

UCAT Route Optimization Plan: Service Launch and Optimization Technical Memorandum



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Introduction

This technical memo is intended to serve as a roadmap for Ulster County Area Transit (UCAT) and Ulster County Transportation Council (UCTC) staff to implement the substantial network changes that are proposed in the Route Optimization Plan. The strategies identified in this memo are best practices for any service change and should be incorporated into UCAT's standard operating procedures.

This memo is divided into two sections: First, it discusses the different **Marketing and Education** tactics that should be considered for service changes to help promote public awareness of the changes and educate riders on how their trip may be impacted. Second, it identifies metrics that should be recorded as part of a regular **Service Monitoring** plan; tracking these metrics at consistent intervals will help UCAT better understand the performance of each route and will provide insight on how routes performing below expectations could be modified for improvement.

It is important to note that some elements identified in this memo may already be part of UCAT procedure. The objective of this memo is to help UCAT identify which strategies are appropriate for different scenarios and to codify their use. UCAT will work with UCTC and Ulster County government to identify the specific strategies that it intends to adopt as official procedure. This memo presents a menu of options to potentially include in said procedures. **This memo does not represent a definitive list of strategies that UCAT is committed to.**

Marketing and Education

Marketing and education campaigns are critical to the successful launch of any transit service change or system redesign. A variety of outreach strategies exist, and it is important to leverage the unique benefits of each method to reach people where they are and facilitate a smooth education and feedback process. This section aims to advise UCAT and UCTC staff on best practices for marketing and educational campaigns, both for service changes and for ongoing community engagement.

The strategies identified in this section are intentionally generic – for examples specific to Ulster County, see **Appendix A: Ulster County Outreach and Engagement Resources.**

Direct Outreach Strategies

Direct outreach aims to disseminate information and solicit input or feedback regarding proposed plans by meeting people in person at a variety of community events, pop-ups, and stakeholder meetings. Direct outreach strategies can be used to reach a wide audience or can be employed in specific areas to reach target populations. However, in-person events are limited by scheduling constraints, so it may be difficult for some potential participants to attend. The planning process for direct, in-person outreach events may be more involved than some other methods, with at least several weeks needed to coordinate staffing, book venues, design and print materials, and advertise the event to potential attendees. **Table 1** summarizes the benefits and drawbacks of several types of in-person outreach events.

Table 1: Direct Outreach Strategy Overview

Direct Outreach Strategy	Intended Audience & Purpose	Considerations	Benefits
In-person public meetings (open house, town hall, or other formats)	- Reaches members of the public, affected community members and stakeholders. - Structured method of sharing project information to larger groups. - Opportunity to receive feedback, answer questions, identify opportunities.	- May require a longer planning process to coordinate location, staffing, materials, and advertising. - Scheduling: participant attendance limited by time, location of event.	- Personal, point-in-time engagement. - One-on-one discussions between the public and staff. - Visibility in community.
Virtual public meetings	- Reaches members of the public, affected community members and stakeholders. - Structured method of sharing project information to larger groups. - Opportunity to receive feedback, answer questions, identify opportunities.	Participation in virtual public meetings may be limited by age, access to reliable internet connection, and technological proficiency.	- Flexible timing and potential broader reach due to virtual format. - Personal, point-in-time engagement. - One-on-one discussions between the public and staff. - Visibility in community.
Targeted stakeholder meetings	- Reaches key stakeholders relevant to the project/outreach goals (e.g., such as residents or business owners in a neighborhood; organizations supporting vulnerable populations, students, elected officials). - Invite key stakeholders into the planning process for their buy-in and insight.	Stakeholders may or may not be truly representative of the community or existing riders.	- Reach harder-to-reach populations or groups by targeting leaders with direct connections and/or influence in the community. - Facilitate in-depth and more objective conversations (as opposed to conversations directly with riders about impacts to their individual trip).

Direct Outreach Strategy	Intended Audience & Purpose	Considerations	Benefits
Attending community events	- Reaches members of key stakeholder groups outside of the structured meeting setting. - Informal method of sharing project information to large groups of stakeholders. - Effective at reaching stakeholders who may not attend more formal public meetings.	- Coordinating staffing, promotional materials is required. - Scheduling multiple events throughout the county to reach different populations and communities will help maximize reach and impact.	- Personal, point-in-time engagement. - One-on-one discussions between public and staff. - Can help reach target populations and/or stakeholders not represented in traditional public meeting attendance. - Meeting riders where they are.
Pop-up events	- Reaches community members who may not be able to attend traditional structured meetings. - Smaller-scale events in public locations (transit hubs, grocery stores, public areas). - Brief interactions with the public to raise awareness of a project or promote an ongoing survey.	- Many locations will require prior approval, which may take several weeks to plan. - Equipment requirements may include tables, canopies, chairs. - Scheduling: consider peak pedestrian activity windows.	- Designed to be easy to set up and take down. - Opportunity to introduce the project to underserved communities or stakeholders who have not participated in other phases.
Ambassadors/Street Teams	- Engages commuters, local residents, pedestrians, and other stakeholders, focusing on key corridors and destinations. - Small groups of staff move around given areas to proactively engage with people and distribute quick info materials (flyers, postcards, etc.).	- Street team ambassadors should typically wear bright shirts/vests or other identifying clothing. - Street teams can be deployed in conjunction with pop-up events. - Ambassadors should be bilingual to reach more people.	- Can be placed at key stops and transfer locations affected by challenges and potential changes. - Can cover larger geographic areas. - Can be strategically utilized to fill demographic or geographic gaps left by other engagement strategies.

Print Marketing Strategies

Print marketing strategies aim to disseminate informational materials on the project to stakeholders. Broadly speaking, print marketing can increase engagement and comprehension of information by providing stakeholders and community members with tangible sources of information. Print marketing can be used as a complementary strategy to other marketing strategies to fill gaps and reach community members who cannot attend outreach events and/or do not rely on digital platforms for news and information. **Table 2** summarizes the benefits and drawbacks of several types of print marketing strategies.

