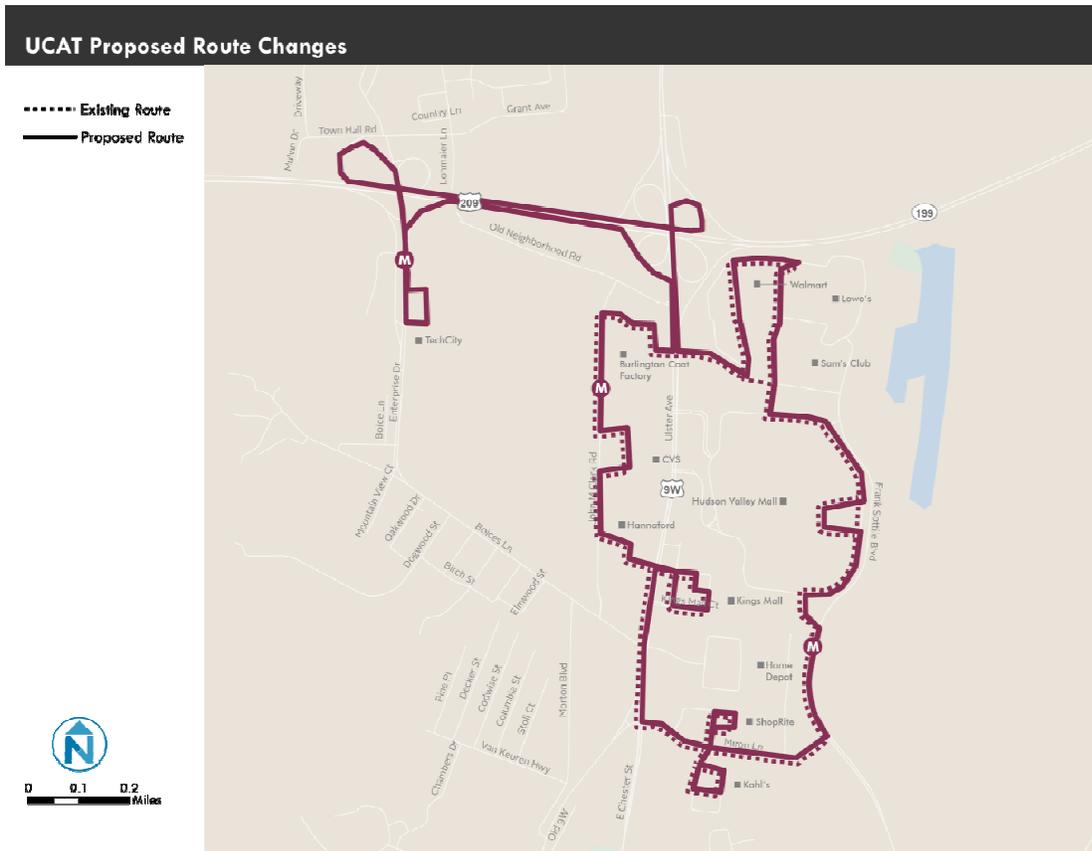
Thurston to Downtown								
From Route	Bus Leaves Wegmans Distribution Center	Bus Leaves Rochester Airport	Bus Leaves Thurston and Brooks	Bus Leaves Arnett and Thurston	Bus Leaves Main & Genesee	Bus Leaves Main & Broad/Ford	Bus Arrives Main and Clinton (Chase Tower)	To Route
	7	6	5	4	3	2	1	
2			5:21	5:25	5:30		5:37	2
2	5:33	5:38	5:42	5:46	5:51		5:58	2
2		5:58	6:02	6:06	6:12		6:20	2
2		6:20	6:24	6:28	6:34		6:42	2
2X			6:26	6:30	6:36	6:43		8
2X			6:19	6:23	6:31	6:38		3C
4/2X			6:33	6:38	6:45	6:50		10
4X/2			6:42	6:47	6:54			7
2		6:40	6:44	6:49	6:56		7:04	2
2	6:39	6:51	6:56	7:01	7:08		7:17	2

3. *Install and maintain bus stop signs to mark transit routes.* Bus stop signs help create a more predictable transit experience for existing passengers while advertising the existence of transit service to prospective passengers. After signs have been installed it is also important to ensure that all route and schedule information on the signs is kept current so as not to misinform passengers.

Begin and end Z Route service in Pine Hill – To reduce deadhead and better align service supply with demand, UCAT should consider staging a bus at an appropriate facility in Pine Hill. Service on the Z Route, must begin before 5:00 AM in Kingston in order to be in Pine Hill in time for the 6:15 trip to Kingston. This outbound trip is too early to attract any riders, and is thus a very unproductive trip. A similar situation occurs on the last trip back to Kingston in the evening. A satellite bus storage facility in the Pine Hill area (along with a driver who lives near-by) could help avoid long, unproductive dead-head runs. Buses assigned to the route could be rotated out periodically, so that regular preventative maintenance can be performed at the main UCAT maintenance facility.

Extend M Route to TechCity – Extending the M Route to serve Tech City could generate additional lunch-time trips by Tech City workers, particularly if the employment base at the site increases. There is existing time in the current schedule to facilitate this extension with no impact on operating cost. A further step to help attract choice-riders who may not be accustomed to transit service is to create a distinct brand for the M Route. A unique shopping and dining themed livery can help increase the service's appeal to TechCity workers by alleviating fears that they may get on the wrong bus and fail to make it back to work on time. This unique branding can be extended to passenger amenities and other associate infrastructure such as bus lanes that may be added over time.

Figure 3-4 Proposed M Route Changes



However, it should also be noted that as long as the M Route maintains a highly circuitous route, providing front-door service to nearly every retail center in the mall area, the route will have limited appeal to time-conscious TechCity workers. The route could be streamlined to provide front-door service only to Hudson Valley Mall, with other destinations connected through improved pedestrian connections, making it more appealing to lunch-time shoppers coming from TechCity. This may however alienate older riders who value the front-door connections, even if the route is slower. As the likelihood of improved pedestrian connections is uncertain, a streamlined M Route will only be considered a long-range vision for the time-being.

Streamline S Route and K Route – Most S Route and K Route trips are currently interlined to provide a one-seat connection between Kingston and Saugerties. However, these interlines take place on the east side of Hudson Valley Mall (near the food court entrance), which adds at least 20 minutes to total travel time between Kingston and Saugerties. Instead, routing the combined route through TechCity would decrease scheduled travel time as well as the potential for unscheduled delays caused by heavy traffic in the vicinity of the mall. The revised route may produce enough time-savings that the route may only require one vehicle to maintain an hourly frequency (compared to the current two), thus reducing operating cost by half. Alternatively, service frequency could be doubled to every 30 minutes without an increase in current operating cost.

If the S/K Route is restructured to serve TechCity instead of the Hudson Valley Mall, it would be advisable to simply consolidate the routes under the S Route name (Figures 3-5 and 3-6), as TechCity is not quite the prominently know regional anchor that the mall is. Connections to the mall from the S Route would be facilitated by the extended M Route.

