Iowa City-North Liberty Commuter Rail Conceptual Feasibility Study

Final

July 31, 2020

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Executive Summary

The purpose of this Iowa City-North Liberty Commuter Rail Conceptual Feasibility Study (the Study) is to incorporate previous work performed between 2015 to 2017 that considers the potential for commuter rail service implementation between Gilbert Street in Iowa City, Iowa, and Penn Street in North Liberty, Iowa – a 9.1-mile long, active freight railroad corridor over which no passenger rail services are offered at present. The Study examines the conceptual feasibility of a commuter rail service over the Cedar Rapids and Iowa City Railway (CRANDIC) Corridor and provides a more detailed understanding of the potential benefits, costs, funding, and oversight for development, operation, and maintenance of a commuter rail service.

CRANDIC, the Iowa Department of Transportation (Iowa DOT) Bureau of Rail, and the Metropolitan Planning Organization of Johnson County, Iowa (MPOJC) selected HDR as its consultant team for the Study. The railroad, Iowa DOT, MPOJC, and other local project stakeholders participated in, contributed to, and informed the development of the Study through coordination with HDR during the life of the project.

The Study was divided into the following general tasks, which culminated in this report:

- **Background** – Describe the background of recently completed and ongoing study of the feasibility passenger rail implementation in the CRANDIC Corridor right-of-way.
- **Existing Corridor Conditions** – Describe the existing conditions and infrastructure within the CRANDIC Corridor right-of-way.
- **Conceptual Economic and Social Impact and Benefit Analysis** – Qualitatively describe potential conceptual economic and social impacts and benefits associated with the implementation of a daily commuter rail service operating on 30-minute headways in the CRANDIC Corridor right-of-way between Dubuque Street in Iowa City and Penn Street in North Liberty, based on recent best planning practices and the general experience of recent rail transit implementation in the U.S. and in concert with current and anticipated future land use in Johnson County, Iowa.
- **Conceptual Commuter Rail Ridership and Revenue Forecasts, including a University of Iowa On-Board Survey** – Describe the preparation of the Federal Transit Administration's (FTA) Simplified Trips on Software (STOPS) model and the collection of a supplementary special survey data to understand the University of Iowa student travel market for the development of conceptual ridership and revenue forecasts.
- **Conceptual Equipment and Service Plan** – Describe the general characteristics of the mode and frequency of passenger rail service and equipment selected by stakeholders and its applicability to service in the CRANDIC Corridor.
- **Conceptual Opinion of Probable Cost Estimate** – Develop the conceptual opinion of probable capital and operations and maintenance costs for the selected mode of passenger rail service assessed for potential implementation on the Corridor, and identify potential alternatives that could reduce the capital cost to implement the service.
- **Federal Regulatory Requirements** – Describe the basic federal regulatory requirements for the implementation of passenger rail service selected for potential implementation on the CRANDIC Corridor.

- **Financial Plan Strategies** – Describe the federal capital project funding programs and other strategies that may be used to fund planning, design, construction, and implementation of a proposed passenger rail project like that under study for the CRANDIC Corridor, including public-private partnerships, special taxation districts, and other approaches.
- **Commuter Rail Governance and Organization Planning** – Describe common commuter rail organization and governance models that are used by U.S. rail transit agencies and could potentially be used for system ownership, management, procurement and construction, and operations and maintenance of a potential commuter rail service on the CRANDIC Corridor right-of-way between Iowa City and North Liberty.

Conceptual Equipment and Service Plan

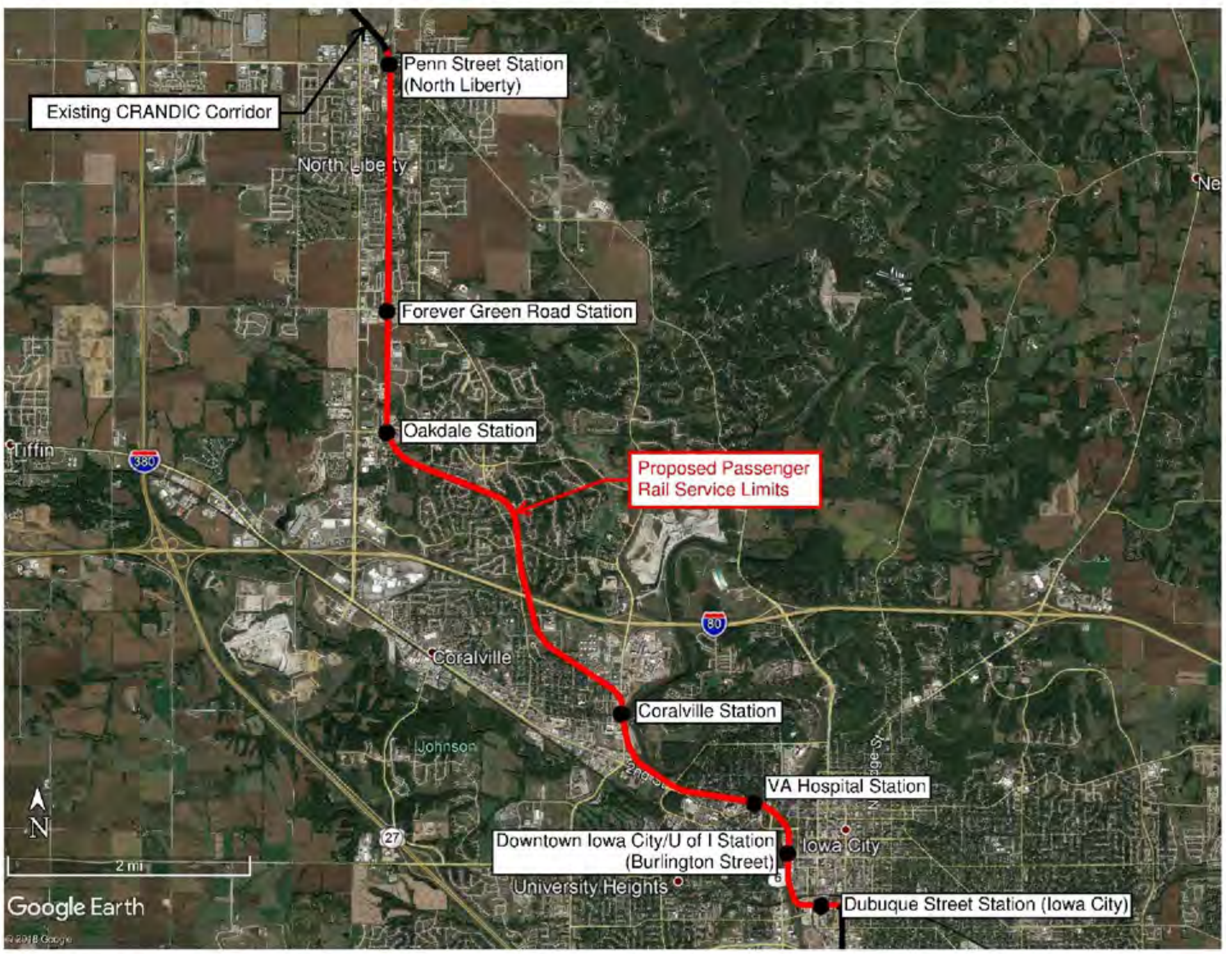
In the previous Iowa City and North Liberty Commuter Rail Study, the commuter rail transit self-propelled Diesel Multiple Unit (DMU) railcar equipment was selected by the stakeholder group as the preferred equipment type. Equipment for the potential commuter rail service implementation would include six new, self-propelled DMU coach railcars, which will be used to assemble three trainsets of two railcars each to accommodate the Iowa City-North Liberty passenger rail service. The six DMU cars would be designated as FRA Compliant, meaning they would meet the current Federal Railroad Administration (FRA) safety regulations that are generally built around specifications providing the structural integrity to withstand a crash between passenger trains and freight trains on shared-use passenger and freight rail corridors. While the Study assumes that the CRANDIC Corridor between Iowa City and North Liberty would be designated passenger rail only, the acquisition of FRA Compliant passenger cars could potentially be required later by FRA, if CRANDIC decides to restore its common carrier obligation and host freight rail operations on this segment in the future.

The Study's conceptual Service Plan for the Iowa City-North Liberty commuter rail service assumes the following:

- Potential commuter rail service schedule would operate 26 total revenue trains each way daily (for a total of 52 revenue trains) in the CRANDIC Corridor between Iowa City (Dubuque Street) and North Liberty (Penn Street), with train departures on 30-minute headways from these terminal points from 6 a.m. until 7 p.m.
- The CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty would be passenger rail only, with the potential for redevelopment as a shared-use corridor with freight trains, if the need for freight rail service arises in the future.
- The CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty would have Centralized Traffic Control (CTC) as its Method of Operation, allowing a CRANDIC dispatcher or manager in Cedar Rapids to remotely control train traffic.
- Commuter trains would be operated as a push-pull turnaround service, with one commuter train operating from each of the terminal points in the Corridor at a time. It is assumed that meet-pass events for commuter trains would routinely occur at roughly the approximate mid-point of the Corridor at a new siding located in between First Avenue and Seventh Avenue in Coralville. Meet-pass events and trainset staging (for periods of non-operation) could also occur on stub-ended station tracks at the Iowa City (Dubuque Street) and North Liberty (Penn Street) terminal points.
- Maximum commuter train speed of 50 mph assumed and average commuter train speed of 30 mph assumed.

- Operating headways (departures) of 30 minutes are assumed from terminal points. Schedules of approximately 25 minutes running time between Dubuque Street in Iowa City and Penn Street in North Liberty, including the time necessary for stops at five intermediate stations and one meet-pass event between commuter trains at Coralville, are assumed. Time necessary for a train crew to change ends (reverse direction) at the Iowa City and North Liberty terminals is assumed to be 5 minutes.
- Level boarding would be provided at the seven potential stations locations identified by CRANDIC, MPOJC, and other local stakeholders for the Study (see Figure ES-1), including:
    - Dubuque Street (Iowa City) – Southern Terminus
    - Downtown Iowa City/University of Iowa (Burlington Street)
    - VA Hospital
    - Coralville
    - Oakdale
    - Forever Green Road
    - Penn Street (North Liberty) – Northern Terminus

Figure ES-1: Potential Commuter Rail Stations



Source: HDR and Google Earth

Implementation and Operating and Maintenance Costs

Per the service plan identified above, a conceptual probable opinion of capital costs estimate to implement passenger rail service between Iowa City and North Liberty, and an associated conceptual probable opinion of probable annual Operations & Maintenance (O&M) costs were developed for the Study.

The conceptual opinion of probable capital cost for implementation of a passenger rail service between Iowa City and North Liberty is based on other recently implemented commuter rail corridors and rail industry projects in the U.S. and a conceptual level analysis of the CRANDIC Corridor. The conceptual capital cost is estimated at $49.0 million, in 2019 dollars. The conceptual opinion of probable annual O&M costs for the first year of passenger rail operations are expected to be $4.8 million, in 2019 dollars, largely driven by a more robust service operating on 30-minute headways and the enhanced infrastructure required, the need for two passenger train consists operating throughout the day, and the resulting increase in train mileage and labor requirements when compared to previous feasibility studies. Both opinions of probable cost summaries are shown in Table ES-1 below.

Table ES-1: Conceptual Opinion of Probable Costs Summary for Passenger Rail Implementation on the CRANDIC Corridor (Iowa City-North Liberty) in 2019 Dollars

Cost Component	Total (in 2019 Dollars)
Conceptual Capital Cost to Implement Passenger Rail Service on the CRANDIC Corridor	$49.0 million
Conceptual Annual Operations and Maintenance Costs on the CRANDIC Corridor	$4.8 million*

** This is an opinion of probable annual cost for operations and maintenance of the proposed service. This annual cost may fluctuate year-to-year due to changes with respect to inflation and market conditions related to fuel, labor rate, etc.*

Commuter rail service in the CRANDIC Corridor between Iowa City and North Liberty could be considered for implementation in the future by stakeholders, based upon need for the service and the availability of funding for construction and implementation. Value planning alternatives to the conceptual capital cost estimate were developed during the Study, which may potentially reduce the upfront capital cost experience for passenger rail implementation. The acquisition of reconditioned secondhand equipment could potentially lower the capital cost for procurement of equipment, if available. Conceptual capital costs could potentially be reduced further by phasing some improvements to track and bridge infrastructure.

Conceptual Ridership and Revenue Forecasts

Initial ridership forecasts show that the conceptual commuter rail service between Iowa City and North Liberty would transform the regional transit market. The travel time and reliability benefits from the commuter rail service would both attract riders currently using other modes as well as new transit riders.

In consultation with the FTA, conceptual ridership forecasts for the proposed commuter rail line were prepared using the FTA's STOPS model and the collection and integration of a special survey needed to understand the University of Iowa student travel market.

The potential commuter rail service would operate every 30 minutes between Dubuque Street in Iowa City and Penn Street in North Liberty between 6 a.m. and 7 p.m. Traveling at an average of 30 miles per hour, the 9.1-mile trip would require 25 minutes. Park-and-ride locations at several stations may likely divert some commuters from existing shuttle service on the University of Iowa campus. Travel forecasts also show the conceptual service attracting new riders to the regional system, potentially reducing the number of automobiles commuting on regional roads.

The STOPS application estimated 5,282 average weekday boardings for the conceptual Iowa City-North Liberty commuter rail service in 2019. It shows that many riders would make short trips along the line. For example, 63 percent of passengers boarding at Penn Street would only travel as far as Coralville. More than 75 percent of passengers boarding at Coralville would travel into Iowa City. Table ES-2 shows the origin-destination estimates from the STOPS application for the seven proposed commuter rail stations.

Table ES-2: Average Weekday Station Utilization by Project Trips, 2019

Origin Station/ Destination Station	Penn Street	Forever-green Road	Oakdale Commuter	Coralville	VA Hosp.	Downtown Univ. of Iowa	Dubuque Street	Total
Penn Street		366	223	156	37	263	85	**1,130**
Forevergreen Road	366		34	19	28	116	9	**572**
Oakdale Commuter	223	34		15	82	127	11	**491**
Coralville	156	19	15		109	361	128	**789**
VA Hospital	37	28	82	109		256	105	**617**
Downtown Univ. of Iowa	263	116	127	361	256		111	**1,235**
Dubuque Street	85	9	11	128	105	111		**448**
Total	**1,130**	**572**	**491**	**789**	**617**	**1,235**	**448**	**5,282**

In 2027, the STOPS model forecasted average weekday boardings to grow to 6,140, and by 2042 average weekday ridership may grow to 7,730. See Tables ES-3 through ES-5 for commuter rail 0boarding estimates below.

Table ES-3: Commuter Rail Boarding Estimates by Station and Mode of Access, 2019

Station	Walk	KNR	PNR	XFR	All
Penn Street (North Liberty)*	986	37	106	0	1,130
Forevergreen Road*	274	65	233	0	572
Oakdale Commuter*	256	38	108	90	491
Coralville*	357	81	322	29	789
VA Hospital	556	17	0	44	617
Downtown-University of Iowa	1,001	9	0	225	1,235
Dubuque Street	378	19	0	51	448
Total	3,808	266	769	439	5,282

Notes: KNR – Kiss-and-Ride; PNR – Park-and-Ride; XFR - Transfer
** Park-and-ride location*

Table ES-4: Commuter Rail Boarding Estimates by Station and Mode of Access, 2027

Station	Walk	KNR	PNR	XFR	All
Penn Street (North Liberty)*	868	35	104	0	1,009
Forevergreen Road*	605	92	279	0	976
Oakdale Commuter*	197	45	105	70	418
Coralville*	422	96	412	31	962
VA Hospital	1,118	18	0	155	1,291
Downtown-University of Iowa	1,364	12	0	201	1,577
Dubuque Street	445	18	0	44	507
Total	5,019	316	900	501	6,740

Notes: KNR – Kiss-and-Ride; PNR – Park-and-Ride; XFR - Transfer
** Park-and-ride location*

Table ES-5: Commuter Rail Boarding Estimates by Station and Mode of Access, 2042

Station	Walk	KNR	PNR	XFR	All
Penn Street (North Liberty)*	1,033	42	124	0	1,200
Forevergreen Road*	807	126	360	0	1,292
Oakdale Commuter*	196	59	123	75	453
Coralville*	422	114	464	28	1,028
VA Hospital	1,217	21	0	201	1,439
Downtown-University of Iowa	1,506	12	0	220	1,738
Dubuque Street	511	19	0	48	578
Total	5,692	393	1,071	572	7,728

Notes: KNR – Kiss-and-Ride; PNR – Park-and-Ride; XFR - Transfer
** Park-and-ride location*

To complement the conceptual ridership forecasting analysis, a peer review was performed to understand typical fare rates, structure, and recovery ratios of similar services to help determine the revenue forecasting. Six representative transit agencies were selected for analysis based on similar corridors, system lengths, and area population, with a primary objective of understanding the base fares of peer markets. Similar to other peer markets of similar size and length, it was decided that a fare rate of $1.50 per trip would be used for the potential commuter rail service fare structure.

As this project is not yet built and is without data, fare recovery was identified using two best practice methodologies:

1. Fare recovery as a product of ridership forecasts, fare estimates, and a calculated annualization factor
2. Fare recovery as a portion of projected operations costs.

The two methodologies produced different results, from fare revenues as low as $0.48 million (10 percent fare rate recovery; with respect to a $4.8 million annual O&M cost) to as high as $2.1 million (44 percent fare rate recovery; with respect to a $4.8 million annual O&M cost). Based on the projected ridership, the CRANDIC Corridor could potentially be a transformative transit service for the region and draw ridership from those currently using other modes and also attract many new customers. A 44 percent fare recovery rate seems unlikely, but the analysis suggests the fare recovery rate could be on the high end or exceed the average for small corridor/system fare recovery rates in the U.S.

Table ES-5 details the fare revenue projections by station relative to plan year 2019. The total forecasted revenues equate to a 44 percent fare recovery rate. Table ES-6 and Table ES-7 show projected fare revenue estimates for 2027 and 2042, respectively.

Table ES-5: Projected Fare Revenue in 2019, in 2019 Dollars

Station	Weekday Ridership in 2019	Fare Revenue, $
Penn Street (North Liberty)*	1,130	$449,000
Forevergreen Road*	572	$227,000
Oakdale Commuter*	491	$195,000
Coralville*	789	$314,000
VA Hospital	617	$246,000
Downtown-University of Iowa	1,235	$493,000
Dubuque Street	448	$179,000
Total	**5,282**	**$2,103,000**

Table ES-6: Estimated Projected Fare Revenue in 2027, in 2019 Dollars

Station	Weekday Ridership in 2027	Fare Revenue, $
Penn Street (North Liberty)*	1,009	$401,000
Forevergreen Road*	976	$388,000
Oakdale Commuter*	418	$166,000
Coralville*	962	$382,000
VA Hospital	1,291	$513,000
Downtown-University of Iowa	1,577	$627,000
Dubuque Street	507	$202,000
Total	**6,740**	**$2,679,000**

Table ES-7: Estimated Projected Fare Revenue in 2042, in 2019 Dollars

Station	Weekday Ridership in 2042	Fare Revenue, $
Penn Street (North Liberty)*	1,200	$477,000
Forevergreen Road*	1,292	$514,000
Oakdale Commuter*	453	$180,000
Coralville*	1,028	$409,000
VA Hospital	1,439	$572,000
Downtown-University of Iowa	1,738	$691,000
Dubuque Street	578	$230,000
Total	**7,728**	**$3,073,000**

Next Steps

This Study represents the culmination of various phases of conceptual study by local and state stakeholders to determine the feasibility of passenger rail implementation on the CRANDIC Corridor within the context of a rapidly growing metropolitan area and the need for more robust multimodal transportation options that complement existing and proposed land use. It is anticipated that the outcomes of this Study are to provide inputs that can be used by local and state stakeholders to determine next steps for the potential development and implementation of a commuter rail service in Johnson County, Iowa.

Based on this Study's analysis, inclusive of the conceptual ridership and revenue forecasts and the opinion of probable capital and operations and maintenance costs, a positive business case is emerging as it relates to the concept of implementing commuter rail service on the CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty.

Project stakeholders will ultimately determine the feasibility of further study and the potential for commuter rail service implementation on the CRANDIC Corridor. The purpose of these successive feasibility studies is to inform the stakeholders on the likely pathways of implementing passenger rail service on an existing and functioning railroad corridor, as well as provide likely paths forward if capital funding for the implementation of passenger rail service is pursued from the FTA capital investment grant program and its various requirements for engineering, operations, revenue/ridership, safety, and so on. The project would also require environmental clearance through the National Environmental Policy Act (NEPA), in order to advance to the construction phase.

More detailed future analysis and study could be performed to include a comprehensive operating plan (supported by rail operations modeling), conceptual station designs and infrastructure engineering, environmental fatal-flaws analysis and screening, and the potential for subsequent phased implementation of commuter rail service including the potential extension of commuter services north to the Eastern Iowa Airport in Cedar Rapids, and into Downtown Cedar Rapids.

Below are some potential next steps highlighting an approach for advancing the development of commuter rail on the CRANDIC Corridor between Iowa City and North Liberty:

- Develop Consensus Regarding Conclusions from the Recent Iowa City-North Liberty Commuter Rail Conceptual Feasibility Study and Stakeholder Outreach
- Confirm Lead Agency for Potential Development of Commuter Rail on the CRANDIC Corridor

- Establish CRANDIC Corridor Commuter Rail Study and Implementation Committee
- Consider Potential for Pilot Commuter Rail Service on CRANDIC Corridor
- Conduct Additional CRANDIC Corridor Right-of-Way Study
- Identify and Pursue Preferred Funding and Financing Options for Implementation of Commuter Rail on the CRANDIC Corridor
- Determine Potential Phased Implementation of Commuter Rail on the CRANDIC Corridor Based on Local Priorities and Funding Availability
- Develop a Plan for Development of Commuter Rail on the CRANDIC Corridor
- Evaluate Potential Impacts of Commuter Rail on Existing Ridership of Area Transit Agencies

See Section 10 for more detail.

1 Background

The potential for preservation and repurposing some or all of the Cedar Rapids & Iowa City Railway (CRANDIC) Corridor right-of-way between Iowa City and Cedar Rapids, Iowa, for alternative transportation use, has been the subject of ongoing feasibility studies and discussions by state and local stakeholders since 2015.

The Iowa City – Cedar Rapids Passenger Rail Conceptual Feasibility Study Project (Phase 1) completed in 2015 by the Iowa Department of Transportation (Iowa DOT), CRANDIC, Metropolitan Planning Organization of Johnson County, Iowa (MPOJC), and other local stakeholders explored the conceptual feasibility of a passenger rail service operating in the existing 20.5-mile CRANDIC Corridor between Gilbert Street in Iowa City and the Eastern Iowa Airport in Cedar Rapids. The Study and a workshop enabled stakeholders of the proposed passenger service to identify likely potential types and modes of passenger rail service for the Corridor, and to understand the general capital and operating maintenance costs, service frequencies, service capabilities, and the regulatory and funding environment for a passenger rail service in the Corridor. Stakeholders decided to pursue an additional phase of feasibility study for an initial phase of passenger rail service implementation between Iowa City and North Liberty, Iowa.

The Iowa City – North Liberty Passenger Rail Conceptual Feasibility Study Project (Phase 2) completed in 2016 by Iowa DOT, CRANDIC, and MPOJC explored the feasibility of an initial phase of passenger rail service implementation in the existing CRANDIC Corridor between Gilbert Street in Iowa City and Forever Green Road in North Liberty, a distance of approximately 7.1 miles. The Study provided stakeholders with a conceptual assessment of existing corridor conditions, conceptual passenger rail equipment and service plan, probable conceptual capital and operations and maintenance costs, potential alternatives that could reduce the capital cost to implement the service, and a summary description of the federal regulatory requirements for the implementation of passenger rail service.

The Impact of Alternative Modes on Interstate 380 Technical Memorandum completed independently by Iowa DOT in 2017 examined the long-term potential for commuter rail and/or automated bus transit as a component of an enhanced multimodal transportation network for growing communities in the Iowa City-Cedar Rapids Corridor. The Technical Memorandum was developed concurrently with the broader Iowa DOT Interstate 380 Corridor Planning and Environmental Linkage Study (I-380 PEL Study) that evaluated safety, capacity, and infrastructure deficiencies on the principal roadway between the two cities and made recommendations for improvements to increase regional mobility in the near-term horizon. In terms of exploring alternative transportation use of the parallel CRANDIC Corridor right-of-way to supplement capacity on I-380, and to provide additional modal options to the public during a longer-term horizon, Iowa DOT:

- Conducted additional public outreach;
- Developed a conceptual short-term and long-term vision for CRANDIC Corridor right-of-way alternative uses;
- Conceptually explored the feasibility of four different alternative use scenarios that involve some or all of the CRANDIC Corridor right-of-way between Iowa City and the Eastern Iowa Airport at Cedar Rapids which included conceptual ridership forecasts, probable conceptual cost of implementation, and general findings and recommendations; and

- Presented next steps for potential study, preservation of the corridor right-of-way, and alternative transportation implementation in the CRANDIC Corridor right-of-way.

