

Table 6-3. Estimated budget for Approach#1 Implementation

| Budget Item                                                                              | Estimated Cost             | Notes                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project coordination &amp; regional data steward (0.5 Full-Time Equivalent (FTE))</b> | \$20,000–\$40,000/year     | Can be hosted by a regional entity, such as Central Pines, Triangle West, GoTriangle or CAMPO; covers coordination & governance. Future discussion with regional entities is needed to identify the most appropriate transit data steward for the region. |
| <b>Integration software/scripts</b>                                                      | \$10,000–\$15,000 (Year 1) | Open-source tools exist; customization and integration may be needed.                                                                                                                                                                                     |
| <b>Metadata development and feed documentation</b>                                       | \$5,000–\$10,000 (Year 1)  | One-time cost for feed standards, dataset description, and metadata.                                                                                                                                                                                      |
| <b>Portal landing page (basic website or Content Management Systems (CMS))</b>           | \$5,000–\$15,000 (Year 1)  | Lightweight approach using WordPress, CKAN, or similar tools.                                                                                                                                                                                             |
| <b>GTFS and GTFS-RT feed validation tools</b>                                            | \$5,000–\$15,000 (Year 1)  | Tools like Transitland Feed Registry or Google Transit Validator.                                                                                                                                                                                         |
| <b>Staffing: Part-time data coordinator (0.5 FTE)</b>                                    | \$40,000–\$60,000/year     | For data Quality Assurance (QA), updates, support, and communication with agencies. Can include staff time for data automation work on dashboard for region.                                                                                              |
| <b>Ongoing hosting &amp; maintenance</b>                                                 | \$10,000–\$15,000/year     | For server space, cloud backups, and domain registration.                                                                                                                                                                                                 |

#### *Approach #2: Develop a Regional Open Data Portal with Dashboards, Analytics, and Public Engagement Tools*

Approach 2 introduces more sophisticated user interfaces, real-time visualizations, and data tools, and as such, has higher upfront and recurring costs. Table 6-4 presents an estimated budget for implementing this approach. The total initial year investment is estimated to range from approximately \$130,000 to \$205,000, with annual ongoing costs projected between \$90,000 and

\$130,000<sup>39 40 41 42</sup>. Major cost drivers for implementation include platform licensing (e.g., Socrata, ArcGIS Hub), dashboard development, and integration of diverse data sources like performance metrics or GIS overlays. The complexity of desired features, such as API endpoints, interactive charts, or accessibility filters, has a direct impact on costs. However, agencies can manage these expenses by leveraging existing enterprise licenses or dedicating internal staff with GIS or data science expertise to manage dashboard content and system upkeep. Over time, as with Approach 1, staffing becomes the largest share of recurring costs, covering data curation, stakeholder support, and continuous improvements to meet public and partner expectations. External development and maintenance contracts add flexibility but also increase costs.

*Table 6-4. Estimated budget for Approach#2 Implementation*

| Budget Item                                                   | Estimated Cost              | Notes                                                                                                                                       |
|---------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regional data portal platform (ArcGIS Hub/Socrata)</b>     | \$30,000–\$60,000/year      | Pricing varies; consider platform already in use by city/county agencies.                                                                   |
| <b>Dashboard &amp; analytics development (e.g., Power BI)</b> | \$20,000–\$40,000 (Year 2+) | Interactive visualizations for ridership, performance, and equity.                                                                          |
| <b>Custom APIs and developer documentation</b>                | \$10,000–\$25,000 (Year 2+) | To allow real-time data access and app development.                                                                                         |
| <b>GIS data integration and mapping tools</b>                 | \$15,000–\$30,000 (Year 2+) | Includes stop locations, routes, amenities, and overlays.                                                                                   |
| <b>Schema and standardization efforts (GTFS-ride, etc.)</b>   | \$10,000–\$20,000 (Year 1)  | Needed for ridership, APC, and performance datasets.                                                                                        |
| <b>Staffing: Full-time open data coordinator (1 FTE)</b>      | \$75,000–\$100,000/year     | Leads data governance, QA, publishing, and stakeholder engagement. Can include staff time for data automation work on dashboard for region. |
| <b>Regional stakeholder engagement &amp; training</b>         | \$10,000–\$15,000/year      | Workshops, technical assistance, and agency coordination.                                                                                   |
| <b>Cybersecurity &amp; licensing audit</b>                    | \$5,000–\$10,000 (Year 1)   | Terms of use, access levels, and compliance.                                                                                                |

<sup>39</sup> City of Fort Collins. (n.d.). *Open data portal software as a service: RFP documents*. Retrieved from <https://records.fcgov.com/WebLink/DocView.aspx?dbid=0&id=8604650&repo=FortCollins>

<sup>40</sup> City of Sacramento. (2023). *Enterprise agreement with Esri for ArcGIS software* [Council report]. Retrieved from [https://sacramento.granicus.com/MetaViewer.php?clip\\_id=5619&meta\\_id=738436&view\\_id=22](https://sacramento.granicus.com/MetaViewer.php?clip_id=5619&meta_id=738436&view_id=22)

