

## MEMORANDUM

**To: Jamie Smith and Chris Damiani**

**From: Stephen Falbel**

**Re: Transit Service in Richmond**

**Date: March 7, 2023**

This memorandum presents an analysis of potential transit service in the Town of Richmond. The town's Transportation Committee expressed interest in a line-haul bus route connecting Waterbury to Williston via US 2 through Richmond, as well as a feeder bus service within the most densely populated portions of the town. The market for these services is analyzed below and an alternative recommendation is proposed.

### **Market Analysis**

Even in an era when more people than ever are working from home, the point of departure in assessing the potential market for a new transit service remains the patterns of commuting in a corridor. Work trips are the most repetitive type of travel and the form of travel about which we have the most detailed information. Thus, the first step in analyzing the proposed bus route between Waterbury and Williston was to obtain commuting data for the towns in that corridor.

The OnTheMap tool, part of the Longitudinal Employer-Household Dynamics (LEHD) database from the US Census, can provide worktrip origin-destination data for any geographical area. A series of queries were made from this tool to gauge the size of the commuting market among the towns in the corridor. Highlights of the results are listed below. Maps of the relevant areas are shown on the next page. Other than the Richmond CDP, the areas shown on the maps are not official definitions.

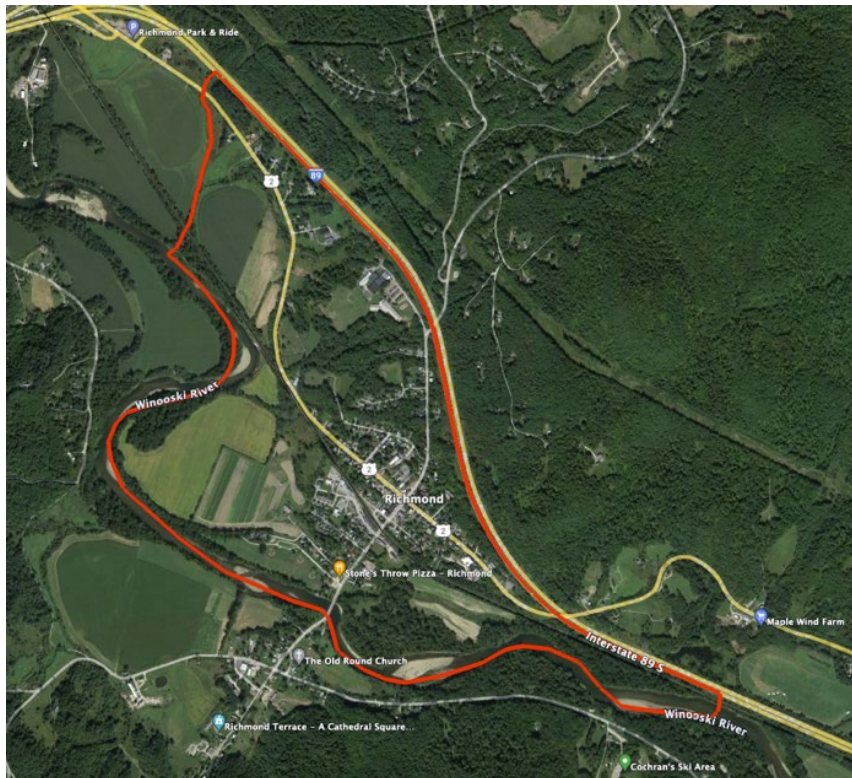
- Among people living in the most densely developed parts of Richmond, including Riverview Commons, Main Street, and Bridge Street as far south as Huntington Road, the number of people commuting to relevant worktrip destinations were as follows:
  - Burlington – 89
  - South Burlington – 50
  - Williston – 49
  - Montpelier – 8
  - Waterbury – 6
- Among people working in Taft Corners, the numbers of people living in relevant residence towns were as follows:
  - Richmond – 28
  - Bolton – 16
  - Waterbury – 12
- Among people working in Waterbury Village, the numbers of people living in relevant residence towns were as follows:

- Richmond – 22
- Williston – 17
- Among people working in Richmond Village, the numbers of people living in relevant residence towns were as follows:
  - Burlington – 101
  - South Burlington – 56
  - Williston – 50
  - Waterbury – 17
  - Bolton – 15

It is clear from these figures that Richmond has a stronger orientation to Chittenden County than it does to Washington County. The interchange between Richmond and Waterbury is relatively small, and given that commuter bus routes, at best, capture only a small percentage of the commuting market (5% or less), a bus route traveling between Richmond and Waterbury does not appear to be viable.