Table 2: Print Marketing Strategy Overview

Print Marketing Strategy	Intended Audience & Purpose	Considerations	Benefits
Brochures and flyers	- Engages current and potential riders at transit centers and community hubs, local businesses, and other residents. - Printed informational materials that can be posted and distributed at a variety of events, workplaces, public spaces, and community centers.	- Cost effective; printed materials in bulk are often discounted. - Important to implement print marketing strategies alongside digital strategies for greater impact and reach.	Printed materials may allow for better comprehension and engagement.
Transit ads	- Reaches current transit riders who would benefit from updated route, stop, and schedule information. - Printed advertisements for the proposed plan at transit shelters, stops, transfer stations, and on bus interiors and exteriors.	Some ads should be printed in Spanish or other prevalent languages to reflect the needs of the community.	High visibility among current UCAT users.
Newspaper ads	- Reaches the broader community, particularly those who may not be reached via digital strategies. - Advertisements and informational materials in local newspapers and publications.	- A featured newspaper story could help bring attention to the project and encourage engagement. - Print newspaper ads can be expensive.	Can be leveraged for last-minute event promotion or reminders due to frequent releases of newspapers.

Digital Marketing Strategies

Digital marketing strategies can share information, promote events, and advertise engagement/feedback opportunities. Digital marketing can be used as a complementary strategy to direct and print marketing strategies to fill gaps and reach more digitally connected people, particularly younger community members. **Table 3** summarizes the benefits and drawbacks of several types of digital marketing strategies.

Table 3: Digital Marketing Strategy Overview

Digital Marketing Strategy	Intended Audience & Purpose	Considerations	Benefits
Dedicated project page on UCAT/UCTC website	- Reaches current and potential UCAT riders. - Provide a dedicated online “home-base” for all information, updates, and events related to the service changes and plans.	Digital advertising should be deployed in tandem with other methods to reach people who lack reliable access to internet or technology.	- Concentrates all information and updates regarding service changes in one place. - Can streamline the feedback process by linking surveys and suggestion boxes.
Social media posts and paid engagement (e.g., Facebook, Instagram, Twitter, TikTok, etc.)	- Reaches existing social media followers. - Can utilize geo-targeted social media ads to reach communities impacted by service changes. - Share project updates on social media, utilizing both “stories” and timeline posts.	- Effective way to leverage existing social media following; however, following must exist for campaigns to be effective. - Consider intended audience and how to engage people who may not be following the agency/county’s social media channels.	Can be used to engage younger audiences and educate potential riders on the new service changes.
Radio/TV ads	- Reaches general audiences in affected areas, particularly local community radio stations. - Provide educational information, testimonials, and/or event/engagement opportunities to general audiences.	- May require strategically running ads at relevant times, depending on the intended audience. - Requires crafting, clear, simple, memorable messages.	- Radio and TV networks have a wide reach, but ads can also be targeted to reach certain geographic areas or demographics. - Opportunity for greater visual and auditory impact.

Digital Marketing Strategy	Intended Audience & Purpose	Considerations	Benefits
Email outreach to relevant associations/groups	- Reaches specific members of community groups and organizations. - Establish connections and relationships with local organizations and groups to help share information and updates to their networks. - Examples include outreach to HOAs, social service providers, civic associations, and neighborhood listservs.	Consider what associations and groups might be connected to communities not represented in the rest of the engagement process.	Collaborating with trusted local leaders and organizations can help reach more people and refine messaging to be more effective.

Marketing and Education Implementation

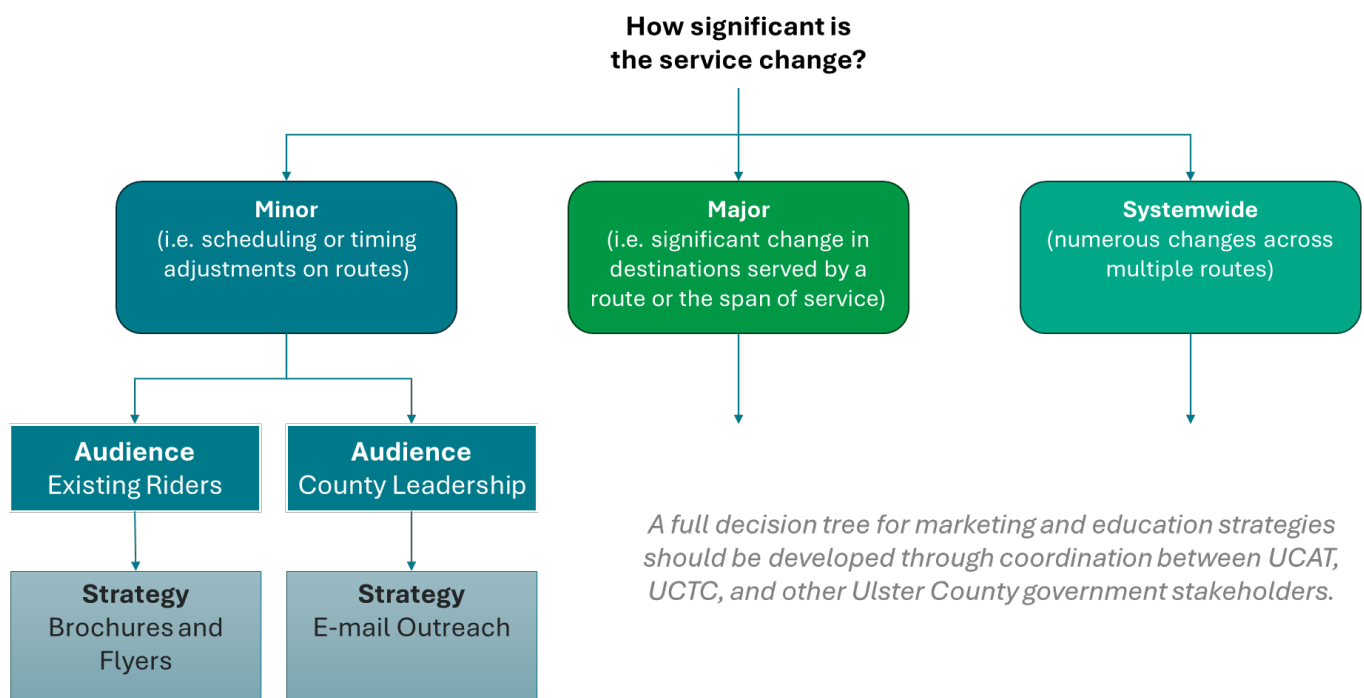
In the context of a service change, there are two phases of marketing: Gathering Input and Education.