Based on a favorable public benefits assessment and ridership forecasts for commuter rail implementation between Iowa City and North Liberty, as determined during development of this Technical Memorandum in 2017 and reinforced by other previous studies developed during 2015-2016, project stakeholders, Iowa DOT, CRANDIC, and MPOJC decided to pursue an additional and more comprehensive phase of feasibility study for an initial phase of commuter rail service implementation between Iowa City and North Liberty. That additional and more comprehensive phase of feasibility study will developed by HDR through consultation with project stakeholders.

This report, for the **Iowa City – North Liberty Commuter Rail Conceptual Feasibility Study Project (Phase 3)**, by Iowa DOT, CRANDIC, and MPOJC, explored the feasibility of an initial phase of commuter rail service implementation in the existing CRANDIC Corridor right-of-way between Gilbert Street in Iowa City, Iowa, and Penn Street in North Liberty, Iowa, a distance of approximately 9.1 miles. An additional 2 miles of alignment, from Forevergreen Road to Penn Street in North Liberty, were added to this phase of study, as the previous Iowa DOT I-380 PEL Study indicated stronger potential ridership through the North Liberty Area, making Penn Street a logical ending point for this phase of analysis. The study will incorporate or reference the work developed in the ongoing study of alternative transportation use of the CRANDIC Corridor during 2015-2017 as outlined above, and will provide a more detailed understanding of the potential benefits, costs, funding, and oversight for development, operation, and maintenance of a commuter rail service.

At the request of CRANDIC and Iowa DOT, a supplemental special survey was conducted to better understand the potential University of Iowa student travel market for commuter rail in the Iowa City-North Liberty Area based on previous Federal Transit Administration (FTA) recommendations for development of preliminary ridership forecasts for this project. Through on-going coordination with local transit providers and the City of Iowa City, the study sought to understand existing travel patterns and the current and potential future availability of student travel and survey data, in order to understand the potential ridership (and revenue) of the proposed commuter rail service.

The outputs from this study will enable project stakeholders to consider next steps for future implementation of commuter rail service between Iowa City and North Liberty.

2 Existing CRANDIC Corridor Right-of-Way Assessment

This section describes existing conditions of the CRANDIC Corridor right-of-way between Iowa City and North Liberty, including the current condition of the CRANDIC railroad infrastructure, demographics and geographic characteristics of the service area, and other connecting transportation infrastructure and services. It includes a brief history of previous passenger rail transportation services in the CRANDIC Corridor.

2.1 CRANDIC Corridor Service Area, Intersections, and Connectivity

The CRANDIC Corridor connects Iowa City and North Liberty, in Johnson County, Iowa. According to U.S. Census data, the Iowa City Metropolitan Statistical Area (MSA), which includes Iowa City, Coralville, North Liberty, and outlying areas in Johnson and Washington counties, was estimated to have a population of 171,491 as of July 1, 2017[1]. The Iowa City MSA is one of the State of Iowa's fastest growing metropolitan areas. The nearby Cedar Rapids MSA adjoining the Iowa City MSA on the north, was estimated to have a population of 270,293 as of July 1, 2017.

The north-south CRANDIC Corridor, and the parallel Interstate 380 Corridor, sit astride growing residential, commercial, and light industrial development – particularly in Iowa City, Coralville, and North Liberty.

The Iowa City-North Liberty segment of the CRANDIC Corridor intersects or is near to:

- **Universities –** including the University of Iowa in Iowa City and the University of Iowa Research Park at Oakdale.
- **Employment –** including access to several major area employers.
- **Shopping Destinations –** including downtown Iowa City, the Iowa River Landing in Coralville, Coral Ridge Mall in Coralville, and other local shopping centers in Coralville and North Liberty.
- **Recreation and Entertainment –** including University of Iowa sporting and cultural events, and access to parks and multi-use trails.
- **Hospitals –** including the University of Iowa Hospitals and Clinics, Iowa City Veterans Administration Hospital, and Mercy Hospital in the Iowa City Area.

Commuter rail service in the CRANDIC Corridor could potentially relieve vehicular congestion and improve traffic safety on parallel Interstate 380 between Iowa City and North Liberty and on connecting Interstate 80 between Coralville and Iowa City, and also provide a transportation alternative to driving for students, workers, business and leisure travelers, retail shoppers, the elderly, and hospital patients. Commuter rail service in the CRANDIC Corridor could also reduce travel times and provide a transportation alternative for current and potential future area commuters who drive to Iowa City and the University of Iowa facilities from North Liberty, Oakdale, Coralville, and other outlying locations. Many of these commuters are presently transit dependent, as they drive to Iowa City and park their vehicles in parking lots (some free and others for a fee) and then continue their commute on local transit buses and trails.

Commuter rail service on the CRANDIC Corridor between Iowa City and North Liberty could also potentially provide intermodal connectivity with existing and future rail, transit, intercity bus services, and trails in the area, as generally described below.

Intercity Passenger Rail – Implementation of a twice-daily intercity passenger rail service between Chicago and Moline, Illinois (Quad Cities of Illinois and Iowa), and Iowa City is presently under study by Iowa DOT and the Illinois Department of Transportation (Illinois DOT). Commuter rail service on CRANDIC could terminate at Dubuque Street, one block south of a potential Iowa City station for the intercity passenger rail service, which would provide a transfer point between the two services.

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[1] U.S. Census, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2017 – United States – Metropolitan Statistical Area; 2017 Population Estimates; U.S. Census website: https://factfinder.census.gov/bkmk/table/1.0/en/PEP/2017/GCTPEPANNR.US24PR); accessed September 20, 2018

Public Transit – Commuter rail service on the CRANDIC could potentially provide access to and enhance existing and future connecting public transit systems in the Corridor. Potential connections could be made with Iowa City Transit buses at Iowa City; University of Iowa CAMBUS network at Iowa City; and Coralville Transit buses at Iowa City, Coralville, and North Liberty[2]. On October 1, 2018, 380 Express began providing express bus service from the Cedar Rapids Ground Transportation Center to the Iowa City Court Street Transportation Center, with intermediate stops at education facilities and hospitals within the area[3].

Intercity Buses – Burlington Trailways serves the Court Street Transportation Center on Court Street in downtown Iowa City, which is located in close proximity to the CRANDIC Corridor. Megabus serves the Coralville Transit Intermodal Facility on Quarry Road in Coralville, which is located in close proximity to the CRANDIC Corridor.

Trails – Commuter rail service on the CRANDIC Corridor could potentially provide access to the area's recreational trail network for pedestrians and bicycles, including the Iowa River Trail, North Ridge Trail, North Liberty Trail, and other trails.

2.2 CRANDIC Corridor History

The CRANDIC Corridor – inclusive of a linear right-of-way – was constructed as a high-speed interurban rail line between its namesake cities by the Iowa Railway & Light Company during 1903 and 1904[4]. The railroad provided electrified passenger (interurban) and freight service over the 27 miles between Iowa City and Cedar Rapids via North Liberty starting on August 13, 1904. Interurban trains operated on city streets within downtown areas in Iowa City and Cedar Rapids, in much the same manner as streetcars, while the rest of the route was located within private right-of-way.

Figure 1 below presents a circa 1910 view of early CRANDIC interurban service at the depot in North Liberty. The map in Figure 2 below shows the route of the CRANDIC Corridor and its proximity to other rail lines in the region today. The bold red line identifies the CRANDIC Corridor Study Area between Iowa City and North Liberty.

Figure 1: Early CRANDIC Interurban Service at North Liberty

[2] Iowa Commuter Transportation Study; Iowa Department of Transportation, December 2014

[3] 380 Express, Flyer; https://www.380express.com/flyer.pdf; September 27, 2018

[4] Cedar Rapids & Iowa City Railway (CRANDIC) website; www.crandic.com; July 27, 2016

Source: HDR (Christian J. Goepel Collection)

Figure 2: CRANDIC Corridor between Iowa City, North Liberty, and Cedar Rapids

Source: HDR

The height of CRANDIC interurban operations began when the railroad upgraded its passenger car fleet in 1939, via the acquisition of second-hand high-speed electric interurban cars, and the initiation of faster and more efficient service[5]. Figure 3 below shows a southbound high-speed interurban car operating from Cedar Rapids to Iowa City crossing the Iowa River Bridge at Iowa City.

[5] Cedar Rapids & Iowa City Railway (CRANDIC) website; www.crandic.com; July 27, 2016

Figure 3: High-Speed Interurban Car on the CRANDIC at Iowa City

Source: CRANDIC (William D. Middleton Photo)

By 1944, CRANDIC operated 17 interurbans each way daily, which provided almost hourly service between Iowa City and Cedar Rapids, from approximately 5 a.m. until midnight[6]. In 1945, CRANDIC reached the zenith of ridership, carrying a record 573,307 passengers[7]. Figure 4 below shows CRANDIC's station locations and frequent interurban service offerings in the Corridor, as they existed in October 1946.

[6] Cedar Rapids & Iowa City Railway (CRANDIC) website; www.crandic.com; July 27, 2016

[7] *Ibid.*

Figure 4: CRANDIC Passenger Service Timetable, October 1946

CEDAR RAPIDS TO IOWA CITY

SOUTHBOUND—READ DOWN	2 Dly AM	4 Ex8 AM	6 Dly AM	8 Dly AM	10 Dly AM	12 Dly AM	14 Dly PM	16 Dly PM	18 Dly PM	20 Dly PM	22 Dly PM	24 Dly PM	26 Dly PM	28 Dly PM	30 Dly PM	32 Dly PM	34 Dly AM
Cedar Rapids Lv	4 40	5 50	6 45	7 50	10 00	11 00	12 01	1 00	2 00	3 00	4 00	5 15	6 15	7 45	9 00	10 05	12 01
Crandic	4 46	5 56	6 51	7 56	10 05	11 06	12 07	1 06	2 06	3 06	4 06	5 21	6 21	7 51	9 06	10 10	12 05
Hawkeye Downs	4 50	6 00	6 57	8 02	10 10	11 11	12 12	1 11	2 11	3 11	4 11	5 26	6 26	7 56	9 11	10 15	12 10
Waconia	4 51	6 01	6 58	8 04	10 11	11 12	12 13	1 12	2 12	3 12	4 12	5 27	6 27	7 57	9 12	10 16	12 11
Konigsmark	4 56	6 06	7 02	8 08	10 15	11 17	12 18	1 17	2 17	3 17	4 17	5 32	6 32	8 01	9 16	10 20	12 15
Swisher	5 00	6 10	7 07	8 12	10 19	11 22	12 23	1 22	2 22	3 22	4 22	5 37	6 37	8 05	9 20	10 24	12 19
Cou Falls	5 03	6 13	7 10	8 16	10 22	11 25	12 26	1 25	2 25	3 25	4 25	5 40	6 40	8 08	9 23	10 27	12 22
North Liberty	5 13	6 23	7 22	8 27	10 32	11 35	12 35	1 35	2 35	3 35	4 35	5 50	6 50	8 18	9 33	10 37	12 32
Oakdale	5 16	6 26	7 26	8 31	10 36	11 39	12 39	1 39	2 39	3 39	4 39	5 54	6 54	8 22	9 37	10 41	12 36
Coralville	5 21	6 31	7 31	8 36	10 41	11 44	12 44	1 44	2 44	3 44	4 44	5 59	6 59	8 27	9 42	10 46	12 41
Iowa City—*Yards*	5 25	6 35	7 35	8 40	10 45	11 48	12 48	1 48	2 48	3 48	4 48	6 03	7 03	8 31	9 46	10 50	12 45
Iowa City—*Passenger Station* Ar	5 30	6 40	7 40	8 45	10 50	11 52	12 52	1 52	2 52	3 52	4 52	6 07	7 07	8 35	9 50	10 55	12 50

Ship via the ***CRANDIC ROUTE . . .***

Through freight service in connection with ALL railroads.

TO PASSENGERS: In the interest of safety please do not ride in the front vestibule of car or converse with the engineer.

IOWA CITY TO CEDAR RAPIDS

NORTHBOUND—READ DOWN	1 Dly AM	3 ExS AM	5 Dly AM	7 Dly AM	9 Dly AM	11 Dly PM	13 Dly PM	15 Dly PM	17 Dly PM	19 Dly PM	21 Dly PM	23 Dly PM	25 Dly PM	27 Dly PM	29 Dly PM	31 Dly PM	33 Dly AM
Iowa City—*Passenger Station* Lv	5 35	6 45	7 50	9 30	11 00	12 01	1 00	2 00	3 00	4 00	5 15	6 15	7 15	9 05	10 00	11 00	12 55
Iowa City—*Yards*	5 40	6 49	7 55	9 35	11 05	12 06	1 05	2 05	3 05	4 05	5 20	6 20	7 21	9 10	10 06	11 05	1 00
Coralville	5 44	6 53	7 59	9 39	11 09	12 10	1 09	2 09	3 09	4 09	5 24	6 24	7 26	9 14	10 10	11 09	1 04
Oakdale	5 50	6 58	8 05	9 44	11 14	12 15	1 14	2 14	3 14	4 14	5 29	6 29	7 31	9 19	10 15	11 14	1 09
North Liberty	5 56	7 02	8 09	9 48	11 18	12 19	1 18	2 18	3 18	4 18	5 33	6 33	7 35	9 23	10 19	11 18	1 13
Cou Falls	6 06	7 10	8 16	9 56	11 25	12 26	1 25	2 25	3 25	4 25	5 40	6 40	7 42	9 30	10 27	11 25	1 20
Swisher	6 10	7 14	8 21	10 00	11 29	12 30	1 29	2 29	3 29	4 29	5 44	6 44	7 46	9 34	10 31	11 29	1 24
Konigsmark	6 14	7 18	8 25	10 04	11 33	12 34	1 33	2 33	3 33	4 33	5 48	6 48	7 50	9 38	10 35	11 33	1 28
Waconia	6 18	7 22	8 29	10 09	11 38	12 38	1 38	2 38	3 38	4 38	5 53	6 53	7 55	9 43	10 40	11 37	1 32
Hawkeye Downs	6 19	7 23	8 30	10 10	11 39	12 39	1 39	2 39	3 39	4 39	5 54	6 54	7 56	9 44	10 41	11 41	1 36
Crandic	6 24	7 28	8 34	10 14	11 43	12 43	1 43	2 43	3 43	4 43	5 58	6 58	8 00	9 48	10 45	11 45	1 40
Cedar Rapids Ar	6 30	7 35	8 40	10 20	11 50	12 50	1 50	2 50	3 50	4 50	6 05	7 05	8 05	9 55	10 50	11 50	1 45

A.M. TIME (12 00 night to 11 59 noon) is shown in light face type.
P.M TIME (12 00 noon to 11 59 night) is shown in **bold face type.**

Printed in U.S.A. by Russell's Guide Co., Cedar Rapids, Ia. 4332.30

Source: HDR (Christian J. Goepel Collection)

Owing to the surging popularity of the automobile and the dominance of hard-surfaced roadways in Iowa during the immediate post World War II era, CRANDIC ridership declined markedly by the early 1950s, and passenger rail service was discontinued altogether on May 30, 1953[8]. The full dieselization of the remaining freight railroad operations immediately followed.

The CRANDIC's freight service, network, and franchise grew considerably in the ensuing years, largely through the acquisition of two other railroad lines between Cedar Rapids and South Amana, Iowa, and between Iowa City and Hills, Iowa, in the 1980s. CRANDIC and its parent company, Alliant Energy, currently have offices in and manage the CRANDIC from Cedar Rapids.

In 2014, the short line railroad had approximately 54 route miles and continued to provide direct access to several large industries and multiple connections with other railroads in the Cedar Rapids area. CRANDIC carried 99,334 carloads of freight during 2014, and freight volumes have continued to grow into 2018.

The CRANDIC's former Iowa City-Cedar Rapids interurban line – today known as CRANDIC Division 2 – once served as a primary artery for considerable volumes of freight rail traffic originating in

[8] Ibid.

Cedar Rapids, that was interchanged to the Iowa Interstate Railroad (IAIS) at Iowa City for furtherance to the Quad Cities of Iowa and Illinois; Chicago and Peoria, Illinois; and Council Bluffs, Iowa. The interchange of freight rail traffic between the carriers was shifted from Division 2 and Iowa City, west to South Amana, Iowa, and over another CRANDIC line in 2001.

Today, the CRANDIC's former interurban line is still used by CRANDIC to serve one rail shipper in North Liberty and a considerable industrial base for additional shippers within Cedar Rapids. The CRANDIC Corridor right-of-way also has a non-transportation purpose, as it hosts infrastructure for a fiber optic line and various other utilities. Additional details about present rail operations within the CRANDIC Corridor between Iowa City and North Liberty can be found in Section 2.3.10 of this Study.

2.3 Present General CRANDIC Corridor Characteristics

The segment of the CRANDIC Corridor under consideration for potential implementation of commuter rail service in this Study includes the segment of CRANDIC Division 2 between Gilbert Street in central Iowa City (Milepost 25.8) and Penn Street (Milepost 16.7) on the north side of North Liberty (Milepost 16.9), for a total of 9.1 miles. This section contains an assessment of the present general characteristics and conditions of the CRANDIC Corridor, as noted during desktop analysis of available aerial imagery and a field observation conducted in cooperation with CRANDIC and Iowa DOT in September 2018.

2.3.1 Railroad Timetable Stations

Railroad timetable stations on CRANDIC Division 2 and their railroad milepost location within the CRANDIC Corridor are listed in Table 1 below.

Table 1: CRANDIC Division 2 Railroad Timetable Stations and Railroad Milepost Locations in the Iowa City-North Liberty Corridor

Railroad Timetable Station	CRANDIC Railroad Milepost
Iowa City, Iowa	25.1
Coralville, Iowa	22.9
Great Lakes, Iowa	22.3
Oakdale, Iowa	19.8
North Liberty, Iowa	16.9

Source: CRANDIC (September 2018)

2.3.2 Railroad Track Configuration

The CRANDIC Corridor between Iowa City and North Liberty is comprised of a single railroad main track with sidings to accommodate meet-pass events between trains, switching of online freight customers, and to stage and store rail cars. Short sidings exist on the Corridor at Iowa City and Coralville.

CRANDIC does not maintain yards for classifying, staging, and meeting trains on the Corridor.

The profile of the Iowa City-North Liberty Corridor is characteristic of the standard of construction employed to develop electrified interurban railroads in Iowa in the early 20th century. Main track grades up to 2.06 percent and curve sharpness (curvature) up to 14 degrees exist on the CRANDIC

Corridor. Segments of the Corridor in Iowa City and Coralville closely parallel public roadways and waterways.

Figure 5 below demonstrates a typical interurban railroad profile on the CRANDIC Corridor, with a 6.5 degree curve and 1 percent grade over the Iowa Avenue overpass in Iowa City (Milepost 24.7).

Figure 5: Curvature and Grade on the CRANDIC Corridor at Iowa Avenue in Iowa City

Source: HDR

Figure 6 below demonstrates the proximity of the CRANDIC Corridor to public roadways at First Avenue in Coralville (Milepost 23.1).

Figure 6: Proximity of the CRANDIC Corridor to Public Roadways at First Avenue in Coralville

Source: HDR

Figure 7 below demonstrates the proximity of the CRANDIC Corridor to waterways. Pictured is the CRANDIC Corridor right-of-way along the east bank of the Iowa River in Iowa City (Milepost 25.4).

Figure 7: Proximity of CRANDIC Corridor to Waterways – Along the East Bank of the Iowa River in Iowa City

Source: HDR

2.3.3 Existing Railroad Track Characteristics

The CRANDIC Corridor main track between Gilbert Street in Iowa City (Milepost 25.8) and Penn Street in North Liberty (Milepost 16.7) consists primarily of 90 to 112 lb./yd. jointed rail. Rail in sidings is 100 lb./yd. rail or smaller. Timber ties and crushed rock ballast are used on main tracks and sidings[9]. Track curves are constructed with superelevation, which is the difference between the heights of track. Superelevation is typically employed on railroad curves to allow trains to operate at higher speeds than would otherwise be attainable if the railroad profile was flat or level. The minimum track superelevation in the CRANDIC Corridor Study Area is 0.25 inch. Track unbalance refers to the amount of superelevation that would be necessary for a train to reach a balanced condition through a curve. CRANDIC operates with no track unbalance, as operating speeds are low enough in the Corridor at present that current track curvature and elevations meet FRA-approved superelevation requirements. Main track switches to sidings and industrial trackage are mostly No. 9 or smaller hand-throw turnouts.

A recently rehabilitated section of CRANDIC main track west of Rocky Shore Drive in Iowa City (Milepost 23.8) is shown in Figure 8 below.

Figure 8: CRANDIC Corridor Main Track Structure near Rocky Shore Drive in Iowa City

Source: HDR

2.3.4 Railroad Bridges and Drainage Structures

There are 24 known railroad bridges and drainage structures that have been identified on the CRANDIC Corridor Study Area between Gilbert Street in Iowa City (Milepost 25.8) and Penn Street in North Liberty (Milepost 16.7), including 7 bridges and approximately 17 culverts, as estimated by

[9] Cedar Rapids & Iowa City Railway Track Chart

CRANDIC[10]. Bridge superstructure types vary and include through-plate girders (TPG), deck-plate girders (DPG), beam spans, and reinforced concrete spans. The majority of bridges have open decks. Track culverts vary in size and condition, but mostly act to convey local drainage through the railroad embankment. Track ditches are also present along the majority of the Corridor. A typical track ditch consists of a swale located near the ballast shoulder that matches the grade changes of the rails, effectively allowing ballast and subgrade drainage to occur. There are some areas along the Corridor where ditches are filled in and will require cleaning to improve local site drainage. There are no rail tunnels on the CRANDIC Corridor; however, two reinforced concrete box culverts do act as pedestrian tunnels.

The most prominent bridge on the Corridor is shown in Figure 9 below – the four-span deck plate girder Iowa River Bridge in Iowa City (Milepost 24.5).

Figure 9: Iowa River Bridge in Iowa City

Source: HDR

A typical culvert on the Corridor is shown in Figure 10 below – 36" Diameter Circular Concrete Culvert (CCP) near Coralville (Milepost 21.4).

[10] Cedar Rapids & Iowa City Railway Bridge and Structures Inventory, 2015-2016

Figure 10: Typical Circular Concrete Culvert (CCP)

Source: HDR

An inventory of bridges and known drainage structures in the CRANDIC Corridor are identified and described by type in Table 2 and 3, respectively.

Table 2: Railroad Bridges on the CRANDIC Corridor

Railroad Milepost	Superstructure Description	Deck Type	Crossing Feature	Crossing Name
17.50	1-14'-6" TPT, 1-13'-10" TPT, 1-13'-4" TPT, 1-14'-3" TPT	Open	Water	Muddy Creek
23.30	1-43' SBM, 4-50'-8" SBM, 1-31'-9" SBM	Ballast	Water	Clear Creek
23.80	1-35'-9" TPG	Open	Roadway	Rocky Shore Drive
24.60	1-22' SBM, 1-34'-6" SBM, 1-24'-6" SBM	Open	Roadway	Riverside Drive
24.70	4-74'-6" DPG	Open	Water	Iowa River
24.80	1-14' TPG, 1-24'-9" TPG, 1-20'-3" TPG, 1-24'-6" TPG, 1-17' TPG	Open	Roadway	Iowa Avenue
24.90	1-19'-6" RC, 1-20'-10" RC, 1-19'-6" RC	Ballast	Pedestrian	University Library pedestrian underpass
25.75	3-24'-8" SBM	Open	Water	Ralston Creek

Source: CRANDIC

Railroad Bridge Type Notes:

- *DPG – Deck Plate Girder*
- *RC – Reinforced Concrete Span*
- *SBM – Steel Beam Span*
- *TPG – Through Plate Girder*
- *TPT – Timber Pile Trestle*

Table 3: Railroad Drainage Structures on the CRANDIC Corridor

Railroad Milepost	Culvert Description	Crossing Type	Length (feet)
16.70	1st: 1-3' CCP 2nd: 1-2.5' CCP	1st: Water 2nd: Water	1st: Water 2nd: Water
16.90	1-2' CMP	Water	Water
17.75	1-3'x8' CA	Water	Water
17.80	1-5.5' CCP	Water	Water
18.00	1st: 1-3.5' SSP 2nd: 1-2.5' CCP	1st: Water 2nd: Water	1st: Water 2nd: Water
18.30	1-3' CCP	Water	Water
18.90	1-1.25' CCP	Water	Water
19.30	1-1.5' VCP	Water	Water
19.50	1-3' CCP	Water	Water
20.00	1-0.67' CCP	Water	Water
20.50	1-1.5' VCP	Water	Water
21.35	1-2' SSP	Water	Water
21.40	1-3' CCP	Water	Water
21.41	1-1.5' CMP	Water	Water
21.60	1-2' CCP	Water	Water
21.75	1-6' CCP	Water	Water
22.00	1-4' CMP	Water	Water
22.30	1-2' CMP	Water	Water
22.33	1-1.5' SSP	Water	Water
22.40	2-4' CCP	Water	Water
24.45	1- CCP (Unknown diameter)	Water	Water
24.69	1-8'x8' RCB	Pedestrian	Pedestrian
24.71	1-5'x7' RCB	Pedestrian	Pedestrian

Source: CRANDIC

Railroad Drainage Structures Notes:

- *CCP – Circular Concrete Pipe*
- *CMP – Corrugated Metal Pipe*
- *SSP – Smooth Steel Pipe*
- *VCP – Vitrified Clay Pipe*

2.3.5 At-Grade Roadway/Railroad Crossings

At-grade roadway/railroad crossings with the CRANDIC include public roadways which are typically protected by active warning devices and private crossings which are typically protected by passive warning devices. A total of 27 at-grade roadway/railroad crossings have been identified in the CRANDIC Corridor between, and including, Gilbert Street in Iowa City (Milepost 25.8) and Penn Street in North Liberty (Milepost 16.7), as noted by CRANDIC[11].