The total population of Richmond Village (technically the Richmond Census Designated Place, or CDP) is 785, and the working age population (18 to 65) is about 480 people. Among Richmond households, 85.3% have two or more cars and 13.8% have one care, leaving less than one percent with no cars available. These numbers suggest that for any transit service to be attractive to Richmond riders, it must provide convenient service to the most popular destinations, otherwise people will just drive. There are likely not enough people without access to cars to make a transit service viable on their own.

***Richmond CDP***



*Waterbury Village*



*Taft Corners*



## Proposed Services

Richmond’s Transportation Committee requested an evaluation of a route between Waterbury and Williston as well as a feeder service within Richmond to connect Riverview Commons and the center of the village with the Richmond Park & Ride. The corridor route would provide access to job centers in Waterbury and Williston, and the feeder route would improve access to the LINK Express and the new corridor route for those who do not have cars available. Prior to the pandemic, the Richmond Park & Ride was usually filled to capacity. Should demand return to those levels, a feeder service could help free up some spots that would be otherwise taken by Richmond residents.

As indicated above, there does not appear to be a substantial transit market between Richmond and Waterbury. Therefore, this memorandum will only consider a corridor service between Richmond and Williston. By setting aside service to the east of Richmond, it becomes possible to combine the feeder service and the corridor service into a single route, which makes it both less expensive to operate and more attractive to passengers by providing one-seat rides.

It should be noted that the most recent Transit Development Plan for CCTA (2010) recommended a regional commuter service between Richmond and Williston. This was conceived of as an extension of the Williston Village route (since discontinued) and thus would have offered a one-seat ride to downtown Burlington via US 2.

The two pieces of the proposed service are shown in the maps below. As indicated in the draft schedule shown thereafter, the feeder route would turn into the corridor route at the Richmond Park & Ride, so that it would really be one route with a feeder component and a corridor component.