<sup>41</sup> City of Chicago. (2023). *Application infrastructure hosting and cloud computing services: Tyler Technologies Inc. (AIS)* [Procurement document]. Retrieved from <https://www.chicago.gov/content/dam/city/depts/dps/SoleSource/NCRB2023/Tyler%20Technologies%20Inc%20%28AIS%29%20-%20Application%20Infrastructure%20Hosting%20and%20Cloud%20Computing%20Services.pdf>

<sup>42</sup> National League of Cities. (2016). *Open data policies report*. Retrieved from <https://www.nlc.org/wp-content/uploads/2016/12/CSAR-Open-Data-Report-FINAL.pdf>

Tables 6-5 and 6-6 on the following page present a recommended split of the cost estimate among Wake, Durham, and Orange Counties based on a percentage of 2024 NTD hours within the region. The average amount of the range of figures provided in Tables 6-3 and 6-4 is multiplied by the percent of all NTD hours for each agency to arrive at the totals presented in Table 6-5 and 6-6. Note that these are planning-level cost estimates to guide Counties in planning for the two approaches described within this chapter.

Table 6-5. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Approach 1 - Leveraging Existing Data Feeds

|                                                                                                                                           | 2024 NTD Hours ** | Percent of All NTD Hours |                              | Year 1 Total    | Annual Total (Years 2-5) | Totals           |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|------------------------------|-----------------|--------------------------|------------------|
| GoTriangle                                                                                                                                | 146,063           | 11%                      | <b>Wake County Total</b>     | <b>\$23,972</b> | <b>\$55,436</b>          | <b>\$245,717</b> |
| GoCary                                                                                                                                    | 73,052            | 6%                       | GoRaleigh Estimate           | \$19,211        | \$44,425                 | \$196,912        |
| GoDurham                                                                                                                                  | 282,605           | 22%                      | GoCary Estimate              | \$2,268         | \$5,244                  | \$23,244         |
| GoRaleigh                                                                                                                                 | 618,864           | 48%                      | GoTriangle Estimate          | \$2,494         | \$5,767                  | \$25,561         |
| Chapel Hill Transit                                                                                                                       | 167,983           | 13%                      | <b>Durham County Total</b>   | <b>\$10,133</b> | <b>\$23,432</b>          | <b>\$103,863</b> |
|                                                                                                                                           |                   |                          | GoDurham Estimate            | \$8,773         | \$20,287                 | \$89,920         |
| Total                                                                                                                                     | 1,288,567         | 100%                     | GoTriangle Estimate          | \$1,360         | \$3,146                  | \$13,942         |
| ** Annual Vehicle Revenue Hours                                                                                                           |                   |                          | <b>Orange County Total</b>   | <b>\$6,381</b>  | <b>\$14,757</b>          | <b>\$65,407</b>  |
| Note: Cost estimate split is based upon the planning-level cost estimate by vehicles. GoTriangle hours are split 55/30/15 among counties. |                   |                          | Chapel Hill Transit Estimate | \$5,215         | \$12,059                 | \$53,449         |
|                                                                                                                                           |                   |                          | OCPT Estimate                | \$487           | \$1,125                  | \$4,987          |
|                                                                                                                                           |                   |                          | GoTriangle Estimate          | \$680           | \$1,573                  | \$6,971          |

Table 6-6. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Approach 2 - Developing Regional Open Data Portal

|                                                                                                                                           | 2024 NTD Hours ** | Percent of All NTD Hours |                              | Year 1 Total    | Annual Total (Years 2-5) | Totals           |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|------------------------------|-----------------|--------------------------|------------------|
| GoTriangle                                                                                                                                | 146,063           | 11%                      | <b>Wake County Total</b>     | <b>\$13,484</b> | <b>\$128,852</b>         | <b>\$528,891</b> |
| GoCary                                                                                                                                    | 73,052            | 6%                       | GoRaleigh Estimate           | \$10,806        | \$103,259                | \$423,841        |
| GoDurham                                                                                                                                  | 282,605           | 22%                      | GoCary Estimate              | \$1,276         | \$12,189                 | \$50,031         |
| GoRaleigh                                                                                                                                 | 618,864           | 48%                      | GoTriangle Estimate          | \$1,403         | \$13,404                 | \$55,019         |
| Chapel Hill Transit                                                                                                                       | 167,983           | 13%                      | <b>Durham County Total</b>   | <b>\$5,700</b>  | <b>\$54,464</b>          | <b>\$223,558</b> |
|                                                                                                                                           |                   |                          | GoDurham Estimate            | \$4,935         | \$47,153                 | \$193,547        |
| Total                                                                                                                                     | 1,288,567         | 100%                     | GoTriangle Estimate          | \$765           | \$7,311                  | \$30,010         |
| ** Annual Vehicle Revenue Hours                                                                                                           |                   |                          | <b>Orange County Total</b>   | <b>\$3,589</b>  | <b>\$34,299</b>          | <b>\$140,785</b> |
| Note: Cost estimate split is based upon the planning-level cost estimate by vehicles. GoTriangle hours are split 55/30/15 among counties. |                   |                          | Chapel Hill Transit Estimate | \$2,933         | \$28,028                 | \$115,046        |
|                                                                                                                                           |                   |                          | OCPT Estimate                | \$274           | \$2,615                  | \$10,734         |
|                                                                                                                                           |                   |                          | GoTriangle Estimate          | \$383           | \$3,656                  | \$15,005         |

While Approach 1 offers a low-cost and practical starting point by centralizing access to existing transit feeds, Approach 2 provides a more future-ready solution that aligns with long-term regional goals. By incorporating interactive dashboards, performance metrics, and advanced data visualization tools, Approach 2 enables deeper insights for planners, researchers, and the public. It supports more sophisticated use cases such as equity analysis, service optimization, and cross-agency performance comparisons—capabilities that are increasingly essential for modern transit planning and public accountability. Additionally, by investing in a robust platform now, regional agencies can reduce technical debt over time and avoid duplicative efforts across agencies, ultimately fostering stronger collaboration and public trust.