Public crossings are typically protected by active warning devices, including crossbucks, flashing light signals, and bells. Some public crossings with active warning devices also include gates. Pedestrian sidewalk protection is minimal in the Corridor.

Private crossings are typically protected by passive warning devices, including crossbucks only or crossbucks and stop signs.

Grade crossing surfaces are typically concrete pads or hot-mix asphalt (HMA) on public crossings and HMA, timber, or gravel on private crossings.

Figure 11 below shows the typical active warning devices and concrete grade crossing surface used on the CRANDIC Corridor. Pictured is the Forever Green Road grade crossing in North Liberty (Milepost 18.8).

Figure 11: Typical CRANDIC Corridor Active Grade Crossing at Forever Green Road in North Liberty

Source: HDR

Figure 12 below shows the typical passive warning devices and timber/HMA grade crossing surface used on the CRANDIC Corridor. Pictured is the Old Hospital Road grade crossing in Oakdale (Milepost 19.87).

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[11] Cedar Rapids & Iowa City Railway Grade Crossing Inventory; 2016-2018

Figure 12: Typical CRANDIC Corridor Passive Grade Crossing at Old Hospital Road in Oakdale

Source: HDR

An inventory of the existing location, type, and signal infrastructure for each at-grade roadway/railroad crossing in the CRANDIC Corridor is shown in Table 4 below.

Table 4: Inventory of At-Grade Roadway Crossings in the CRANDIC Corridor between Iowa City and North Liberty

Roadway	Railroad Milepost	FRA Grade Crossing Number	Type of Crossing	Existing Grade Crossing Infrastructure
Gilbert Street	25.78	607299C	Active (Public)	Crossbucks, bells, and flashing light signals
Lafayette Street Alley	25.70	Not Assigned	Passive (Private)	Crossbucks
Dubuque Street	25.66	607300U	Passive (Public)	Crossbucks
Clinton Street	25.59	840196P	Passive (Public)	Crossbucks
Capitol Street	25.50	840192M	Passive (Public)	Crossbucks
Court Street	25.15	840191F	Passive (Public)	Crossbucks and stop sign
Burlington Street	25.10	840190Y	Active (Public)	Crossbucks, bells, and flashing light signals
University Library Access	25.00	909194Y	Passive (Public)	Crossbucks and stop sign
Kings Material South Entrance	23.21	Not Assigned	Passive (Private)	No signage
Kings Material North Entrance	23.20	840182G	Passive (Private)	No signage

Roadway	Railroad Milepost	FRA Grade Crossing Number	Type of Crossing	Existing Grade Crossing Infrastructure
First Avenue (Iowa River Power House Entrance)	23.06	840181A	Active (Public)	Crossbucks, bells, and flashing light signals
Quarry Road	22.92	840180T	Passive (Private)	Crossbucks and yield signs
First Avenue	22.90	840179Y	Active (Public)	Crossbucks, bells, and flashing light signals
Seventh Avenue	22.30	909184T	Passive (Public)	Crossbucks and stop signs
Tenth Street	21.80	840177K	Active (Public)	Crossbucks, bells, and flashing light signals
Twelfth Avenue	20.70	840173H	Active (Public)	Crossbucks, bells, and flashing light signals
Lynncrest Drive	20.30	909032W	Passive (Public)	Crossbucks and stop signs
North Ridge Trail	20.15	840262A	Passive (Public)	Crossbucks and stop signs
Substation Tiffin-Tharp	19.95	Not Assigned	Passive (Private)	No signage
Postal Road	19.80	840261T	Passive (Public)	Crossbucks and yield signs
Oakdale Boulevard	19.70	840260L	Active (Public)	Crossbucks, bells, and flashing light signals
University Parkway	19.27	840259S	Active (Public)	Crossbucks, gates, bells, and flashing light signals
Forever Green Road	18.70	840258K	Active (Public)	Crossbucks, gates, bells, and flashing light signals
Golf View Drive	17.68	840256W	Active (Public)	Crossbucks, gates, bells, and flashing light signals
West Zeller Street	17.18	840255P	Active (Public)	Crossbucks, bells, and flashing light signals
Cherry Street	16.95	840254H	Active (Public)	Crossbucks, bells, and flashing light signals
Penn Street	16.67	840252U	Active (Public)	Crossbucks, bells, and flashing light signals

Source: CRANDIC (September 2018)

2.3.6 Railroad Wayside Signaling and Wayside Asset Protection Devices

The CRANDIC Corridor is not equipped with a railroad wayside signal system or wayside asset protection devices.

2.3.7 Fiber and Utility Infrastructure

A fiber optic line exists within the length of the CRANDIC Corridor right-of-way. Several utilities exist within, parallel to, or cross the Corridor, including electric utility infrastructure and pipelines for water, wastewater/sewerage, natural gas, and other products. The proximity of the fiber and electric utility infrastructure to the railroad is shown in the view of the CRANDIC Corridor near North Liberty in Figure 13 below.

Figure 13: Fiber Optic and Electric Utility Infrastructure in the CRANDIC Corridor in North Liberty

Source: HDR

2.3.8 Right-of-Way

As determined through coordination with CRANDIC and via a conceptual analysis of available right-of-way mapping from CRANDIC and current Google Earth imagery, the CRANDIC Corridor right-of-way between Gilbert Street in Iowa City and Penn Street in North Liberty generally varies from 50 to 100 feet in width and accommodates an active railroad line and utility infrastructure. Some sections of the CRANDIC right-of-way within urban areas in Iowa City and Coralville, however, are constrained and can be as narrow as approximately 40 feet in width. Figure 14 below shows typical CRANDIC Corridor right-of-way width at 10th Street in Coralville and Figure 15 below shows constrained CRANDIC Corridor right-of-way width in an urban area at Dubuque Street in Iowa City. CRANDIC also owns some additional adjacent property in Iowa City and other locations.

Figure 14: Typical CRANDIC Corridor Right-of-Way Width – 10th Street in Coralville

Source: Google Maps

Figure 15: Constrained CRANDIC Corridor Right-of-Way Width in Urban Area – Dubuque Street in Iowa City

Source: HDR

Right-of-way fencing through urban sections of the Corridor is no longer complete. The right-of-way in urban areas is frequently crossed by pedestrians at locations other than roadway grade crossings.

2.3.9 Current Railroad Method of Operation, Owner, and Operator

The limits and type of railroad Method of Operation in effect for the CRANDIC Corridor, as well as the ownership and operator of the CRANDIC Corridor are identified in Table 5 below.

Table 5: CRANDIC Corridor Method of Operation, Owner, and Operator

Limits	Owning Railroad	Operating Railroad	Railroad Line Designation	Railroad Method of Operation
Iowa City at Gilbert Street (Milepost 25.8) – North Liberty at Penn Street (Milepost 16.7)	Cedar Rapids & Iowa City Railway	Cedar Rapids & Iowa City Railway	CRANDIC Division 2	Yard Limits; Track Permit

Source: CRANDIC (September 2018)

Freight railroad operations in the CRANDIC Corridor are made at slow speeds. Maximum authorized speed for trains over the Corridor's main tracks operated by CRANDIC is 10 mph for freight trains, except where operating conditions and track geometry require lower speeds. CRANDIC yard managers in Cedar Rapids authorize main track authority over CRANDIC Division 2 between Iowa City and North Liberty via track permit.

No locomotive number-of-axle restriction is in place on the CRANDIC Corridor's main track between Iowa City and North Liberty. Tonnage restrictions include a maximum allowable gross weight of 286,000 lbs. per railcar between Iowa City and North Liberty and 263,000 lbs. per railcar within Iowa City. No vertical clearance restrictions were identified on the CRANDIC Corridor by CRANDIC.

2.3.10 Current Railroad Operations

The current volume and frequency of typical freight train operations in the CRANDIC as of September 2018 is described in this section.

The portion of the CRANDIC Corridor operated as its CRANDIC District 2 between Iowa City (Milepost 25.8) and Penn Street in North Liberty (Milepost 16.7) does not presently have any active online rail customers. CRANDIC uses as a short siding south of Cherry Street (Milepost 16.95) in North Liberty (within the Study Area) as a runaround track for serving one customer north of Penn Street in Iowa City (outside of, and to the north of, the Study Area) approximately once weekly. CRANDIC also stores "frac" sand and other railcars at North Liberty, Coralville, and other locations in the Corridor, as required.

CRANDIC did not identify any likely future freight services or activities that would be performed on the CRANDIC Corridor between Gilbert Street in Iowa City (Milepost 25.8) and Penn Street in North Liberty (Milepost 16.7).

Passenger trains do not presently operate over any segment of the CRANDIC Corridor.

3 Conceptual Economic and Social Impact and Benefit Assessment

Below is a qualitative summary of potential conceptual economic and social impacts and benefits associated with the implementation of a daily commuter rail service operating on 30-minute headways in the CRANDIC Corridor right-of-way between Dubuque Street in Iowa City and Penn Street in North Liberty, based on recent best planning practices and the general experience of recent rail transit implementation in the U.S.

3.1 General Benefits of Utilizing the CRANDIC Corridor Right-of-Way for Alternative Transportation Use

The CRANDIC Corridor right-of-way has been a catalyst for development of the region since CRANDIC rail service was inaugurated in 1904, and today it is the only remaining direct and continuous rail corridor between the Iowa City and Cedar Rapids MSAs that has the potential to be adapted for future alternative use. Development of a new, similar linear corridor for alternative transportation use between the two cities would likely be cost prohibitive and time consuming.

The population concentration in Iowa City, Coralville, and North Liberty is generally situated along the CRANDIC Corridor right-of-way. Owing to its location, the CRANDIC Corridor right-of-way has high potential for multimodal connectivity, as well as high potential for transit-oriented and other related economic development in Johnson County, if it is adapted for alternative transportation use. In addition, the redevelopment of the CRANDIC Corridor for commuter rail use will improve overall livability for users.

Other commuter passenger rail services in the large and small U.S. transit markets have produced the following benefits:

- Enhanced quality of life
- Creation and retention of jobs, opportunities, and wage growth
- Adjacent local economic development, small business development, and transit-oriented development
- Enhanced mobility and multimodal connectivity
- Reduced traffic congestion and increased safety due to a reduction in vehicle miles traveled
- Reduced emissions and fuel consumption due to a reduction in vehicle miles traveled
- Reduced roadway maintenance costs due to a reduction in vehicle miles traveled
- Increases to land value and land-use accommodation
- Enhanced access to housing
- Opportunities for enhanced or new local partnerships with multiple public and private stakeholders (including Public Private Partnerships)
- Changes to local planning and policy

3.2 Qualitative Assessment of Economic and Social Impacts and Benefits

3.2.1 Population Growth Trends

According to U.S. Census data, the population of the Iowa City MSA increased from 152,586 in 2010 to 171,941 in 2017[12]. This recent growth of 12.7 percent for the Iowa City MSA was significant, and larger than the 3.2 percent overall growth for the state of Iowa for the same period[13].

Iowa's 10 most populous counties (including Johnson County, where the Iowa City MSA is located) are expected to account for 56 percent of the state's total population by 2045[14]. This marked shift from rural to urban communities will require a planning effort to account for increased congestion and capacity issues within urban corridors. Additionally, more Iowans are traveling farther for work[15]. There is an immediate need to identify and maintain commuter routes to accommodate the demographic changes to the Iowa City MSA over the long-term horizon – including a proposed commuter rail service on the CRANDIC Corridor.

3.2.2 Sustainability

Commuter rail service on the CRANDIC Corridor between Iowa City and North Liberty would promote local and statewide sustainability by:

- Promoting energy efficient alternative transportation
- Reducing traffic congestion, travel times, and costs for commuters
- Reducing single-occupancy vehicle commuting
- Lowering greenhouse gas emissions from motor vehicles on roadways within and around the Study Area
- Minimizing constraints to area parking lot capacity (particularly within and near University of Iowa and other parking facilities in Iowa City)
- Providing an alternative use that is consistent with the best practices and recent experiences with adaptation of alternative use in other metropolitan areas with similar populations and population density

The existing CRANDIC Corridor right-of-way has high potential for enhancing local and statewide sustainability, as there are many social, environmental, and commercial benefits that would be realized through a smart design of the existing corridor for alternative transportation use. The

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[12] U.S. Census, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2017 – United States – Metropolitan Statistical Area; U.S. Census website: https://factfinder.census.gov/bkmk/table/1.0/en/PEP/2017/GCTPEPANNR.US24PR. Accessed October 4, 2018.

[13] U.S. Census, Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2017; U.S. Census website: https://www2.census.gov/programs-surveys/popest/tables/2010-2017/state/totals/nst-est2017-01.xlsx. Accessed October 4, 2018.

[14] Iowa Department of Transportation, Iowa in Motion 2045, Chapter 2, https://www.iowadot.gov/iowainmotion/files/Iowa-in-Motion-Chapter2.pdf. Accessed October 4, 2018.

[15] Ibid.

existing linear footprint of the CRANDIC Corridor right-of-way provides the unique opportunity to preserve an existing asset for future alternative transportation use (including commuter rail implementation) by the public and to avoid any greenfield construction that would be necessary to accommodate alternative transportation development in a new, parallel corridor.

Proactively coordinating land use and transportation planning is key to creating more sustainable, vibrant, and well-connected communities. Transit-oriented development will also be important to the success of this corridor, as transit-oriented development will help to improve the livability and quality of life of Iowa's public adjacent to the CRANDIC Corridor right-of-way (more about transit-oriented development is presented in Section 3.2.9 below). Additionally, commuter rail is likely to bolster sustainability by alleviating some vehicular traffic on local roadways and highways, and will introduce lifecycle cost savings to local roadway jurisdictions through the decrease in vehicular traffic.

3.2.3 Mobility

The CRANDIC Corridor right-of-way passes through downtown, commercial districts, and residential neighborhoods in Iowa City, Coralville, and North Liberty. Development of a proposed commuter rail service on the CRANDIC Corridor between Iowa City and North Liberty would serve to enhance public mobility. Communities along, and in close proximity to, the CRANDIC Corridor right-of-way should continue to develop transportation plans that enhance mobility and better connect the CRANDIC Corridor right-of-way to the community. This includes making improvements that would ease the movement of users within the region's multimodal system, inclusive of a potential commuter rail service on the CRANDIC Corridor between Iowa City and North Liberty.

3.2.4 Accessibility

A proposed commuter rail service on the CRANDIC Corridor would also provide the maximum opportunity for access from the communities located along the CRANDIC Corridor right-of-way (i.e., Iowa City, University Heights, Coralville, Oakdale, and North Liberty) to local destinations and opportunities for students, workers, business and leisure travelers, retail shoppers, elderly, hospital patients, and others. Commuter rail stations will be developed to be compliant with the Americans with Disabilities Act (ADA).

3.2.5 Reliability

A proposed commuter rail service on the CRANDIC Corridor would deliver reliable, timely, and safe all-weather transportation capability for the area. The service would operate on a schedule that would allow for some variances to travel time for unforeseen events.

3.2.6 Efficiency and Capacity

A proposed commuter rail service on the CRANDIC Corridor would enhance the system efficiency of the region's multimodal network. As the Iowa City MSA multimodal transportation network expands and becomes more complex, there is the potential that challenges for public use and access will surface, which has the potential to limit the overall transportation network's efficiency. In this case, the proposed commuter rail service would provide a transit alternative that would help to improve traffic congestion within the Iowa City MSA since it will add another efficient transportation option. It will also supplement and enhance existing capacity on the region's multimodal network, connect commercial areas located within the communities, and will offer transportation system redundancy and resiliency in the event of a disaster or a catastrophic failure of the primary roadway routes, which is needed for an efficient overall regional transportation network.

3.2.7 Safety

The overriding goal for all aspects of transportation safety is to reduce injuries and fatalities, thereby reducing personal and economic losses experienced by families, employers, and communities, and improving quality of life. A proposed commuter rail service on the CRANDIC Corridor would provide a safe method of transportation to the traveling public and a safe interface with the intersecting multimodal transportation network.

COVID-19 is the infectious disease caused by the most recently discovered coronavirus (SARS-CoV-2). This new virus and disease were unknown before the global outbreak began in early 2020. COVID-19 is now a pandemic affecting many countries globally at the time of this report[16]. Owing to this fact, many existing transit agencies regardless of size or mode have developed best practices, following the Center for Disease Control (CDC) guidelines and with input from public health experts, to aid the transit agencies in enhancing existing maintenance, cleaning, and disinfecting programs for their vehicles and facilities. The CDC also has developed guidelines for users of transit services to help reduce the transmission of the virus and spread of the disease. As the world continues to deal with the virus and COVID-19, newer and more effective best practices will be discovered and applied to all transit services.

3.2.8 Multimodal Connectivity

Iowa's extensive multimodal and multi-jurisdictional transportation network is a critical component of economic development and job creation throughout the state, and the system is also a major contributor to Iowans' quality of life. Multimodal transportation focuses on the different modal options that could be utilized to move people and goods from one place to another.

A proposed commuter rail service on the CRANDIC Corridor would enhance or create new connections with the region's multimodal transportation network, including existing and potential future transit routes (i.e., transit and intercity buses, intercity passenger rail, vanpools, car sharing, hired vehicles, park and ride facilities, and multi-use recreational trails).

3.2.9 Economic and Transit-Oriented Development

A proposed commuter rail service on the CRANDIC Corridor would support economic development, transit-oriented development (near potential commuter rail stations), and job retention and creation though area employers. A commuter rail service on the CRANDIC Corridor would be used as a tool to attract new businesses and residential development to the Iowa City MSA.

Transit-oriented development generally[17]:

- Catalyzes joint commercial and residential development opportunities (i.e., through air rights, land leases, etc.)

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[16] World Health Organization, *Q&A on Coronaviruses*, https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses. Accessed July 30, 2020.

[17] The National Academies Press, *TCRP Report 102 – Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects (2004)*, https://www.nap.edu/read/23360/chapter/1.

- Revitalizes neighborhoods
- Increases land values, rents, and real estate performance
- Increases affordable housing opportunities
- Reduces public infrastructure expenditures
- Increases affordable housing opportunities
- Attracts new investments, businesses, and jobs to the area

A proposed commuter rail service on the CRANDIC Corridor presents an opportunity to introduce transit-oriented development that promotes mixed land use that would enhance economic activity by diversifying the types of goods and services readily accessible within the area, as well as providing access to housing for residents requiring goods and services located along the corridor. Read more about Portland, Oregon's success with TOD in the following callout box.

"Transit-oriented development in Portland, Oregon (population 538,544), has helped the city bring new jobs and investment to the urban core, while enhancing the city's transportation network and improving residents' and employees' quality of life. The Portland Streetcar, which opened in 2001, has generated over $1.4 billion in development along its 4.7-mile loop."

Source: International Economic Development Council, 2006[18]

3.2.10 Community Development

The linear CRANDIC Corridor right-of-way is the backbone of the region and it played an integral role in developing and linking several communities during its earlier use as a passenger rail line in the 20th century. The return of passenger rail service to the CRANDIC Corridor between Iowa City and North Liberty presents an opportunity to:

- Continue to smartly develop growing communities in a functional and thoughtful manner that is in concert with land use planning best practices and provides maximum benefits to the public and a vast array of stakeholders.
- Attract residents to growing communities in Johnson County.
- Increase home and property values in the region.
- Introduce access to more affordable housing.
- Enhance community livability, sociability, and cohesion.
- Provide enhanced access to quality jobs, housing, schools, and other attractions.

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[18] International Economic Development Council, *Economic Development and Smart Growth*, https://www.smartgrowthamerica.org/app/legacy/documents/economic_development_and_sg.pdf, 2006.

4 Conceptual Commuter Rail Ridership and Revenue Forecasts

Initial conceptual ridership forecasts show that the proposed commuter rail service between Iowa City and North Liberty would transform the regional transit market. The travel time and reliability benefits from the commuter rail service would both attract riders from existing local bus service as well as new transit riders.

In consultation with the Federal Transit Administration (FTA), ridership forecasts for the proposed commuter rail line were prepared using the FTA's Simplified Trips on Software (STOPS) application. This section describes the preparation of the STOPS application and the collection of an on-board survey needed to understand the University of Iowa student travel market.

4.1 STOPS Overview

The STOPS application is a stand-alone ridership forecasting software package developed FTA. The software applies a set of travel models to predict detailed travel patterns on fixed-guideway systems. STOPS was specifically developed to support New Starts and Small Starts projects.

The application uses a modified four-step (trip generation, trip distribution, mode choice, and trip assignment) model structure to quantify total transit ridership by trip type, mode of access, and auto ownership. STOPS, version 2.5 dated March 25, 2019, was used for this ridership forecast.

4.1.1 STOPS Inputs

STOPS requires data from local, regional, and national sources for implementation:

- Census Data
- On-Board Survey
- Bus Boarding Data
- Population and Employment Data
- Local Street Network
- Highway Skims
- Transit Agency Data
- Additional Inputs

Table 6 identifies the inputs that were used in STOPS for the commuter rail ridership forecasts.

Table 6: STOPS Inputs

Inputs Used	Source	Source Year
GTFS Files	Coralville Transit, CAMBUS, Iowa City Transit	2019 (April)
University of Iowa On-Board Survey	ETC Institute	2019 (October)

Inputs Used	Source	Source Year
Bus Boarding Data	Coralville Transit, CAMBUS, Iowa City Transit	2019 (October)
Population/Employment Data	MPOJC	2010, 2014, 2020, 2025, 2030, 2035, 2040, 2045
A.M. Peak Highway Skims	MPOJC	2014, 2040

University of Iowa On-Board Survey

The FTA STOPS application uses the U.S. Census Bureau's Census Transportation Planning Products (CTPP) journey-to-work information to develop a person trip table. As described in its documentation STOPS uses conventional mode choice models to predict trips using each transit station and route. In its synthetic mode, STOPS self-calibrates to match CTPP transit shares and observed ridership counts at the system and route level.

However, STOPS synthetic mode generally does not represent travel markets unrelated to the worker flows provided by the CTPP. This includes travel by students to university campuses. STOPS can use data on special market trips to supplement the travel information in CTPP. In consultation with FTA and Study sponsors, it was determined that a special survey targeting the University of Iowa was needed to supplement the STOPS model with student travel market information to estimate ridership for the proposed commuter rail line.

This survey, conducted by the ETC Institute in November 2019, collected 1,486 surveys on the 22 bus routes that serve the University of Iowa campus. Table 7 shows linked university student transit trips that were used in STOPS to reflect the travel activity of this special market.

Table 7: University Student Linked Trips by Household Vehicles by Trip Purpose

Trip Purpose	Household Vehicles			
	0	1	2+	Total
Home-Based Work	641	902	126	1,668
Home-Based Other	6,253	3,361	712	10,326
Non-Home Based	1,256	768	185	2,209
Total	8,149	5,030	1,023	14,203

Bus Boarding Data

CAMBUS, Coralville Transit, and Iowa City Transit each provided bus boarding data for October 2019. Coralville Transit and Iowa City Transit provided route-level bus boarding data. CAMBUS provided stop-level boarding data.

Population and Employment Data

Table 8 shows the 2014 and 2040 population estimates for the MPOJC.

Table 8: MPOJC Population and Employment Growth, 2014 and 2040

Inputs Used	2014	2040	Difference	Compound Annual Growth Rate (%)
Population	121,000	177,300	56,300	1.6%
Households	52,300	76,000	23,700	1.6%
University of Iowa Employment	28,600	37,200	8,600	1.0%
Other Employment	65,000	92,200	27,200	1.5%

Highway Skims

Highway skims were prepared from the MPOJC travel model for 2015 and 2040 for estimated morning (a.m.) peak highway travel times.

Transit Agency Data

General Transit Feed Specification (GTFS) is a standardized format for public transportation schedules used by transit agencies throughout the world. GTFS is a collection of text files that, together, provide data necessary for trip planners, schedules, and mobile phone applications. STOPS utilizes GTFS for estimating ridership in the existing, no-build, and build scenarios. GTFS files from October 2018 were as inputs into STOPS. These files were used for calibration and as a foundation for the no-build and build scenarios.