**Figure 1 – Corridor Service between Richmond and Taft Corners**

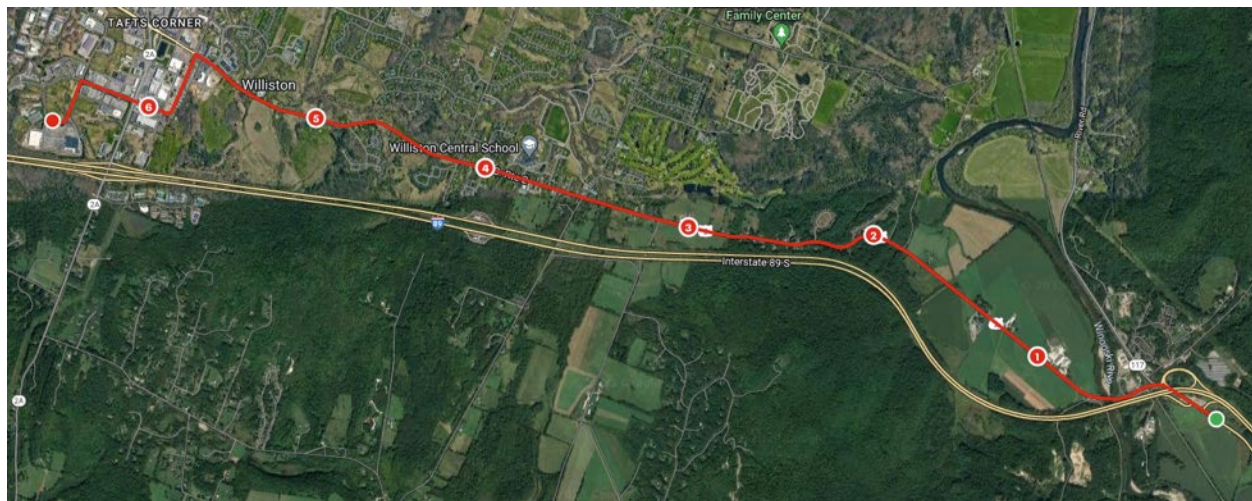
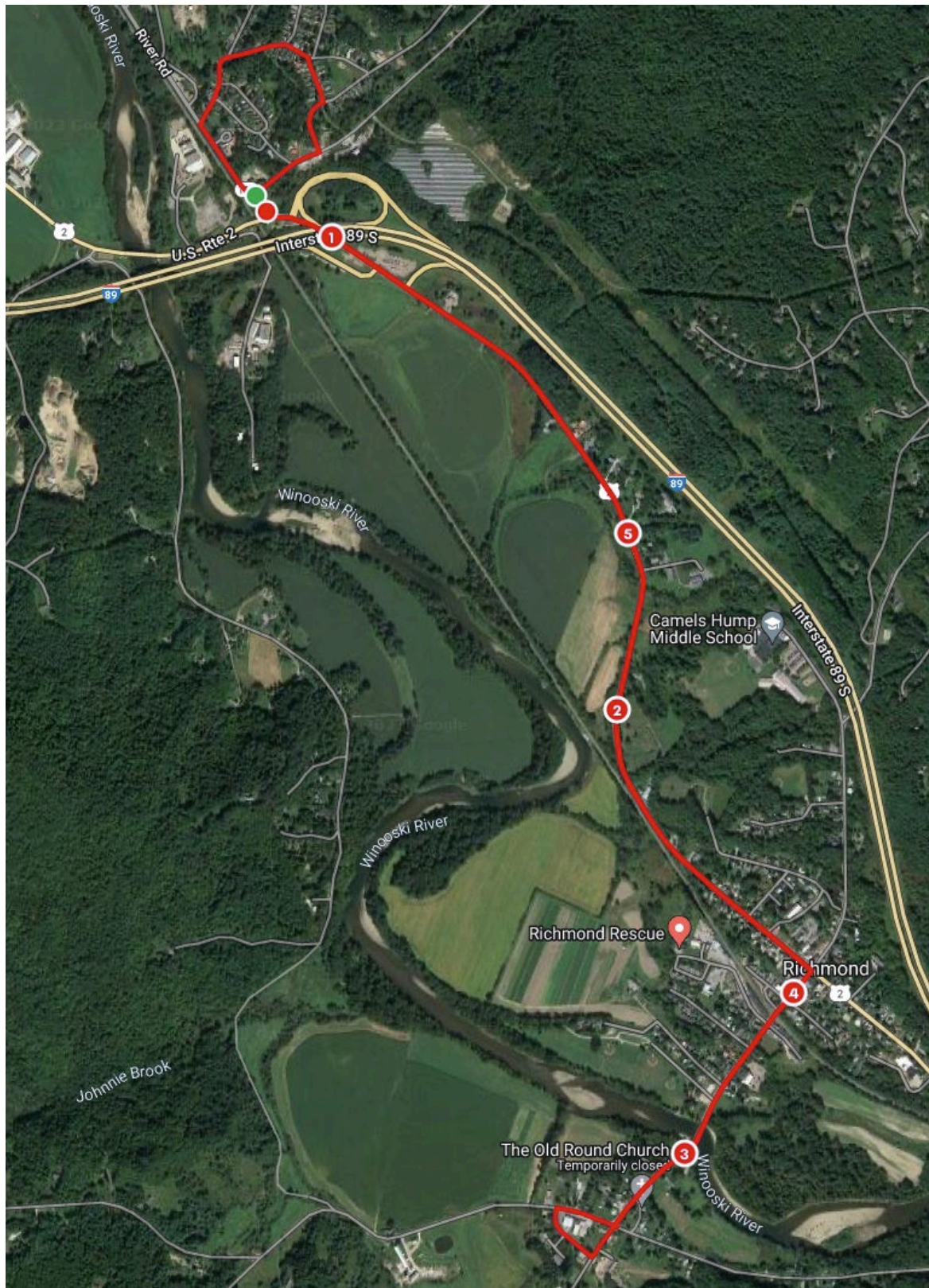


Figure 2 – Feeder Service in Richmond



The feeder component would begin at the intersection of Bridge Street and Huntington Road and travel north on Bridge Street to the center of Richmond Village. It would then head west of US 2 to serve the Park & Ride. Finally, it would loop through the Riverview Commons Manufactured Home Park in a counter-clockwise fashion using Governor Peck and Summers Street and return to the Park & Ride.

The vehicle would then proceed west on US 2 toward Williston, with at least one stop in Williston Village. The route would turn south on Maple Tree Place and west on Marshall Ave to reach Harvest Lane. The route would terminate at Walmart, allowing connections to the Route 1 Williston and Route 10 Williston-Essex. The route would make local stops within the Taft Corners area.

The draft timetable shown below was designed to allow the feeder service to meet as many LINK Express trips as possible at the Richmond Park & Ride, as well as providing convenient access to the employment and retail area at Taft Corners. Morning peak, midday, and afternoon peak trips are proposed to allow the route to meet just about all LINK trips and also to allow the route to serve shopping trips to Williston. The midday service, particularly, is important for shopping access since most people spend two to four hours shopping, rather than a full day.

Note that in the afternoon, rather than having the route follow a prescribed schedule for the feeder portion, it may be better for the driver to query the passengers on board and take them to their destinations (within a limited service zone). Thus, if there is no one on the bus who lives in Riverview Commons, for example, the bus would not need to go there on that trip.