Figure 3-5 Proposed S Route Changes

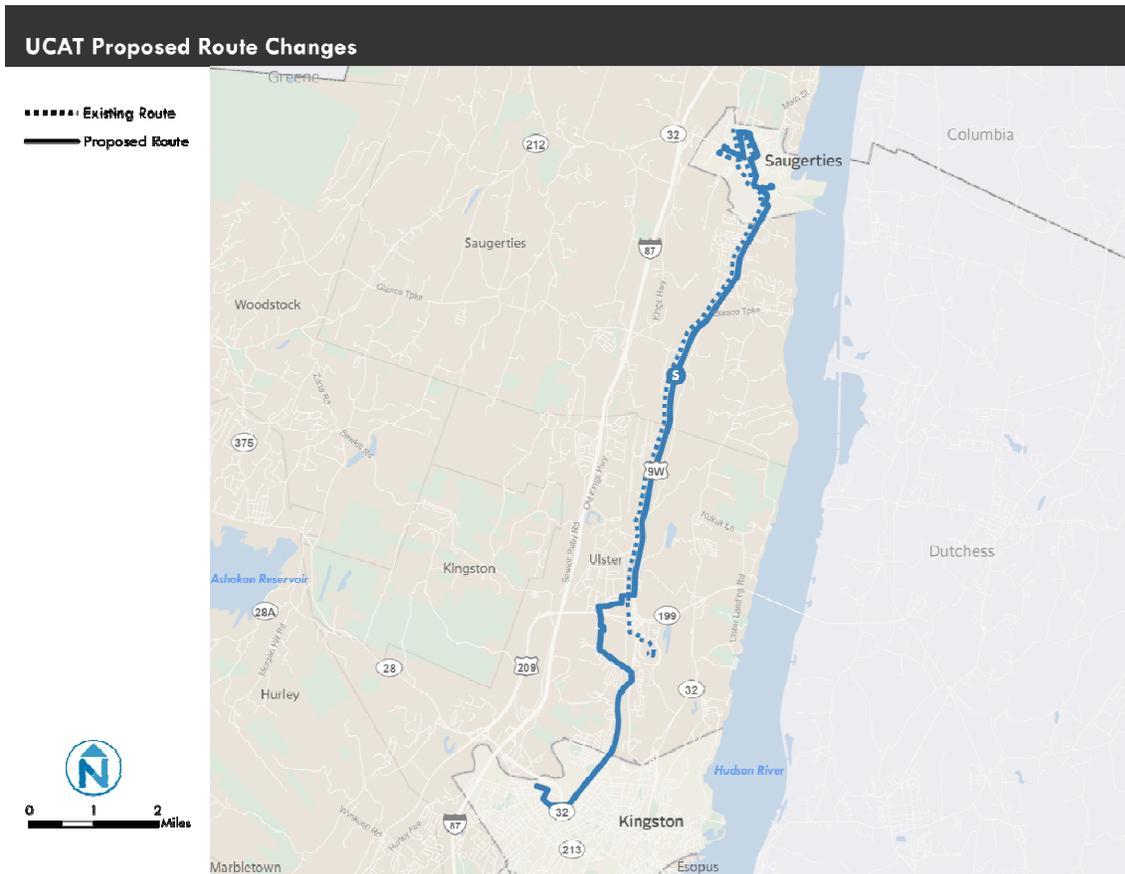
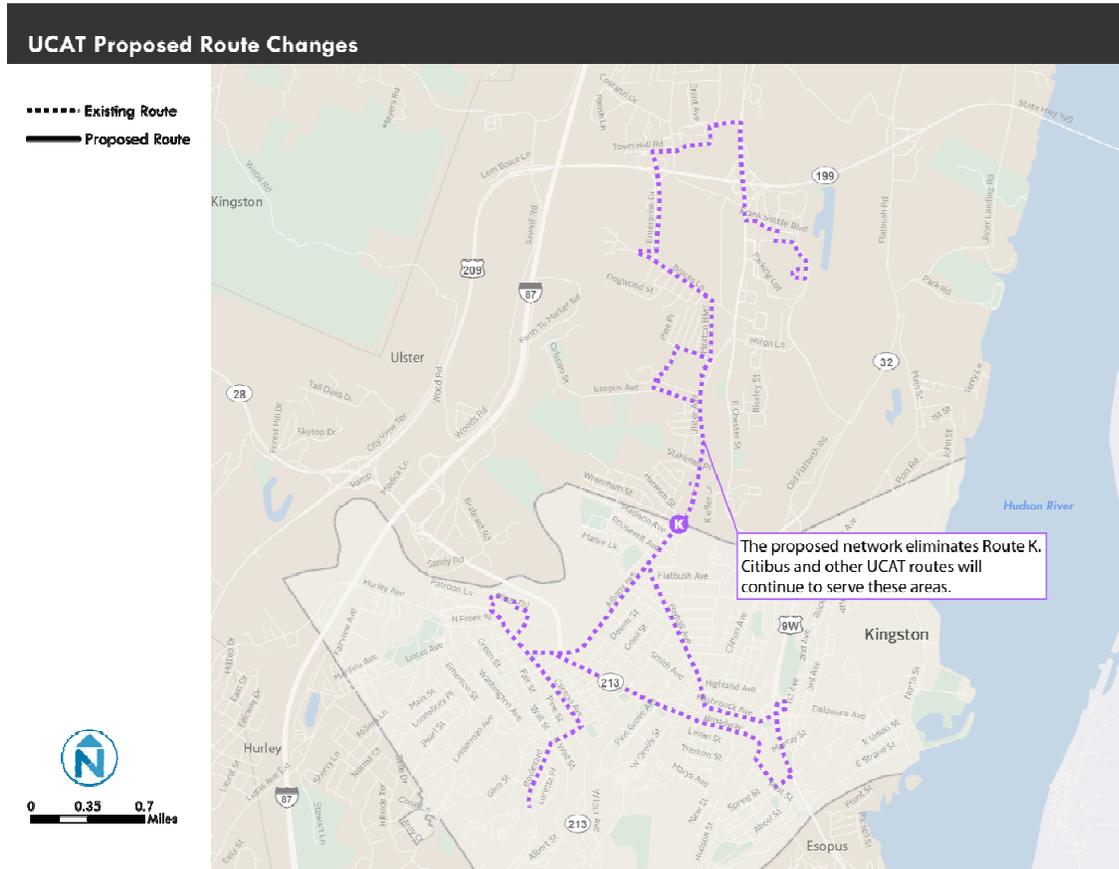
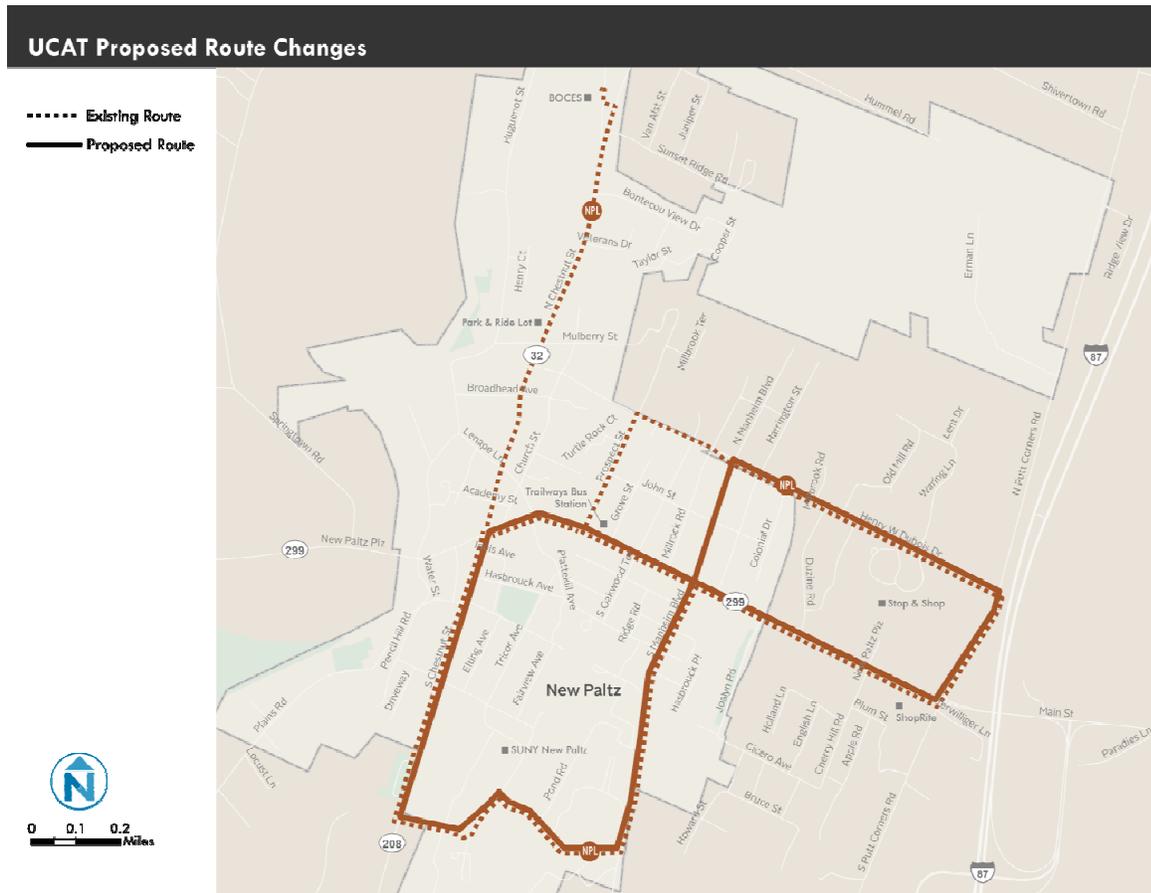


Figure 3-6 Proposed K Route Changes



Focus NPL service – A review of current New Paltz Loop ridership reveals a low level of transit use along Dubois Drive. However, the potential for ridership is quite high as a result of two large apartment complexes fronting the street. Removing North Chestnut Street from the route would increase service frequency and reduce travel time between SUNY Ulster, Main Street retail destinations and Dubois Street residential areas. This change, which would have no impact on operating cost, would make the route far more attractive to students residing in off-campus apartments along Dubois Street, and may compel existing riders to ride more often as service would be available more frequently. Without NPL service, North Chestnut Street would still be served by UPL Route, the R Route and the W Route.

Figure 3-7 Proposed NPL Route Changes



Increased marketing is also recommended for the NPL Route, perhaps through occasional campus events at SUNY New Paltz. The service is “free” to students with a valid SUNY New Paltz student ID, but over the course of this study, consulting team members found that few students seemed to be aware of the service at all.

Medium-Range Changes

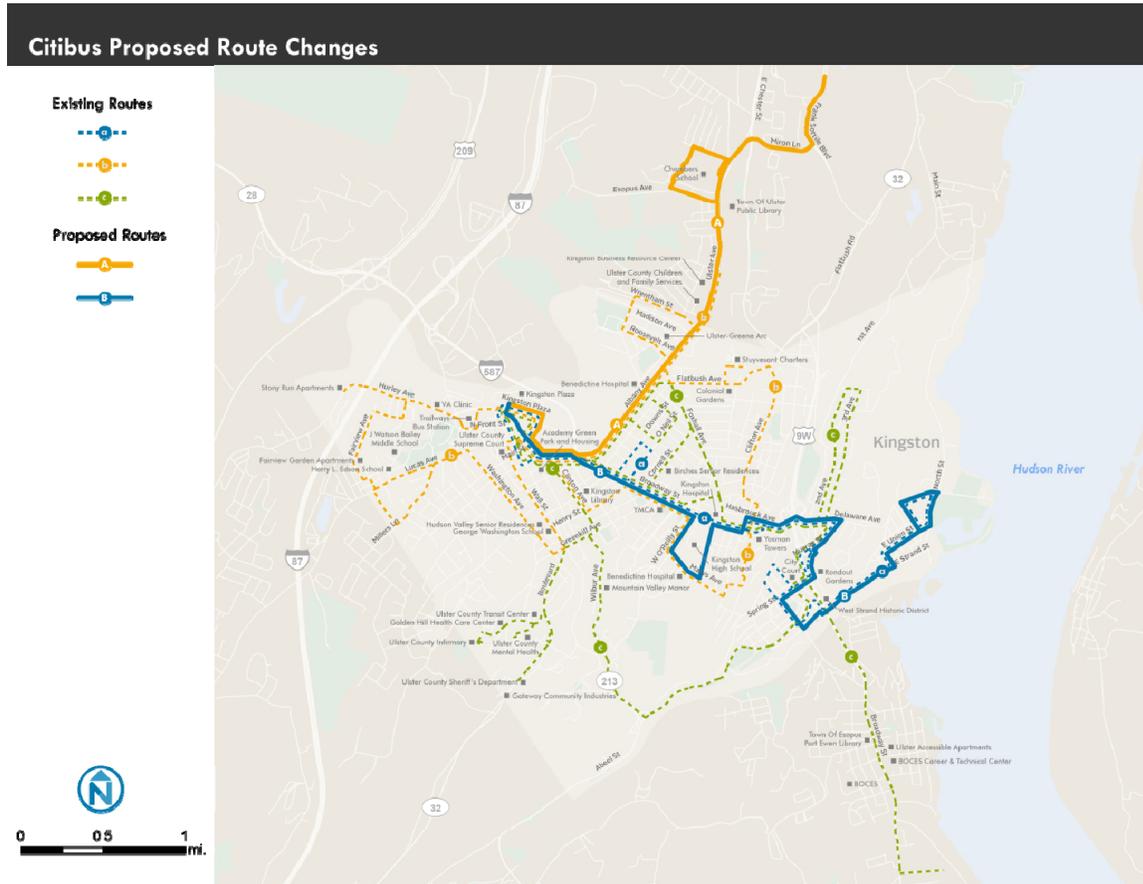
Medium-range changes are changes that must be considered more carefully because of their impact on other services and on projected operating costs.