Additional Inputs

There are several inputs which were also applied for the commuter rail forecasts, including:

- Weekday Unlinked Transit Trips: 26,082

4.2 Conceptual Ridership Forecasts

4.2.1 Commuter Rail Service Parameters

The potential commuter rail service would operate every 30 minutes between Dubuque Street in Iowa City and Penn Street in North Liberty between 6 a.m. and 7 p.m. Traveling at an average of 30 miles per hour, the 9-mile trip would require 25 minutes. This faster and more reliable train service will compete directly with local bus service in several travel markets. Park-and-ride locations at several stations will also divert some commuters from existing shuttle service on the University of Iowa campus. Travel forecasts also show the conceptual service attracting new riders to the regional system, potentially reducing the number of automobiles commuting on regional roads.

Table 9 compares local bus and commuter rail morning peak hour travel times between several stations along the conceptual commuter rail line. These travel times include transfer, walk access, and walk egress estimates from Google Maps. This comparison shows the faster travel times offered by the commuter rail service.

Table 9: Conceptual Travel Time Comparison: Local Bus and Commuter Rail

From	To	Bus	Rail
Penn Street (North Liberty)	Downtown - University of Iowa	43 min	32 min
Coralville (Iowa River Landing)	Downtown - University of Iowa	17 min	11 min
VA Hospital	Downtown - University of Iowa	10 min	7 min
VA Hospital	Dubuque Street	24 min	12 min
Downtown - University of Iowa	Dubuque Street	15 min	5 min

Owing to competition from commuter rail service, the STOPS forecasts show these local bus routes potentially losing 20 percent or more of their current ridership:

- North Liberty (Coralville Transit)
- Hospital Finkbine Arena (CAMBUS)
- Express (Coralville Transit)

Note that area transit agencies may restructure their service to support commuter rail. Local bus service may be reconfigured to serve commuter rail stations and provide greater mobility options. This may offset potential loss of ridership. However, for some existing bus routes, a more efficient commuter rail trip would result in lower ridership.

For 2019, the STOPS application estimated 5,282 average weekday boardings for the conceptual Iowa City-North Liberty commuter rail service. It shows that many of the riders would make short trips along the line. For example, 63 percent of passengers boarding at Penn Street would only travel as far as Coralville. More than 75 percent of passengers boarding at Coralville would travel into Iowa City. Table 10 shows STOPS' origin-destination estimates for the seven proposed commuter rail stations.

Table 10: Average Weekday Station Utilization by Project Trips, 2019

Origin Station/ Destination Station	Penn Street	Forever-green Road	Oakdale Commuter	Coralville	VA Hosp.	Downtown Univ. of Iowa	Dubuque Street	Total
Penn Street		366	223	156	37	263	85	**1,130**
Forevergreen Road	366		34	19	28	116	9	**572**
Oakdale Commuter	223	34		15	82	127	11	**491**
Coralville	156	19	15		109	361	128	**789**
VA Hospital	37	28	82	109		256	105	**617**
Downtown Univ. of Iowa	263	116	127	361	256		111	**1,235**
Dubuque Street	85	9	11	128	105	111		**448**
Total	**1,130**	**572**	**491**	**789**	**617**	**1,235**	**448**	**5,282**

Table 10 shows the weekday boarding forecasts by station by mode of access for 2019. Park-and-ride trips accounts for 15 percent of total boardings. STOPS shows that commuter rail may attract 3,500 new weekday riders to the regional system and reduce weekday person miles of automobile travel by 15,500.

Table 10: Commuter Rail Boarding Estimates by Station and Mode of Access, 2019

Station	Walk	KNR	PNR	XFR	All
Penn Street (North Liberty)*	986	37	106	0	1,130
Forevergreen Road*	274	65	233	0	572
Oakdale Commuter*	256	38	108	90	491
Coralville*	357	81	322	29	789
VA Hospital	556	17	0	44	617
Downtown-University of Iowa	1,001	9	0	225	1,235
Dubuque Street	378	19	0	51	448
Total	3,808	266	769	439	5,282

Notes: KNR – Kiss-and-Ride; PNR – Park-and-Ride; XFR - Transfer
** Park-and-ride location*

The STOPS application estimated that 17 percent of conceptual commuter rail riders will come from households with zero cars. STOPS model forecasts show by 2027 average weekday boardings growing to 6,740. By 2042, STOPS forecasts an average weekday ridership of 7,728. See Table 11 and Table 12 below for commuter rail boarding estimates by station and mode of access for 2027 and 2042, respectively.

Table 11: Commuter Rail Boarding Estimates by Station and Mode of Access, 2027

Station	Walk	KNR	PNR	XFR	All
Penn Street (North Liberty)*	868	35	104	0	1,009
Forevergreen Road*	605	92	279	0	976
Oakdale Commuter*	197	45	105	70	418
Coralville*	422	96	412	31	962
VA Hospital	1,118	18	0	155	1,291
Downtown-University of Iowa	1,364	12	0	201	1,577
Dubuque Street	445	18	0	44	507
Total	5,019	316	900	501	6,740

Notes: KNR – Kiss-and-Ride; PNR – Park-and-Ride; XFR - Transfer
** Park-and-ride location*

Table 12: Commuter Rail Boarding Estimates by Station and Mode of Access, 2042

Station	Walk	KNR	PNR	XFR	All
Penn Street (North Liberty)*	1,033	42	124	0	1,200
Forevergreen Road*	807	126	360	0	1,292
Oakdale Commuter*	196	59	123	75	453
Coralville*	422	114	464	28	1,028
VA Hospital	1,217	21	0	201	1,439
Downtown-University of Iowa	1,506	12	0	220	1,738
Dubuque Street	511	19	0	48	578
Total	5,692	393	1,071	572	7,728

Notes: KNR – Kiss-and-Ride; PNR – Park-and-Ride; XFR - Transfer
** Park-and-ride location*

4.2.2 Informal FTA Review and STOPS Sensitivity Check

STOPS application development is a prescriptive process established by FTA. As such, the results from this fixed-guideway forecasting tool provide a basis for estimating potential ridership. In order to provide more confidence in the STOPS forecasts, project sponsors requested an informal review from FTA of the STOPS model with respect to the special market survey application in January 2020. FTA agreed to review the data and responded with observations and suggestions in February 2020.

Based on FTA's suggestions and observations, the following changes were made to the STOPS models:

- Updated the Special Market Model
  - Following FTA's recommendation, the STOPS census geography was subdivided to be consistent with the MPOJC traffic analysis zone geography. This increased the number of zones in the census geography which provided better resolution, especially for walk-access transit trips.

- Reviewed the Park and Ride (PNR) Markets and Updated the Auto Time Factor
  - Many commuters to the University of Iowa, the University of Iowa Hospitals and Clinics, and the Iowa City Veteran of Affairs (VA) Health Care System drive and park at satellite lots and transfer to CAMBUS. FTA noted that STOPS does not understand this fringe parking behavior and suggested that we update the special market university student trip table to show the home end of these commute trips at the satellite parking lots. In examining the onboard survey, it was found that there were 933 weekday university student transit riders driving and parking to access the transit system. About half of these drive-to-transit trips are to dispersed locations. However, 473 university transit riders boarded transit at the Finkbine and Arena remote parking lots. These 473 trips were coded so their home location was the same as the remote parking lot and reran the STOPS application. This change reduced the commuter rail boarding forecast by 24

trips. This means that university students using the remote parking lots is a small part of the potential commuter rail travel market.

- There is still the question of fringe parking by VA Hospital and University of Iowa Health Care employees. The onboard survey shows this is a larger travel market with 2,761 weekday transit riders driving and parking to access the transit system. Since these are not university students, they were not included in the special trip table. A system-wide transit origin-destination survey may help shed light on how this fringe parking travel market functions.
- The Auto Time Factor is an adjustment used to normalize the peak period highway travel times from the MPOJC model with the transit schedules. The FTA procedure using Google Maps drive times was followed, and estimated an Auto Time Factor of 1.5 that was documented using the FTA methodology.
- Higher auto time factors will make STOPS-simulated car trips slower, making the rail alternative more attractive. A sensitivity test was ran with a reduced auto time factor (even though the 1.5 auto time factor was consistent with FTA methods) to see how sensitive the model was to this parameter. Using an Auto Time Factor of 1.2, which indicates faster car trip times, total boardings on the proposed rail line decreased to 4,328. While the forecasts are lower, this test provides more confidence that the total conceptual ridership will still be significantly higher than those peer lines.

- Included a Street Network for Walk Access
  - FTA commented that the STOPS application needs more information to understand how the Iowa River affects transit access, as there are limited pathways across the river. A local street network was incorporated into STOPS to simulate transit walk access.
- Transit Boarding Data
  - The Coralville and Iowa City transit systems do not currently have stop-level boarding and alighting data. This information, if available, would improve the STOPS application forecasts.
- Reasonableness Check of the Socioeconomic Data along the CRANDIC Corridor to assess some high walk access trips in the northern part of the Corridor.
  - U.S. Census 2010 reported more than 7,000 people living within one mile of the proposed Penn Street Station in North Liberty. The Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) data available at onthemap.ces.census.gov shows that most of the 9,000 workers living in North Liberty and commute to Coralville and Iowa City. This information helps explain both the high number of Penn Street boardings and the shorter trips between North Liberty and Coralville.
  - While the MPOJC's population and employment data is a direct input into the STOPS model, it is not used to estimate existing transit trips. STOPS uses the system and route-level boarding data together, along with the special market trip table, to build a table of existing transit trips. STOPS does use the MPOJC population and employment projections to estimate future transit trips. STOPS' regional transit trip growth was reviewed and found it consistent with the population and employment growth in the

MPOJC socioeconomic data[19]. The STOPS inputs match the MPOJC model population and employment values. One thing that stands out is the fact that the CRANDIC Corridor is a high-growth corridor, as evident by the on-going development and construction along the Corridor.

4.3 Conceptual Fare Revenue Forecasts

4.3.1 Peer Review

Prior to calculating conceptual fare revenue forecasts, the consultant team conducted a peer review to understand typical fare rates, structure, and recovery ratios. Nine agencies were selected based on similar corridor/system lengths and area population. The agencies and their general information are provided in Table 13. Drawing direct comparisons between the commuter rail services described here and the proposed Iowa City-North Liberty service can be potentially challenging. Many of these services only operate during the morning and evening commuter peaks. In contrast, the proposed Iowa City-North Liberty service would operate in both directions throughout the day, seven days a week.

Table 13: Peer Agencies General Information

City	Agency/Operator	Line	Length	No. of Stations	Population
Beaverton, OR	TriMet	WES Commuter Line	14.7 mi	5	97,500
Denton, TX	DCTA	A-Train	21 mi	6	138,500
Nashville, TN	NRTX	Music City Star	32 mi	7	1,931,000
San Rafael, CA	Sonoma-Marin Area Rail Transit	SMART	45 mi	12	177,600
New Haven, CT	ConnDOT	Shore Line East	90 mi	15	862,500
Albuquerque, NM	NMRX	New Mexico Rail Runner	97 mi	15	905,000
Norfolk, VA	Hampton Roads Transit	The Tide Light Rail	7.4 mi	11	243,000
Oceanside, CA	North County Transit District	SPRINTER	22 mi	15	176,193
Seattle, WA	Sound Transit	LINK Light Rail	22 mi	22	724,745

A primary objective of the review was to understand base fares. Of the agencies reviewed, the A-Train line in Denton had the lowest fare at $1.50 for a single trip, and SMART in San Rafael had the highest fare rate at $11.50 for a one-way ticket. SMART, Shore Line East, and New Mexico Rail Runner all use a zone or distance based fare, but are also the largest systems reviewed. Notably, the WES Commuter Line and A-Train, which are most similar to the CRANDIC Corridor in terms of length, have the lowest and third lowest base fares ($1.50 and $2.50, respectively). Table 15 shows the peer agency fare structure.

[19] Metropolitan Planning Organization of Johnson County, 2018.

Table 14: Peer Agency Fare Structure

City	Line	Fare Structure		
		Single Fare	All Day Fare	Reduced Fare
Beaverton, OR	WES Commuter Line	$2.50	$5.00	$1.25
Denton, TX	A-Train	$1.50	$3.00	$0.75
Nashville, TN	Music City Star[1,2]	$5.25	N/A	$2.00
San Rafael, CA	SMART[2]	$3.50-$11.50	$23.00	$1.75-$5.75
New Haven, CT	Shore Line East[2]	$3.25-$10.25	N/A	$1.50-$5.00
Albuquerque, NM	New Mexico Rail Runner[2]	$2.00-$10.00	$3.00-$11.00	$1.00-$5.00
Norfolk, VA	The Tide Light Rail	$2.00	$4.50	$1.00
Oceanside, CA	SPRINTER	$2.50	$6.00	$1.25
Seattle, WA	LINK[1] Light Rail	$2.25-3.00	$4.50-6.00	$1.50

[1] *Advanced fare available*
[2] *Distance or zone based fare*

Fare recovery is the percentage of commuter rail operating and maintenance (O&M) costs that are paid for by passenger fares; see Section 6.3.2 for the conceptual O&M costs breakdown. For established agencies, using existing operations and fare data can produce trends and inform forecast efforts. As this project is not yet built and is without data, fare recovery was calculated using two best practice methodologies:

1. Fare recovery as a product of ridership forecasts, fare estimates, and an annualization factor
2. Fare recovery as a portion of projected operations costs.

The following sections describe the methodologies and resulting fare recovery forecasts in greater detail.

4.3.2 Fare Recovery as a Product of Ridership Forecasts, Fare Estimates, and an Annualization Factor

As described above, the CRANDIC Corridor would have an estimated 5,282 average daily riders in 2019 STOPS model. In addition to ridership, a fare cost and annualization factor were also required in order to calculate fare revenue.

Given the similarities between the CRANDIC Corridor, the WES Commuter Line, and the A-Train, as well as considering the Iowa City – North Liberty existing transit service fares, a base fare of $1.50 was selected for this analysis.

The annualization factor was calculated by examining the region's existing services' weekday, Saturday, and Sunday ridership. The three existing services include Coralville Transit, Iowa City Transit, and CAMBUS (University of Iowa). Table 15 summarizes 2018 ridership for the three agencies.

Table 15: Existing Transit Services Ridership (2018)

Existing Transit Services	Weekday	Saturday	Sunday
Coralville	1,734	460	0
Iowa City Transit	5,601	1,300	0
CAMBUS	14,029	2,232	1,765
Total	**21,364**	**3,992**	**1,765**

Source: NTD, 2018

The total number of weekdays, Saturdays, and Sundays in 2018 were then determined and used in combination with the region's ridership to calculate an annualization factor of 265. Conceptual fare revenues were then calculated using the formula:

$$\text{Fare Revenue} = \text{Ridership} \times \text{Fare} \times \text{Annualization Factor}$$

Table 16 details the fare revenue projections by station relative to plan year 2019. The total forecasted revenues equate to a 44 percent fare recovery rate. Table 17 and

Table 18 show projected fare revenue estimates for 2027 and 2042, respectively.

Table 16: Projected Fare Revenue in 2019, in 2019 Dollars

Station	Weekday Ridership in 2019	Fare Revenue, $
Penn Street (North Liberty)*	1,130	$449,000
Forevergreen Road*	572	$227,000
Oakdale Commuter*	491	$195,000
Coralville*	789	$314,000
VA Hospital	617	$246,000
Downtown-University of Iowa	1,235	$493,000
Dubuque Street	448	$179,000
Total	**5,282**	**$2,103,000**

Table 17: Estimated Projected Fare Revenue in 2027, in 2019 Dollars

Station	Weekday Ridership in 2027	Fare Revenue, $
Penn Street (North Liberty)*	1,009	$401,000
Forevergreen Road*	976	$388,000
Oakdale Commuter*	418	$166,000
Coralville*	962	$382,000
VA Hospital	1,291	$513,000
Downtown-University of Iowa	1,577	$627,000
Dubuque Street	507	$202,000
Total	**6,740**	**$2,679,000**

Table 18: Estimated Projected Fare Revenue in 2042, in 2019 Dollars

Station	Weekday Ridership in 2042	Fare Revenue, $
Penn Street (North Liberty)*	1,200	$477,000
Forevergreen Road*	1,292	$514,000
Oakdale Commuter*	453	$180,000
Coralville*	1,028	$409,000
VA Hospital	1,439	$572,000
Downtown-University of Iowa	1,738	$691,000
Dubuque Street	578	$230,000
Total	**7,728**	**$3,073,000**

4.3.3 Fare Revenue as a Percent of Operations Costs

Fare recovery was calculated using the traditional methodology of fare revenue as a percent of operations and maintenance costs, as is common practice, and because the above calculated revenue recovery uses ridership forecasts that, while possible, are higher than anticipated. For example, the WES Commuter Line and A-Train had 1,600 and 1,500 average weekday riders in 2018, while the CRANDIC Corridor STOPS model forecasts nearly 5,300 average weekday riders in 2019. Table 19 summarizes the peer agencies' average weekday ridership from 2015 to 2018. The Oceanside Sprinter, Sound Transit's LINK light rail, and Hampton Roads Transit Tide light rail operate all-day service. These services have both higher boardings and higher fare recovery rates than traditional commuter rail lines, like WES.

Table 19: Peer Agency Average Weekday Ridership (2015-2018)

City	Line	Average Weekday Ridership			
		2015	2016	2017	2018
Beaverton, OR	WES Commuter Line	1,700	1,700	1,700	1,600
Denton, TX	A-Train	1,900	2,000	1,600	1,500
Nashville, TN	Music City Star	-	1,200	1,100	1,100
San Rafael, CA	SMART*	-	-	-	2,500
New Haven, CT	Shore Line East	2,000	1,900	-	1,800
Albuquerque, NM	New Mexico Rail Runner	2,900	2,700	2,600	2,500
Norfolk, VA	The Tide Light Rail	3,700	4,300	4,100	4,600
Oceanside, CA	SPRINTER	8,900	8,500	8,600	7,500
Seattle, WA	LINK Light Rail	1,800	1,900	4,800	5,500

Source: APTA Ridership Reports 2015-2018
**SMART opened in 2017*

Additionally, the 2018 Maricopa County Association of Governments (MAG) Commuter Rail Study found that while the national average fare recovery for commuter rail systems was approximately 52 percent in 2016; the result includes a range in fare recovery from 15 percent fare recovery, up to 70 percent fare recovery. The study found that large systems often see higher fare recovery rates, usually above 50 percent, while smaller agencies typically have lower fare recovery rates[20]. As outlined in Table 20, the agencies reviewed have significantly lower fare recovery rates than described in the MAG Commuter Rail Study. Overall, the median peer agency average fare recovery in 2018 was 13 percent, a significant 31 percent lower than the conceptual fare recovery rate calculated for CRANDIC using the ridership forecast.

Table 20: Peer Agency Fare Recovery Rates

		Fare Recovery			
City	Line	2015	2016	2017	2018
Beaverton, OR	WES Commuter Line	8%	7%	7%	6%
Denton, TX	A-Train	6%	6%	5%	4%
Nashville, TN	Music City Star	17%	17%	22%	22%
San Rafael, CA	SMART*	-	-	-	14%
New Haven, CT	Shore Line East	8%	8%	8%	7%
Albuquerque, NM	New Mexico Rail Runner	9%	8%	8%	6%
Norfolk, Virginia	The Tide Light Rail	14%	11%	12%	15%
Oceanside	SPRINTER	19%	18%	17%	14%
Seattle	LINK Light Rail	16%	14%	14%	13%

Source: NTD Reports 2015-2018
**SMART opened in 2017*

With an understanding of fare recovery rates among the peer agencies, a range of recovery rates to the projected operating cost were applied. Table 21 summaries the range of possible fare revenues based on the projected $4.8 million annual operating cost. Note that the annual operating costs will likely change year to year due to inflation and other factors, such as market value for fuel, labor, and other input costs.

Table 21: Possible Fare Revenues Based on Recovery Rate, in 2019 Dollars

Operating Budget	Fare Recovery Rate	Projected Fare Revenue, $
$4,800,000	10%	$480,000
$4,800,000	15%	$720,000
$4,800,000	20%	$960,000
$4,800,000	25%	$1,200,000
$4,800,000	30%	$1,440,000

4.3.4 Comparison of Results

The two methodologies produced different results, from fare revenues as low as $480,000 to as high as $2,103,000. Table 22 summarizes the range in fare revenues.

[20] Source: MAG Commuter Rail Study, 2018

Table 22: Range of Potential Fare Revenues, in 2019 Dollars

Methodology	Fare Recovery Rate	Projected Fare Revenue
As percent of operating cost	10%	$480,000
As percent of operating cost	15%	$720,000
As percent of operating cost	20%	$960,000
As percent of operating cost	25%	$1,200,000
As percent of operating cost	30%	$1,440,000
Annualized based on ridership	44%	$2,103,000

Based on the projected ridership, the CRANDIC Corridor could potentially be a transformative transit service for the region and not only draw ridership from the existing transit customers, but also attract many new customers. A 44 percent fare recovery rate seems unlikely, but the analysis suggests the fare recovery rate could exceed the average for small corridor/system fare recovery rates.

4.4 Advertising

As a way to enhance asset utilization, supplement revenue, and to reduce dependence on subsidies for operations and maintenance, transit agencies nationwide are increasingly examining opportunities to increase revenues through advertising. Many transit agencies are working with agents to sell advertising space on and in trains, stations, shelters, timetables, maps, other agency property, and so on, to generate this revenue. Transit agencies in pursuit of this opportunity often develop an advertising program that considers legal, operational, safety, and aesthetic issues associated with these activities, as well as consistency with the agency's values[21]. The table below illustrates what some examples of advertising opportunities pursued by various transit agency peers.

Table 23: Peers and Advertising

City	Line	Advertising	Notes
Beaverton, OR	WES Commuter Line	$3.7 million (FY18 TriMet system)	Budget
Denton, TX	A-Train	None	N/A
Nashville, TN	Music City Star	$35,000 (FY19)	Budget
San Rafael, CA	SMART*	Has advertising	Advertising policy
New Haven, CT	Shore Line East	Unknown	N/A
Albuquerque, NM	New Mexico Rail Runner	Has advertising; $75,000 in FY15	Advertising link
Norfolk, Virginia	The Tide	Has advertising	Advertising sheets; Advertising policy
Oceanside	SPRINTER	Has advertising	Advertising policy
Seattle	LINK	Has advertising	Advertising policy

[21] http://onlinepubs.trb.org/onlinepubs/tcrp/tsyn32.pdf

Based on this review, any operator of the proposed Iowa City-North Liberty commuter rail service should consider any potential to generate revenue from advertising.

5 Service Plans

In the previous *Iowa City-Cedar Rapids Passenger Rail Conceptual Feasibility Study*, the service characteristics of streetcar, light rail transit, and commuter rail transit modes were identified and described and were considered for their applicability for a passenger rail service on the CRANDIC Corridor. During development of that study, and subsequent project coordination, stakeholders identified the Diesel Multiple Unit (DMU) equipment of the commuter rail transit mode as a potential option for a Phase 1 passenger rail service between Iowa City and North Liberty. This DMU equipment and an associated potential commuter rail service plan in the Iowa City-North Liberty Corridor are the subjects of this section.

5.1 Conceptual Commuter Rail Equipment Plan

Equipment for the potential commuter rail service implementation would include six new self-propelled DMU coach railcars, which will be used to assemble three trainsets of two railcars to accommodate the Iowa City-North Liberty passenger rail service. Two trainsets would be required to protect potential scheduled operations of the commuter rail service between Iowa City and North Liberty as outlined in the conceptual Service Plan presented later in this Study and the third, or spare, two-car trainset would be used to accommodate regular equipment maintenance schedules at the CRANDIC Shops outside of the Corridor at Cedar Rapids.

The new DMU commuter train consist would operate in a push-pull configuration, which allows the train to be operated from control cabs at either end, thus eliminating the need to turn trains at terminal points in Iowa City and North Liberty. Typical new DMU railcars are 85 feet in length and have a seating capacity of 75 to 85 on average, including accommodations for disabled persons in wheelchairs, and often include bicycle storage and a lavatory. Each two-car trainset would therefore be approximately 170 feet in length and have a seating capacity of 150 to 170 on average.

The six DMU cars would be designated as FRA Compliant, meaning that they would meet the current Federal Railroad Administration (FRA) safety regulations that are generally built around specifications providing the structural integrity to withstand a crash between passenger trains and freight trains on shared-use corridors. While the Study assumes that the CRANDIC Corridor between Iowa City and North Liberty would be designated passenger rail only, the acquisition of FRA Compliant passenger cars could potentially be required later by FRA, if CRANDIC decides to restore its common carrier obligation and host freight rail operations on this segment in the future.

A typical two-car trainset of new FRA Compliant DMU equipment recently constructed by Nippon Sharyo and the Sumitomo Corporation and to be operated in revenue service by Sonoma-Marin Area Rail Transit (SMART) in the San Francisco Bay Area of California beginning in 2016 is shown in Figure 16 below[22]. Passenger rail equipment of this type and configuration is what has been explored in this Study for potential implementation on the CRANDIC Corridor.