Table 6-7 presents a summary of the pros and cons of these two approaches for review and consideration.

*Table 6-7 Comparison of Pros and Cons of Approaches for Regional Open Data Portal*

| <b>Approach 1:<br/>Leverage Existing Data Feeds<br/>to Build Open Data Portal</b> |                                                                | <b>Approach 2:<br/>Develop New Regional Open Data Portal</b>            |                                                       |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------|
| <b>Pros</b>                                                                       | <b>Cons</b>                                                    | <b>Pros</b>                                                             | <b>Cons</b>                                           |
| <b>Lower cost overall due to use of existing agency resources</b>                 | Limited in different types of analyses that could be performed | <b>More sophisticated user interfaces</b>                               | Higher cost due to licensing with vendors             |
| <b>Minimizes new system development</b>                                           | Require lead agency to manage ongoing coordination in region   | <b>Aligned with longer term regional goals</b>                          | Additional cost with maintenance of servers over time |
| <b>Use of existing staff as regional steward(s) for data analysis</b>             |                                                                | <b>Can allow for deeper analysis of equity and service optimization</b> |                                                       |
| <b>Use of existing data feeds in region</b>                                       |                                                                | <b>Can help to reduce duplicative efforts</b>                           |                                                       |

## 6.8 Roadmap and Resiliency Plan for OTD in Future Years

The following roadmap outlines phased steps that regional transit partners can take to establish and sustain an Open Transit Data (OTD) Portal, regardless of whether they pursue a foundational data aggregation model (Approach 1) or a more advanced portal with analytics and dashboards (Approach 2). Phases 1 through 4 represent common actions applicable to both approaches, including data standardization, governance, and centralized public access. Phases 5 and 6 apply when the region elects to pursue the expanded functionality described in Approach 2, such as visualization tools, performance dashboards, and engagement features. This roadmap is supported by resiliency strategies to ensure the portal remains accurate, secure, and adaptable over time.

Figure 5-6. Budgetary Planning-Level Recommendations for Transit Agency Consideration<sup>27</sup>

|                                   | Per Vehicle Estimate for Transit Agencies | Notes on Cost Estimates for Agency Considerations                                                                                                                  |
|-----------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software for creating GTFS-Static | <b>\$180-\$700 annually per vehicle</b>   | Costs are based on existing contracts held by Rio Metro Regional Transit District, Northwest Arkansas Regional Planning Commission and posted prices by AddTransit |
| Average Cost                      | <b>\$440 per vehicle</b>                  |                                                                                                                                                                    |

Figure 5-7. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Regional GTFS Updates

| Agency                                                                                                                                    | Buses in Fleet ** |                              | Total Cost per Year | Total Cost for all Years 1-5 |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------|---------------------|------------------------------|
| GoTriangle                                                                                                                                | 82                | <b>Wake County Total</b>     | <b>\$88,044</b>     | <b>\$440,220</b>             |
| GoCary                                                                                                                                    | 20                | GoRaleigh Estimate           | \$59,400            | \$297,000                    |
| GoDurham                                                                                                                                  | 63                | GoCary Estimate              | \$8,800             | \$44,000                     |
| GoRaleigh                                                                                                                                 | 135               | GoTriangle Estimate          | \$19,844            | \$99,220                     |
| Chapel Hill Transit                                                                                                                       | 99                | <b>Durham County Total</b>   | <b>\$40,348</b>     | <b>\$201,740</b>             |
|                                                                                                                                           |                   | GoDurham Estimate            | \$27,720            | \$138,600                    |
| ** Based on 2024 NTD Data                                                                                                                 |                   | GoTriangle Estimate          | \$12,628            | \$63,140                     |
| Note: Cost estimate split is based upon the planning-level cost estimate by vehicles. GoTriangle hours are split 55/30/15 among counties. |                   | <b>Orange County Total</b>   | <b>\$53,036</b>     | <b>\$265,181</b>             |
|                                                                                                                                           |                   | Chapel Hill Transit Estimate | \$43,560            | \$217,800                    |
|                                                                                                                                           |                   | OCPT Estimate                | \$4,064             | \$20,321                     |
|                                                                                                                                           |                   | GoTriangle Estimate          | \$5,412             | \$27,060                     |

<sup>27</sup> Costs for GTFS-RT are outlined in Chapter 1, Real-time and Trip Planning.

#### 4.6.1 Regional Fare Collections Budget Recommendations (Wake, Durham, and Orange County)

The region's agencies have different fare collection equipment systems on board their buses. The following provides a rough order-of-magnitude (ROM) estimate for three options to achieve regionally integrated payments. See Appendix B for a more detailed estimate.