Restructure Kingston Citibus service – The City of Kingston is currently served by three routes (Route A, B, and C), providing weekday and Saturday service to major destinations throughout the city. While the three routes provide extensive coverage throughout Kingston, as well as Port Ewan, the routes are extremely circuitous and with the exception of the A Route, provide primarily one-way service. This translates to very long travel times for passengers who are often forced to travel in the opposite direction of their desired final destination along a one-way loop.

Many portions of the routes serve very few riders, while other stops serving many riders could likely support a higher frequency than the current hourly headways. As with most urban areas, Kingston residents' major travel destinations do not stop at the city limits, and have expanded into the Town of Ulster. Passenger surveys and stakeholder input reveal that the biggest link needed is between Kingston and Hudson Valley Mall.

To improve Citibus service, a comprehensive restructuring of the Kingston transit network is proposed (Figure 3-8). The new network would include two bi-directional routes serving the strongest transit corridors in the city – Albany / Ulster Avenue and Broadway.

Figure 3-8 Proposed Kingston Citibus Changes



The A Route would operate primarily along Albany / Ulster Avenue, from Kingston Plaza to Hudson Valley Mall, entering the mall from Miron Lane and Frank Sottile Boulevard and stopping at the food court. The only major deviation from the Albany / Ulster corridor would be a loop to serve the Chambers Senior Housing complex west of Ulster Avenue.

The B Route would serve the Broadway Corridor from Kingston Plaza to downtown. Other major destinations would include Benedictine Hospital, Rondout Gardens Apartments and the Rondout Landing area.

To maintain consistent headways along both major transit corridors, it is recommended that the A Route and B Route should be interlined. Interlined routes are operated as a circuit with the same bus (or buses) alternating between the two routes. Generally, if several routes are of different lengths, they will also have different service frequencies or fleet requirements. By interlining two routes of different lengths, service frequency and fleet requirements can be made uniform throughout the multi-route circuit.

The proposed weekday service frequency for the A Route and B Route would be hourly. However, each of the two transit corridors would also be served by a UCAT route operating on an hourly frequency (see S Route and G Route discussion below). If the UCAT and Citibus services are strategically staggered, the result for passengers could be service every 30-minutes, in both directions, along both corridors.

The proposed A and B routes would serve the vast majority of current Citibus stops that generate five or more boardings and alightings per day. The few exceptions are stops serving Port Ewan, the Golden Hill complex, and the Colonial Gardens apartments. Port Ewan and the Golden Hill area would instead be served by UCAT routes (see G Route and R Route discussions below), leaving Colonial Gardens as the only significant ridership generator not served by fixed-route service.

Colonial Gardens is generally difficult to serve because of its location away from the other major transit corridors and its proximity to an active freight railroad corridor.

Figure 3-9 Colonial Gardens Location



Freight trains passing through Kingston often force Citibus buses to make long detours to serve Colonial Gardens. However, Colonial Gardens provides significant ridership to the system and should be served. To reduce fixed-route detours and delays, Colonial Gardens can be removed from the fixed-route network, and instead be served with “anchored flex” trips. Under this scenario, during certain times of the day, Colonial Gardens and Kingston Plaza would be designated time-points on a route served by a paratransit vehicle. The path between the two time-points would not be defined, allowing for paratransit or other demand-responsive pick-ups along the way. When not serving Colonial Gardens, the demand-responsive vehicle would revert to traditional paratransit service in Kingston.

Citibus' paratransit fleet consists of two vehicles. One operates from 6 AM-1 PM and the other from 9 AM-4 PM. Given that the fixed-route restructuring will condense service in major corridors, Citibus' paratransit service area will shrink somewhat. Daily flex runs serving Colonial Gardens could thus be scheduled into the paratransit vehicles' manifests. If anchored flex service negatively impacts Citibus' ability to meet its paratransit obligations, it may be necessary to add a shift to at least one paratransit vehicle. However, this is not being recommended at this time.

Technical Memo #4: Recommended Service Improvements

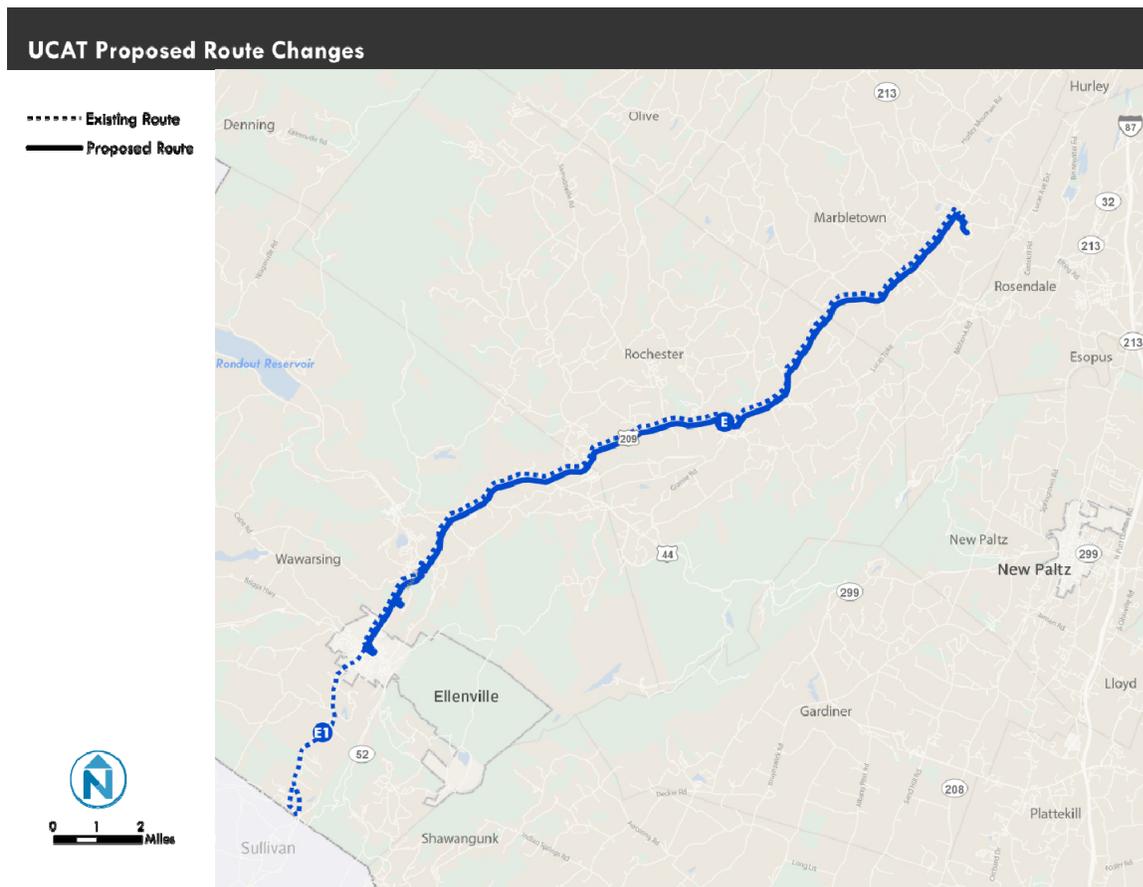
ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

On Saturdays, it is recommended that service in the Albany / Ulster and Broadway corridors be provided by UCAT routes S and G only (described later in this report). Sunday service is not recommended at this time due to budget impact, but should be considered if budget conditions permit.

Service statistics such as route length, span of service, fleet requirement, revenue hours, and estimated operating cost are presented along with other routes in a comprehensive table at the end of this chapter.