[22] Nippon Sharyo, *SMART*, https://www.n-sharyo.co.jp/business/tetsudo_e/pages/zsmart.html. Access February 20, 2020.

Figure 16: Typical Two-Car Trainset of New FRA Compliant DMU Equipment

Source: Nippon Sharyo

5.2 Conceptual Commuter Rail Service Plan

This section presents a conceptual Service Plan for operation of a daily commuter rail service using DMU equipment on the 9.1-mile CRANDIC Corridor between Dubuque Street in Iowa City and Penn Street in North Liberty.

The Study's conceptual Service Plan for the Iowa City-North Liberty commuter rail service assumes the following:

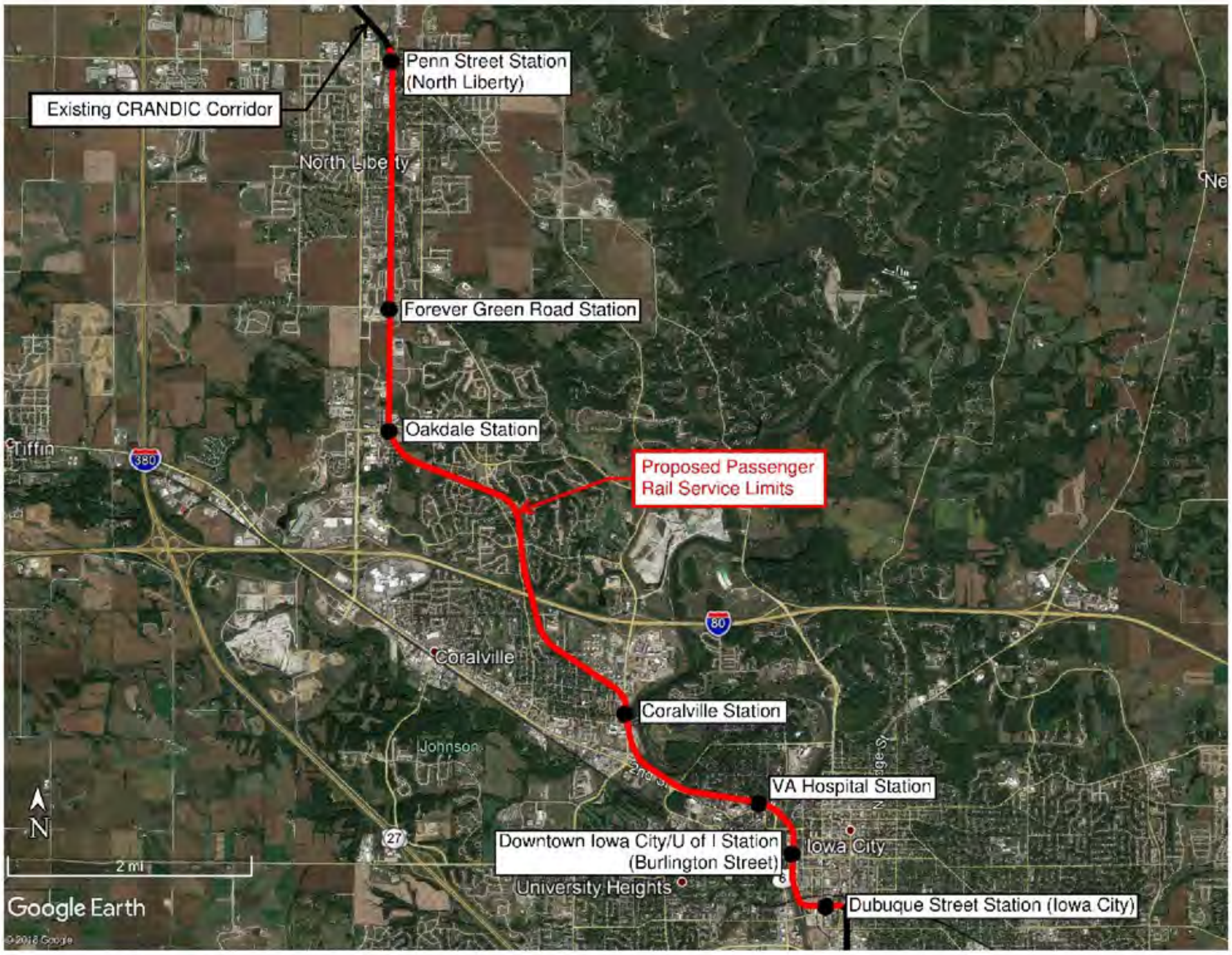
- Potential commuter rail service schedule would operate 26 total revenue trains each way daily (for a total of 52 revenue trains) in the CRANDIC Corridor between Iowa City (Dubuque Street) and North Liberty (Penn Street) and with train departures on 30-minute headways from these terminal points from 6 a.m. until 7 p.m.
- The CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty would be passenger rail only, with the potential for redevelopment as a shared-use corridor with freight trains, if the need for freight rail service arises in the future.
- The CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty would have Centralized Traffic Control (CTC) as its Method of Operation, allowing a CRANDIC dispatcher or manager in Cedar Rapids to remotely control train traffic in blocks, which is relayed to the commuter train crew via wayside signal aspect. Implementation of a Positive Train Control (PTC) overlay of the CTC system will not be required, as would be the case for a shared-use corridor with passenger and freight trains.
- Commuter trains would be operated as a push-pull turnaround service, with one commuter train operating from each of the terminal points in the Corridor at a time. It is assumed that meet-pass events for commuter trains would routinely occur at roughly the mid-point of the Corridor at a new siding located in between First Avenue and Seventh Avenue in Coralville that would be controlled by the dispatcher. Meet-pass events and trainset staging (for

periods of non-operation) could also occur on dispatcher-controlled stub-ended station tracks at the Iowa City (Dubuque Street) and North Liberty (Penn Street) terminal points.

- Maximum commuter train speed of 50 mph assumed and average commuter train speed of 30 mph assumed.
- Operating headways (departures) of 30 minutes are assumed from terminal points. Schedules of approximately 25 minutes running time between Dubuque Street in Iowa City and Penn Street in North Liberty, including the time necessary for stops at five intermediate stations and one meet-pass event between commuter trains at Coralville, are assumed. Time necessary for a train crew to change ends (reverse direction) at the Iowa City and North Liberty terminals is assumed to be 5 minutes.
- Level boarding would be provided at the seven potential stations locations identified by CRANDIC, MPOJC, and other local stakeholders for the Study (see Figure 17), including:
  - Dubuque Street (Iowa City) – Southern Terminus
  - Downtown Iowa City/University of Iowa (Burlington Street)
  - VA Hospital
  - Coralville
  - Oakdale
  - Forever Green Road
  - Penn Street (North Liberty) – Northern Terminus

(See Figure 17 on next page).

Figure 17: Potential Commuter Rail Stations



Source: HDR and Google Earth

During hours of non-operation, the two in-service commuter trainsets would layover, be refueled using Direct Truck to Locomotive (DTL) fueling, and receive routine light maintenance and interior cleaning at the North Liberty Station (Penn Street). It is assumed that the in-service commuter trainsets would be deadheaded empty between North Liberty Station, the CRANDIC Shops in Cedar Rapids (which is located outside of, and to the north of, the Iowa City-North Liberty Corridor), and the North Liberty Station, as a means of facilitating equipment rotation and maintenance cycles at Cedar Rapids, once weekly. In this process, one of the in-service trainsets would be swapped out with the spare trainset staged at the CRANDIC Shops to create the next week's in-service trainsets. The deadhead between North Liberty Station and the CRANDIC Shops at Cedar Rapids is approximately 16 miles on CRANDIC Division 2 each way, is estimated to take 2 hours each way, and would not carry any passengers.

5.2.1 Conceptual Commuter Rail Service Schedule

A conceptual commuter train schedule for the CRANDIC Corridor based upon the Service Plan assumptions listed in the section above has been created for this Study, which also takes into account potential transportation needs for the public during peak hours and the benefits of adopting a "memory schedule" with departure times from terminal points at easy to remember intervals.

Additional stakeholder coordination would be required in the future to determine a schedule best matched to the needs and demands of the traveling public.

Conceptual southbound commuter train schedules between Penn Street in North Liberty and Dubuque Street in Iowa City and conceptual northbound commuter train schedules between Dubuque Street in Iowa City and Penn Street in North Liberty are shown in Table 24 and Table 25 below, respectively. Note that the schedule includes deadhead moves to position trainsets at the appropriate terminals to accommodate the commuter train schedule and to stage equipment during periods of non-operation. The schedule also includes a 35-minute layover at the Iowa City and North Liberty terminals to accommodate a midday train crew change and light cleaning of equipment.

Table 24: Conceptual Daily Southbound Commuter Train Schedule – North Liberty to Iowa City

Commuter Train Number	Depart Penn Street (North Liberty)	Arrive Dubuque Street (Iowa City)
Trainset Deadhead (No Passengers)	*5:25 a.m.*	*5:50 a.m.*
1	6:00 a.m.	6:25 a.m.
3	6:30 a.m.	6:55 a.m.
5	7:00 a.m.	7:25 a.m.
7	7:30 a.m.	7:55 a.m.
9	8:00 a.m.	8:25 a.m.
11	8:30 a.m.	8:55 a.m.
13	9:00 a.m.	9:25 a.m.
15	9:30 a.m.	9:55 a.m.
17	10:00 a.m.	10:25 a.m.
19	10:30 a.m.	10:55 a.m.
21	11:00 a.m.	11:25 a.m.
23	11:30 a.m.	11:55 a.m.
25	12 Noon	12:25 p.m.
Mid-Day Layover/Train Crew Change	*12:25 p.m.*	*1:00 p.m.*
27	1:00 p.m.	1:25 p.m.
29	1:30 p.m.	1:55 p.m.
31	2:00 p.m.	2:25 p.m.
33	2:30 p.m.	2:55 p.m.
35	3:00 p.m.	3:25 p.m.
37	3:30 p.m.	3:55 p.m.
39	4:00 p.m.	4:25 p.m.
41	4:30 p.m.	4:55 p.m.
43	5:00 p.m.	5:25 p.m.
45	5:30 p.m.	5:55 p.m.

Commuter Train Number	Depart Penn Street (North Liberty)	Arrive Dubuque Street (Iowa City)
47	6:00 p.m.	6:25 p.m.
49	6:30 p.m.	6:55 p.m.
51	7:00 p.m.	7:25 p.m.

Table 25: Conceptual Daily Northbound Commuter Train Schedule – Iowa City to North Liberty

Commuter Train Number	Depart Dubuque Street (Iowa City)	Arrive Penn Street (North Liberty)
2	6:00 a.m.	6:25 a.m.
4	6:30 a.m.	6:55 a.m.
6	7:00 a.m.	7:25 a.m.
8	7:30 a.m.	7:55 a.m.
10	8:00 a.m.	8:25 a.m.
12	8:30 a.m.	8:55 a.m.
14	9:00 a.m.	9:25 a.m.
16	9:30 a.m.	9:55 a.m.
18	10:00 a.m.	10:25 a.m.
20	10:30 a.m.	10:55 a.m.
22	11:00 a.m.	11:25 a.m.
24	11:30 a.m.	11:55 a.m.
26	12 Noon	12:25 p.m.
Mid-Day Layover/Train Crew Change	*12:25 p.m.*	*1:00 p.m.*
28	1:00 p.m.	1:25 p.m.
30	1:30 p.m.	1:55 p.m.
32	2:00 p.m.	2:25 p.m.
34	2:30 p.m.	2:55 p.m.
36	3:00 p.m.	3:25 p.m.
38	3:30 p.m.	3:55 p.m.
40	4:00 p.m.	4:25 p.m.
42	4:30 p.m.	4:55 p.m.
44	5:00 p.m.	5:25 p.m.
46	5:30 p.m.	5:55 p.m.
48	6:00 p.m.	6:25 p.m.
50	6:30 p.m.	6:55 p.m.
52	7:00 p.m.	7:25 p.m.
Trainset Deadhead (No Passengers)	*7:30 p.m.*	*7:55 p.m.*

Source: HDR

Railroad operations modeling would be required in the future to confirm the feasibility of the conceptual passenger train schedules identified above and to determine passenger train arrival and departure times at intermediate stations in the Corridor.

5.2.2 Conceptual Train Crew Plan

The conceptual Service Plan developed for this Study assumes that four regular train crew assignments (each requiring one engineer and one conductor from CRANDIC, or from another entity if the commuter rail service is not operated by CRANDIC) would be necessary to protect the conceptual daily commuter train operating schedule between Iowa City and North Liberty identified in the section above, as follows:

Morning Crew 1 (On Duty 4:00 a.m.)

- Comes on duty at the CRANDIC Shops in Cedar Rapids at 4 a.m. and participates in job and safety briefing with management and Morning Crew 2.
- Deadheads by CRANDIC crew vehicle or taxi service from the CRANDIC Shops in Cedar Rapids to North Liberty Station (Penn Street), arriving 5 a.m. Shares deadhead vehicle with Morning Crew 2.
- Operates a deadhead movement with one trainset from North Liberty (Penn Street) to Iowa City (Dubuque Street), leaving North Liberty at 5:25 a.m., and arriving Iowa City at 5:50 a.m.
- Operates the first daily scheduled northbound departure from Iowa City at 6 a.m. to the time of the scheduled 12:25 p.m. southbound arrival at Iowa City.
- Participates in crew change and light equipment cleaning from 12:25 p.m. to 1:00 p.m.
- Deadheads by CRANDIC crew vehicle or taxi service from Iowa City Station (Dubuque Street) at 1 p.m. and goes off duty at the CRANDIC Shops in Cedar Rapids at 2 p.m.
- Approximately 10 hours on-duty time.

Morning Crew 2 (On Duty 4:00 a.m.)

- Comes on duty at the CRANDIC Shops in Cedar Rapids at 4 a.m. and participates in job and safety briefing with management and Morning Crew 1.
- Deadheads by CRANDIC crew vehicle or taxi service from the CRANDIC Shops in Cedar Rapids to North Liberty Station (Penn Street), arriving 5 a.m. Shares deadhead vehicle with Morning Crew 1.
- Operates between North Liberty and Iowa City from the time of the first daily scheduled southbound departure from North Liberty (Penn Street) at 6 a.m. to the time of the scheduled 12:25 p.m. northbound arrival at North Liberty (Penn Street).
- Participates in crew change and light equipment cleaning from 12:25 p.m. to 1:00 p.m.
- Deadheads by CRANDIC crew vehicle or taxi service from North Liberty Station (Penn Street) at 1 p.m. and goes off duty at the CRANDIC Shops in Cedar Rapids at 2 p.m.
- Approximately 10 hours on-duty time.

Afternoon Crew 3 (On Duty 11:00 a.m.)

- Comes on duty at CRANDIC Shops in Cedar Rapids at 11:00 a.m. and participates in job and safety briefing with management and Afternoon Crew 4.
- Deadheads by CRANDIC crew vehicle or taxi service from the CRANDIC Shops in Cedar Rapids to North Liberty Station (Penn Street), arriving at 12:01 p.m. Shares deadhead vehicle with Afternoon Crew 4.
- Participates in crew change and light equipment cleaning from 12:25 p.m. to 1:00 p.m.
- Operates between North Liberty and Iowa City from the time of the daily scheduled southbound departure from North Liberty (Penn Street) at 1:00 p.m. to the time of the last scheduled northbound arrival at North Liberty (Penn Street) at 7:25 p.m. Secures trainset for overnight staging and servicing.
- Deadheads by CRANDIC crew vehicle or taxi service from North Liberty Station (Penn Street) at 8:15 p.m. and goes off duty at the CRANDIC Shops in Cedar Rapids at 9 p.m. Shares deadhead vehicle with Afternoon Crew 4.
- Approximately 10 hours on-duty time.

Afternoon Crew 4 (On Duty 11:00 a.m.)

- Comes on duty at CRANDIC Shops in Cedar Rapids at 11:00 a.m. and participates in job and safety briefing with management and Afternoon Crew 3.
- Deadheads by CRANDIC crew vehicle or taxi service from the CRANDIC Shops in Cedar Rapids to Iowa City Station (Dubuque Street), arriving at 12:25 p.m. Shares deadhead vehicle with Afternoon Crew 3.
- Participates in crew change and light equipment cleaning from 12:25 p.m. to 1:00 p.m.
- Operates between Iowa City and North Liberty from the time of the daily scheduled northbound departure from Iowa City (Dubuque Street) at 1:00 p.m. to the time of the last scheduled southbound arrival at Iowa City (Dubuque Street) at 7:25 p.m.
- Operates a deadhead movement with one trainset from Iowa City (Dubuque Street) to North Liberty (Penn Street), leaving Iowa City at 7:30 p.m. and arriving North Liberty at 7:55 p.m. Secures trainset for overnight staging and servicing.
- Deadheads by CRANDIC crew vehicle or taxi service from North Liberty Station (Penn Street) at 8:15 p.m. and goes off duty at the CRANDIC Shops in Cedar Rapids at 9 p.m. Shares deadhead vehicle with Afternoon Crew 3.
- Approximately 10 hours on-duty time.

It is assumed that an extra crew (one engineer and one conductor) based in Cedar Rapids would be required once weekly to deadhead one of the empty in-service commuter trainsets between North Liberty Station (Penn Street), the CRANDIC Shops in Cedar Rapids, and the North Liberty Station (Penn Street), as a means of facilitating equipment rotation and maintenance cycles at Cedar Rapids. The deadhead between North Liberty Station (Penn Street) and the CRANDIC Shops at Cedar Rapids on CRANDIC Division 2 is approximately 16 miles each way and is estimated to take approximately 2 hours each way.

Crew rotation and extra board labor requirements to protect labor vacancies and other considerations for the four regular CRANDIC train crew assignments described above were not considered in this estimate. This estimate is for planning purposes only and would be subject to the CRANDIC labor and union agreements and/or other labor and union agreements if the commuter rail service is operated by an entity other than CRANDIC. There is also the potential that a train crew base could be established at Iowa City or North Liberty (rather than Cedar Rapids), if the commuter rail service is operated by an entity other than CRANDIC.

5.2.3 Stations Concept

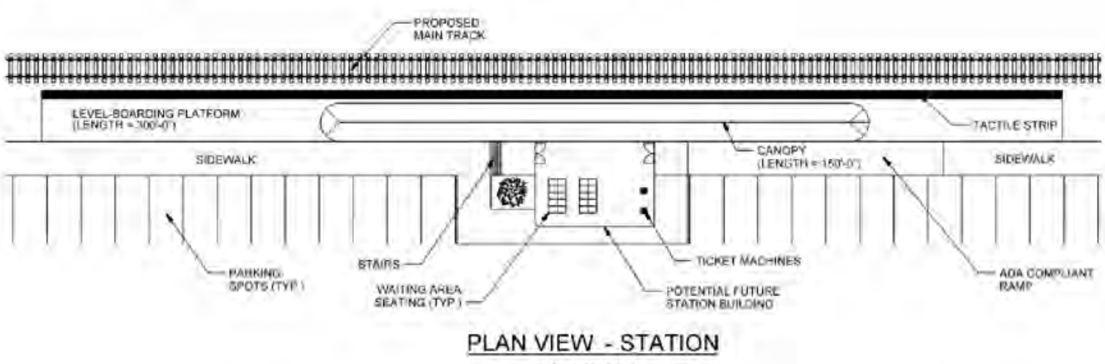
The conceptual Service Plan developed for this Study assumes that potential passenger rail stations for the Iowa City-North Liberty Corridor would include platforms, platform canopy (over one-half the length of the platform), lighting, signage, and ticketing machine, as would be typically constructed for commuter rail services in the U.S. Concrete platforms are elevated for level boarding with passenger rail equipment, comply with ADA requirements, meet recent American Railway Engineering and Maintenance-of-Way Association (AREMA) design requirements, and are single-face and 300 feet in length. Potential future station buildings, parking facilities, and land acquisition for station development were not included in this Study.

In consideration of the 9.1-mile length of the Corridor, the typical spacing of stations on other passenger rail corridors hosting commuter rail service, and inputs received from stakeholders in previous study of the Corridor, seven stations were assumed. The following general locations identified by CRANDIC, MPOJC, and other local stakeholders could potentially host a station:

- Dubuque Street (Iowa City) – Southern Terminus
- Downtown Iowa City/University of Iowa (Burlington Street)
- VA Hospital
- Coralville
- Oakdale
- Forever Green Road
- Penn Street (North Liberty) – Northern Terminus

Based upon the assumptions identified above, a typical station layout concept for potential implementation in the Corridor is shown in Figure 18 below.

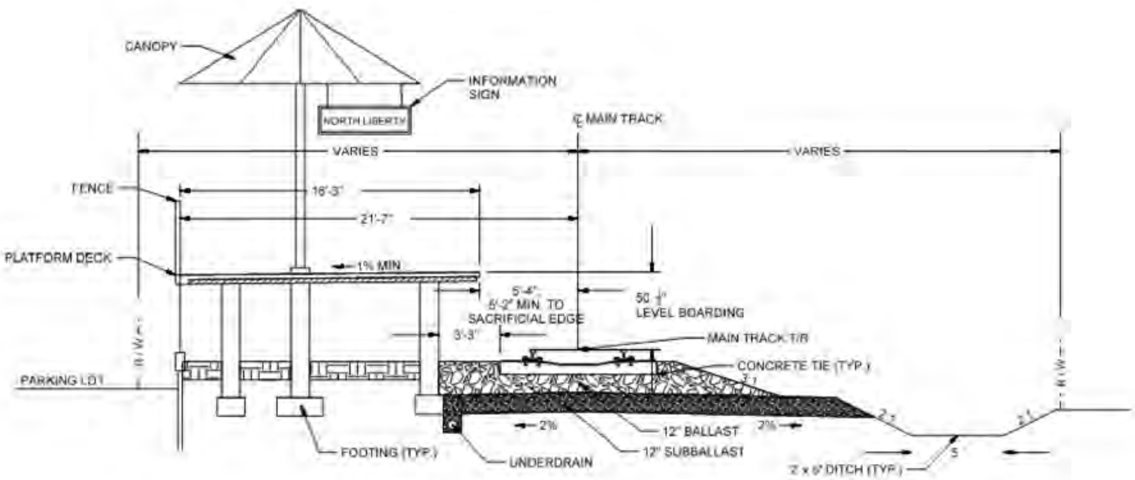
Figure 18: Typical Station Site Layout Concept



Source: HDR

Based upon the assumptions identified above, a typical station platform concept for potential implementation in the Corridor is shown in Figure 19 below.

Figure 19: Typical Station Platform Concept



TYPICAL SECTION - PLATFORM
NOT TO SCALE

Source: HDR

Precise station locations, requirements, and amenities in the Corridor would be identified through future coordination with project stakeholders.

5.2.4 Layover and Maintenance Facility Concept

The conceptual Service Plan developed for this Study assumes that incorporation of a layover and maintenance facility to accommodate the potential passenger rail service on the Iowa City-North Liberty Corridor. A layover and maintenance facility is where passenger rail rolling stock is maintained and staged between scheduled operations and is also used as a train operations base that accommodates the transit system workforce and all administrative, management, and control functions (including train dispatching). A layover and maintenance facility typically includes:

- Combined shop and office building for use as an equipment maintenance and train operations and administration base
- Parking for vehicles
- Track(s) to stage and maintain equipment
- Track access pad(s)
- Potable water and general utility services
- Electrical service for standby power, as required
- Perimeter security fencing

- Site lighting

This project assumes that the existing CRANDIC Shops and offices in Cedar Rapids (outside of the CRANDIC Corridor, and located approximately 16 miles north of the proposed commuter rail station at Penn Street in North Liberty) will be used to maintain commuter rail equipment and to provide a location for an operations base (including facilities for managers, dispatchers, and train crews going on and coming off duty); therefore, development of a new layover and maintenance facility for a commuter rail service in the CRANDIC Corridor was not considered.

As outlined earlier in the Service Plan section, it is assumed that the in-service commuter rail trainsets will layover at the North Liberty Station (Penn Street) in periods of non-operation and that DTL fueling, routine light maintenance, and car cleaning can be facilitated at this location. A small utility building is assumed at the North Liberty Station (Penn Street) to support these requirements and to provide a facility for train crews. The conceptual Service Plan assumes that one of the two in-service commuter rail trainsets will be swapped out with the spare trainset staged at the CRANDIC Shops and receive heavy maintenance and cleaning at the existing CRANDIC Shops in Cedar Rapids, and that a deadhead move once weekly between Cedar Rapids and North Liberty would be required to facilitate this equipment rotation.

6 Infrastructure and Equipment Requirements and Conceptual Opinion of Probable Cost Estimates

This section identifies infrastructure and equipment requirements and associated conceptual opinion of probable capital and O&M costs for the mode of potential commuter rail service identified in Section 5 and potential applicability of that mode to the 9.1-mile CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty.

The requirements of the Iowa City-North Liberty service and the related cost experience is representative of other commuter rail projects, and is largely dependent on the use of the existing CRANDIC freight railroad infrastructure within the Corridor.