First, UCAT should make the proposed service change available for public comment. Like outreach campaigns for specific projects like the Route Optimization Plan, this is a chance for public feedback on the proposed changes before they are implemented.

Second, UCAT must work to promote the service change after it is finalized but before it is implemented. This is critical for educating the public on how their service may be changing so that existing riders can plan the trip accordingly.

While more information is generally better in this context, time and resource constraints make it unlikely that UCAT could effectively implement every direct, print, and digital marketing strategy. To ensure that the marketing campaign is the best use of resources, UCAT should formalize a worksheet or decision tree like the concept in **Figure 1**. This helps formalize UCAT communications depending on the service change and allow it to focus on creating effective, targeted materials.

Figure 1: Sample Decision Tree for Marketing and Education Strategies



Service Monitoring

Ongoing service monitoring is a critical component of effective transit planning, enabling agencies to make data-driven decisions, respond to changing rider needs, and ensure the efficient use of resources. As the transit network changes to better serve the market and riders, it is vital to continuously monitor the performance of each route and ensure the system remains optimized. The final recommendations proposed as part of the overall Route Optimization Plan will be a prime opportunity to introduce a new and regular service monitoring approach as they can be seen as a “blank slate” for assessing new routes and services from day one.

The purpose of this section is to outline a service performance and monitoring plan for UCAT. Regular monitoring will help UCAT identify any potential issues, assess the effectiveness of changes, and ensure that the service aligns with the needs and priorities of the agency. The identified metrics in the report should be considered when selecting a new technology system for fixed-route dispatching and scheduling, described in more detail in the Task 7 technical memo **System Technology Analysis and Recommendations**.

Overview

The service monitoring plan is designed to track the performance of the transit network across several key categories: reliability, efficiency, customer satisfaction, and safety. These categories reflect the priorities of the transit agency and provide a comprehensive view of the network's performance. To effectively monitor the system, specific metrics have been identified for each category, and data will have to be collected at regular intervals to evaluate the system's success and to ensure that resources are allocated efficiently, and that appropriate transit service type is operated within the network.

Table 4 provides a high-level overview of the service performance categories and their key performance indicators (metrics).

Table 4: Service Performance Categories

Service Performance Category	Metric
Reliability	• On-Time Performance
	• Mean Distance Between Service Calls
Efficiency	• Maximum Load
	• Passengers per Revenue Hour
	• Passengers per Revenue Mile
	• Operating Cost per Passenger
	• Farebox Recovery
Customer Satisfaction	• Complaints per 100,000 Trips
Safety	• Incidents per 100,000 Miles

Each service performance category contains one or more performance metric and either a recommended target or reported values from peer transit providers. For each performance metric, there may be variations in the target or metric by mode and/or operating environment. When available, this section cites the average and ranges of a performance metric from other transit providers and/or UCAT historical averages. A full list of the peer providers is included in **Appendix B: UCAT Peer Group Performance Table**.

Reliability

Reliability is a critical measure of a transit system’s consistency and dependability. It ensures that services are operating as scheduled, which is essential for building trust among the transit users. If buses frequently run late or break down, passengers may opt for alternative modes of transportation, leading to a decline in ridership. The following two key metrics are used to measure reliability:

On-Time Performance

On-time performance measures the percentage of trips that depart or arrive within a specified time window compared to the scheduled time. On-time performance is a key indicator of both service quality and reliability, directly influencing passengers' decisions to use transit. As UCAT does not currently have a formal definition of on-time performance, the agency would need to define what constitutes on-time performance. For example, a larger transit agency might allow a bus to arrive up to five minutes after the schedule arrival time before it is considered “late”, but only two minutes ahead of the scheduled arrival time before it is considered “early” – these final values should be developed with UCAT staff based on real-time observations of existing performance.

Once the on-time performance window is defined, UCAT would then have to determine what percentages of trips need to fall within the on-time window for both fixed-route and on-demand (paratransit) services. Industry practice varies: agencies often set their on-time performance thresholds between 75 and 95 percent of trips served on time. While this memo suggests 85 percent as a reasonable benchmark for UCAT, both at the route level and system-wide, the final decision on the target should rest with agency leadership. Regardless of the threshold, achieving a strong on-time performance target not only enhances customer satisfaction but also recognizes the impact of external factors, such as traffic congestion, accidents, or special events, on maintaining the schedule. When planning routes, it is essential to account for these variables, particularly during peak traffic periods, to ensure realistic and achievable scheduling. **Table 5** presents the proposed targets for on-time performance.

Table 5: On-Time Performance Targets

Metric	Mode	Proposed Metric Target
On-time Performance	• Fixed-Route Service	• 85% percent or more of trips arrive at their final destination on-time • On-time is defined as ## minutes early and ## minutes late
	• On-Demand	• 85% percent or more of reserved trips have a wait time of 30 minutes or less

On-time performance tracking should begin at the trip level, which provides a manageable first step for evaluating service reliability. Over time, an agency can choose to further drill down into fixed-route on-time performance by examining and tracking on-time performance at the timepoint level. To do this, UCAT should first declare timepoints for routes and then track schedule adherence at the timepoint level. Timepoints should be spaced approximately five to 15 minutes apart, occur at major stops or transfer points, and be published in timetables as well as delineated on operators’ runsheets as a “timepoint.” It is generally not recommended to make every stop along a transit route into a timepoint, as this practice can create unnecessary complexity. Tracking at the trip and timepoint levels will help refine runtimes by segment and ultimately help improve overall reliability.