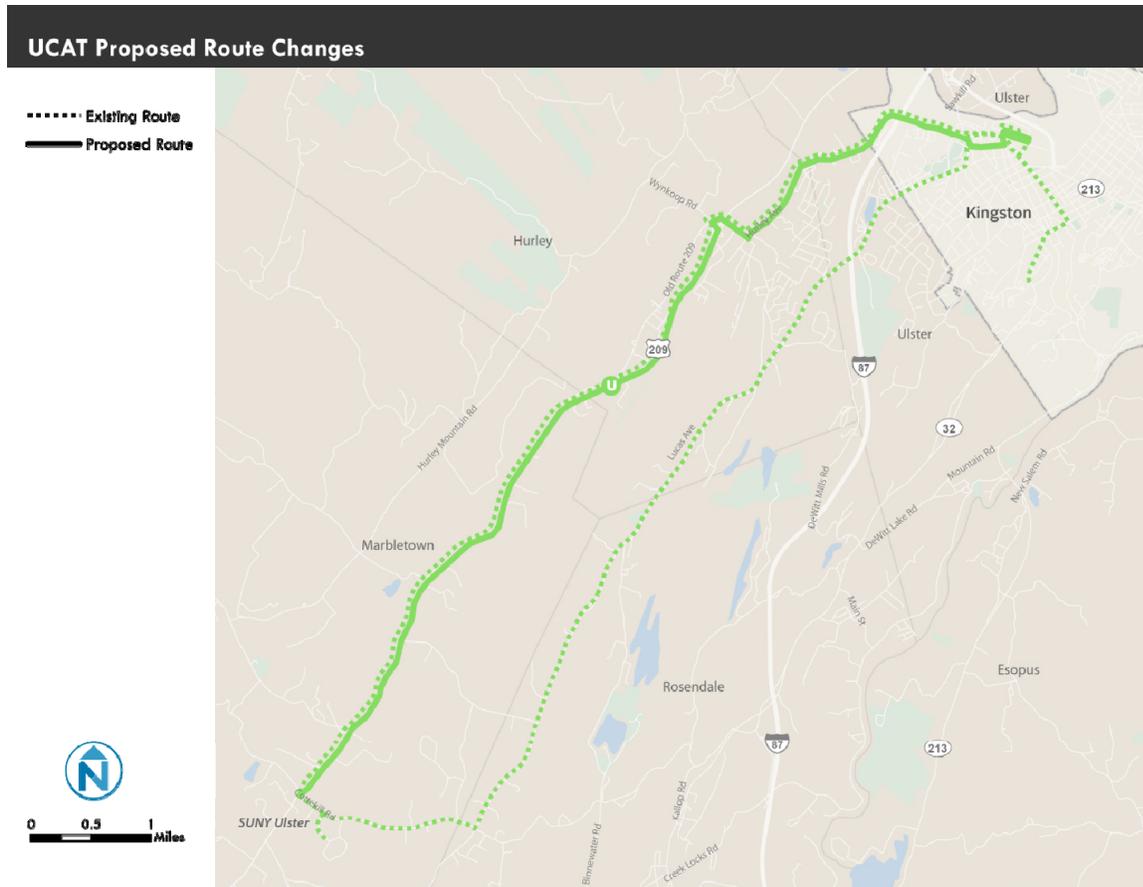
Right-Size Service along US 209 corridor – The US 209 corridor in Ulster County is currently served by three routes: U, E, and E1. The U Route and E Route are two of the four highest total ridership routes in the county, while on many days the E1 Route has the lowest ridership of all routes. Thus, in order to bring supply in line with demand, it is recommended to both eliminate the E1 Route (Figure 3-10) and expand service on the E and U Routes.

Figure 3-10 Proposed E Route Changes



While ridership on the U and E routes is already strong, it could improve further if a more regular schedule were introduced to the corridor. Consolidating U Route service along the US 209 corridor would simplify the route with minimal impact on ridership. The US 209 corridor would also allow for slightly shorter travel times for passengers as operating speeds are generally higher than along Lucas Avenue.

Figure 3-11 Proposed U Route Changes



By interlining the E Route with the U Route, an hourly service frequency can be provided along the entire corridor from Kingston to Ellenville using two buses. Eventually, when there is a stronger regional anchor in Ellenville such as the planned Wal-Mart, the E and U routes could be consolidated into a single route under the E Route name. This would reduce the number of pocket schedules that passengers would need to carry to navigate the corridor, but would also necessitate new headsigns for buses that say Ellenville via SUNY Ulster and Kingston via SUNY Ulster, as the college is such an important destination.

Hourly U Route service would help facilitate the restructuring of Kingston Citibus Service by operating without restrictions through Kingston. For example, the Stoney Run Apartments, which is served by the current Citibus B Route would not be served under the restructured Citibus route network. However, the U Route could easily serve this destination on the way to and from Kingston Plaza.

Saturday service along the US 209 corridor can be provided once every two hours with a single bus. This service must include both the U Route and the E Route to be effective, because there is little weekend activity at their junction - SUNY Ulster. By providing weekend E Route service, Ellenville residents would have access to Kingston and the Hudson Valley Mall area. In the

future, residents of the corridor would also be able to access the planned Wal-Mart in Ellenville. Sunday service is not recommended at this time due to budget impact, but should be considered in the future if budget conditions permit.

E1 service could be replaced in several different ways. These will be discussed in the next section along with discussions about other low performing routes in rural areas.

Service statistics for the E/U Route such as route length, span of service, fleet requirement, revenue hours, and estimated operating cost are presented along with other routes in a comprehensive table at the end of this chapter.

Find alternatives to Fixed-Route service in low-density environments – Besides the E1 Route, the lowest ridership UCAT Routes are the W, F, G, and H Routes. These routes share two characteristics: very few trips and predominantly low density corridors. Together, these factors make it difficult to attract and retain ridership. If service is too infrequent, it is not considered a viable option by most prospective passengers. There may be some people whose commuting schedules coincide with the available trip times of a low-frequency service, but in a low-density environment, these passengers are too few to justify the service.