6.1 Commuter Rail Capital Cost Estimate Approach

The conceptual capital costs presented in this section are applicable to the potential commuter service mode identified in the previous section, for the implementation of commuter rail service on the Corridor. The quantities developed for the estimate are based upon conceptual level analysis of the CRANDIC Corridor and application of typical U.S. railroad industry standard approaches and typical costs on other U.S. rail projects. The conceptual capital cost includes the rehabilitation of CRANDIC infrastructure and construction of new infrastructure in the Corridor, as appropriate. This section includes the methodology and assumptions for deriving the capital costs and potential infrastructure and equipment requirements for each category. Estimated capital costs for right-of-way acquisition, easements, site preparation, and potential earthwork are not included in this estimate. This Study assumes that CRANDIC presently owns the right-of-way in the CRANDIC Corridor between Iowa City and North Liberty and some adjacent property at locations along the CRANDIC Corridor.

Potential rehabilitation and construction of CRANDIC infrastructure in the Corridor to accommodate implementation of commuter rail service is described below.

6.1.1 Rehabilitation of Structures and Track

The Corridor's existing track structure, which at present hosts only minimal local freight railroad operations, would require track and track structures components to be renewed or upgraded to support the implementation of commuter rail service. This is necessary to meet federal regulations for passenger rail services, to provide for adequate safety, reliability, and ride quality for the commuter rail mode, and to reduce regular and capital maintenance program costs after operation commences.

Bridge rehabilitation is primarily centered on the conversion of existing open-deck bridges to ballast-deck bridges to provide for passenger ride quality and reduce future maintenance costs. For the CRANDIC Corridor, the estimate assumes converting open-deck bridges to ballast decks. This concept is consistent with bridge infrastructure improvements made on other commuter rail corridors in the U.S. Additionally, the two bridge replacements proposed within the estimate are consistent with previous structures replacements on CRANDIC's network. Other nominal bridge improvements and conditional work are also included in this estimate.

In terms of track rehabilitation, current tie condition and main track rail size warrant the replacement of track ties and rail along the CRANDIC Corridor. Presently, CRANDIC does not make any through freight traffic moves through the Iowa City-North Liberty Corridor that would impede construction crews. Instead, these crews can work under complete curfew, or without interruption from train traffic. In order to keep capital costs down, it is recommended that crews incrementally construct the track via wood crosstie and continuous welded rail (CWR) construction. Ballast dumping and track surfacing can occur after the track has been constructed. The use of new 115 lb./yd. CWR, which has been used on other U.S. passenger rail corridors, was assumed to eliminate existing legacy jointed rail in the Corridor, enhance track reliability, provide better passenger ride quality, and to realize long-term maintenance cost savings. It is assumed that CRANDIC or a potential commuter rail operator will replace any wood ties and relay rail through routine maintenance cycles in future years.

In addition, this part of the CRANDIC Corridor is located within an urban environment, and will require multiple access points to deliver track materials, crews, and equipment. Owing to this fact, there may be additional permitting and easement agreements necessary to complete the track rehabilitation work. These ancillary costs were not looked at as part of this Study, and subsequently not accounted for in the construction estimate.

The assumed rehabilitation scope is identified below:

- Five bridge deck conversions from existing open-deck bridges to ballast-deck bridges at CRANDIC Milepost 17.5, Milepost 24.6, Milepost 24.7, Milepost 24.8, and Milepost 25.75
- Miscellaneous bridge repairs
- Miscellaneous culvert repairs and replacements
- Ditching and drainage work
- Track undercutting at other spot locations, as needed
- Track surfacing over the entire Corridor

Potential construction of infrastructure in the CRANDIC Corridor is described below.

6.1.2 Construction of Track Structures and Track

New infrastructure construction and upgrades are typically required when implementing passenger rail service on a freight only corridor. Main track rail replacement is assumed to be 115 lb./yd. CWR. Track derails are also included in the estimate, as a means to physically separate the passenger rail only Corridor between Iowa City and North Liberty from CRANDIC's connecting freight only network.

The assumed construction scope is identified below:

- Two new bridges:
  - Milepost 23.8 – previously considered for replacement in past passenger rail study of the Corridor, per CRANDIC
  - Milepost 24.9 – this structure is a candidate for replacement in order to reduce maintenance costs and enhance pedestrian traffic flows
- Three culvert replacements (including removals) to enhance site drainage and minimize long-term maintenance costs:
  - Milepost 20.50
  - Milepost 21.40
  - Milepost 22.33
- Main track rail replacement (9.1 miles) – 115 lb./yd. CWR and wood ties on 24" spacing
- Removal and disposal of 10.0 miles of existing rail and wood ties, including yard tracks
- CWR joint elimination (welds CWR ribbons, panels, and existing rail together)
- Two new stub-ended station tracks at Dubuque Street in Iowa City and Penn Street in North Liberty (including bumping posts at the ends of the two tracks)
- Four new main track derails
  - Two near Gilbert Street in Iowa City and near Penn Street in North Liberty, for physical separation of the passenger rail only Corridor from the rest of CRANDIC's freight-only network (south from Iowa City to Hills and north from North Liberty to Cedar Rapids)
  - Two at stub-ended tracks at the Iowa City and North Liberty terminal stations
- Removal and disposal of 12 existing track turnouts
- Four new powered turnouts (POTO)
  - 2 – No. 11 POTO at the Iowa City and North Liberty stub-ended station tracks (located at Dubuque Street and Penn Street, respectively.
  - 2 – No. 15 POTO for the Coralville Siding, to accommodate 30 mph diverging train movements into and out of the siding from the main track.

The estimate includes a potential credit for scrapping existing rail and other unneeded "other track materials (OTM)" to offset construction costs, resulting in a credit of approximately $0.60 million toward construction costs.

6.1.3 Equipment

This cost includes procurement of six new self-propelled FRA Compliant DMU coach rail cars required to operate the Iowa City-North Liberty commuter rail service (four cars to assemble two in-service trainsets to protect scheduled operations and two cars to assemble one spare trainset to protect maintenance cycles) based upon the conceptual Service Plan presented previously in Section 5, and is based upon a recent industry transaction in which Sonoma-Marin Area Rail Transit in the San Francisco Bay Area of California procured similar DMU equipment for use on its commuter rail network[23].

6.1.4 Signaling and Communications

Passenger rail corridors in the U.S. typically include active warning signal equipment at all public at-grade crossings to enhance safety and limit the potential for collisions and other accidents with vehicles and pedestrians. This category includes the cost of at-grade crossing automatic warning devices (with constant warning time devices), where applicable. Cost for equipment at public at-grade crossings assumes the rehabilitation of and upgrade of existing active warning signal equipment, as appropriate, to include crossbucks, bells, flashing light signals, and gates. Cost includes all signal materials and any corresponding power drops, along with labor necessary for construction. Cost includes an intertie for preemption of traffic signals at three grade crossings in the Corridor, but traffic signal costs are not included in this estimate and are assumed to be the responsibility of the municipalities. Cost assumes private at-grade crossings, which are not open to the public and typically host minimal volumes of vehicular and pedestrian traffic, will include passive warning devices, including crossbucks and stop signs.

It is assumed that the CRANDIC Corridor between Gilbert Street in Iowa City and Penn Street in North Liberty will be passenger only, with two commuter trains typically operating on the line at a time, meet-pass events between commuter trains to occur at a siding in Coralville near the midpoint of the Corridor (or, alternatively at stub-ended station tracks inclusive of the terminal station at Dubuque Street in Iowa City and Penn Street in North Liberty), and a Method of Operation to include Centralized Traffic Control (CTC) allowing a CRANDIC dispatcher or manager in Cedar Rapids to remotely control train traffic via wayside signal aspect. Under CTC, train movements will be controlled by wayside ground signals, track circuits, and dual power operated switch machines. Note that implementation of a Positive Train Control (PTC) overlay of the CTC system will not be required, as would be the case for a shared-use corridor with passenger and freight trains. Wayside asset protection devices (e.g., dragging equipment detectors, hot-box detectors, etc.) are also not required, and therefore also not included in the estimate. In addition, it was assumed that CRANDIC's existing radio system would provide road channel coverage over the Iowa City-North Liberty Corridor and that no additional radio upgrades would be required.

6.1.5 Stations

The cost to construct seven potential commuter rail stations identified by stakeholders for the Iowa City-North Liberty Corridor includes platforms, platform canopy (over one-half the length of the platform), lighting, signage, and ticketing machine as would be typically constructed for U.S. commuter rail services and as is necessary to support the conceptual Service Plan in Section 5 of this Study. Other station systems included ticket vending machines, security cameras, real-time

[23] http://www.nipponsharyousa.com/tp101216.htm

information displays, public address, emergency telephones, and an uninterrupted power supply (UPS).

Concrete platforms are elevated for level boarding with passenger rail equipment, comply with ADA requirements, meet recent AREMA design requirements, and are single-face and 300 feet in length. Conceptual cost for a potential future station building, parking facility, and land acquisition for station development were not estimated in this Study.

6.1.6 Layover and Maintenance Facility

The conceptual Service Plan developed in Section 5 of this Study assumes that the existing CRANDIC Shops and offices in Cedar Rapids (outside of the CRANDIC Corridor, and located approximately 16 miles north of the proposed commuter rail station at Penn Street in North Liberty) can be used to maintain commuter rail equipment and to provide a location for an operations base and that the in-service trainsets would layover and would be fueled, cleaned, and receive routine servicing at the North Liberty Station (Penn Street) during periods of non-operation. Therefore, the capital cost to develop a new layover and maintenance facility for a passenger rail service in the CRANDIC Corridor was not estimated.

Additional workstations and servers, at the Operations and Control Center in the CRANDIC Shops and offices are included in the estimate, and will support the management of related station systems components (e.g., ticket vending machines, security cameras, real-time information displays, public address, emergency telephones, etc.).

6.1.7 Grade Crossing Surface and Approaches

This section's cost is applicable to the replacement of timber and asphalt crossing surfaces, with concrete panels (i.e., private crossings), and for other roadway surface and approach improvements at existing at-grade road/rail crossings, in order to enhance safety, improve component reliability, and to realize long-term maintenance cost savings. The estimate assumed the reuse of existing concrete panels at crossings presently equipped in the Corridor. The estimate assumed that track will be built up to all existing concrete grade crossings and that track under existing concrete grade crossings, as well as the grade crossing approach surface, is in good condition due to previous recent investment by CRANDIC.

It should be noted that grade crossing improvements at Burlington Street in Iowa City and First Avenue in Coralville were not included in this estimate due to complex traffic patterns and traffic densities at these locations. In addition, the First Avenue crossing panels, surface, and active warning devices were recently upgraded in 2018 as part of a street widening project.

6.1.8 Fencing

This cost is applicable to construction of new fencing in the right-of-way through the urban sections of the Corridor to discourage trespassing, encroachment, and dumping on railroad property; enhance railroad and public safety and security; and to reduce the likelihood of accidents involving trespassers.

6.1.9 Professional Services

This cost includes preliminary and final design, environmental review and permitting, and project management for design and construction of a passenger rail service in the Corridor. It also includes the professional services cost for equipment procurement and associated project management.

NEPA clearance/preliminary engineering could range from $1.5 million to $4 million in cost, and is largely dependent on the level of effort required for the alternatives analysis as required by FTA. It was assumed that NEPA clearance cost would run approximately 53 percent of the total construction cost.

6.1.10 Contingency

Contingency was applied to the estimated conceptual cost by line item within each category to account for potential cost variability. In instances when costs were better understood, based upon other recent railroad industry projects and subject to less variability, a lower contingency was applied.

Contingency was not applied to Professional Services costs for the construction and equipment segments of the project.

6.2 Commuter Rail Operations and Maintenance Cost Approach

The conceptual opinion of probable annual O&M costs presented in this section are applicable to the potential commuter service mode identified in Section 5, which includes commuter rail transit with DMUs. The conceptual costs developed for this estimate are based upon conceptual level analysis of the CRANDIC Corridor and application of typical U.S. railroad and transit industry standard approaches and typical O&M costs on other projects. This section identifies what is included and what is not included in the annual O&M costs for each category.

Annual O&M costs typically cover all aspects of daily commuter rail service delivery and maintenance, including:

- Equipment operation
    - Fully burdened operating department labor consisting of six qualified full-time engineers and four qualified full-time conductors.
    - Assumes $170,000/year (burdened at 2.0) for each train service employee.
- Fuel for equipment operation based on:
    - Train miles to protect the regular operating schedule between Iowa City and North Liberty (179,361 miles/year) and equipment rotation once weekly between North Liberty and Cedar Rapids to accommodate maintenance cycles (1,664 miles/year).
    - Fuel consumption rate of 3 mpg for operation of a two-car DMU trainset.
    - An estimated multiplier of $3.12 per gallon[24].

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[24] U.S. Energy Information Administration, Average Monthly Retail Gasoline and Diesel Prices (December 2018), https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_m.htm

- Routine vehicle maintenance
  - Fully burdened qualified mechanical department labor consisting of one full-time electrician, one full-time laborer, and one full-time railcar/facility cleaner.
  - Assumes $35/hour for electrician or $145,600/year fully burdened at 2.0
  - Assumes $25/hour for laborer or $104,000/year fully burdened at 2.0
  - Assumes $20/hour for railcar/facility cleaner or $83,200/year fully burdened at 2.0
  - Capital spare parts including diesel engine parts, wheel sets, etc.
  - Assumes $5,000/month as an industry average.
  - Consumables including brake shoes, filters, air hoses, seat covers, etc.
  - Assumes $5,000/month as an industry average.
- Routine track, bridge, and right-of-way maintenance at $741,000 per year, including:
  - Replacement of curve-worn rail.
    - Assumes 528 feet per year, although this will not be needed in the short-term horizon.
  - Track tie replacement.
    - Assumes 50 concrete ties per year, although tie cycles would not likely be needed in the short-term horizon.
  - Track surfacing
  - Track undercutting
    - For mud spot removal or other fouled ballast.
  - Track inspection
  - Grade crossing maintenance
    - Assumes one grade crossing surface per year.
  - Routine bridge maintenance, inspections, and repairs
    - Footwalk and handrail securement
    - Drift removal
  - Culvert inspections, cleaning, and repairs
- Track ditch cleaning
- Brush cutting, weed spraying, and other vegetation removal
- Maintenance of signal and communications infrastructure at $500,000 per year, including:
  - Crossing equipment inspections, testing, and routine repairs
  - Traffic control center expenses

The annual O&M cost developed for this Study does not include:

- Operating, Maintenance-of-Way, Mechanical, and Signal Department Management – existing CRANDIC management team assumed adequate to accommodate the needs of the passenger rail service in the Corridor.
- Extra Board Operating Department Labor – necessary to protect vacancies on regular train crew assignments.
- Maintenance-of-Way and Signal Department Forces – existing CRANDIC departmental forces assumed adequate to accommodate the needs of the passenger rail service in the Corridor.
- Station Maintenance – assumes that municipalities, public agencies, private entities, and other local partners along the Corridor would be responsible for the cost to maintain stations and station facilities, which would also include utilities, landscaping and snow removal, cleaning, and security.
- Other Costs – for insurance, overhead, marketing, advertising, and police.

6.3 Presentation of Conceptual Opinion of Probable Costs Estimate

This section presents the conceptual opinion of probable capital costs estimate for the construction and implementation of commuter rail service on the CRANDIC Corridor between Dubuque Street in Iowa City and Penn Street in North Liberty and an opinion of probable conceptual annual O&M costs to support the service.

6.3.1 Conceptual Opinion of Probable Capital Costs Estimate

The conceptual opinion of probable capital costs estimate to implement commuter rail service on the Corridor between Iowa City and North Liberty is approximately $49.0 million. The capital cost estimate is identified by category and line item in 2019 dollars, in Table 26 below. Alternatives to the capital cost estimate presented below and associated potential cost savings are discussed in Section 6.4.

Table 26: Conceptual Opinion of Probable Capital Costs Estimate – Iowa City to North Liberty Commuter Rail Service Implementation (2019 Dollars)

Description	Contingency	Total Estimated Cost (in 2019 Dollars)
10 - TRACK STRUCTURES & TRACK		
10.1 - Track Structure: Bridge Repairs	15%	$2,198,000
10.2 - Track Structure: New Bridges	15%	$627,000
10.3 - Track Structure: Culverts and Drainage Structures	15%	$167,000
10.4 - Track Structure: Miscellaneous	15%	$59,000
10.5 - Track: New Construction	10%	$9,882,000
Total for Category 10 - TRACK STRUCTURES & TRACK		**$12,932,000**
20 - STATIONS & TERMINALS		

Description	Contingency	Total Estimated Cost (in 2019 Dollars)
20.1 - Stations	15%	$2,464,000
20.2 - Platforms	15%	$2,696,000
20.3 - Canopy	15%	$1,161,000
20.4 - Signage and Lighting	15%	$1,012,000
Total for Category 20 - STATIONS & TERMINALS		**$7,334,000**
30 - SUPPORT FACILITIES		
30.1 - Maintenance Facilities (New Utility Building)	25%	$64,000
30.2 - Maintenance Facilities (Tools and Equipment for DMU Railcar Maintenance)	25%	$255,000
Total for Category 30 - SUPPORT FACILITIES		**$319,000**
40 - SITEWORK		
40.1 - Corridor Fencing	10%	$1,215,000
Total for Category 40 - SITEWORK		**$1,215,000**
50 - COMMUNICATIONS & SIGNALING		
50.1 - Grade Crossing Protection	15%	$5,513,000
50.2 - Communication Infrastructure	15%	$11,531,000
Total for Category 50 - COMMUNICATIONS & SIGNALING		**$17,044,000**
60 - GRADE CROSSING IMPROVEMENTS		
60.1 - New Concrete Crossing Panels	10%	$372,000
60.2 - Crossing Surface and Approaches for New Concrete Crossing Panels	10%	$294,000
Total for Category 60 - GRADE CROSSING IMPROVEMENTS		**$667,000**
70 - PROFESSIONAL SERVICES (CONSTRUCTION)		
70.1 - Preliminary Design/NEPA	5%	$1,678,000
70.2 - Final Design	5%	$964,000
70.3 - Project Management for Design and Construction	5%	$402,000
70.4 - Construction Administration and Management	5%	$804,000
Total for Category 70 - PROFESSIONAL SERVICES (CONSTRUCTION)		**$3,848,000**
80 - EQUIPMENT		

Description	Contingency	Total Estimated Cost (in 2019 Dollars)
80.1 - Equipment Procurement	20%	$5,508,000
80.2 - Equipment Reconditioning	N/A	N/A
Total for Category 80 - EQUIPMENT		**$5,508,000**
90 - PROFESSIONAL SERVICES (EQUIPMENT)		
90.1 - Professional Services: Equipment	N/A	$115,000
Total for Category 90 - PROFESSIONAL SERVICES (EQUIPMENT)		**$115,000**
Total Capital Costs: Category 10 - 90		**$48,981,000**

Source: HDR

6.3.2 Conceptual Opinion of Probable O&M Costs Estimate

The conceptual opinion of probable annual O&M costs to support daily commuter rail service on the Corridor, is approximately $4.8 million. The O&M estimate is identified by line item in 2019 dollars, in Table 27 below. Note that factors such as inflation or market changes to fuel, labor rates, etc. may change the annual O&M costs year-to-year.

Table 27: Conceptual Opinion of Probable Annual O&M Costs – Iowa City to North Liberty Commuter Rail Service (2019 Dollars)

Category	Line Description	Total Estimated Cost (in 2019 Dollars)
100	**Maintenance**	
100.1	Track Structure: Bridge Repair	$102,000
100.2	Track Structure: Culverts and Drainage Structures	$26,000
100.3	Track Structure: Miscellaneous	$231,000
100.4	Track: New Construction	$37,000
100.5	Track: Rehabilitation - Ballast and surfacing	$323,000
100.6	Track: Rehabilitation - Component Replacement	$37,000
100.7	Maintenance Facilities	$3,000
100.8	Wayside Signaling	$128,000
100.9	Traffic Control and Dispatching	$128,000
100.10	Communications	$255,000
100.11	Labor	$2,420,000
100.12	Equipment O&M Costs	$314,000
	Category 100 Contingency (20%)	$801,000
Total for Category 100 Maintenance		**$4,805,000**

Source: HDR

6.4 Alternatives to Infrastructure and Equipment Requirements and Conceptual Cost Estimate

This section identifies alternatives to the infrastructure and equipment requirements and the associated conceptual capital cost estimate presented above, which may potentially reduce upfront capital costs for commuter rail implementation and allow for a varied equipment procurement strategy and a phased plan of infrastructure improvements for the CRANDIC Corridor between Iowa City and North Liberty.

6.4.1 Equipment Procurement Alternative

The conceptual capital cost estimate developed for this Study assumed that six new self-propelled DMU railcars (for three trainsets of two cars apiece) would be procured for implementation of passenger rail service on the Corridor between Iowa City and North Liberty. Alternative equipment procurement could provide another option besides acquiring new equipment and provide a capital cost savings. Two potential alternative equipment procurements approaches are identified and described in this section.

Procurement of Vivarail Class 230 (Pop-Up Metro) DMU Equipment

Potential procurement of reconditioned rapid transit equipment converted to DMUs for use in commuter rail service on the CRANDIC Corridor could provide an alternative to acquiring new equipment and provide a capital cost savings. The technical specifications of this DMU equipment and the potential conceptual capital cost for its procurement are described in this section.

Vivarail in the United Kingdom (in partnership with shareholder Railroad Development Corporation [RDC] based in Pittsburgh, Pennsylvania) has acquired 200 former London Underground subway cars and has been converting them to diesel-electric, battery powered, hybrid, and fuel cell self-propelled DMUs called the Vivarail Class 230 (or Pop-Up Metro) since 2017[25]. These converted cars have been cleared for main line operation in the U.K., and would not be considered fully FRA compliant in the U.S., thus requiring a shared-use waiver issued by the FRA based on temporal separation. Vivarail anticipates bringing its Class 230 equipment to the U.S. for demonstration purposes in 2019[26].

The cars are placed in a two or three-car trainset (known as a Class 230 train), accelerate quickly like a typical rapid transit vehicle, have average operating speeds of 45 mph, and are designed to be well suited for operation on corridors with close station spacing[27]. The Class 230 trainsets require level boarding platforms at stations[28].

As with the new DMU equipment and conceptual Service Plan described earlier in this Study, the alternative equipment approach would include six self-propelled secondhand DMU coach railcars, which will be used to assemble three trainsets of two railcars apiece for the Iowa City-North Liberty commuter rail service. Two trainsets would be required to protect potential scheduled operations of the commuter rail service between Iowa City and North Liberty and the third, or spare, trainset would

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[25] Vivarail Pop-Up Metro Data Sheet; September 14, 2018 (provided by RDC)

[26] Ibid.

[27] Ibid.

[28] Ibid.

be used to accommodate regular equipment maintenance schedules at the CRANDIC Shops outside of the Corridor at Cedar Rapids.

The Class 230 train consist would operate in a push-pull configuration, which allows the trains to be operated from either end, thus eliminating the need to turn trains at terminal points in Iowa City and North Liberty. The reconditioned Class 230 railcars are each approximately 60 feet in length and 9 feet 4 inches in width at their maximum extent (narrower than typical U.S. passenger rail cars, which require a car-mounted gap filler at platforms)[29]. Each two-car Class 230 trainset has a capacity of approximately 88 seated and 106 standing passengers on average and includes accommodations for disabled persons in wheelchairs, a lavatory, and bicycle and luggage storage[30]. Reconditioning of the former London Underground equipment to Class 230 trainsets generally includes a new or updated railcar propulsion system (i.e., engines, generators, traction control systems, etc.), air brake system, modifications required to comply with ADA requirements, interior cosmetic changes and improvements (i.e., seating, flooring, lighting, and signage), exterior cosmetic changes and improvements (i.e., color scheme, signage, etc.), and a comprehensive cleaning to the interior and exterior[31]. More information about the Vivarail Class 230 equipment can be found at http://vivarail.co.uk.

A typical two-car Class 230 DMU trainset is shown in Figure 20 below. Vivarail Class 230 passenger rail equipment of this type and configuration has been generally considered in this Study for potential alternative commuter rail service implementation on the CRANDIC Corridor.

Figure 20: Typical Two-Car Pop-Up Metro Trainset

Source: RDC

The conceptual cost estimate for acquiring six Class 230 cars (or three two-car trainsets) for passenger rail service implementation on the CRANDIC Corridor is approximately $0.75 million per car (diesel)[32]. The conceptual estimate presented in Table 28 below was provided by RDC for this

[29] Vivarail Starter Kit for Developing Metros; April 19, 2018 (provided by RDC)

[30] Ibid.

[31] Ibid.

[32] Note that this conceptual cost is subject to a confirmed price to Iowa DOT, CRANDIC, and MPOJC from Vivarail.

Study. Note that a 2.5 percent cost for professional services was applied to the capital cost to account for the additional coordination with the equipment supplier as it relates to procurement and project management.