Three agencies in the region use Umo 2.0 validators for electronic fare collection and two currently collect cash using Genfare fareboxes to collect fixed route fares in the region. As shown earlier in Figure 4-3, three agencies representing the highest ridership in the region collect fares while ten do not collect fares at this time. The blended approach of fare-free transit and fared transit creates additional complexity when regionalizing a payment system. Agencies working towards integrating a regional payment system typically align fare policies, business rules, hardware, and software solutions. The fewer variations and exceptions to rules typically translate into a simpler development and deployment of integrated payments in the region. It also translates into simpler fare rules that riders can understand and generalize for travel in the region.

In addition to the capital costs below, when agencies seek common fare collection systems agencies must consider funding internal work by planning and operations staff in the region for agency collaboration before, during, and after procurements. Regional alignment requires coordination and mutual understanding of current systems and criteria of future fare collection system throughout design and implementation.

**Assumptions:** While initial integration effort is considered, none of the on-going operational costs (SaaS, transaction fees, cell service, etc.) are included. Estimates are limited to equipment, hardware, and related software implementation including initial integration development and back-office development. Fleet size is based on 2023 NTD data. Table 4-1 presents a recommended split of the cost estimate among Wake, Durham, and Orange Counties based on a percentage of 2024 NTD hours within the region. The average amount of the range of figures provided for Options A, B, and C below are multiplied by the percent of all NTD hours for each agency to arrive at the totals presented in Table 4-1. Note that these are planning-level cost estimates to guide Counties in planning for the three approaches described within this chapter.

|                              | OPTION A.<br>Replace/upgrade current fareboxes with single validating farebox for all payments and open loop functions. Remove validators in use. Single back office. |                     | OPTION B.<br>Replace validators to accept open payment. Replace fareboxes with mechanical farebox. Single back office. |                    | OPTION C.<br>Integrate existing systems with open payment overlay. Keep newer existing fareboxes. Likely validator replacement. Preserve back-office status-quo. |                    |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                              | Low                                                                                                                                                                   | High                | Low                                                                                                                    | High               | Low                                                                                                                                                              | High               |
| <b>System Costs</b>          | \$4,112,500                                                                                                                                                           | \$6,557,800         | \$1,582,500                                                                                                            | \$3,278,800        | \$3,007,500                                                                                                                                                      | \$4,524,800        |
| <b>Variable System Costs</b> | \$2,454,990                                                                                                                                                           | \$5,177,870         | \$2,454,990                                                                                                            | \$5,177,870        | \$2,454,990                                                                                                                                                      | \$5,177,870        |
| <b>Warranty</b>              | \$104,400                                                                                                                                                             | \$182,700           | \$104,400                                                                                                              | \$182,700          | \$104,400                                                                                                                                                        | \$182,700          |
| <b>Option Estimate TOTAL</b> | <b>\$6,671,890</b>                                                                                                                                                    | <b>\$11,918,370</b> | <b>\$4,141,890</b>                                                                                                     | <b>\$8,639,370</b> | <b>\$5,566,890</b>                                                                                                                                               | <b>\$9,885,370</b> |

**NOTE: Staffing and internal operations costs are not included.**

Table 4-1. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Fare Collection Technology Options

| Option A                        | 2024 NTD Hours ** | Percent of All NTD Hours |
|---------------------------------|-------------------|--------------------------|
| GoTriangle                      | 146,063           | 11%                      |
| GoCary                          | 73,052            | 6%                       |
| GoDurham                        | 282,605           | 22%                      |
| GoRaleigh                       | 618,864           | 48%                      |
| Chapel Hill Transit             | 167,983           | 13%                      |
|                                 |                   |                          |
| Total                           | 1,288,567         | 100%                     |
| ** Annual Vehicle Revenue Hours |                   |                          |

| Option B                        | 2024 NTD Hours ** | Percent of All NTD Hours |
|---------------------------------|-------------------|--------------------------|
| GoTriangle                      | 146,063           | 11%                      |
| GoCary                          | 73,052            | 6%                       |
| GoDurham                        | 282,605           | 22%                      |
| GoRaleigh                       | 618,864           | 48%                      |
| Chapel Hill Transit             | 167,983           | 13%                      |
|                                 |                   |                          |
| Total                           | 1,288,567         | 100%                     |
| ** Annual Vehicle Revenue Hours |                   |                          |

| Option C                        | 2024 NTD Hours ** | Percent of All NTD Hours |
|---------------------------------|-------------------|--------------------------|
| GoTriangle                      | 146,063           | 11%                      |
| GoCary                          | 73,052            | 6%                       |
| GoDurham                        | 282,605           | 22%                      |
| GoRaleigh                       | 618,864           | 48%                      |
| Chapel Hill Transit             | 167,983           | 13%                      |
|                                 |                   |                          |
| Total                           | 1,288,567         | 100%                     |
| ** Annual Vehicle Revenue Hours |                   |                          |

Note: Cost estimate splits are based upon percent of all NTD hours within region. GoTriangle hours are split 55/30/15 among counties.