Figure 3-12 Proposed F Route Changes

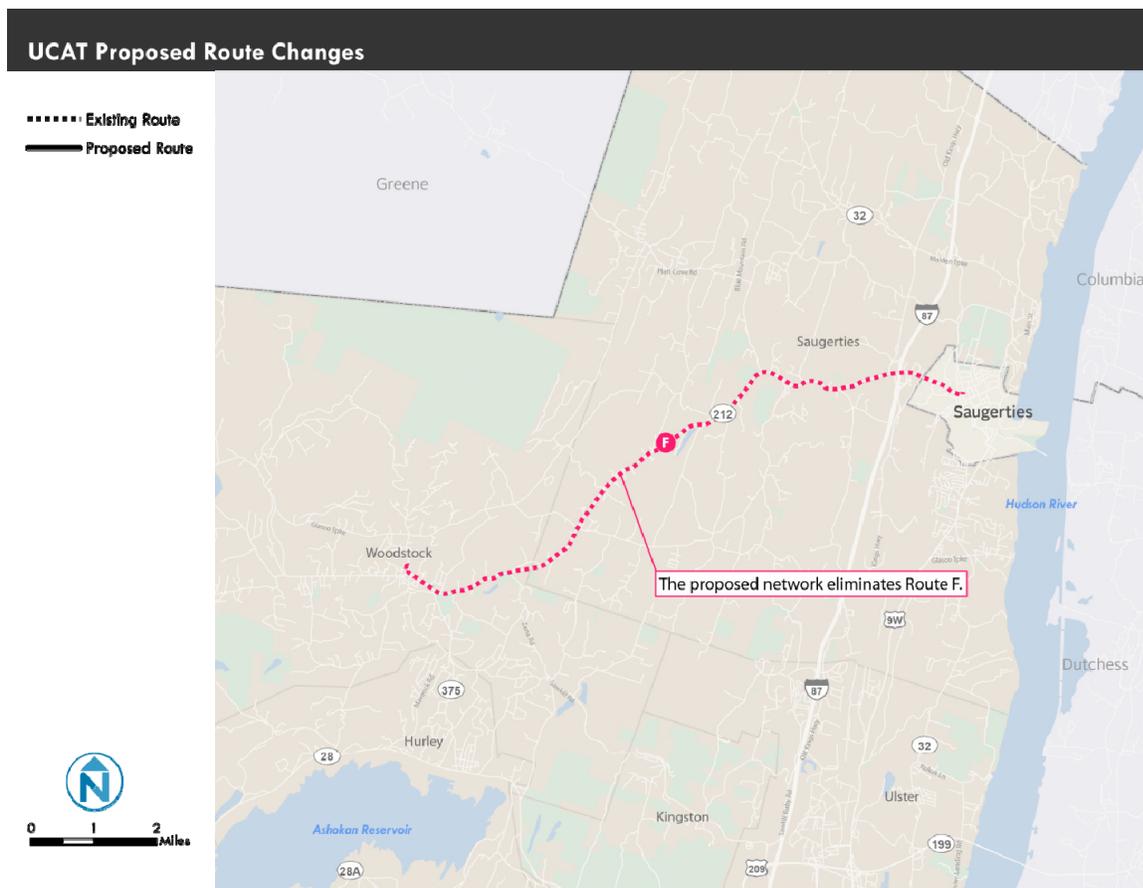


Figure 3-13 Proposed G Route Changes

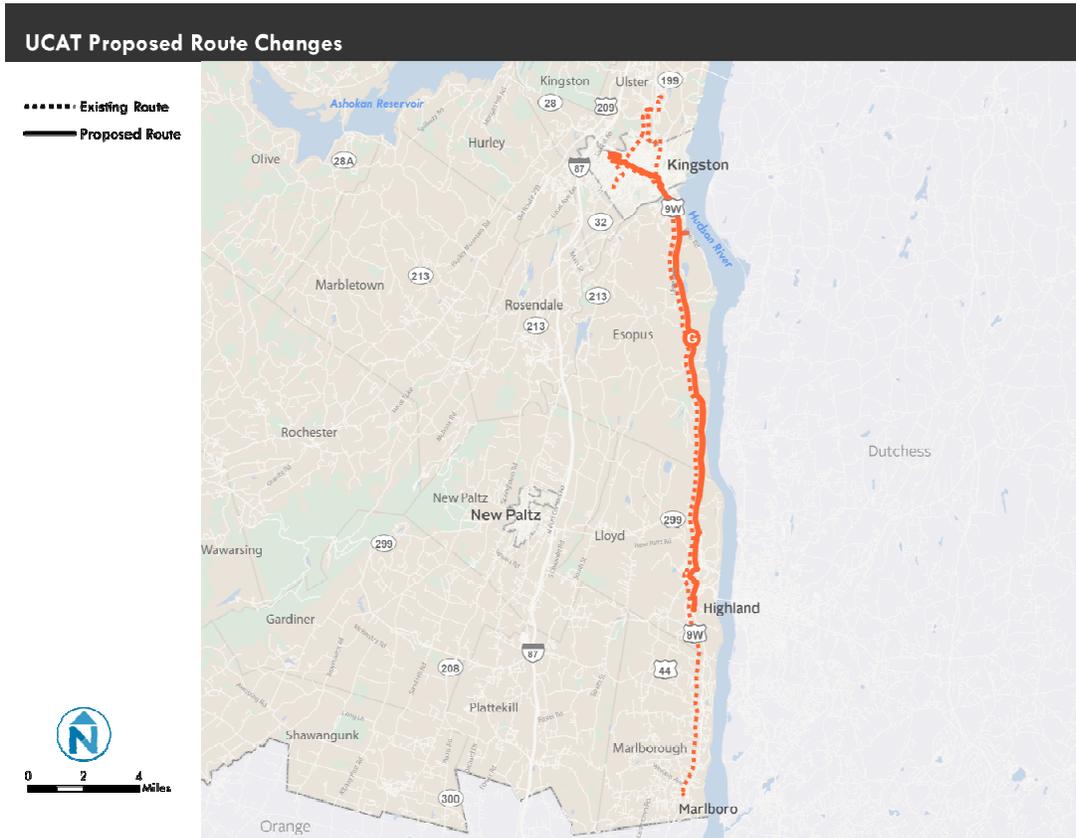
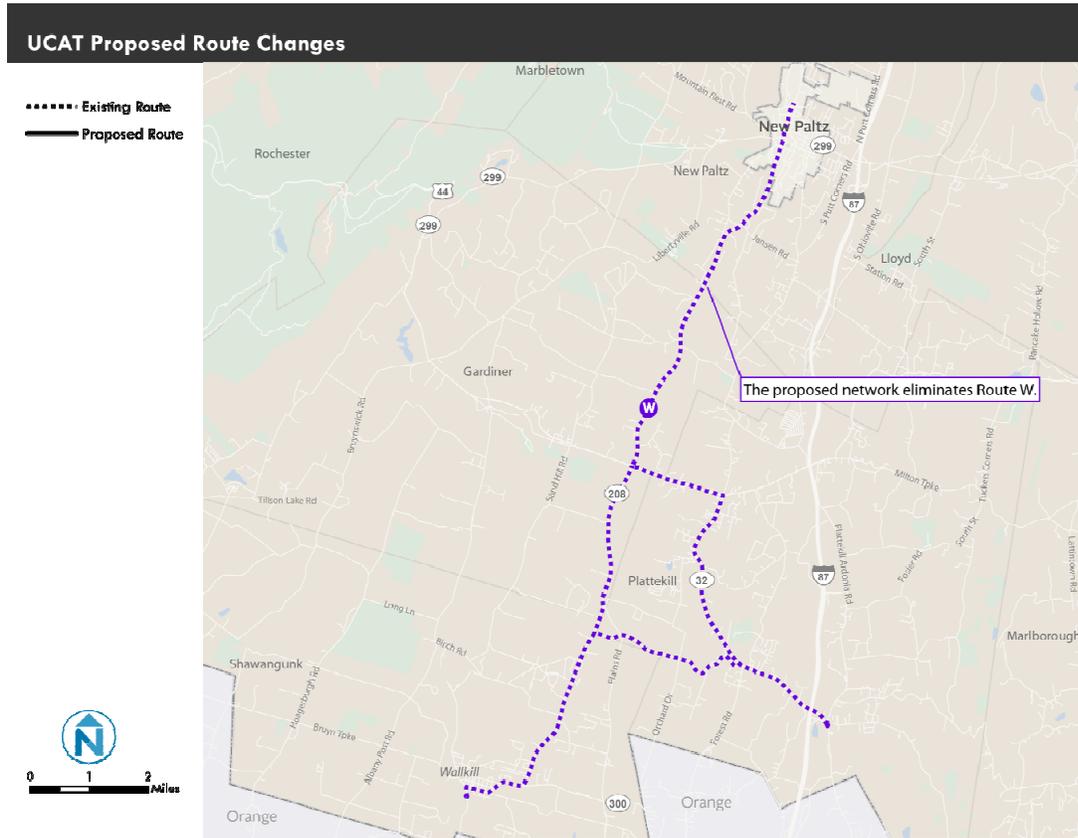


Figure 3-14 Proposed W Route Changes



To serve these low-density environments, it is recommended that the E1 Route, F Route, W Route, and the southern end of the G Route (south of the Wingate) be replaced by demand-responsive service, which can take one of several forms (H Route service and G Route service north of Wingate are discussed later in this chapter):

- Expand Rural Route Service by one bus, for a total of two Rural Route buses operating each weekday. This can allow for more frequent service to some areas that are served just once per month or by appointment only, including communities near Ellenville and Saugerties (Figure 3-15).
- Expand eligibility for paratransit service to include members of the general public who are not within $\frac{3}{4}$ miles of fixed-route service. The same vehicles that are used for paratransit can be used for this expanded service, but ADA paratransit trips would always receive top priority. An additional vehicle would likely need to be added to the current paratransit fleet to maintain current levels of service and accommodate new discretionary trips.
- Provide anchored flex service using paratransit vehicles. For example, at certain times of the day, a paratransit vehicle could provide scheduled service from Marlboro to Highland, to connect passengers to fixed-route service. This same vehicle would then revert to paratransit duty until the next scheduled flex-route trip. This scenario would also likely require the addition of one paratransit vehicle to ensure that existing levels of service are maintained.

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

Figure 3-15 UCAT Rural Route Schedule

Day	Monday		Tuesday		Wednesday						Thursday				Friday			
	All (except 5th)		All		1st		2nd, 4th		3rd		5th		1st, 3rd, 5th		2nd, 4th		All	
Trip	I	O	I	O	I	O	I	O	I	O	I	O	I	O	I	O	I	O
Clintondale													10:00	2:00				
Connelly																	9:30	1:15
East Kingston			9:20	1:15														
Ellenville Spec.					9:45	3:00												
Gardiner													8:45	2:00	10:00	2:00		
Highland							10:15	2:00	10:15	2:00								
Marlboro							9:45	2:00	9:45	2:00								
New Paltz							10:30	2:00										
Olivebridge			9:30	2:00														
Pine Bush													9:15	2:00	9:30	2:00		
Port Ewen/Ulster Park																	9:15	1:15
Rosendale/Tillson					9:15	1:15	9:15	1:15	9:15	1:15	9:15	1:15						
Saugerties					#													
Sawkill	9:45	1:15																
Walkill													9:30	2:00	9:15	2:00		

Originating from...

By appointment only

All three of the demand-responsive scenarios described above would have the same impact on operating cost, as each would require one additional demand-responsive vehicle than is currently in use.

Service statistics for this additional demand-response vehicle, such as revenue hours and estimated operating cost, are presented along with other routes in a comprehensive table at the end of this chapter.

By monitoring the performance of demand-responsive service over time, it is possible to identify areas that may be “ripe” for fixed-route service. Conversely, there may be areas served by fixed-route service that would be better served by demand-responsive service. The service standards guide for determining the most appropriate type of transit solution will be presented in the upcoming final report.

Prepare for changes to Trailways service – Trailways currently has operating Authority along US 9W and NY 32 connecting Kingston, New Paltz, and Newburgh, as well as Poughkeepsie. UCAT routes in these corridors are designed in such a way as to avoid duplication of service with Trailways. This includes schedules that avoid similar trip times and route alignments that either include a transfer or have slightly different origins and destinations to their Trailways counterparts (for example, the R Route along NY 32 terminates at Golden Hill on several trips rather than Kingston Plaza, to differentiate from Trailways service operating between New Paltz and Kingston along Route 32).

Recently, Trailways has indicated their interest in shifting service from US 9W and possibly from NY 32 to the New York State Thruway. Should this happen, it will create new opportunities for UCAT to increase and/or geographically extend service and attract new riders on both the G Route and R Route.

The G Route in particular is well positioned to realize ridership gains due to planned and proposed service changes to both Trailways and Kingston Citibus. The proposed restructuring of Citibus service includes dropping service to Port Ewan, which is currently served hourly for much of the service day by the C Route. Port Ewan could instead be served by the G Route (Figure 3-15 above), which would be able to provide increased service frequency if Trailways were no longer operating in the 9W corridor.

G Route service could be provided hourly with two buses through an interline with the R Route (discussed below). However, to achieve hourly frequency, the G Route would need to terminate at the Wingate facility just south of Highland rather than in Marlboro. A terminus at Wingate would serve the vast majority of current ridership in the corridor (including Port Ewan) and facilitate transfers to the UPL Route in Highland. South of Wingate, Rural Route or anchored flex service is more appropriate than fixed-route service given the low population density of the corridor. Eventually, it may make sense to extend the G Route to the Newburgh-Beacon Ferry landing in Newburgh, but this is not currently recommended because of the resources that would be required to provide the additional service, the current low ridership south of Highland, and the uncertainty of the timeline for Trailways’ move to the Thruway.

To maximize the utility of the G Route, schedules should be coordinated with the proposed B Route, as both will be operating along the Broadway corridor in Kingston. By strategically staggering the schedules, service can be provided every 30 minutes along the Broadway Corridor in Kingston. In addition, routing the G Route through Highland (perhaps along NY 55), as well as Bridgeview Plaza and Wingate could allow for the elimination of the H Route which is mostly redundant with the UPL.

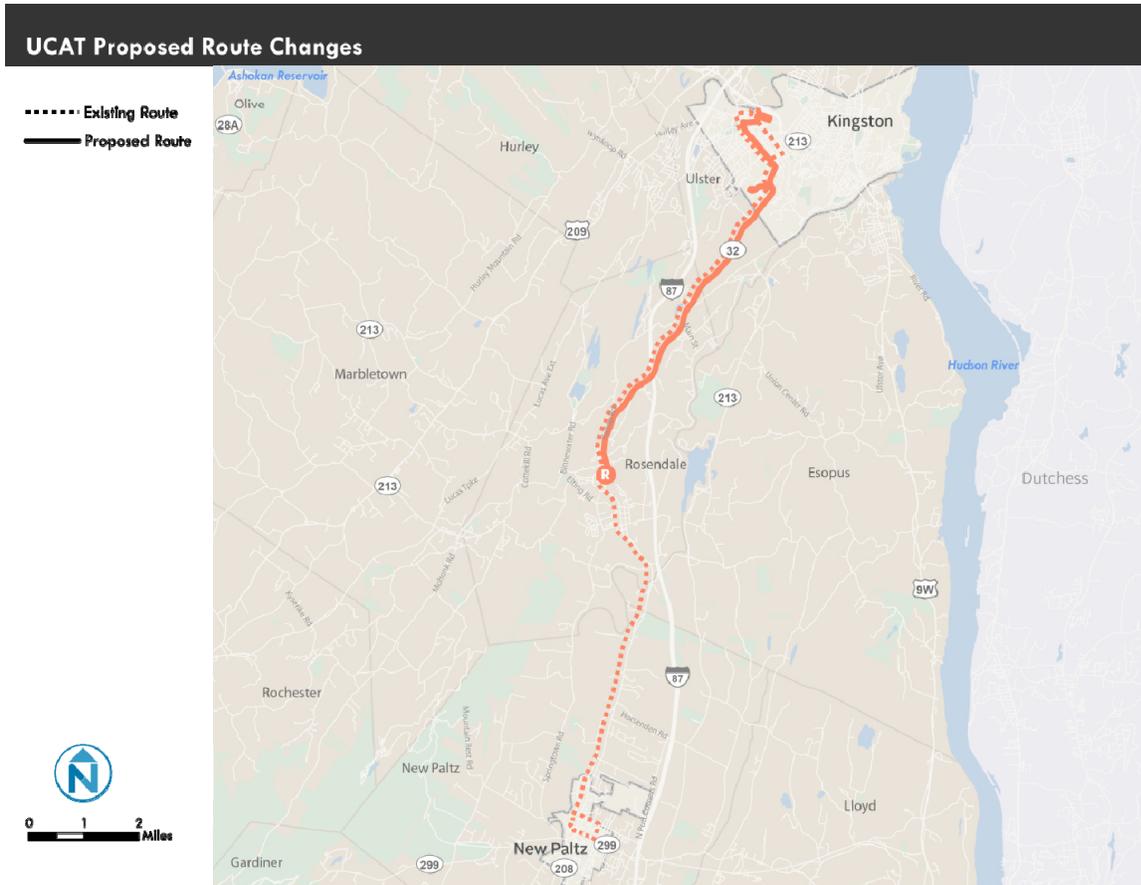
Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