Mean Distance Between Failures

Mean Distance Between Failures (MDBF) measures fleet reliability by calculating the average distance a vehicle travels before experiencing a major mechanical system failure.

According to the National Transit Database (NTD), a major mechanical system failure is defined as a failure of a mechanical element of the revenue vehicle that either:

- Prevents the vehicle from completing a scheduled revenue trip, or
- Prevents the vehicle from starting the next scheduled revenue trip, due to limitations in vehicle movement or safety concerns.¹

A failure occurs when a vehicle must receive immediate maintenance or repair to restore safe operation and continue revenue service. These failures can range from engine or transmission issues to brake, steering, or other critical mechanical system problems. MDBF is calculated as:

$$\text{MDBF} = \text{Total Revenue Miles Traveled} / \text{Number of Major Mechanical Failures}$$

A higher mean distance indicates a more reliable fleet with fewer breakdowns, contributing to the overall reliability of the service (as a disabled vehicle often results in cancelled trips). UCAT should track MDBF by mode (fixed-route vs. on-demand) as well as by vehicle size, and fuel type, given a mixed fleet. This disaggregated data can help identify underperforming vehicles, inform maintenance priorities, and guide future fleet procurement.

Table 6 presents the proposed maximum distance after which a vehicle would be called for service for UCAT and peer agencies.

Table 6: Mean Distance Between Failures Targets (Miles)

Metric	Mode	Ulster County	Average Among Selected Peer Agencies	Range Among Selected Peer Agencies
Mean Distance Between Failures	• Fixed-Route Service	22,551	42,112	8,285 - 66,846
	• On-Demand	16,521	41,600	22,583 - 63,249

¹ Federal Transit Administration. 2021. Safety Performance Targets Guide: Public Transportation Agency Safety Plan Regulation: <https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-06/SPTs-Guide-v2-20210629.pdf>

Efficiency

Efficiency focuses on how effectively the transit system uses its resources to transport passengers. It is crucial for maintaining the financial health of the transit service and ensuring that it provides value to both the agency and the community. The following five metrics are used to measure efficiency: Maximum Load, Passengers per Revenue Hour, Passengers per Revenue Mile, Operating Cost per Passenger, and Farebox Recovery Percentage.

Maximum Load

This metric assesses how full a vehicle is during its journey by comparing the number of passengers on board to the vehicle’s total capacity. It provides a clearer picture of actual vehicle utilization than simply looking at boardings. While passengers per trip—defined as the total number of boardings divided by the number of one-way trips—can offer some insights, it does not account for passenger activity along the route (i.e., boarding and alighting patterns) and thus may misrepresent actual crowding or capacity utilization. UCAT's current fleet includes a mix of standard buses and cutaway vehicles, with a range of passenger capacities. The typical seated capacity for UCAT’s standard buses falls between 25 and 38 passengers, with standing room for 15 to 22 additional riders². An effective service should generate enough passengers to fill a majority of those seats during peak travel periods but should be flagged if the load starts to exceed the seated capacity of the vehicle. **Table 7** presents the proposed maximum passengers load targets for any observed trip.

Table 7: Maximum Load Performance Targets

Metric	Mode	Proposed Service Target
Maximum Load	• Fixed-Route Service	• 100% of seated capacity for any trip.
	• On-Demand	• 100% of seated capacity.

Passengers per Revenue Hour

This metric is a key performance indicator that measures the number of passengers carried for every revenue hour a vehicle is in service (inclusive of layover/recovery time). It provides insight into how efficiently a transit route utilizes revenue hours to move people. High values typically indicate strong demand and effective use of operating time, while low values may suggest excessive delays, low ridership, or inefficient scheduling. It is useful for assessing route performance in areas with variable traffic conditions, as slower routes may yield fewer passengers per revenue hour even if total ridership is stable. Passengers per revenue hour and passengers per revenue mile are often correlated, but they highlight different aspects of service efficiency. For instance, if a route has a high passengers per revenue mile but a low passengers per revenue hour, we can infer that the route may be popular route covering a long distance for commuters riding end-to-end. Inversely, a route with a high count of passengers per revenue hour but a low passengers per mile metric could indicate the route is popular but slow moving – potentially due to congestion. This could prompt a route assessment to improve travel speeds and/or streamline the service to find opportunities to connect passengers with their destinations but avoid unproductive or congested segments.

Passengers per revenue hour is usually a metric that is looked at relative to the performance of other fixed-routes within a system. However, UCAT may also choose to set a minimum passenger per revenue hour target for all fixed-route and on-demand services. Likewise, it might be measured separately for weekdays vs weekend operating days, as

² See Service Analysis Technical Memorandum.

service tends to be less utilized on the weekends. **Table 8** shows the 2023 passengers per revenue hour performance for UCAT and a selection of peers. No target is suggested for this metric, but rather UCAT should examine the lowest performing routes on a rolling basis to identify ways to improve their efficiency.

Table 8: Passengers per Revenue Hour Performance Targets

Metric	Mode	Ulster County	Average Among Selected Peer Agencies	Range Among Selected Peer Agencies
Passengers per Revenue Hour	• Fixed-Route Service	6.8 passengers / revenue hour	2.2	1.7 - 3
	• On-Demand	1.4 passengers / revenue hour	7.4	1.8 - 10.3

Passengers per Revenue Mile

This metric measures the number of passengers carried for every mile a vehicle travels while in service (revenue mile). It excludes miles operated while not in revenue service (e.g., deadheading miles). It helps assess how well routes and services are utilized over distance, making it particularly relevant for identifying spatial ridership patterns. This metric is especially valuable for evaluating routes in rural areas and commuter style routes, where trips have longer distances and relatively lower passenger counts. A low value could indicate that the route travels long distances compared to the markets it serves and could be reviewed for opportunities to simplify or streamlining the alignment.