| Option A                     | Total Cost for Years 1-5 |
|------------------------------|--------------------------|
| <b>Wake County Total</b>     | <b>\$5,570,661</b>       |
| GoRaleigh Estimate           | \$4,464,200              |
| GoCary Estimate              | \$526,964                |
| GoTriangle Estimate          | \$579,497                |
| <b>Durham County Total</b>   | <b>\$2,354,672</b>       |
| GoDurham Estimate            | \$2,038,583              |
| GoTriangle Estimate          | \$316,089                |
| <b>Orange County Total</b>   | <b>\$1,482,583</b>       |
| Chapel Hill Transit Estimate | \$1,211,752              |
| OCPT Estimate                | \$113,056                |
| GoTriangle Estimate          | \$158,045                |

| Option B                     | Total Cost for Years 1-5 |
|------------------------------|--------------------------|
| <b>Wake County Total</b>     | <b>\$3,829,966</b>       |
| GoRaleigh Estimate           | \$3,069,247              |
| GoCary Estimate              | \$362,300                |
| GoTriangle Estimate          | \$398,419                |
| <b>Durham County Total</b>   | <b>\$1,618,895</b>       |
| GoDurham Estimate            | \$1,401,576              |
| GoTriangle Estimate          | \$217,319                |
| <b>Orange County Total</b>   | <b>\$1,019,498</b>       |
| Chapel Hill Transit Estimate | \$833,109                |
| OCPT Estimate                | \$77,729                 |
| GoTriangle Estimate          | \$108,660                |

| Option C                     | Total Cost for Years 1-5 |
|------------------------------|--------------------------|
| <b>Wake County Total</b>     | <b>\$4,630,344</b>       |
| GoRaleigh Estimate           | \$3,710,652              |
| GoCary Estimate              | \$438,013                |
| GoTriangle Estimate          | \$481,679                |
| <b>Durham County Total</b>   | <b>\$1,957,208</b>       |
| GoDurham Estimate            | \$1,694,474              |
| GoTriangle Estimate          | \$262,734                |
| <b>Orange County Total</b>   | <b>\$1,232,551</b>       |
| Chapel Hill Transit Estimate | \$1,007,211              |
| OCPT Estimate                | \$93,973                 |
| GoTriangle Estimate          | \$131,367                |

Table 1-2. Budgetary Planning-Level Cost Estimates for Real-Time Transit Information

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Buses in Fleet | Value-Added Application per Vehicle (1) | Detour Notifications per Vehicle (2) | Service Update Alerts per Vehicle (2) | One-Time Costs (2) | Year 1 Costs     | Annual Cost Estimate After Year 1 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------|--------------------------------------|---------------------------------------|--------------------|------------------|-----------------------------------|
| GoTriangle                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 82             | \$300                                   | \$550                                | \$290                                 | \$405              | \$126,690        | \$93,480                          |
| GoCary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 20             | \$300                                   | \$550                                | \$290                                 | \$405              | \$30,900         | \$22,800                          |
| GoDurham                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 63             |                                         | \$550                                | \$290                                 | \$405              | \$78,435         | \$52,920                          |
| GoRaleigh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 135            |                                         | \$550                                | \$290                                 | \$405              | \$168,075        | \$113,400                         |
| Chapel Hill Transit                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 99             |                                         | \$550                                | \$290                                 | \$405              | \$123,255        | \$83,160                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                         |                                      |                                       |                    | <b>\$527,355</b> | <b>\$365,760</b>                  |
| 1 - Average value based upon multiple existing contracts held by Cleveland RTA, SORTA, Utah Transit Authority, and Champaign-Urbana Mass Transit District. Contract values vary based on economies of scale for larger agencies and the Transit App features purchased beyond the core offer of Royale (fare payment integrations, Passenger feedback/Rate-My-Ride, automatic detour detection & Display, APIs for web-based trip planning, push notifications, network change previews) |                |                                         |                                      |                                       |                    |                  |                                   |
| 2 - Values based on the listed annual price per vehicle provided from a transit vendor to Citibus in Lubbock, Texas                                                                                                                                                                                                                                                                                                                                                                      |                |                                         |                                      |                                       |                    |                  |                                   |

Table 1-3. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Real-Time Transit Information Updates

|                                                                                                                                 | 2024 NTD Hours ** | Percent of All NTD Hours |                              | Year 1 Total     | Annual Total (Years 2-5) | Totals             |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|------------------------------|------------------|--------------------------|--------------------|
| GoTriangle                                                                                                                      | 146,063           | 11%                      | <b>Wake County Total</b>     | <b>\$316,049</b> | <b>\$219,204</b>         | <b>\$1,192,863</b> |
| GoCary                                                                                                                          | 73,052            | 6%                       | GoRaleigh Estimate           | \$253,274        | \$175,665                | \$955,933          |
| GoDurham                                                                                                                        | 282,605           | 22%                      | GoCary Estimate              | \$29,897         | \$20,736                 | \$112,840          |
| GoRaleigh                                                                                                                       | 618,864           | 48%                      | GoTriangle Estimate          | \$32,878         | \$22,803                 | \$124,090          |
| Chapel Hill Transit                                                                                                             | 167,983           | 13%                      | <b>Durham County Total</b>   | <b>\$133,591</b> | <b>\$92,655</b>          | <b>\$504,213</b>   |
|                                                                                                                                 |                   |                          | GoDurham Estimate            | \$115,658        | \$80,217                 | \$436,528          |
|                                                                                                                                 |                   |                          | GoTriangle Estimate          | \$17,933         | \$12,438                 | \$67,685           |
| Total                                                                                                                           | 1,288,567         | 100%                     | <b>Orange County Total</b>   | <b>\$84,129</b>  | <b>\$58,350</b>          | <b>\$317,528</b>   |
| ** Annual Vehicle Revenue Hours                                                                                                 |                   |                          | Chapel Hill Transit Estimate | \$68,748         | \$47,682                 | \$259,476          |
| Note: Cost estimate split is based upon percent of all NTD hours in region. GoTriangle hours are split 55/30/15 among counties. |                   |                          | OCPT Estimate                | \$6,414          | \$4,449                  | \$24,209           |
|                                                                                                                                 |                   |                          | GoTriangle Estimate          | \$8,967          | \$6,219                  | \$33,843           |