Table 28: Conceptual Cost Estimate for the Procurement of Three, Two-Car Pop-Up Metro Class 230 Trainsets for the Iowa City-North Liberty Commuter Rail Implementation

Category	Estimated Cost (in 2018 Dollars)	Contingency	Total Estimated Cost (in 2019 Dollars)
Equipment: Procurement	$4,590,000 (3, 2-car trainsets at $1,530,000 each)	20%	$5,508,000
Equipment: Professional Services (Procurement, Project Management)	$115,000 (2.5% of cost of equipment procurement)	None	$115,000
Total			**$5,623,000**

Source: RDC

During coordination between RDC/Vivarail and project stakeholders during development of this Study, it was determined that the Class 230 equipment could be made available on a lease (instead of solely on a procurement basis) and could also be made available for a potential pilot commuter rail service on the CRANDIC Corridor.

Procurement and Reconditioning of Secondhand Budd RDC DMU Equipment

Potential procurement of secondhand Budd RDC DMU equipment and reconditioning it for use in commuter rail service on the CRANDIC Corridor could provide an alternative to acquiring new equipment and provide a capital cost savings. Secondhand DMU equipment, the potential conceptual capital cost for its procurement and reconditioning, and likely approach for acquiring secondhand equipment are described in this section. However, consideration should be made to the potential for limited availability of such secondhand equipment in the marketplace as of late 2018.

As with the new DMU equipment and conceptual Service Plan described earlier in this Study, the alternative equipment approach would include six self-propelled secondhand DMU coach railcars, which will be used to assemble three trainsets of two railcars apiece for the Iowa City-North Liberty commuter rail service. Two trainsets would be required to protect potential scheduled operations of the commuter rail service between Iowa City and North Liberty and the third, or spare, trainset would be staged in Cedar Rapids used to accommodate regular equipment maintenance schedules at the CRANDIC Shops outside of the Corridor at Cedar Rapids.

The reconditioned secondhand DMU commuter train consist would operate in a push-pull configuration, which allows the trains to be operated from either end, thus eliminating the need to turn trains at terminal points in Iowa City and North Liberty. Typical secondhand DMU railcars are 85 feet in length and have a seating capacity of 75 to 90 on average (and variable capacity for additional standing passengers), including accommodations for disabled persons in wheelchairs. Some secondhand DMUs may have a lavatory and bicycle storage. DMU trainsets require level boarding platforms at stations.

Reconditioning of DMU equipment typically includes updates to the railcar's air brake system, upgrades to event recorders, modifications required to comply with ADA requirements, interior cosmetic changes and improvements (i.e., seating, flooring, lighting, and signage), exterior cosmetic changes and improvements (i.e., color scheme, signage, etc.), and a comprehensive cleaning to the interior and exterior.

A typical two-car trainset of reconditioned secondhand DMU equipment (Budd Rail Diesel Cars [RDCs], in this instance) operated by TriMet on its Westside Express Service (WES) in the Portland, Oregon, area is shown in Figure 21 below. Budd RDC passenger rail equipment of this type and configuration has been considered in this Study for potential alternative commuter rail implementation on the CRANDIC Corridor.

Figure 21: Typical Two-Car Trainset of Secondhand RDC DMU Equipment

Source: TriMet

The conceptual cost estimate for acquiring and reconditioning six secondhand Budd RDC cars for passenger rail service implementation on the CRANDIC Corridor is approximately $1.66 million per car. The conceptual estimate presented in Table 29 below was developed from a recent industry estimate, in which TriMet sought to procure and recondition two secondhand Budd cars from Dallas Area Rapid Transit (DART) in 2016[33]. Note that a higher 12 percent cost for professional services was applied to the capital cost to account for the additional coordination with equipment suppliers and additional inspections of used passenger rail equipment that would likely be required.

[33] *TriMet wants to buy used trains from Dallas to bolster WES service*; The Oregonian; May 23, 2016; http://www.oregonlive.com/commuting/index.ssf/2016/05/trimet_wants_to_buy_used_train.html

Table 29: Conceptual Cost Estimate for the Procurement and Reconditioning of Three Budd RDC Cars for the Iowa City-North Liberty Commuter Rail Implementation

Category	Estimated Cost (in 2018 Dollars)	Contingency	Total Estimated Cost (in 2019 Dollars)
Equipment: Procurement	$4,779,720 (6 cars secondhand Budd RDC cars at $796,620 each)	50%	$7,170,000
Equipment: Reconditioning	$1,856,400 (6 cars reconditioning at $265,200 each)	50%	$2,785,000
Equipment: Professional Services (Procurement, Project Management)	$797,000 (12% of cost of equipment procurement and reconditioning before contingency applied)	None	$797,000
Total			**$10,752,000**

Source: HDR

Based upon the alternative approach presented above, the procurement of six secondhand reconditioned RDC Budd cars ($10,752,000) versus the conceptual capital cost estimate to acquire six new FRA Compliant DMU railcars ($5,623,000) could result in a potential cost increase of $5,129,000.

It is important to note though that the actual and estimated capital cost to acquire and recondition secondhand Budd RDC cars for use by transit agencies has fluctuated considerably in the last 20 years, and this wide variability should be considered by stakeholders for any similar procurement of equipment for passenger rail service implementation on the CRANDIC Corridor. For example, Trinity Railway Express (TRE), in Dallas, Texas, acquired and rehabilitated 13 Budd cars in 1996, for a capital cost of $1.8 million per car in 1996 dollars[34]. Sonoma-Marin Area Rail Transit in the San Francisco Bay Area of California studied the potential of acquiring 14 secondhand reconditioned Budd cars for use as an interim fleet in 2009, and discovered that total procurement and refurbishment costs could potentially be $3.5 million to $4.5 million per car in 2009 dollars[35].

Note also that the supply of secondhand Budd cars and associated replacement capital spare parts are likely to be limited now and in the future, and that the time necessary to acquire a matched set of six Budd cars and appropriate spare parts could be considerable. Secondhand passenger rail equipment is typically acquired from transit agencies, railroads, and rail equipment sellers. Specific availability and the actual cost to procure secondhand Budd equipment for use on the CRANDIC Corridor is subject to future coordination with these parties.

6.4.2 Bridge Rehabilitation Alternatives

The conceptual capital cost estimate developed for this Study assumed that ballast-deck bridges are best suited for this Corridor owing to consideration of passenger ride quality, while also having the advantage of better maintaining track geometry, lowering maintenance costs, and extending bridge

[34] Sonoma-Marin Area Rail Transit District, Use of Budd RDCs as an Interim Fleet; June 18, 2009

[35] Ibid.

life. For these reasons it was assumed that all existing open-deck bridges would be converted to ballast-deck bridges, except for the following structures requiring replacement:

- Bridge 23.8 – previously considered for replacement in past passenger rail study of the Corridor, per CRANDIC
- Bridge 24.9 – this structure is a candidate for replacement in order to reduce maintenance costs and enhance pedestrian traffic flows

If the preference is not to implement the ballast-deck bridges conversions and to instead replace open-deck bridge ties (on Bridges 17.5, 24.6, 24.7, 24.8, and 25.75) as an alternative approach, there would be a potential cost savings of approximately $1.83 million. In addition, if the preference is not to replace Bridges 23.8 and 24.9 and only perform bridge tie replacement (Bridge 23.8) and ballast retainer installation (Bridge 24.9), then there would be a potential cost savings of approximately $0.48 million. If both bridge alternatives were chosen over ballast-deck conversion and bridge construction, as listed in the base capital cost estimate, the potential cost savings could be approximately $2.31 million.

6.4.3 At-Grade Roadway Crossings Alternatives

The estimate assumed the replacement of timber and asphalt crossing surfaces, with concrete panels (i.e., private crossings), and for other roadway surface and approach improvements at existing at-grade road/rail crossings, in order to enhance safety, improve component reliability, and to realize long-term maintenance cost savings. The estimate assumed that track will be built up to all existing concrete grade crossings and that track under existing concrete grade crossings, as well as the grade crossing approach surface, is in good condition due to previous recent investment by CRANDIC.

As an alternative, a complete track renewal at existing at-grade crossings can be elected, consistent with typical Track Renewal Train (TRT) or Track Laying Machine (TLM) practices, with the crossings being upgraded to concrete ties and 115 lb./yd. CWR. In this approach, existing at-grade crossings would be renewed by pulling the existing concrete crossing panels, replacing the wood ties with concrete ties, relaying new rail, replacing the concrete panels, and paving up to 10 feet of feathered HMA. This would result in a uniform track structure and even replacement tie-cycle through all crossings. To reduce costs and complexity, the two busiest and most complex crossings in the Corridor (Burlington Street in Iowa City and First Avenue in Coralville) would be left in place while all of the other crossings will see the complete track renewal. The expected additional cost for this alternative is approximately $3.03 million.

6.4.4 Track Construction Alternatives

The conceptual capital cost estimate developed for this Study assumed stick-build installation of 115 lb./yd. CWR on wood cross ties with a 24" spacing (on center). Stick building will achieve cost savings efficiencies since all the track work will be conducted via a long-term track curfew. This method will avoid reconstructing some recently upgraded track, which was completed in 2013, between Milepost 23.2 and Milepost 23.8. The approximately 0.6 miles of new track (wood track ties on 115 lb./yd. CWR) does not require immediate renewal or replacement. The stick building method would also avoid upgrading ties and rail through recently upgraded at-grade roadway crossings.

As an alternative, track could be constructed out of 115 lb./yd. CWR on concrete ties with a 30" spacing (on center). This would be constructed via TRT or TLM. This method would be more expensive, but it would result in a shorter construction window due to the machine's high production rate. In addition, less construction access would be required since the TRT or TLM can haul construction and salvage materials within the Corridor. Concrete ties would have a longer expected life, greater flexural strength (requires fewer ties per mile), and lower maintenance costs. However, with concrete tie construction, it is recommended that the track under the grade crossing be replaced in order to maintain a uniform track surface. This would add additional project cost related to crossing closure and surfacing work. The expected additional cost for this alternative is approximately $2.68 million in track improvements, plus the $3.03 million in grade crossing improvements (as listed in the subsection above), totaling $5.70 million.

7 Federal Regulatory Requirements

This section describes the basic federal regulatory requirements of the Federal Transit Administration (FTA) for the implementation and operation of a passenger rail service, including provisions that require future federal approvals if federal funding is obtained. FTA would also have a role in safety oversight, as well. Safety standards for FTA are located here: https://www.transit.dot.gov/regulations-and-guidance/safety/compendium-transit-safety-standards.

The section also describes the general federal regulatory requirements that are triggered for locating passenger rail service on an active freight railroad (like CRANDIC), and, if the freight rail services are no longer required, the requirements for abandonment of common-carrier service. This section concludes with a description of the general Environmental Review process for permitting, constructing, and implementing passenger rail service.

A proposed rail passenger service on the CRANDIC Corridor may be impacted by one or more of two federal agencies, listed below:

- FTA
- U.S. Surface Transportation Board (STB)

A third agency, the Federal Railroad Administration (FRA), is generally focused upon the general railway system, and has no authority over transit or urban rail passenger services operating totally outside of that system. When a rail passenger service operates within, or crosses right-of-way within the general railway system, that passenger rail system falls within FRA jurisdiction. Because the passenger rail service explored in this Study does not meet those conditions, FRA regulations are not anticipated to apply to the type of service under study on a passenger rail only corridor. In the future, if a shared-use passenger and freight rail operation is sought for the Iowa City-North Liberty Corridor, then FRA would have jurisdiction and FRA safety regulations and other requirements would apply.

The possible role of the FTA and STB in the establishment and operation of a potential passenger rail service on the CRANDIC Corridor is summarized in the following sections.

7.1 Federal Transit Administration

In its role of providing financial assistance to develop new transit systems and improve, maintain, and operate existing systems nationwide, FTA oversees several grants provided to states, tribes, and local public agencies to support public transportation. Grantees have a responsibility to comply with statutory and regulatory requirements associated with the management of federally assisted grants[36]. These requirements are generally listed below.

FTA monitors grants and federally funded projects to confirm that grantees establish and follow federally mandated procedures, such as[37]:

- Demonstrating legal, financial, and technical capacity to carry out programs and projects
- Providing technical inspection and supervision by qualified professionals of all work in progress
- Ensuring compliance with procurement requirements, including the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards
- Complying with all applicable civil rights statutes and implementing regulations
- Complying with applicable safety and asset management

The FTA planning requirements would be applied to the project if capital funding for the implementation of passenger rail service is pursued from one of the four FTA capital improvement programs/pathways identified below[38]:

- **New Starts:** New Starts projects are new fixed guideway projects or extensions to existing fixed guideway systems with a total estimated capital cost of $300 million or more, or that are seeking $100 million or more in Section 5309 CIG program funds.
- **Small Starts:** Small Starts projects are new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects with a total estimated capital cost of less than $300 million and that are seeking less than $100 million in Section 5309 CIG program funds.
- **Core Capacity:** Core Capacity projects are substantial corridor-based capital investments in existing fixed guideway systems that increase capacity by not less than 10 percent in corridors that are at capacity today or will be in five years. Core capacity projects may not include elements designed to maintain a state of good repair.
- **Programs of Interrelated Projects**: Programs of Interrelated Projects are comprised of any combination of two or more New Starts, Small Starts, or Core Capacity projects. The projects in the program must have logical connectivity to one another and all must begin construction within a reasonable timeframe.

The discussion in this Study will be limited to the New Starts and Small Starts, as Core Capacity is not relevant to the potential for passenger rail implementation in the CRANDIC Corridor. Programs of Interrelated Projects would only apply if New Starts and Smalls Starts are used in parallel to each other.

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36 https://www.transit.dot.gov/regulations-and-guidance/regulations-and-guidance

37 Ibid.

38 https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/5309_Capital_Investment_Grant_Fact_Sheet.pdf

All New Starts and Small Starts projects must follow a rigorous analysis in order to compete for funding in this competitive grant program. These programs are described in greater detail in the previous *Iowa City-North Liberty Passenger Rail Conceptual Feasibility Study*.

The Fixing America's Surface Transportation (FAST) Act ensures there is funding to develop and operate state safety oversight programs, as it builds on the Moving Ahead for Progress in the 21st Century Act (MAP-21). The Fast Act requires the establishment of Minimum Safety Standards for safe transit operations, and reinforces FTA's authority to issue regulations that restrict or prohibit unsafe conditions or practices that create a substantial risk of death or personal injury. FTA is also given authority to withhold or direct federal funds for recipients that do not comply with federal law regarding safety of the public transportation system[39].

Any project receiving FTA funding is subject to FTA oversight through project planning, design, and testing. Although the FTA maintains oversight for the grants that it awards, the grant administration and project management responsibility is assigned to the grantee. The FTA defines oversight as a continuous review and evaluation of grantee and FTA processes to ensure compliance with statutory, administrative, and regulatory requirements. For New Starts projects, this activity is generally led by a Project Management Oversight Consultant (PMOC) reporting the FTA regional office. In this role, the PMOC supplements the FTA technical staff, monitoring the overall schedule, and budget.

The grantee is required to develop a State Safety Oversight Program, https://www.transit.dot.gov/state-safety-oversight, and meet FTA compliance standards. The grantee is also required to develop a Project Management Plan (PMP) that defines in detail how it will manage the project. FTA provides guidance in development of the manual in FTA Circular 5200.1. FTA has also developed several documents that may guide the development of the PMP and overall project management, including:

- FTA Quality Management System Guidelines
- FTA Project and Construction Management Guidelines
- Construction Project Management Handbook

While the grantee has some discretion in establishing its management approach, once the document is accepted by FTA the grantee cannot deviate from the PMP. The elements of the PMP are identified below:

- Basis for project (project description, financial plan, and legal authority for implementation)
- Environmental Documentation/Mitigation Plan
- Design Control Plan
- Design Change and Configuration Control
- Project Controls
- Cost Control Procedures
- Schedule Control Procedures

[39] https://www.apta.com/wp-content/uploads/FAST-Act-A-Guide-to-Public-Transportation-and-Rail-Related-Provisions.pdf

- Risk Control Procedures
- Dispute and Conflict Resolution
- Project Delivery and Procurement
- Labor Relations and Policies
- Construction of Fixed Infrastructure
- System Integration, Pre-Revenue Operations and Revenue Service
- Grantee Technical Capacity and Capability
- Quality Assurance/Quality Control
- Safety and Security Plan
- Real Estate Acquisition and Management Plan
- Fleet Management Plan

Many of the items defined in the PMP are deliverables that must be approved by the FTA before entry into Final Design. A checklist identifying those deliverables is included in Table 30 below.

Table 30: FTA - New Starts Project Planning and Development Checklist

New Starts Project Planning And Development Checklist Of Project Sponsor Submittals To FTA To Enter Final Design (FD)		
Products	**FTA Concurrence Date**	**Reference (Regulations, Guidance, And Other Resources)**
Completion Of Preliminary Engineering	-	
Project Definition/Scope	-	FTA P&CM Guidelines (Chapter 4) Full Funding Grant Agreements Guidance 5200.1A (Chapter 2)
Project Plans, Drawings, Design Criteria, Standards and Specifications with refined project definition for overall project, tracks or routes, stations, stops and other structures		
Master Permitting Plan and Schedule		
Geotechnical Baseline Report		
Documentation of passenger level boarding design for all stations and/or satisfactory determination of infeasibility for one or more stations and satisfactory alternative plan for accessibility.		49 CFR Parts 27, 37 & 38 36 CFR 1191 & 1192 DOT Disability Law Guidance, "*Full-Length, Level-Boarding Platforms in New Commuter and Intercity Rail Stations*" (09/01/05) Association of American Railroads (AAR) Clearance Plates A-F, H & L DoD Strategic Rail Corridor Network (STRACNET) clearance profile
Project Cost, Schedule and Financial Plan	-	FTA P&CM Guidelines (Chapters 3 & 4) Standard Cost Categories for Capital Projects Alternatives Analysis Technical Guidance (Part II.3)
Capital Cost Estimate and Project Schedule in Original Format and Standard Cost Category (SCC) Format (refined and updated to support final design request)		
Summary of O&M Cost Assumptions/Productivities (if O&M costs changed since approval to enter PE)		Alternatives Analysis Technical Guidance (Part II.4) Reporting Instructions

New Starts Project Planning And Development Checklist Of Project Sponsor Submittals To FTA To Enter Final Design (FD)		
Products	**FTA Concurrence Date**	**Reference (Regulations, Guidance, And Other Resources)**
Financial Plan and Supporting Information Supporting Final Design Request and Financial Capacity Assessment		49 CFR 611.11 Financial Capacity Policy Circular 7008.1A Guidance for Transit Financial Plans June 2000 Reporting Instructions Guidelines and Standards for Assessing Local Financial Commitment
Project Development Requirements	-	23 CFR 771 49 CFR 622 2006 Guidance on New Starts Policies and Procedures - May 16, 2006 (Section 1) - Reference for New Starts Rating Information in ROD
Final NEPA Documentation (i.e., Categorical Exclusion, Finding of No Significant Impact, or Record of Decision) including description of required environmental permits and New Starts Rating Information in ROD if the New Starts Rating is less than "medium"		
Before and After Study Documentation of Methods and "Predicted" Results and Identification of Responsible Contractors		Draft Before and After Guidance Available on Request 2006 Guidance on New Starts Policies and Procedures - May 16, 2006
TIP and STIP Programming of Final Design and Construction (and update or amendment of long range plan, if needed)		Capital Program Circular 9300.1A Transportation Planning Final Rule
Travel Forecasts (If changed since approval to enter PE)	-	Travel Forecasting for New Starts Proposals (From FTA Workshop) Alternatives Analysis Technical Guidance (Part II.5-6) Reporting Instructions
Documentation of Methodologies and Assumptions		
Summit Reports and Maps		
Travel Forecasts Template		
Annualization Factor Justification		
Project Management Plan (PMP) Update	-	49 CFR 633 (Subpart C) FTA P&CM Guidelines (Chapter 2-4) Grant Management Circular 5010.1C (Chapter 1) Full Funding Grant Agreements Guidance 5200.1A (Chapter 2) QA/QC Guidelines
Basic Requirements Update	-	
Project Sponsor Staff Organization		
Project Budget & Schedule		
Procedures Update	-	
Document Control Procedures		
Change Order Procedures		
Material Testing Procedures		
Internal Reporting Procedures		
Operational Testing Procedures		
Quality Assurance/Quality Control (QA/QC)		
Plans Update	-	FTA P&CM Guidelines (Chapter 2 & 3)
Contingency Management Plan (identifying significant areas of uncertainty in scope, cost and schedule)		
Real Estate Acquisition Management Plan (RAMP)		49 CFR 24 Uniform Act Real Estate Page of FTA Website and FTA Real Estate Course
Rail Fleet Management Plan (RFMP)		Grant Management Circular 5010.1C (Chapter 1) FFGA Guidance 5200.1A (Chapter 2)
Bus Fleet Management Plan (BFMP)		
Safety and Security Management Plan (SSMP)		SSMP Circular 5800.1 Full Funding Grant Agreements Guidance 5200.1A (Chapter 2) 49 CFR 659 FTA P&CM Guidelines (Chapter 2)
Operating Plan		FTA P&CM Guidelines (Chapter 3)

New Starts Project Planning And Development Checklist Of Project Sponsor Submittals To FTA To Enter Final Design (FD)		
Products	**FTA Concurrence Date**	**Reference (Regulations, Guidance, And Other Resources)**
Configuration Management Plan		FTA P&CM Guidelines (Chapter 5)
Other Project Management Products	-	Capital Program Circular 9300.1A (Chapter V) Grant Management Circular 5010.1C (Chapter 1) FTA P&CM Guidelines (Chapter 4)
Value Engineering Analysis Report		
Procurement Contract Packages	-	FTA P&CM Guidelines (Chapter 4) Third Party Contracting Circular 4220.1E
Contracting Plan for Final Design Phase		
Contracting Plan for Construction/Procurement (draft policies and procedures for all proposed contracting) inclusive of profit strategies and proposed risk allocation measures		
Claims Avoidance Plan for Final Design		FTA P&CM Guidelines (Chapter 3)
Claims Avoidance Plan for Construction/Procurement Phase		
General Conditions (preliminarily drafted for design, construction and procurement contracts)		
Third Party Agreements	-	Grant Management Circular 5010.1C (Chapter 1) 23 CFR 645, Utilities FTA P&CM Guidelines (Chapter 4) FFGA Guidance 5200.1A (Chapter 2)
Utility Agreements (negotiated and completed to the extent possible)		
Master, Interagency, Public/Private, Joint Development, Railroad and Right of Way Agreements (negotiated and completed to the degree possible)		FTA P&CM Guidelines (Chapter 4)
New Starts Templates, Certifications, and Other Reports	-	Reporting Instructions
New Starts Criteria Templates and Certifications		
SCC Annualized Cost Worksheets		Standard Cost Categories for Capital Projects
Land Use Supporting Information		Reporting Instructions Guidelines and Standards for Assessing Transit-Supportive Land Use
Making the Case Document		Reporting Instructions Examples on FTA Website
Administrative Requirements	-	Capital Program Circular 9300.1A (Chapter 6)
Legal Capacity (Authority to undertake implementation of proposed transit mode)		
Authority to pursue and contract with project delivery method proposed (if not design-bid-build)		FTA P&CM Guidelines (Chapter 4)
Grantee Letter of Request for FD Initiation		

Source: FTA

In addition to meeting FTA requirements for project evaluation, design, and construction, projects receiving FTA funding must also meet the Buy America requirements outlined in 49 CFR Part 661 and the final policy guidance for Buy America requirements issued by FTA on September 1, 2016[40].

[40] http://www.progressiverailroading.com/passenger_rail/news/FTA-issues-final-policy-guidance-for-Buy-America-requirements

According to the FTA in its final guidance, the domestic content requirement minimum for passenger rail equipment procurements for Fiscal Years 2016 and 2017 is more than 60 percent and by Fiscal Year 2020, the minimum will be more than 70 percent[41]. These requirements have had a significant impact on the range of rolling stock available for rail passenger services. DMU railcars are now available for commuter rail implementation that meet these requirements, including new FRA Compliant DMU vehicles, like those considered for potential implementation on the Iowa City-North Liberty Corridor.

It is possible that a proposed passenger rail project may fall within both FTA and FRA programs. A common example would be a commuter rail project sharing tracks with an active freight railroad and that is also seeking FTA New Starts or Small Starts funding. In this instance, the FRA safety regulations would apply, along with the FTA project evaluation and project management requirements. The two agencies have worked together in the past to apply complementary regulations when appropriate.

7.2 Surface Transportation Board

The STB is generally focused upon the economic regulation of the general railway system in the U.S., dealing with rail line construction; implementation of new freight or passenger common-carrier services that expand geographically beyond existing services; rate and service levels, adequacy, and disputes; acquisition, sale, or merger of private rail freight operators; and abandonments of common-carrier obligations. The STB generally does not have jurisdiction over mass transportation provided by a local government authority. The most common STB involvement related to urban passenger service results from abandonment of an existing freight common-carrier obligation associated with implementation of new rail passenger service. In addition, STB authority may be required for implementation of a new commuter rail service if it is jointly marketed or operated with an interstate passenger rail service. Because the CRANDIC segment proposed for the Corridor is currently a freight railroad with a common-carrier obligation, STB abandonment procedures may be required if the selected passenger rail mode, or the characteristics of the passenger service, preclude or substantially modify the CRANDIC's ability to provide for its common-carrier obligation.