Like with passengers per revenue hour metric, the passengers per revenue mile metric is usually a metric that is looked at relative to the performance of other fixed-routes within a system. UCAT could consider setting a minimum target for this metric as well.

Table 9 shows the 2023 passengers per revenue mile performance for UCAT and a selection of peers. No target is suggested for this metric, but rather UCAT should examine the lowest performing routes on a rolling basis to identify ways to improve their efficiency.

Table 9: Passenger per Revenue Mile Performance Targets

Metric	Mode	Ulster County	Average Among Selected Peer Agencies	Range Among Selected Peer Agencies
Passengers per Revenue Mile	• Fixed-Route Service	0.4	0.5	0.1 - 0.7
	• On-Demand	0.1	0.2	0.1 - 0.2

Operating Cost per Passenger

By considering the operating cost per unlinked passenger, this metric evaluates the financial efficiency of the service. Lower costs per passenger indicate that the service is providing good value and is being run efficiently. **Table 10** presents the UCAT's 2023 cost per passenger performance targets and the average performance across select peers.

Table 10: Cost per Passenger Performance Targets

Metric	Mode	Ulster County	Average Among Selected Peer Agencies	Range Among Selected Peer Agencies
Operating Cost per Passenger	• Fixed-Route Service	\$10.4	\$20	\$11.7 - \$41.9
	• On-Demand	\$78.7	\$76	\$22.3 - \$169.4

Farebox Recovery Percentage

Farebox recovery percentage refers to the portion of operating expenses that is covered by the revenue generated from passenger fares. It helps transit agencies evaluate how much of their operational costs are being covered by the fares paid by passengers. A higher farebox recovery percentage indicates that the transit service is generating a higher percentage of revenue relative to its costs, which can be a sign of financial sustainability. This is particularly important for ensuring that the system can continue operating without requiring excessive subsidies from external sources.

It is noteworthy that UCAT currently operates a fare-free system, meaning it does not collect passenger fares. As such, traditional farebox recovery metrics are not applicable. Instead, alternative measures of cost-effectiveness and financial sustainability—such as cost per passenger or cost per service hour—may be more appropriate for evaluating system performance. **Table 11** presents the proposed farebox recovery targets for **reference and comparison purposes only**.

Table 11: Farebox Recovery Performance Targets

Metric	Mode	Ulster County	Average Among Selected Peer Agencies	Range Among Selected Peer Agencies
Farebox Recovery	• Fixed-Route Service	0.0	0.4	0.01 - 2.3
	• On-Demand	0.0	0.1	0.01 - 0.15

Customer Satisfaction

Customer satisfaction reflects the passengers' overall experience and perceptions of the service. It is vital for retaining ridership and maintaining a positive public image. Satisfied customers are more likely to continue using the service and recommend it to others. The primary customer satisfaction metric is: Complaints per 100,000 trips.

Complaints per 100,000 Trips

This metric tracks the number of formal complaints received relative to the total number of trips, providing insight into passenger dissatisfaction. A higher rate of complaints might indicate systemic issues that need to be addressed, such as service quality or customer service. **Table 12** presents the proposed customer complaints performance targets.

Table 12: Customer Complaints Performance Targets

Metric	Mode	Proposed Service Target
Customer Complaints	• Fixed-Route Service	• Less than 15 complaints per 100,000 trips
	• On-Demand	• Less than 15 complaints per 100,000 trips

Safety

Safety is a fundamental aspect of any transit service. It ensures that passengers, drivers, and the general public are protected from accidents, injuries, and other safety-related incidents. A safe transit system is essential for maintaining public trust and preventing costly liabilities.

The Federal Transit Administration (FTA) recommends tracking safety across three primary categories:

- **Fatalities** (per 100,000 miles): The number of deaths resulting from transit-related incidents.
- **Injuries** (per 100,000 miles): The number of reportable injuries sustained by passengers, employees, or others.
- **Safety Events** (per 100,000 miles): Significant safety-related incidents, such as collisions or derailments, regardless if they result in injuries.³

UCAT may choose to report on the total number of safety incidents across all three categories as a high-level metric for performance reporting, while maintaining records of each category separately to be able to delve into detailed data when investigating trends or identifying corrective actions. The primary safety metric is:

Incidents per 100,000 Miles

This metric measures the frequency of safety-related incidents (events) per 100,000 miles traveled. It provides a clear indicator of the overall safety of the service. Lower incident rates indicate a safer system, which is critical for protecting both passengers and staff and for promoting the overall perception of the agency. Additionally, UCAT can classify incidents as “preventable” or “non-preventable” (the latter designating elements outside of UCAT’s control, like medical emergencies). **Table 13** presents the proposed safety performance targets.

Table 13: Safety Performance Targets

³ Federal Transit Administration. 2021. Safety Performance Targets Guide: Public Transportation Agency Safety Plan Regulation: <https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-06/SPTs-Guide-v2-20210629.pdf>

Metric	Mode	Ulster County	Average Among Selected Peer Agencies	Range Among Selected Peer Agencies
Incidents per 100,000 Miles	• Fixed-Route Service	0.0	0.1	0 - 0.3
	• On-Demand	0.0	0.2	0 - 0.9

Service Monitoring Implementation

UCAT's acquisition of a new technology platform for fixed-route scheduling, dispatching, and data collection (see Task 7: System Technology Analysis and Recommendations) offers the ideal opportunity to begin regularly collecting data for the metrics identified in this report. This will facilitate regular data collection to ensure there are no gaps in the data when reporting.

While data collection should be continuous, analyzing the data should be done as frequently as possible without becoming an undue burden on UCAT staff. **Table 14** represents a potential schedule for performance monitoring.