As with the G Route and U Route, the R Route could also play an important role in facilitating the restructuring of Citibus service in Kingston. With an hourly frequency, the R Route could provide regular connections between the Golden Hill Complex and Kingston Plaza via Washington Avenue and Front Street (currently served by the Citibus C Route).

To reduce redundancy with the UPL Route and to ensure that Trailways service is not duplicated (in the event that Trailways continues to serve the NY 32 corridor), the R Route should terminate at Rosendale Park & Ride (Figure 3-16).

Figure 3-16 Proposed R Route Changes



From the Rosendale Park & Ride, passengers from Kingston could transfer to the UPL for service to SUNY Ulster, New Paltz, Highland, or Poughkeepsie. Current ridership data suggests a strong demand for service between New Paltz and SUNY Ulster than between New Paltz and Kingston, so from New Paltz it is preferable to provide a one-seat connection to SUNY Ulster than to Kingston.

On Saturdays, it is recommended that the G Route should be interlined with the S Route instead of the R Route, as R Route ridership does not justify weekend service. An interlined G/S Route could provide 75-minute service frequency from Saugerties to Highland using two buses. This service would also cover the Broadway and Albany / Ulster corridors in Kingston, and serve Hudson Valley Mall, instead of Tech City. Sunday service is not recommended at this time for the G Route due to budget impact, but should be considered if budget conditions permit. No Saturday or Sunday service is currently recommended on the R Route.

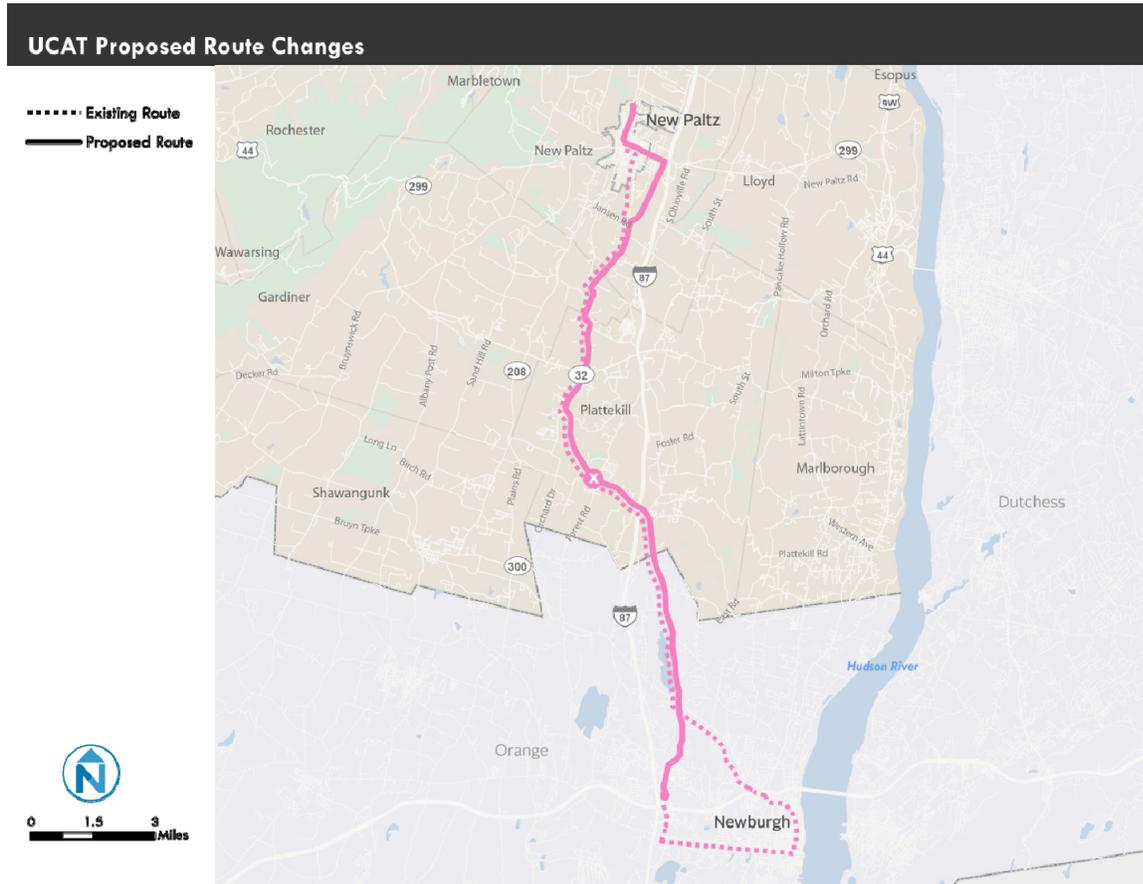
Service statistics for the G/R Route such as route length, span of service, fleet requirement, revenue hours, and estimated operating cost are presented along with other routes in a comprehensive table at the end of this chapter.

Avoid local service out of county – Two UCAT routes currently serve destinations outside of Ulster County: The UPL Route provides connections to Poughkeepsie, while the X Route terminates in Newburgh. In both cases the routes serve multiple destinations in these communities, such as Poughkeepsie Station and Main at Market Street in Poughkeepsie, and Newburgh Mall and the Waterfront District in Newburgh.

While the distance between Poughkeepsie Station and Main at Market Street in Poughkeepsie is not very great, the distance between Newburgh Mall and the Waterfront Distance is about five miles. Meaning that UCAT provides at least ten revenue miles of service (round-trip) in a community outside of Ulster County.

Both Newburgh and Poughkeepsie have transit systems of their own that provide local connections within their service areas. To reduce out-of-county revenue miles, UCAT should choose a single destination that is also served by the local transit provider to serve as a transfer hub. Based on existing ridership, Newburgh Mall would be an ideal candidate for such a hub, as it is the highest ridership UCAT stop in Newburgh and is also served by Newburgh local service (Figure 3-17). The Waterfront District is a good choice as well because of connection opportunities to Newburgh-Beacon Ferry, which is partly funded by Ulster County. However, this would result in an over-all longer route with higher operating cost.

Figure 3-17 Proposed X Route Changes



With service terminating at Newburgh Mall, 90 minute service frequency can be provided with a single vehicle. Service statistics for the X Route such as route length, span of service, fleet requirement, revenue hours, and estimated operating cost are presented along with other routes in a comprehensive table at the end of this chapter.

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

Connect the SUNYs – Current ridership data suggests a relatively strong travel demand between SUNY Ulster and SUNY New Paltz. This travel pattern is currently facilitated through an interline of the N Route and R Route on certain trips. However, this one-seat connection is neither advertised nor apparent from published passenger information. Extending the UPL Route from Rosendale to SUNY Ulster would link the two SUNYs (Figure 3-18). It would also create an intuitive cross-county connector, bridging the US 209, NY 32, and US 9W corridors, and allow for the elimination of the N Route (Figure 3-19).