Table 2-1, below, presents an example cost estimate that assumes one (1) primary agency and five (5) additional agencies which are using a combination of the eight tools listed. The cost estimate also assumes the unified platform approach will include service planning tools currently used by at least 3 partner agencies.

*Table 2-1. Cost Estimate Comparison of Multiple Service Planning Tools and Consistent Service Planning Tools*

| Cost Element                                      | Separate Tools<br>(across 6 agencies) | Unified Platform Adopted by<br>all Agencies (same<br>combination of tools) |
|---------------------------------------------------|---------------------------------------|----------------------------------------------------------------------------|
|                                                   | <i>Estimated Range</i>                | <i>Estimated Range</i>                                                     |
| Licensing & Subscriptions<br>(Year 1)             | \$470,000 – \$510,000                 | \$325,000 – \$490,000                                                      |
| Initial Training & Onboarding                     | \$150,000 – \$170,000                 | \$96,000 – \$180,000                                                       |
| Data Integration & Management<br>(Annual)         | \$230,000 – \$270,000                 | \$165,000 – \$275,000                                                      |
| Interagency Planning and<br>Coordination (Annual) | \$140,000 – \$180,000                 | \$92,000 – \$145,000                                                       |
| Year 1 Total Estimated Cost                       | <b>\$990,000 – \$1,130,000</b>        | <b>\$678,000 – \$1,090,000</b>                                             |
| Annual (Multi-Agency) Cost                        | \$740,000 – \$800,000                 | \$390,000 – \$420,000                                                      |

Note: Costs in this figure are aggregated and blended from a review of the USDOT ITS Costs and Benefits database available at: <https://www.itskrs.its.dot.gov/costs/>

In addition to the capital and operating costs, agencies must consider key factors such as workflow efficiency and inter-agency collaboration requirements.

Table 2-2 and 2-3 on the following page present a recommended split of the cost estimate among Wake, Durham, and Orange Counties based on a percentage of 2024 NTD hours within the region. The average amount of the range of figures provided in Table 2-1 is multiplied by the percent of all NTD hours for each agency to arrive at the totals presented in Tables 2-2 and 2-3. Note that these are planning-level cost estimates to guide Counties in planning for the two approaches described within this chapter.

Table 2-2. Wake /Durham/Orange County Split of Planning-Level Cost Estimate Under Approach #1 of Separate Tools Across All Agencies

|                                                                                                                                 | 2024 NTD Hours ** | Percent of All NTD Hours |                              | Year 1 Total     | Annual Total (Years 2-5) | Totals (Years 1-5) |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|------------------------------|------------------|--------------------------|--------------------|
| GoTriangle                                                                                                                      | 146,063           | 11%                      | <b>Wake County Total</b>     | <b>\$635,268</b> | <b>\$461,468</b>         | <b>\$2,481,142</b> |
| GoCary                                                                                                                          | 73,052            | 6%                       | GoRaleigh Estimate           | \$509,089        | \$369,810                | \$1,988,330        |
| GoDurham                                                                                                                        | 282,605           | 22%                      | GoCary Estimate              | \$60,094         | \$43,653                 | \$234,707          |
| GoRaleigh                                                                                                                       | 618,864           | 48%                      | GoTriangle Estimate          | \$66,085         | \$48,005                 | \$258,105          |
| Chapel Hill Transit                                                                                                             | 167,983           | 13%                      | <b>Durham County Total</b>   | <b>\$268,523</b> | <b>\$195,059</b>         | <b>\$1,048,758</b> |
|                                                                                                                                 |                   |                          | GoDurham Estimate            | \$232,476        | \$168,874                | \$907,974          |
| Total                                                                                                                           | 1,288,567         | 100%                     | GoTriangle Estimate          | \$36,046         | \$26,185                 | \$140,784          |
| ** Annual Vehicle Revenue Hours                                                                                                 |                   |                          | <b>Orange County Total</b>   | <b>\$169,102</b> | <b>\$122,838</b>         | <b>\$660,455</b>   |
| Note: Cost estimate split is based upon percent of all NTD hours in region. GoTriangle hours are split 55/30/15 among counties. |                   |                          | Chapel Hill Transit Estimate | \$138,186        | \$100,380                | \$539,708          |
|                                                                                                                                 |                   |                          | OCPT Estimate                | \$12,893         | \$9,365                  | \$50,355           |
|                                                                                                                                 |                   |                          | GoTriangle Estimate          | \$18,023         | \$13,092                 | \$70,392           |