Table 14: Proposed Performance Monitoring Schedule

Reporting Period	Audience	Purpose
Monthly	• UCAT Internal Staff	- Monthly service monitoring is for internal purposes and allows for UCAT leadership to assess if any emergency service recommendations need to be implemented - Monthly service monitoring also provides the chance to review the results and identify outliers (for example, a severe weather event may have major impacts on service). These events are easier to identify and log on a more frequent basis.
Biannually	- UCAT Staff - UCTC Staff - County Leadership	- Biannual performance monitoring allows UCAT staff to aggregate and more critically assess the previous six months of data to look for larger trends on systemwide and route performance - Major and long-term service changes should be based on data analyzed as part of the biannual performance monitoring

Composite Performance Scores for Fixed-Routes

UCAT could future summarize individual fixed-route performance by developing composite scores by quantifying and aggregating a score for each topic area (reliability, efficiency, customer satisfaction and safety). Some transit agencies choose a composite score approach to help decipher complex and nuanced performance across many individual metrics. This can help focus improvements and interventions (i.e., service changes) by UCAT staff.

An example composite score could be categorizing a route's performance into low, average, and high-performance buckets. One to three points could be assigned for each metric depending on the performance bucket the route falls into. The resulting points would be totaled to make an overall score.

Based on a route's performance relative to the metrics in each category (reliability, efficiency, customer satisfaction and safety), each route will fall into one of the following three groups:

- Low-performing service
- Average-performing service
- High-performing service

Based on the performance category that a route falls into, certain corrective actions could be explored to enhance its performance. **Table 15** presents the performance categories and suggests some possible corrective actions.

Table 15: Performance Categories and Possible Corrective Actions

Performance Category	Category Definition	Score	Potential Corrective Action
Low-performing service	• Route performs within the bottom $\frac{1}{3}$ of all routes (worse than $\frac{2}{3}$ of the other routes.)	1	Segment-level and operational analysis to identify potential route issues, which could result in: • Targeted marketing • Rider outreach • Change in service levels • Change in schedules and runtimes • Discontinuation
Average-performing service	• Performs within the middle $\frac{1}{3}$ of all routes (better than bottom $\frac{1}{3}$, worse than top third)	2	• Periodic trip-by-trip segment analysis to identify potential route issues
High-performing service	• Performs within the top $\frac{1}{3}$ of all routes (better than $\frac{2}{3}$ of routes)	3	• Increase service levels • Introduce additional system types

Conclusion

A major systemwide service like that which is proposed as part of the Route Optimization Plan offers an opportunity to implement new standard operating procedures for UCAT marketing, education, and service performance monitoring. A major service change will require significant public education ahead of implementation. Additionally, major changes to routes will invite increased public scrutiny on UCAT operations; stakeholders and residents will want to see data that shows that new recommendations or changes to the system are yielding positive results.

The strategies and metrics identified in this memo are not intended to be the final procedure, but establish a framework for UCAT, UCTC, and other local bodies to develop processes and benchmarks that are contextually appropriate and sustainable.

Appendix A: Ulster County Outreach and Engagement Resources

Strategy Type	Strategy	Ulster County Example(s)
Direct Outreach	In-person public meetings (open house, town hall, or other formats)	• Ulster County Legislature Transportation and Housing Committee • Ulster County Legislature Transit Riders & Intermodal Advisory Committee (TRIAC) • Local city/town/village board meetings • Ulster County Chamber of Commerce meetings
Direct Outreach	Virtual public meetings	• Many local public and board meetings are offered virtually in addition to being in person. Online calendars for each locality will indicate the format of the meeting. • Planning and town board meetings in the town of Ulster • Public board, commission, and committee meetings in the city of Kingston • Public and board meetings in the village of Ellenville • Public board meetings and community events in the town of New Paltz • Town Board meetings in the town of Saugerties • Ulster County Chamber of Commerce meetings
Direct Outreach	Targeted stakeholder meetings	• Advertise planned stakeholder meetings on Participate Ulster
Direct Outreach	“Meeting in a box”	Potential community partners: • Hudson Valley LGBTQ+ Community Center • Junior League of Kingston • Ulster County Community Action Committee • Ulster County Office for the Aging • Family of Woodstock • Local neighborhood associations

Strategy Type	Strategy	Ulster County Example(s)
Direct Outreach	Attending community events	• Farmer's Markets • Kingston, Rosendale, Ellenville, and Saugerties • Visit Ulster County Tourism Events • Waterfront Wednesdays (Saugerties) • Fourth Fridays at Water Street Market (New Paltz) • Ulster County Regional Chamber of Commerce
Direct Outreach	Pop-up events	Potential Pop-up Locations: • Pine Hill Community Center • Kingston Plaza Shopping Center • Wallkill Popp Park • Rosendale Park & Ride • Poughkeepsie Train Station
Print Marketing	Newspaper ads	• Daily Freeman • Times Herald-Record • Times Hudson Valley Media (Southern Ulster Times or Wallkill Valley Times) • Shawangunk Journal • Hudson Valley One • Hudson Valley Press • Southern Ulster Times • Blue Stone Press
Print Marketing	Transit Ads	• UCAT fixed-route buses • UCAT Paratransit vehicles
Digital Marketing	Radio/TV ads	• News 12 Hudson Valley • Spectrum News 1 • News10 ABC • WKNY • WDST
Digital Marketing	Email outreach to relevant associations/groups	• Ulster County Newsletter • Ulster County Community Action Committee Newsletter