LINK connections

|  | Richmond Village | Richmond P&R | Riverview Commons | Richmond P&R | Williston Village          | Walmart | Next           |
|--|------------------|--------------|-------------------|--------------|----------------------------|---------|----------------|
| <b>AM service</b>                            |                  |              |                   |              |                            |         |                |
| 6:35 inbound and 6:40 outbound               | 6:15             | 6:25         | 6:27              | 6:31         | 6:41                       | 6:48    | DH to RV       |
| 7:15 outbound and 7:20 inbound               | 7:03             | 7:13         | 7:15              | 7:19         | 7:29                       | 7:36    | DH to RV       |
| 8:05 inbound, 8:13 outbound and 8:25 inbound | 7:51             | 8:01         | 8:03              | 8:07         | 8:17                       | 8:24    | Out of service |
| <b>Midday</b>                                |                  |              |                   |              |                            |         |                |
| LINK connections                             | X                | X            | X                 | X            | X                          | 12:00   | via US 2 to RV |
| 12:38 inbound                                | 12:20            | 12:30        | 12:32             | 12:36        | 12:46                      | 12:53   | via US 2 to RV |
| 1:33 outbound                                | 13:13            | 13:23        | 13:25             | 13:29        | 13:39                      | 13:46   | Out of service |
| <b>PM service</b>                            |                  |              |                   |              |                            |         |                |
| 4:25 outbound                                | 16:05            | 16:25        | 16:28             | 16:39        | or circulation in Richmond |         |                |
| 5:18 inbound and 5:20 outbound               | 16:58            | 17:20        | 17:24             | 17:35        | can be determined by       |         |                |
| meets 5:43 outbound                          | X                | 17:45        | 17:48             | 17:59        | on-board request           |         |                |
| meets 6:38 outbound                          | 18:20            | 18:40        | 18:43             | 18:54        | Out of service             |         |                |

## Other Services Not Recommended

A prior study called the Future of Rural Transit, by the Vermont Energy Investment Corporation, considered the possibility of merging public transportation and school transportation. The study suggested bus routes connecting Richmond with Mount Mansfield Union High School in Jericho, as well as Camels Hump Middle School in Richmond. Federal regulations prevent public transit agencies that use federal funds from providing school transportation. [Part 605 of Title 49 Subtitle B Chapter VI](#) contains detailed language prohibiting this practice: “No grantee or operator of project equipment shall engage in school bus operations using buses, facilities or equipment funded under the Acts.” “Project equipment” and “funded under the Acts” refers to buses paid for with Federal Transit Administration funds. There are exceptions for “tripper buses” which are added trips to regular bus routes that also serve schools. GMT’s Neighborhood Specials are tripper buses and are legal within the regulations because they largely parallel regular bus routes. A route such as the one proposed in the VEIC study is obviously intended to serve the school and not general transportation needs, and there is no other regular bus service in the vicinity. If the Mount Mansfield Union Unified School District feels that bus service is needed between Richmond and MMUHS, then it should purchase buses and run them, or hire a private contractor to operate the service.

Another proposal was to operate a microtransit service in Richmond as a feeder to the LINK Express or the potential corridor route. A scheduled feeder service is superior to microtransit in this environment for several reasons. Microtransit is not ideal for guaranteeing connections to line-haul services, as trip requests are likely to have similar desired arrival times (a few minutes before the bus departure) and a single van cannot be in two places at once. Having more than one van in service would increase the cost substantially. Also, the very flexibility of microtransit service makes it more likely to miss a connection to a scheduled bus route.

In some environments, microtransit can save money compared to fixed route service, but this particular service area in Richmond is not such a case. For the microtransit service to be responsive, a vehicle would have to be actively in service in Richmond, meaning a driver would be paid for that time whether the van is picking up passengers or not. While a feeder fixed route may not always be carrying passengers, the marginal cost savings for a microtransit van that is just sitting and waiting would be small; really just the cost of the fuel. A scheduled bus is more convenient for passengers because they do not have to request rides. If commuters are the target market, they would find it annoying to have to request feeder trips every day. The trips provided by the proposed fixed route feeder will be relatively direct and will meet all of the LINK trips, so a microtransit service would have no advantages.

## Cost and Ridership Estimates

The schedule shown above, including deadhead trips to the garage for each of the three parts of the service day, entails 8.5 total vehicle hours and about 191 total vehicle miles.<sup>1</sup> For a full year, the route would require 2,170 vehicle hours and 48,782 vehicle miles. Using cost factors based on FY22 data that apply to total vehicle hours and miles, the estimated annual cost for this route would be

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<sup>1</sup> Total vehicle hours and miles were used for this calculation, rather than revenue vehicle hours and miles, because this route would have much more deadhead time and distance than the typical GMT urban route.