Table 2-3. Wake/Durham/Orange County Split of Planning-Level Cost Estimate Under Approach #2 of Unified Platform Adopted by All Agencies

|                                                                                                                                 | 2024 NTD Hours ** | Percent of All NTD Hours |                              | Year 1 Total     | Annual Total (Years 2-5) | Totals (Years 1-5) |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|------------------------------|------------------|--------------------------|--------------------|
| GoTriangle                                                                                                                      | 146,063           | 11%                      | <b>Wake County Total</b>     | <b>\$529,790</b> | <b>\$242,720</b>         | <b>\$1,500,671</b> |
| GoCary                                                                                                                          | 73,052            | 6%                       | GoRaleigh Estimate           | \$424,561        | \$194,511                | \$1,202,604        |
| GoDurham                                                                                                                        | 282,605           | 22%                      | GoCary Estimate              | \$50,116         | \$22,960                 | \$141,958          |
| GoRaleigh                                                                                                                       | 618,864           | 48%                      | GoTriangle Estimate          | \$55,112         | \$25,249                 | \$156,110          |
| Chapel Hill Transit                                                                                                             | 167,983           | 13%                      | <b>Durham County Total</b>   | <b>\$223,938</b> | <b>\$102,596</b>         | <b>\$634,321</b>   |
|                                                                                                                                 |                   |                          | GoDurham Estimate            | \$193,876        | \$88,823                 | \$549,170          |
| Total                                                                                                                           | 1,288,567         | 100%                     | GoTriangle Estimate          | \$30,061         | \$13,772                 | \$85,151           |
| ** Annual Vehicle Revenue Hours                                                                                                 |                   |                          | <b>Orange County Total</b>   | <b>\$141,025</b> | <b>\$64,610</b>          | <b>\$399,463</b>   |
| Note: Cost estimate split is based upon percent of all NTD hours in region. GoTriangle hours are split 55/30/15 among counties. |                   |                          | Chapel Hill Transit Estimate | \$115,242        | \$52,797                 | \$326,432          |
|                                                                                                                                 |                   |                          | OCPT Estimate                | \$10,752         | \$4,926                  | \$30,456           |
|                                                                                                                                 |                   |                          | GoTriangle Estimate          | \$15,031         | \$6,886                  | \$42,575           |

Table 3-3. Budgetary Planning Recommendations for Transit Agency Consideration

| TSP System Approaches                                     | Vehicle Budget Items                                                                                                     | Intersection Budget Items                                                                                                     | Other TSP Project Items                                                                                                                                                                       |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Use of Connected Vehicle (CV) Approach for TSP Operations | <b>\$5,000</b> per OnBoard Unit (OBU) for purchase, installation, and integration with existing AVL hardware on vehicles | <b>\$5,000</b> per Roadside Unit (RSU) for purchase, installation, and setup at traffic signal                                | <b>\$30,000</b> for communications backhaul from intersections to central software.<br><br><b>\$25,000</b> per year for vendor PM costs, warranty, and central software access for monitoring |
| Use of Existing Cloud-Based TSP Software                  | <b>\$5,000</b> per OnBoard Unit (OBU) for purchase, installation, and integration with existing AVL hardware on vehicles | If expanding to signals outside of current deployment, <b>\$10,000</b> for new equipment and integration with traffic signals | <b>\$25,000</b> per year for vendor PM costs, warranty, and central software access for monitoring                                                                                            |

Table 3-4. Planning-Level Cost Estimate for Use of Connected Vehicle (CV) Approach for TSP Operations

|                                 | Buses in Fleet | Vehicle Cost Estimate | Intersections on Transit Routes | Intersection Cost Estimate | Other TSP Project Items* | Total Costs        | Notes                                                 |
|---------------------------------|----------------|-----------------------|---------------------------------|----------------------------|--------------------------|--------------------|-------------------------------------------------------|
| GoTriangle                      | 82             | \$5,000               | 203                             | \$5,000                    | \$55,000                 | \$1,480,000        | Assumes 7 intersections on Western Blvd. with CV RSUs |
| GoCary                          | 15             | \$5,000               | 78                              | \$5,000                    | \$55,000                 | \$520,000          |                                                       |
| GoDurham                        | 0              | \$5,000               | 291                             | \$5,000                    | \$55,000                 | \$1,510,000        | Assumes all Durham buses capable of TSP               |
| GoRaleigh                       | 135            | \$5,000               | 506                             | \$5,000                    | \$55,000                 | \$3,260,000        | Assumes 7 intersections on Western Blvd. with CV RSUs |
| Chapel Hill Transit             | 99             | \$5,000               | 87                              | \$5,000                    | \$55,000                 | \$985,000          |                                                       |
| * See notes in Table 3-3 above. |                |                       |                                 |                            |                          | <b>\$7,755,000</b> |                                                       |