Appendix B: UCAT Peer Group Performance Table

Metric	Mode	Ulster County Area Transit (Ulster County, NY)	Dutchess County Public Transit (Dutchess County, NY)	Fredericksburg Regional Transit (Fredericksburg, VA)	Housatonic Area Regional Transit (Danbury, CT)	Newburgh Beacon Bus Corporation (Newburgh, NY)	River Bend Transit (Davenport, IA)	Biddeford-Saco-Old Orchard Beach Transit Committee Shuttle Bus (Biddeford, ME)	Piedmont Authority for Regional Transportation (Greensboro, NC)
Mean Distance Between Service Calls	Demand Response	18,792.8	6,147		32,917.9		61,704.1		
	Fixed-Route Service	7,064.2	18,476.9		13,996.5		63,249		27,872.7
Passengers per Revenue Hour	Demand Response	1.4	1.7		1.9		3.0		
	Fixed-Route Service	6.8	10.3	7.6	9.1	9.2	1.8	9.0	4.6
Passengers per Revenue Mile	Demand Response	0.1	0.1		0.1		0.2		
	Fixed-Route Service	0.4	0.7	0.5	0.6	0.7	0.1	0.5	0.2
Operating Cost per Passenger	Demand Response	78.7	169.4		36.3		22.3		
	Fixed-Route Service	10.4	11.8	17.7	11.7	12.9	41.9	15.6	27.9
Farebox Recovery Ratio	Demand Response	0.0	0.0		0.0		0.2		
	Fixed-Route Service	0.0	0.0	0.1	0.0	0.1	2.3	0.1	0.1
Incidents per 100,000 Miles	Demand Response	0.0	0.0		0.9		0.0		
	Fixed-Route Service	0.0	0.0		0.3		0.0		0.0

Appendix C: Industry Best Practices on Public Materials

This appendix provides a summary of industry best practices on designing customer information such as route maps and timetables. As UCAT moves closer to fully implementing the Route Optimization Plan, it can use the opportunity to take a fresh look at how to convey this type of information to the public. It should consider these best practices as well as look at local and national peer agencies (of all sizes) for inspiration. This section cites best practices identified by the National Rural Transit Assistance Program⁴.

Schedules

Orientation

Schedules can be formatted so that single bus trip reads horizontally (left to right) or vertically (top to bottom). A horizontal orientation in most cases is more intuitive as information is typically read left to right. A vertical orientation should be saved for particular circumstances, such as when there are proportionally many more stops than trips.

Stops

The identified timepoints on a schedule should match labeled stops on an accompanying map. Timepoints should be limited to approximately eight stops or less for legibility and accuracy. These should correspond with a route's scheduled timepoints and/or major destinations along the route and should match in both directions.

1 2 3 4 5 6 7 8								
Timepoint Stops	South Attleboro Station	Newport & Armistice	Newport & Beverage Hill	Newport & Ferris	N Broadway & Roger Williams	Taunton & Waterman	Taunton & Potter	KENNEDY PLAZA Stop H
XFER	1	80	78	78		78	78	HUB
MONDAY TO FRIDAY AM	5:11	5:16	5:20	5:22	5:27	5:30	5:32	5:38
	6:16	6:21	6:25	6:27	6:32	6:35	6:37	6:43
	6:46	6:51	6:55	6:57	7:02	7:06	7:09	7:18
	7:39	7:45	7:49	7:51	7:57	8:01	8:04	8:13
	8:24	8:30	8:34	8:36	8:42	8:46	8:49	8:58
	9:11	9:16	9:20	9:22	9:28	9:32	9:35	9:43
	9:56	10:01	10:05	10:07	10:13	10:17	10:20	10:28
	10:41	10:46	10:50	10:52	10:58	11:02	11:05	11:13
MONDAY TO FRIDAY PM	11:26	11:31	11:35	11:37	11:43	11:47	11:50	11:58
	12:11	12:16	12:20	12:22	12:28	12:32	12:35	12:43
	12:56	1:01	1:05	1:07	1:13	1:17	1:20	1:28
	1:41	1:46	1:50	1:52	1:58	2:02	2:05	2:13
	2:24	2:30	2:34	2:37	2:43	2:47	2:50	2:58
	3:08	3:14	3:18	3:21	3:27	3:31	3:34	3:43
	3:53	3:59	4:03	4:06	4:12	4:16	4:19	4:28
	4:38	4:44	4:48	4:51	4:57	5:01	5:04	5:13
5:33	5:39	5:43	5:46	5:52	5:56	5:59	6:08	

Figure 2: This horizontally oriented timetable only shows 8 key timepoints as opposed to every stop along the route. It also uses changes in color and font to indicate AM versus PM service.

⁴ <https://www.nationalrtap.org/Toolkits/Marketing-Toolkit/Marketing-Tools-and-Templates/>

Other Design Considerations

- Avoid using transit terminology in the bus stop names, such as the position (nearside, farside, etc.) or the stop id/stop code (if a stop id or stop code must be used, make sure it is secondary to the actual location name).
- Ensure consistency of nomenclature, abbreviations, and other syntax elements. For examples, stops named after intersections should be consistent: “Broadway & First St.” or “Broadway + First Street” are both acceptable names, but all stops in the system should follow consistent rules.
- Ensure that times are in a standard format (8:24) instead of unpolished numbers generated by scheduling software or military time.
- Indicating AM/PM on the side or top of the schedule and distinguishing those times from each other (such as bolding all PM times) can remove the need to spell out AM or PM on each time point.
- Ensure that the type/font size is large enough to read both on screen and printed out.
- Print timetables should also include general agency information including contact details and fare policy.

Maps

Individual route maps are often the “face” of a service that is used by external actors when discussing a route. Maps can either be directly exported from a GIS or scheduling software (and maintain geographic accuracy) or depicted in a schematic form via a graphic design software like Adobe Illustrator or Canva.

- Geographic maps are often quicker to produce and easier to compare to other resources but can face legibility issues when stops and streets are close together.
- Schematic maps require a higher effort to produce and maintain, but allow the agency artistic license to simplify features and adjust scale to enhance legibility.

Overall Aesthetic and Color

- The color of route alignments should be consistent with other materials and overall agency branding (i.e. if a route is purple on the map, look for other elements on the timetable or other material that could match).
- Background elements (such as bodies of water, roads, and highways) should follow a light and/or neutral color palate, so that routes can stand out.
- If the agency uses a different color for each route, these colors should be easily distinguishable from each other, especially for color blind users. Some graphic design programs have a “colorblind mode” that agencies can use to ensure adequate contrast for all users.

Labels and Information

- All major streets that a route travels on should be labeled; cross streets should only be labeled if they are adjacent to a bus stop or represent a popular boarding/alighting location.
- Maps should at minimum symbolize and label the stops identified in the corresponding schedule. Consider using timepoint letters or numbers to strengthen the connection between the two materials.