Figure 3-18 Proposed UPL Route Changes

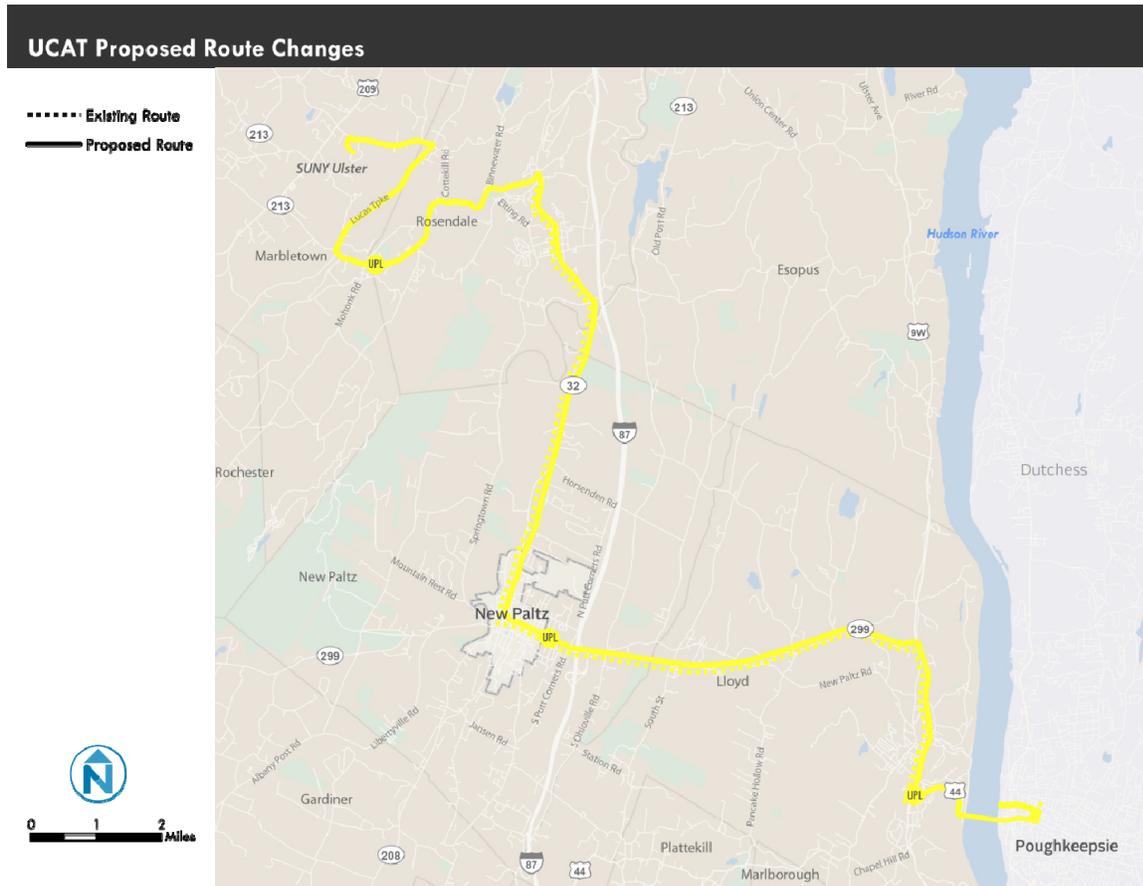
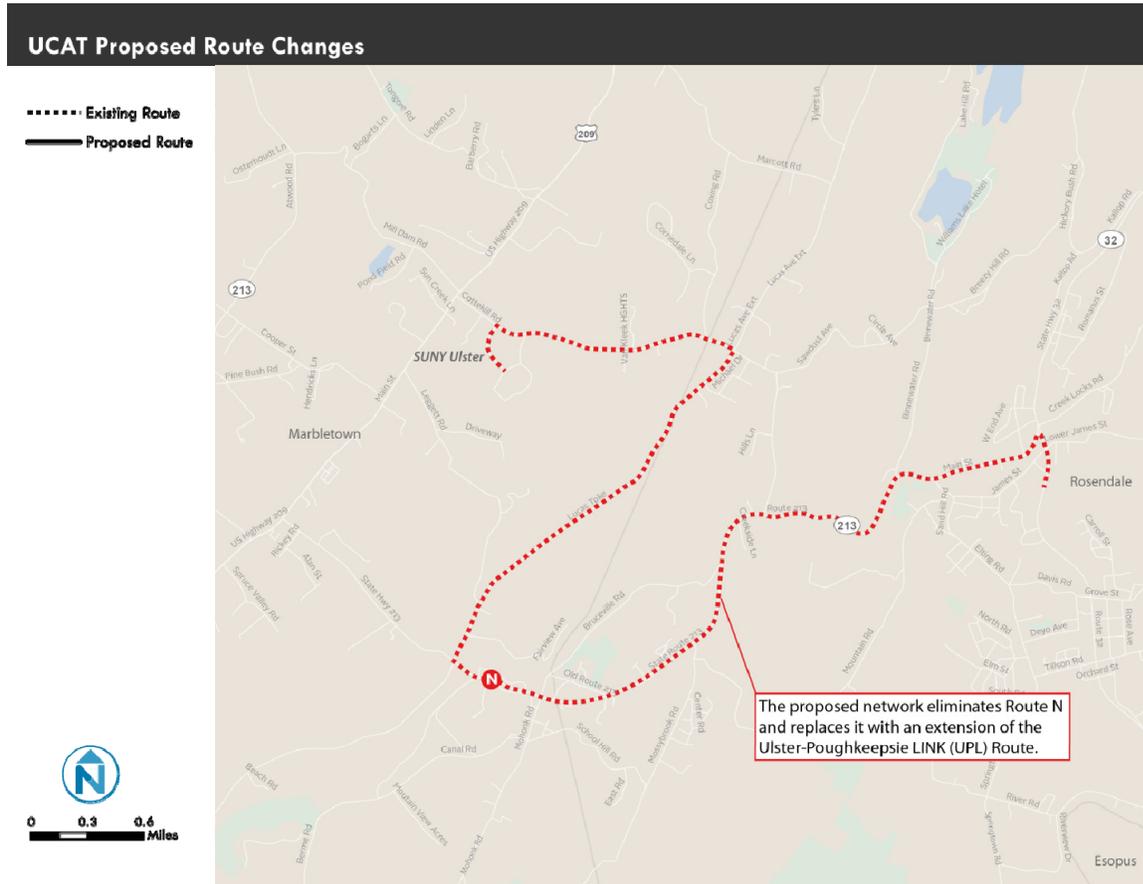


Figure 3-19 Proposed N Route Changes



With two vehicles, hourly service can be provided on the expanded UPL Route. A cross-county connector with a regular and predictable schedule can make navigation easier for transit users. For example, passengers in Kingston wishing to connect to the UPL could do so via three routes: The U Route, the R Route, or the G Route. So, although a transfer would be required, passengers would have the flexibility to choose a series of routes that best meets their schedule.

As mentioned previously, an important principle of transit service design is that service should be simple. The UPL Route currently has 17 slightly different variants that occasionally serve destinations such as Wingate, Bridgeview Plaza, Highland, and SUNY New Paltz. However, under the proposed route changes discussed previously, Wingate, Bridgeview Plaza, and parts of Highland would be served by the G Route, and SUNY New Paltz would be served by an improved NPL Route. These changes would allow for a more consistent UPL Route, and along with hourly service would make the route simpler to understand and navigate.

An hourly schedule would not match up exactly with the irregular schedule of the Metro-North Railroad, but based on recent ridership data, more UPL passengers have a final destination in Poughkeepsie than are transferring to Metro-North.

On weekends, a truncated UPL could provide hourly service from Poughkeepsie to New Paltz hourly with a single vehicle. By terminating the route with a loop around SUNY New Paltz, the

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

route would help meet ridership demand between the campus and the retail along Main Street that is covered by the NPL on weekdays.

Service statistics for the UPL Route such as route length, span of service, fleet requirement, revenue hours, and estimated operating cost are presented along with other routes in a comprehensive table at the end of this chapter.

Coordinate / consolidate service – Many of the scenarios described above involve a closer level of coordination between UCAT and Citibus than exists today. In order to streamline Citibus service, UCAT must be allowed to step in and serve some parts of Kingston that are outside of the Albany / Ulster or Broadway corridors. Similarly, in order to most conveniently meet the travel needs of Kingston residents, Citibus should be able to provide direct service to Hudson Valley Mall. These changes may require cost sharing agreements between the city and county, or system consolidation may prove to be a simpler option. These issues will be discussed in the upcoming final report.

Service Statistics

The system maps below illustrate the proposed weekday (Figure 3-20) and Saturday (Figure 3-21) medium-range network. Sunday service would only include the UPL and one paratransit vehicle.