Table 3-5. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Connected Vehicle (CV) Approach for TSP Operations

|                                                                                                                                     | 2024 NTD Hours ** | Percent of All NTD Hours |  | County Estimates with Transit Agencies | Totals             | Notes                       |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|--|----------------------------------------|--------------------|-----------------------------|
| GoTriangle                                                                                                                          | 146,063           | 11%                      |  | <b>Wake County Total</b>               | <b>\$4,647,646</b> | Five-year total amount      |
| GoCary                                                                                                                              | 73,052            | 6%                       |  | GoRaleigh Estimate                     | \$3,724,517        |                             |
| GoDurham                                                                                                                            | 282,605           | 22%                      |  | GoCary Estimate                        | \$439,650          |                             |
| GoRaleigh                                                                                                                           | 618,864           | 48%                      |  | GoTriangle Estimate                    | \$483,479          | 55% of GoTriangle NTD Hours |
| Chapel Hill Transit                                                                                                                 | 167,983           | 13%                      |  | <b>Durham County Total</b>             | <b>\$1,964,521</b> | Five-year total amount      |
|                                                                                                                                     |                   |                          |  | GoDurham Estimate                      | \$1,700,805        |                             |
| Totals                                                                                                                              | 1,288,567         | <b>100%</b>              |  | GoTriangle Estimate                    | \$263,716          | 30% of GoTriangle NTD Hours |
| ** Annual Vehicle Revenue Hours from 2024 NTD Reporting                                                                             |                   |                          |  | <b>Orange County Total</b>             | <b>\$1,237,156</b> | Five-year total amount      |
| Note: Cost estimate split is based upon percent of all NTD hours within region. GoTriangle hours are split 55/30/15 among counties. |                   |                          |  | Chapel Hill Transit Estimate           | \$1,010,974        |                             |
|                                                                                                                                     |                   |                          |  | OCPT Estimate                          | \$94,324           |                             |
|                                                                                                                                     |                   |                          |  | GoTriangle Estimate                    | \$131,858          | 15% of GoTriangle NTD Hours |

Table 3-6. Planning-Level Cost Estimate for Use of Existing Cloud-Based TSP Software

|                                | Buses<br>in Fleet | Vehicle Cost<br>Estimate | Intersections<br>on Transit<br>Routes | Intersection<br>Cost<br>Estimate | Other TSP<br>Project<br>Items* | Total Costs        | Notes                                                                                      |
|--------------------------------|-------------------|--------------------------|---------------------------------------|----------------------------------|--------------------------------|--------------------|--------------------------------------------------------------------------------------------|
| GoTriangle                     | 82                | \$5,000                  | 140                                   | \$10,000                         | \$25,000                       | \$1,835,000        | Intersection total accounts for signals in Durham and Cary areas already equipped for TSP. |
| GoCary                         | 15                | \$5,000                  | 0                                     | \$10,000                         | \$25,000                       | \$100,000          | 5 buses already using TSP. Intersections in Cary ready for cloud-based TSP.                |
| GoDurham                       | 0                 | \$5,000                  | 0                                     | \$10,000                         | \$25,000                       | \$25,000           | Assumes all Durham buses capable of TSP                                                    |
| GoRaleigh                      | 135               | \$5,000                  | 497                                   | \$10,000                         | \$25,000                       | \$5,670,000        | Intersection total accounts for 16 signals on New Bern with cloud-based TSP                |
| Chapel Hill Transit            | 99                | \$5,000                  | 87                                    | \$10,000                         | \$25,000                       | \$1,390,000        |                                                                                            |
| * See notes in Table 3-3 above |                   |                          |                                       |                                  |                                | <b>\$9,020,000</b> |                                                                                            |

Table 3-7. Wake/Durham/Orange County Split of Planning-Level Cost Estimate for Use of Existing Cloud-Based TSP Software

|                                                                                                                                     | 2024 NTD<br>Hours ** | Percent of All<br>NTD Hours |  | County Estimates with<br>Transit Agencies | Totals             | Notes                       |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------|--|-------------------------------------------|--------------------|-----------------------------|
| GoTriangle                                                                                                                          | 146,063              | 11%                         |  | <b>Wake County</b>                        | <b>\$5,405,773</b> | Five-year total amount      |
| GoCary                                                                                                                              | 73,052               | 6%                          |  | GoRaleigh Estimate                        | \$4,332,063        |                             |
| GoDurham                                                                                                                            | 282,605              | 22%                         |  | GoCary Estimate                           | \$511,366          |                             |
| GoRaleigh                                                                                                                           | 618,864              | 48%                         |  | GoTriangle Estimate                       | \$562,344          | 55% of GoTriangle NTD Hours |
| Chapel Hill Transit                                                                                                                 | 167,983              | 13%                         |  | <b>Durham County</b>                      | <b>\$2,284,975</b> | Five-year total amount      |
|                                                                                                                                     |                      |                             |  | GoDurham Estimate                         | \$1,978,242        |                             |
| Totals                                                                                                                              | 1,288,567            | <b>100%</b>                 |  | GoTriangle Estimate                       | \$306,733          | 30% of GoTriangle NTD Hours |
| ** Annual Vehicle Revenue Hours from 2024 NTD Reporting                                                                             |                      |                             |  | <b>Orange County</b>                      | <b>\$1,438,962</b> | Five-year total amount      |
| Note: Cost estimate split is based upon percent of all NTD hours within region. GoTriangle hours are split 55/30/15 among counties. |                      |                             |  | Chapel Hill Transit Estimate              | \$1,175,885        |                             |
|                                                                                                                                     |                      |                             |  | OCPT Estimate                             | \$109,710          |                             |
|                                                                                                                                     |                      |                             |  | GoTriangle Estimate                       | \$153,367          | 15% of GoTriangle NTD Hours |