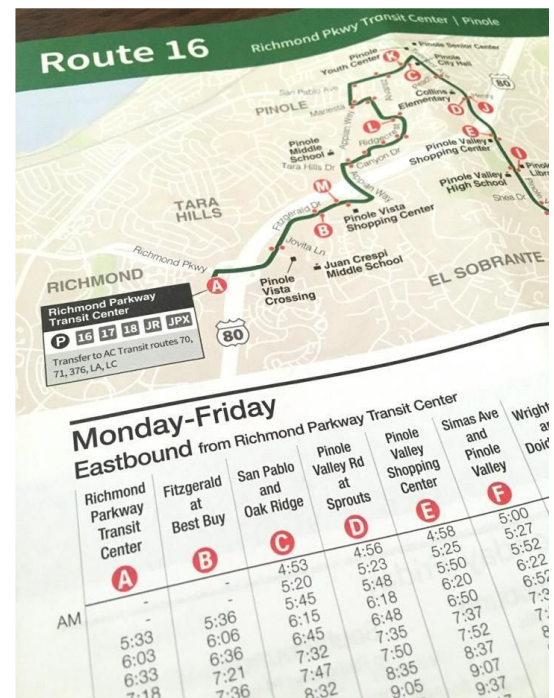


Figure 3: On this example, the route's green color is also incorporated into the header of the print timetable. Timepoints are also identified with letters on both the map and timetable. The basemap also relies primarily of neutral colors, so that the route and labels contrast effectively.

- Consider using different line weights or types (such as a dashed line) for segments that have unique service characteristics (such as limited service or peak-only service).
- Identify local landmarks along the route to assist users in orienting themselves without adding so many that the map becomes cluttered.

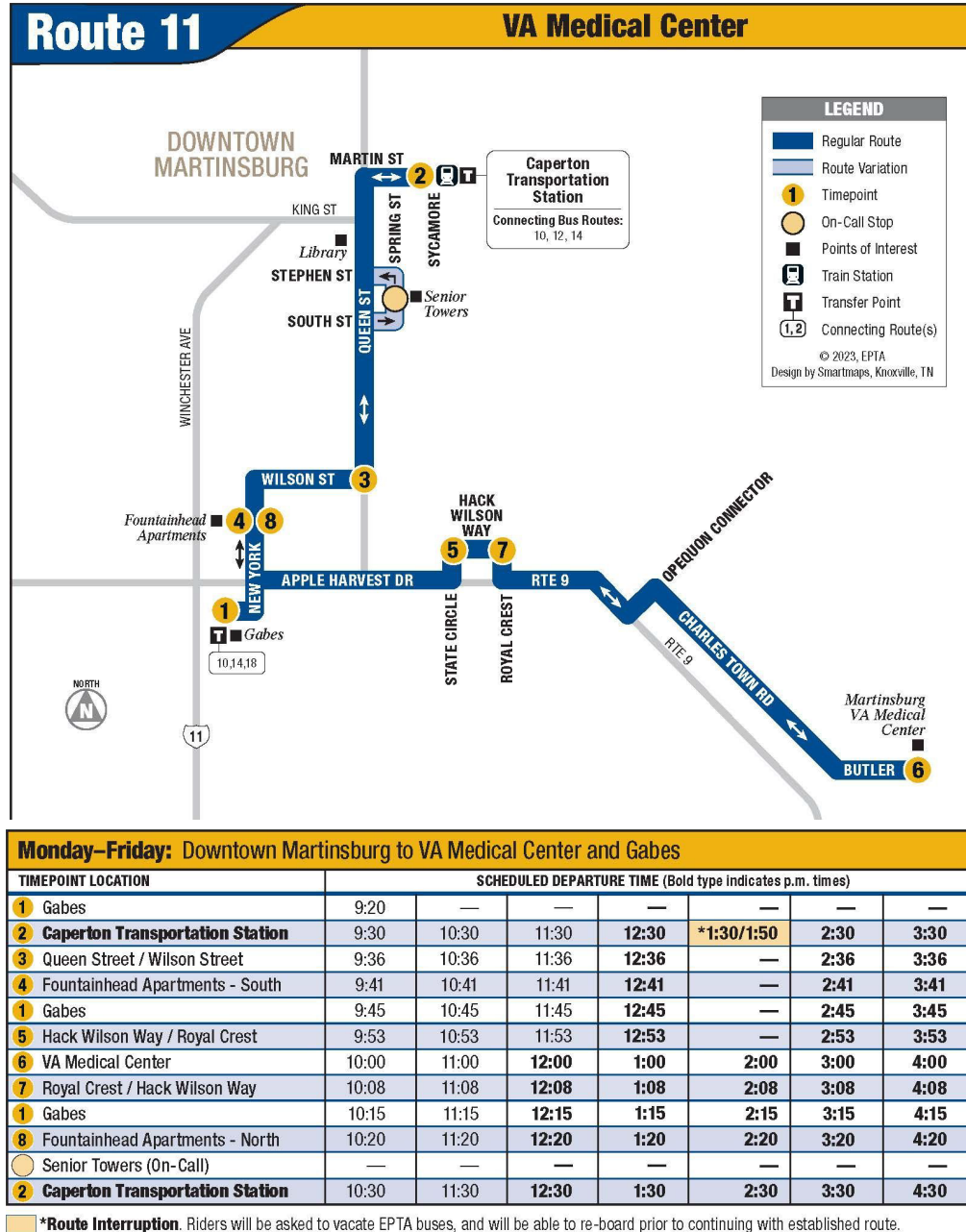


Figure 4: Route 11 map and timetable from the Eastern Panhandle Transit Authority in Martinsburg, WV. The map is schematic, which allowed the designer to show more detail in Martinsburg while simplifying the alignment as it headed towards the VA Medical Center (via a highway alignment). The timetable is arranged in a vertical format and includes service variations along the route that are common with smaller transit agencies.