Figure 3-20 Proposed Weekday UCAT Changes

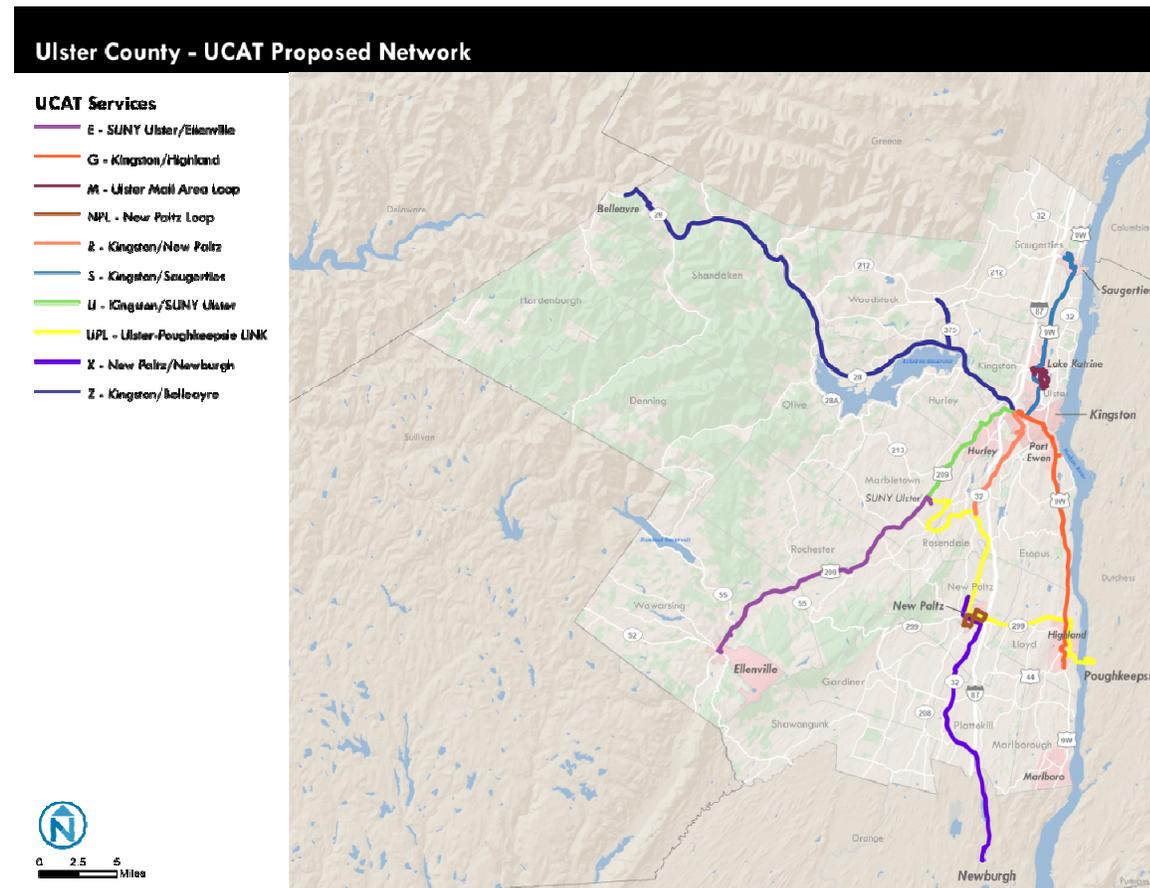
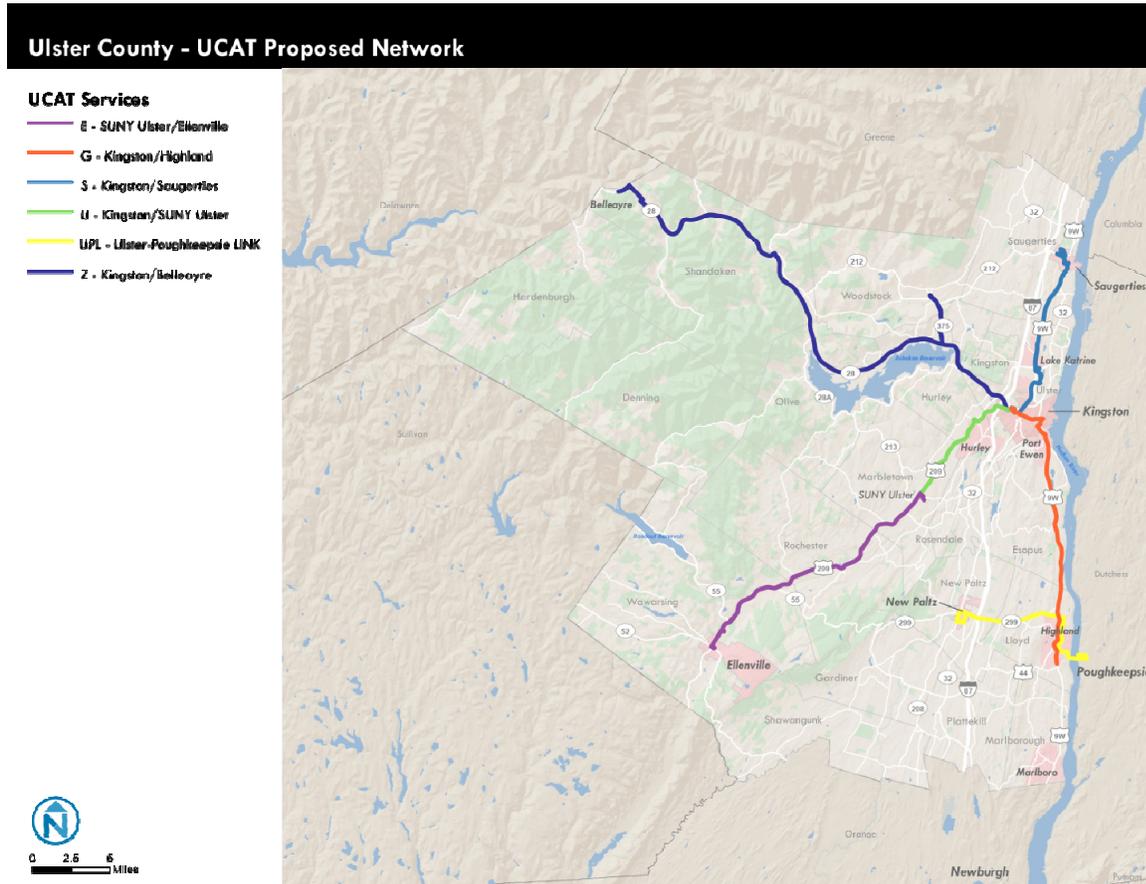


Figure 3-21 Proposed Saturday UCAT Changes



The estimated operating cost for these revised networks is a function of several factors including span of service, required vehicles, and cost per revenue hour. The cost per revenue hour is assumed to be \$90 for fixed-route service and \$60.50 for demand-responsive. These figures were derived from UCAT’s 2011 NTD report. Citibus’ unit costs may be slightly lower, but operating costs for Citibus are not broken down by fixed-route and demand-response services. In the absence of accurate Citibus unit costs, the UCAT figures are used for both systems.

The number of vehicles needed to operate any given route is determined by the frequency of the route, the route length, and its operating speed. Estimated average operating speeds of 15 mph were assumed for routes operating only in urban environments such as the A Route, B Route, M Route, and NPL Route. 30 mph was assumed for all other routes. Figure 3-22 shows the weekday service frequency and other metrics used for each route.

As a baseline, it was assumed that most routes would be operating from about 6:00 AM to 10:00 PM, for a total of 16 hours of service (with the exception of the M Route and NPL Route which serve the Mall area and SUNY New Paltz). This is a common span of service for many transit systems, but can be adjusted upwards or downwards based on budget availability. Similarly, frequency of service can be adjusted at certain times of the day in order to meet

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

budgetary targets. These adjustments will be discussed in the final report based on input from the Technical Advisory Committee.

Figure 3-23 shows service statistics for Saturdays. As a baseline, it is assumed that all routes operate for 8 hours on Saturdays compared to the typical 16 hours of weekday service. Again, this can be adjusted upwards or downwards based on input from the Technical Advisory Committee.

Finally, Sunday service statistics, which include just the UPL Route and one paratransit vehicle are shown in Figure 3-24.

A comparison of current and proposed medium-range service statistics (reflecting base-line assumptions) are shown in Figures 3-25.

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

Figure 3-22 Weekday Service Statistics

Service Area	Round Trip Route Miles	Estimated Cycle Time (Minutes)	Recommended Frequency (Minutes)	Peak Vehicles Required	Estimated Service Hours per Vehicle	Estimated Trips Per Day (One-Way)	Estimated Revenue Hours	Estimated Daily Operating Cost	
Fixed Route									
A/B	Kingston	21.8	90	60	2	16	43	32	\$2,880
M	Mall Area	6.9	30	30	1	14	28	14	\$1,260
NPL	New Paltz	4.2	20	20	1	14	42	14	\$1,260
E/U	Kingston - SUNY Ulster - Ellenville	60.1	120	60	2	16	32	32	\$2,880
G/R	Rosendale - Kingston - Highland	58.4	120	60	2	16	32	32	\$2,880
S	Kingston - Tech City - Saugerties	29.0	60	60	1	16	32	16	\$1,440
Z	Kingston - Woodstock - Belleayre	89.4	180	90	2	16	21	32	\$2,880
UPL	SUNY Ulster - SUNY New Paltz - Highland - Poughkeepsie	55.7	120	60	2	16	32	32	\$2,880
X	Kingston - New Paltz - Newburgh	39.8	90	90	1	16	21	16	\$1,440
Demand-Responsive									
Kingston Para / Flex	Kingston				2*	8		16	\$968
Ulster Para / Rural / Flex	County Wide				6*	8		48	\$2,904

* Demand Responsive Vehicles Have Overlapping Schedules

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

Figure 3-23 Saturday Service Statistics

Service Area		Round Trip Route Miles	Estimated Cycle Time (Minutes)	Recommended Frequency (Minutes)	Peak Vehicles Required	Estimated Service Hours per Vehicle	Estimated Trips Per Day (One-Way)	Estimated Revenue Hours	Estimated Daily Operating Cost
Fixed Route									
E/U	Kingston - SUNY Ulster - Ellenville	60.1	120	120	1	8	8	8	\$720
S/G	Rosendale - Kingston - Highland	69.7	75	75	2	8	26	16	\$1,440
Z	Kingston - Woodstock - Belleayre	89.4	180	180	1	8	5	8	\$720
UPL	SUNY Ulster - SUNY New Paltz - Highland - Poughkeepsie	29.2	75	75	1	8	13	8	\$720
Demand-Responsive									
Kingston Para / Flex	Kingston				1	8		8	\$484
Ulster Para / Rural / Flex	County Wide				1	8		8	\$484

Figure 3-24 Sunday Service Statistics

Service Area		Round Trip Route Miles	Estimated Cycle Time (Minutes)	Recommended Frequency (Minutes)	Peak Vehicles Required	Estimated Service Hours per Vehicle	Estimated Trips Per Day (One-Way)	Estimated Revenue Hours	Estimated Daily Operating Cost
Fixed-Route									
UPL	SUNY Ulster - SUNY New Paltz - Highland - Poughkeepsie	29.2	75	75	1	8	13	8	\$720
Demand-Responsive									
Ulster Para / Rural / Flex	County Wide				1	8		8	\$484

Technical Memo #4: Recommended Service Improvements

ULSTER COUNTY TRANSIT DEVELOPMENT PLAN

Figure 3-25 Comparison

Weekday		
	Current	Medium-Range
Fixed -Route Peak Vehicles Required	18	14
Fixed-Route Estimated Revenue Hours	165	220
Demand Reponsive Peak Vehicles Required (Para and Rural)	5	8
Demand-Responsive Estimated Revenue Hours	43	64
Estimated Daily Fixed-Route Operating Cost	\$14,850	\$19,800
Estimated Daily Demand-Responsive Operating Cost	\$2,602	\$3,872
Total Estimated Daily Operating Cost	\$17,452	\$23,672

Saturday		
	Current	Medium-Range
Fixed -Route Peak Vehicles Required	3	5
Fixed-Route Estimated Revenue Hours	27	40
Demand Responsive Peak Vehicles Required	1	2
Demand-Responsive Estimated Revenue Hours	9	16
Estimated Daily Fixed-Route Operating Cost	\$2,430	\$3,600
Estimated Daily Demand-Responsive Operating Cost	\$545	\$968
Total Estimated Daily Operating Cost	\$2,975	\$ 4,568

Sunday		
	Current	Medium-Range
Fixed -Route Peak Vehicles Required	1	1
Fixed-Route Estimated Revenue Hours	6	8
Demand Reponsive Peak Vehicles Required	1	1
Demand-Responsive Estimated Revenue Hours	6	8
Estimated Daily Fixed-Route Operating Cost	\$540	\$720
Estimated Daily Demand-Responsive Operating Cost	\$363	\$484
Total Estimated Daily Operating Cost	\$903	\$1,204