\$292,180. Given typical inflation factors, it is likely that the route would cost over \$300,000 if it were implemented in FY2024. If the funding package for the route required a 20% local match, the Town of Richmond would need to contribute roughly \$60,000 per year. If Richmond were to become a member municipality of GMT, then the funding package may work differently, though there would be a capital buy-in provision.

In the last set of stop-level counts (taken in Fall 2018), there were 66 total boardings at the Richmond Park & Ride over the course of the day: 44 in the outbound (eastbound) direction and 22 in the inbound (westbound) direction. Somewhat surprisingly, this shows a stronger orientation toward Montpelier than to Burlington. However, this is not necessarily inconsistent with the commuting data shown above, since people parking at the lot in Richmond do not necessarily live in Richmond. There are likely many people from Jericho, Underhill, Huntington and other communities who find that lot to be convenient. Of course, the pandemic caused a major ridership loss for all commuter routes, including the Montpelier LINK Express.

Ridership on this service would consist of two primary components: commuters to Taft Corners or the core of Chittenden County, and shoppers (and people making other types of trips) to Taft Corners. The OnTheMap data listed above provide the number of commuters (as of 2019) between the relevant residential and commercial areas. Past analyses showed that LINK Express routes, prior to the pandemic, captured up to 4% of the commuting market between the origin and destination locations. That share may be an appropriate estimate for people living in the Richmond CDP and working in Burlington. For other pairs, the share is likely to be lower, either 2% or 1% because of the availability of abundant free parking (Taft Corners) or the need to transfer (commuting to South Burlington). Using this range of market shares and the OnTheMap figures, the number of people using the route for commuting purposes is likely to be in the range of 10, including one or two riders who live in Williston Village. That means 20 trips per day for commuting.

The route may also be attractive for some Richmond residents to reach shopping opportunities in Williston. There may be 20 or 30 people who use it for this purpose over the course of a month, but because shopping trips do not occur every day, that group of people may translate only into 4 or 5 riders on any given day, or perhaps another 10 one-way trips.

These estimates result in a ridership forecast of about 30 trips per day, or about 7,650 per year. Dividing the \$300,000 annual cost by that number of riders results in a very high cost per passenger of roughly \$40. In the FY22 VTrans Route Performance Report, the worst-performing bus route in the GMT-Urban system was the Williston-Essex route, which attracted nearly 27,000 passengers and had a net cost per trip of \$19.52. It is not clear to which route class this service would belong, since it is not really an urban route, but it is not really a rural route, nor purely a commuter route given the midday service oriented toward shopping. The Small Town class may be the most appropriate spot for it. The “acceptable” level of performance for Small Town routes in FY22 was a net cost per passenger of \$23.46, so even considering this route to be not urban would not allow it to achieve acceptable performance. If it were considered a Rural Commuter route, the \$40 cost per passenger would be lower than the acceptable threshold of \$75.11.

It would be possible to reduce the cost of the Richmond route by eliminating the midday service, but then it would become much less attractive to shoppers. Trimming some time off of the morning and afternoon shifts could save a little money, but soon the shifts would hit the 2-hour minimum to pay drivers, so that no more money could be saved. In order for the route to achieve even the



modest ridership in the forecast, it would likely need to operate all of the service shown in the draft schedule.

Ultimately, what is limiting the ridership potential of this route is the small number of people who live in the central part of Richmond that would be served. As mentioned earlier, there are only 480 people of working age in the Richmond CDP and almost all of them own cars. It's possible that the proposed route could achieve much higher market share than the typical route, but for this service to be considered acceptable in the annual route performance report, ridership would have to be triple what is forecast here. It's not impossible, but it seems unlikely. A very high level of engagement and frequent, active promotion of the service by local officials and community leaders could possibly result in higher-than-normal mode shares.

## **Conclusions**

Given the desire of the Richmond Transportation Committee to improve access to transit for Riverview Commons and the central part of Richmond Village, it is possible to operate a route that meets that goal in a relatively efficient way. However, the low population density of a small town and the high cost of operating a bus route results in a relatively high cost per passenger, based on the ridership forecasts.

If Richmond officials believe there is an unusually strong need and market for this service, the proposed route could be operated as a pilot project for a year or two to determine how it would actually perform. A large commitment of local funds would likely be necessary, given GMT's budgetary pressures. If the market does prove sufficient to make the route viable, then in the future, it would be funded through regular mechanisms and Richmond could join GMT as a member municipality, with the operating and capital assessments to be negotiated.