Railroad abandonment requirements follow a process documented in 49 CFR 1152: Abandonment and Discontinuance of Rail Lines and Rail Transportation. The Iowa DOT actively participates in the railroad abandonment process within the state[42]. The key activities in the railroad abandonment process are summarized below:

- Filing of a Notice of Intent weekly for three consecutive weeks in a local newspaper in each county in which any part of the line is located.
- Filing the Abandonment Application with the STB and appropriate State offices. Application will describe physical condition of the line, financial aspects of the operation, and justification for the abandonment. Notice of intent to file and offer of financial assistance must be made within 30 days of the application filing.
- Public involvement for 45 days following the application filing for persons who oppose the application. An oral hearing may be requested. Notarized comments must be sent to the STB and the railroad/representative filing the application.

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[41] Ibid.

[42] Railroad Abandonment, Iowa Department of Transportation, Revised March 25, 1997

- Applicant's reply or rebuttal to opposition within 60 days of application filing.
- Deadline for STB decision on merits of case within 110 days of filing.
- Offers of financial assistance to preserve service must be made within 10 days of STB decision.

A carrier may file for a Notice of Exemption if it can certify that:

- No local traffic has moved over the line for at least 2 years
- Any overhead traffic on the line can be rerouted over other lines
- No formal complaint filed by the user of rail service on the line is pending or has been decided in favor or the complainant within two years.

The STB must find that the line is not necessary to carry out the rail transportation policy of the U.S. Government as established in Title 49 USC 10101, and the line is of limited scope and continued regulation is unnecessary to protect shippers from abuse of market power before the abandonment can be approved.

Parties seeking a public use condition in an abandonment proceeding must file a written request for public use condition with the STB no later than 45 days after the application is filed. If successful negotiations are not completed within 180 days, the railroad company is free to accept any other offer.

The Study anticipates that the CRANDIC Corridor between Gilbert Street in Iowa City (approximately Milepost 25.8) and Penn Street in North Liberty (approximately Milepost 16.7) would be passenger rail only, and that CRANDIC would maintain physical connections to its existing contiguous freight only network at those locations. If in the future CRANDIC desires to reinstate its common-carrier obligation and provide freight rail service over the Iowa City-North Liberty segment, which would establish a shared-use passenger and freight rail corridor, it would be required to file with the STB.

7.3 Environmental Review

This section summarizes the general environmental requirements for construction and implementation of a passenger rail corridor and service between Iowa City and North Liberty.

7.3.1 Assumptions for Environmental Review

The process for environmental documentation review for a passenger rail project in the CRANDIC Corridor assumes the following:

- The document will analyze the environmental impact(s) of a passenger rail service in the Corridor between Iowa City and North Liberty.
- The FTA is the Lead Agency for the National Environmental Policy Act (NEPA) with cooperation from the STB and other federal agencies.
- The Iowa DOT or one or more local Iowa jurisdictions will be the Grantee, and if Iowa DOT is not the Grantee, it may be the Lead Agency.
- Based upon the characteristics of the Iowa City to North Liberty Corridor and the range of alternatives, the environmental class of action is anticipated to be either an Environmental Assessment (EA) or an Environmental Impact Statement (EIS).

7.3.2 Review Process

The Lead Agency and Grantee for the project will conduct scoping to determine major project issues and additional studies that may be needed in accordance with FTA requirements. The findings will be documented in memoranda and ultimately the NEPA document. Based on the conclusions of the scoping process, a class of action recommendation for FTA review and a Project Work Plan, which specifically includes a project schedule and detailed scope of work, will be submitted. The FTA will decide if the class of action for the project is an EA or an EIS. This step may be delayed until completion of additional environmental analysis.

If it is determined that the appropriate environmental class of action is an EIS, the Lead Agency will issue a Notice of Intent (NOI) to advise agencies and the public about the preparation of an EIS. The NOI will invite the public to comment on the scope of the document, purpose and need of the project, alternatives to be considered, impacts to be evaluated, and methodologies to be used in the evaluation.

The Lead Agency and Grantee will prepare technical studies and appropriate documentation in accordance with FTA's environmental procedures. The analysis will include typical impacts associated with passenger rail projects including noise, traffic, cultural and historical resources, wetlands, and other waters of the U.S., threatened and endangered species, and other components. If the class of action was not determined prior to the technical studies, it would be determined using the results of the technical studies.

A Public Involvement Plan (PIP) will be developed which identifies various private and public stakeholders. These will include, but are not limited to agency partners, community groups, advocacy groups, business groups, potential riders of the passenger rail service, freight railroad hosting the service, and potential passenger rail service providers. The PIP typically includes strategies for the receiving and processing public input.

The Lead Agency and Grantee will complete an FTA-approved EA or EIS for construction of the project. For an EIS, a draft environmental document will be circulated and a public hearing for public input will be held. The FTA will complete a Final EIS document and a Record of Decision (ROD). For an EA, the environmental document will be circulated and a public meeting for public input will be held. If an EA is required, the FTA will complete a decision document, either a Finding of No Significant Impact (FONSI), or recommendation for completion of an EIS. The Grantee will identify all necessary mitigation and permits required for project construction and implementation.

The environmental process may potentially take between 12 months and 36 months to complete, depending upon the environmental class of action and the review process, as well as public support or opposition to the project.

7.3.3 Contents of the Environmental Document

The EA or EIS will include, but is not limited to, the following:

- Project Description including a description of existing conditions in the Corridor.
- Purpose and Need for the project.
- Identification and environmental analysis of project build alternatives.
- Assessment of impacts of the proposed action and alternatives and necessary mitigation for impacts.

7.3.4 Impacts of FAST ACT on the Environmental Process

The FAST Act revised the process for preparing an EIS in Draft and Final formats. After the Draft EIS has been prepared by the Grantee and approved by the Lead Agency, the FAST Act provides for the preparation of the Final EIS during Project Development by attaching errata sheets to the Draft EIS if certain conditions are met. In addition, the USDOT allows Grantees to develop a single document that combines the Final EIS and the ROD.

Once the Lead Agency approves the Grantee's request to enter into Project Development (including project Environmental Analysis and Preliminary Engineering), FAST Act requires that the Grantee submits the Final EIS within two years of entry.

7.3.5 Permitting and Mitigation Monitoring Plan

Environmental documentation will include identification of the permits required for the project. Permit applications will need to be developed and all mitigation and associated conditions incorporated into the construction plan. A Mitigation Monitoring Plan (MMP) will be developed that details mitigation monitoring measures to be implemented during construction of the project. The MMP provides the plan to maintain compliance, when to obtain permits, and identification of the agencies responsible for issuing permits. The MMP will identify and describe adverse and beneficial effects of the project, identify specific measures to mitigate the adverse impacts, and list parties that are responsible for ensuring compliance.

8 Financial Plan Strategies

This section identifies the federal capital project funding programs that may be applied to a proposed rail passenger project like that under study for the CRANDIC Corridor, and summarizes the application and review process for the predominant funding sources for fixed-guide way transit projects – Section 5309 New Starts and Small Starts programs.

8.1 Potential Project Funding Sources for Capital Costs

Federal grants have traditionally been a prime source of capital funding for many new transit systems in the U.S., as well as a source of some operating funds. Federal transit funds are distributed under the provisions of Title 49, Chapter 53, of the United States Code. Transit funds are distributed through both formula and discretionary programs. Following Congressional appropriation of funds, specific amounts that are available for states and urbanized areas under formula programs (as established by federal legislation, i.e., FAST Act) are published in an apportionment notice in the Federal Register, as well as amounts for allocated programs. Allocated program funds that are otherwise distributed by Congress are made available to the FTA for "discretionary" distribution. All federal transit funds are categorized as grants, regardless of if they are discretionary or formula-based.

Grant recipients must submit a grant application to the FTA to receive federal transit funds, typically on an annual basis. When FTA approves the grant, the funds are "granted" or obligated to the applicant agency and applied in support of a specific procurement process or as reimbursement for expenditures that have already been made. Transit funds can be used for a variety of expenditures as defined in laws that authorize individual spending programs. Eligible expenditures fall into two general categories: capital expenditures (for which most federal funds may be used), and other expenditures limited to specific programs.

A number of grant programs are available to provide federal funding for transit services, primarily addressing capital needs, but others support planning and design, and in some limited cases, operations and maintenance. Funding programs include traditional FTA programs, opportunities to "flex" funds to transit from the Federal Highway Administration (FHWA), and other "non-traditional" funding opportunities from other agencies such as the FRA, Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA).

The primary federal transit funding opportunities are presented in the categories of FTA Formula Grant Programs, USDOT Flexible Funds, FTA Discretionary Grant Programs, USDOT Discretionary Grant Programs, federal loan programs (e.g., Transportation Infrastructure Finance and Innovation Act [TIFIA] program), and other federal Funding Opportunities. The following paragraphs highlight those sources that are most likely to be relevant to the development of passenger rail projects, including the potential for a passenger rail service on the CRANDIC Corridor.

8.1.1 New Starts and Small Starts Capital Investments

The FTA New Starts and Small Starts (Section 5309 Major Capital Investments) are a highly competitive discretionary grant programs. The federal capital share (in both New Starts and Small Starts) typically does not exceed 50 percent of the total project capital cost, and the federal share has been declining over time. Local entities typically need to identify 50 percent or more of the match to federal funds. The New Starts program has been funded under the various omnibus Transportation Funding authorization bills, the most recent being the FAST Act. Funds are authorized under these programs, but are still subject to annual Congressional appropriations. Once a bill, such as FAST Act has been authorized, annual appropriations must be made by Congress to fund the programs identified in the legislation.

8.1.2 Short-Term Infrastructure Investment Programs

The Better Utilizing Investments to Leverage Development, or BUILD Transportation Discretionary Grant program, provides a unique opportunity for the USDOT to invest in road, rail, transit, and port projects that promise to achieve national objectives. Previously known as Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grants, Congress has dedicated nearly $7.9 billion for eleven rounds of National Infrastructure Investments to fund projects that have a significant local or regional impact.

The Consolidated Appropriations Act of 2018 made available $1.5 billion for BUILD grants through September 30, 2020. For the current round of BUILD Transportation grants (2020), the maximum grant award is $25 million with no more than $100 million awarded to a single state, as specified in the FY 2018 Appropriations Act. At least 50 percent of funds must be awarded to projects located in rural areas.

In each competition, USDOT receives hundreds of applications to build and repair critical pieces of our freight and passenger transportation networks. The BUILD program enables USDOT to examine these projects on their merits to help ensure that taxpayers are getting the highest value for every dollar invested.

Very few projects selected for grant funding are commuter rail transit related, most of them involving streetcars, light rail, or improvements to passenger rail stations and facilities on existing systems. Commuter rail type projects are competing with project entries under many other modes, including bus, road, rail, ports, pedestrian, bike, and multi-modal projects, and a significant portion of funds are reserved for rural locations. In order to be competitive, application requests have to be $25 million or less. It is unclear whether there will be any additional rounds of funding under any of these programs beyond the current competition.

Most recent competitive BUILD project awards have been in the $10 million to $22 million range and represent less than 50 percent of total project costs. However, chances of a project receiving funding from multiple federal sources decreases as the total proportion of federal funding in the project increases. For example, if a project is already receiving a significant amount of federal funding under another federal grant program, such as New or Small Starts, its chances of getting substantial, if any, BUILD funds seem to decrease, based on a review of past awards experience.

Several other federal grant programs have been used by other cities as a source of limited "fill-in" funds to help fund capital costs of commuter rail lines. These programs include the Congestion Mitigation Air Quality (CMAQ) program, Surface Transportation Program (STP) funds, and possible inputs of Economic Development Administration (EDA) and FHWA funding. CMAQ funds are federal funds allocated to the states which must be used for transportation projects that result in reduced traffic congestion and air pollution, such as traffic signalization, bus replacements, and other transit-related projects. In these programs, the amounts of funding are typically limited and are focused on specifically targeted project elements or objectives: for example, use of FHWA funds for street and streetscape improvements associated with the reconstruction of a major street into a multimodal transit corridor. In Cincinnati, Ohio, $4 million of regional CMAQ funds were allocated to a streetcar project. A streetcar project in Kansas City, Missouri, includes $17 million in STP and CMAQ funds as part of the overall funding package for its $102 million total cost.

8.1.3 Public-Private Partnerships

Background

A public-private partnership (also known as PPP or P3s) is a contractual arrangement between a public agency and a private entity that allows for private participation in the delivery and operation of an infrastructure project, facility, or service[43]. P3s are an approach or mechanism that can be utilized to move the funding process from a single strategy of governmental aid (i.e., through grants to regional and local authorities), to a more diversified approach involving private capital markets and investors[44]. Common P3 applications within the transport sector, involves one or more aspects of the funding, financing, planning, design, construction, operation, and maintenance of a transportation facility[45].

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[43] USDOT, *Public-Private Partnerships*, https://www.transportation.gov/buildamerica/programs-services/p3

[44] American Public Transportation Association (APTA), *Public-Private Partnerships In Public Transportation: Policies And Principles For The Transit Industry*, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/apta_ppp_white_paper_final.pdf

[45] Ibid.

Additionally, P3s may be specific to a project (e.g., developing a new type of service or constructing a rail line) or a mechanism that can be applied system wide (e.g., procuring new equipment or bidding out all or defined portions of operations and maintenance)[46]. Whatever the application for using public-private partnerships, it is important to note that the underlying contractual arrangement transfers certain risks and confer certain financial opportunities to the private partner, and in exchange the public agency partner realizes a defined blend of lowered cost for prescribed services, improved service quality, efficient deployment of new technologies, innovative or cost-effective business practices, reduction of financial risk, and increased management expertise and depth[47].

For projects with the potential for transit development and operation, P3s have been used to fund:

1. Project development with direct financial contribution from private sector participants
2. Project delivery and operation, with shared risk among public and private participants
3. Private investment in transit-supportive development.

P3s should be viewed as one of a number of techniques and mechanisms for funding, delivering, and sustaining transit facilities and services. However, P3s should not be viewed as an ultimate funding solution in the absence of other resources, but as a complement to existing and traditional sources of funding for service expansion, modernization, and infrastructure investment.

Examples of P3s

While more popular in Europe, Asia, Australia, and South America, there have been relatively few transit development programs in North America that have utilized direct private financial contribution and/or asset ownership. Some U.S. projects that have recently been named as demonstration programs under the FTA's Public-Private Partnerships Pilot Program ("Penta-P") represent the most innovative forms of private risk capital investment in current U.S. practice[48]. These include[49]:

- Houston - Metro has pursued private ownership of public transportation assets, and has entered into long-term lease agreements with private entities to build and operate rail and busway facilities
- Bay Area Rapid Transit (BART) District in California – BART invited participation and investment by the private sector into its new connection between Oakland Airport and the BART Coliseum Station
- Denver - Regional Transportation District (RTD) has determined that private investment in three new rail corridors will be undertaken using a design-build-operate-maintain (DBOM) model including private investment.

In the U.S. and Canada, communities such as Portland, Vancouver, Charlotte, Toronto, Washington DC, San Diego, Miami, and Atlanta – among many others – have benefited from private participation in transit-oriented development (TOD). Virtually all new rail transit systems, and many that have

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[46] Ibid.

[47] Ibid.

[48] Ibid.

[49] Ibid.

existed for years, are working closely with developers to assure that private investment in station areas and along rail and bus routes will benefit transit ridership.

Private Investment Project Procedures (PIPP)

On May 30, 2018, FTA issued a Private Investment Project Procedures (PIPP) Final Rule allowing FTA grantees considering capital projects to seek a waiver or modification of a FTA regulation, policy, procedure, or guidance that may impede the use of a P3 or private investment in that project[50]. PIPP encourages project sponsors to seek modifications of federal requirements to spur private participation and investment in project planning, development, finance, design, construction, maintenance, and operations. The new procedures will accelerate the project development process, attract private investment, and lead to increased project management flexibility, more innovation, improved efficiency, and/or new revenue streams.

The Private Investment Project Procedures Final Rule can be found here: https://www.federalregister.gov/documents/2018/05/30/2018-11385/private-investment-project-procedures

8.1.4 Other Forms of Private Sector Participation

The FTA also encourages the consideration of the private sector in the development and implementation of transportation improvements (49 U.S.C. 5315). Early involvement with the private sector can bring creativity, efficiency, and capital to solve the transportation and funding problems that many public agency experience. In addition to P3s, other methods of private sector participation are Joint Development, Capital Leasing, and Third Party Contracting[51].

A summary of each of these mechanisms are provided below.

Joint Development

Joint development is a form of value capture, as a transit agency captures some of the economic value created by its transit system and uses the funds to help finance expenses[52]. Joint development projects can involve the integrated development of transit and non-transit improvements, with transit projects physically or functionally related to commercial, residential, or mixed-use development[53].

Joint development would occur when a transit agency partners with a developer to lease property owned by the transit agency near a transit station to build office space or residential units, thereby raising revenue for the transit system in the process[54].

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[50] Federal Transit Administration, *Private Section Participation*, https://www.transit.dot.gov/PIPP

[51] Ibid.

[52] Federal Transit Administration, *Joint Development*, https://www.transit.dot.gov/JointDevelopment

[53] Ibid.

[54] Ibid.

Capital Leasing

According to the FTA, capital leasing is a contractual agreement in which a grantee acquires the right to use a capital asset for a specified period of time without obtaining full ownership[55]. This is in exchange for a periodic payment regardless of the tax status of the transaction[56]. A capital lease is an eligible activity under FTA's 49 USC, Chapter 53 grant programs and can be used to leverage limited funds more efficiently than if the capital assets were purchased or constructed.

Common benefits associated with capital leasing are[57]:

- Improves agency cash flow
- Reduces agency maintenance and replacement costs
- Allows for competitive pricing
- Allows for cost savings for removable power sources

Third Party Contracting

Third Party Contracting refers to a recipient's contract with a vendor or contractor, including procurement by purchase order or purchase by credit card, which is financed with federal assistance awarded by FTA.

Typical areas where third party contracting is involved are:

- Capital Contracts for equipment, supplies and services, including construction and rolling stock
- Preventive Maintenance Contracts
- Operations Contracts
- Revenue Contracts
- Legal and Associated Services
- Employment Contracts (for temporary services)

FTA's "Best Practices Procurement Manual" (BPPM) provides suggested procedures, methods, and examples to advise a recipient how it might conduct its third party procurements in compliance with Federal laws and regulations and FTA Circular 4220.1F guidance.

8.1.5 Special Taxation Districts

Special taxation districts (also referred to tax allocation districts or local taxing districts) are created to finance a wide range of projects, including public transportation and assess an extra levy on property owners within a district in order to finance special projects. Revenue can be generated through sales tax and earmarked for transportation projects, such as the proposed commuter rail service.

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[55] Federal Transit Administration (FTA), *Capital Leasing*, https://www.transit.dot.gov/funding/funding-finance-resources/capital-leasing/capital-leasing

[56] Ibid.

[57] Ibid.

Should a special taxation district be implemented to finance the construction or operations/maintenance of the proposed commuter rail service, the potential users of this service will likely reside within the special taxation district boundary, thus taxes collected for the proposed commuter rail service will be independent of other taxpayers (and likely non-users) outside of the special taxation district boundary.

8.1.6 Value Capture Financing

Value capture is the public recovery of a portion of increased property and other value created as a result of public infrastructure investment. Capturing a portion of that value to fund transit projects is an increasingly viable and desirable option.

Value capture is the public recovery of a portion of increased property value created as a result of public infrastructure investment. Common value capture mechanisms are:

- Impact fees
- Joint development
- Land value taxation
- Negotiated exactions
- Parking fees
- Sale or leasing of air rights
- Sales tax and special assessment districts
- Station naming rights
- Tax increment financing (TIF)

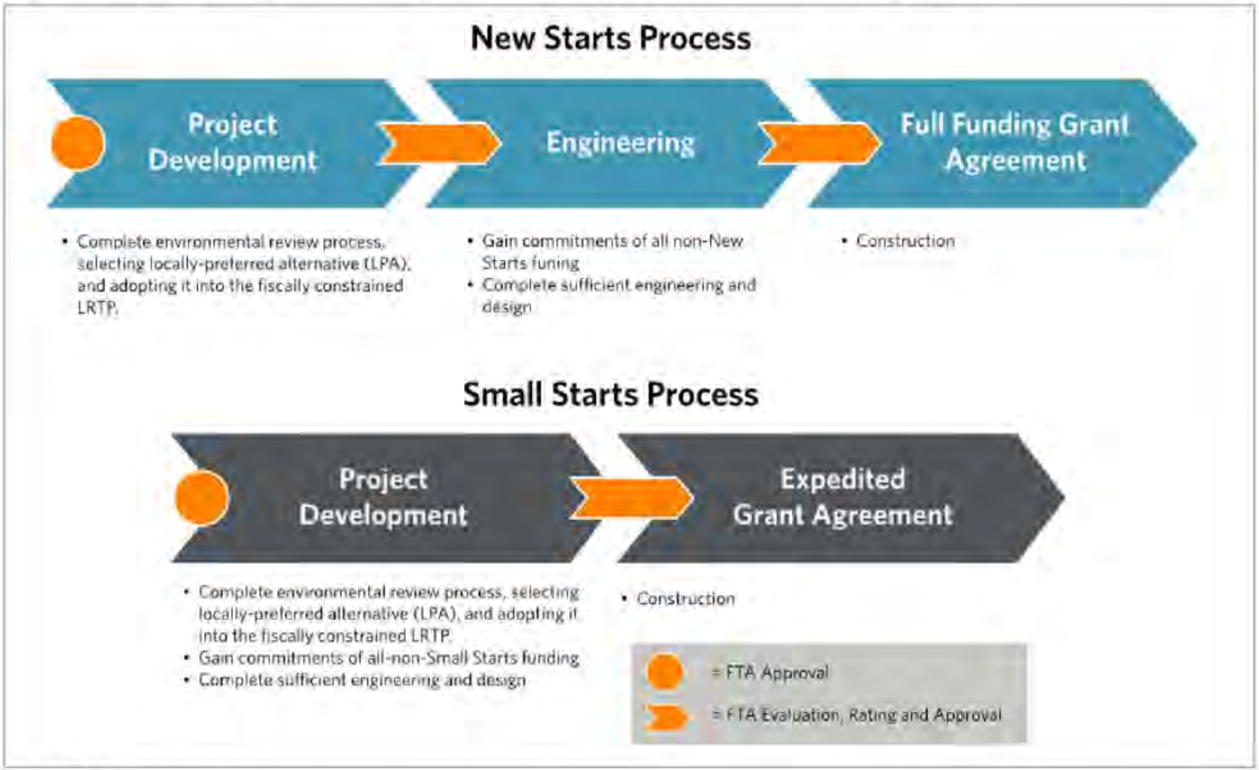
8.2 Overview of FTA New Starts and Small Starts Programs

The FTA New Starts and Small Starts are the primary funding sources for new rail projects. The FTA program applies a standard set of evaluation criteria to facilitate comparison of projects nationally "on a level playing field." The evaluation measures have changed over time to reinforce consistency in project analysis and to simplify the project rating process. The nature of these changes has tended to favor projects with many short trips (streetcar, Bus-Rapid Transit, some light rail) at the expense of projects with a small number of long trips, such as commuter rail.

The FTA New Starts Program includes three major steps listed below and as shown in Figure 22 below:

- Project Development, which allows up to two years for the completion of planning, preliminary engineering, and approval of a project's environmental document.
- Final Design/Engineering, during which design and engineering continue and commitments for project funding are established.
- Full Funding Grant Agreement (FFGA), which moves the project into construction.

Figure 22: FTA Project Development Process for New Starts Projects



Source: FTA

While the boxes appear to show distinct boundaries for activities by phase, there is some overlap between the phases. As noted earlier, the Small Starts process is somewhat abbreviated because the projects tend to be of a smaller scale. The project evaluation criteria and rating system is extremely precise, and has evolved considerably during the FTA discretionary program. The most recent update of the evaluation process is described in Proposed Interim Policy Guidance, Federal Transit Administration Capital Investment Program, June 2016.

FTA approval is necessary to enter the Project Development phase. That approval is based upon a brief description of the project outlining project participants and roles, identifying the financial resources available to complete Project Development, and summarizing the characteristics of the proposed project. The FTA New Starts Evaluation is then applied at the end of the Project Development and engineering phases as outlined below, leading to a Full Funding Grant Agreement committing federal funding for project implementation. The Small Starts program is streamlined to facilitate implementation of smaller, lower cost projects. The process is similar to New Starts except that the engineering phase is combined with Project Development, eliminating the FTA approval step between Project Development and engineering. The Small Starts criteria are applied initially at the end of the combined Project Development. A recommended project is then eligible for an Expedited Grant Agreement (EGA) to fund project implementation.

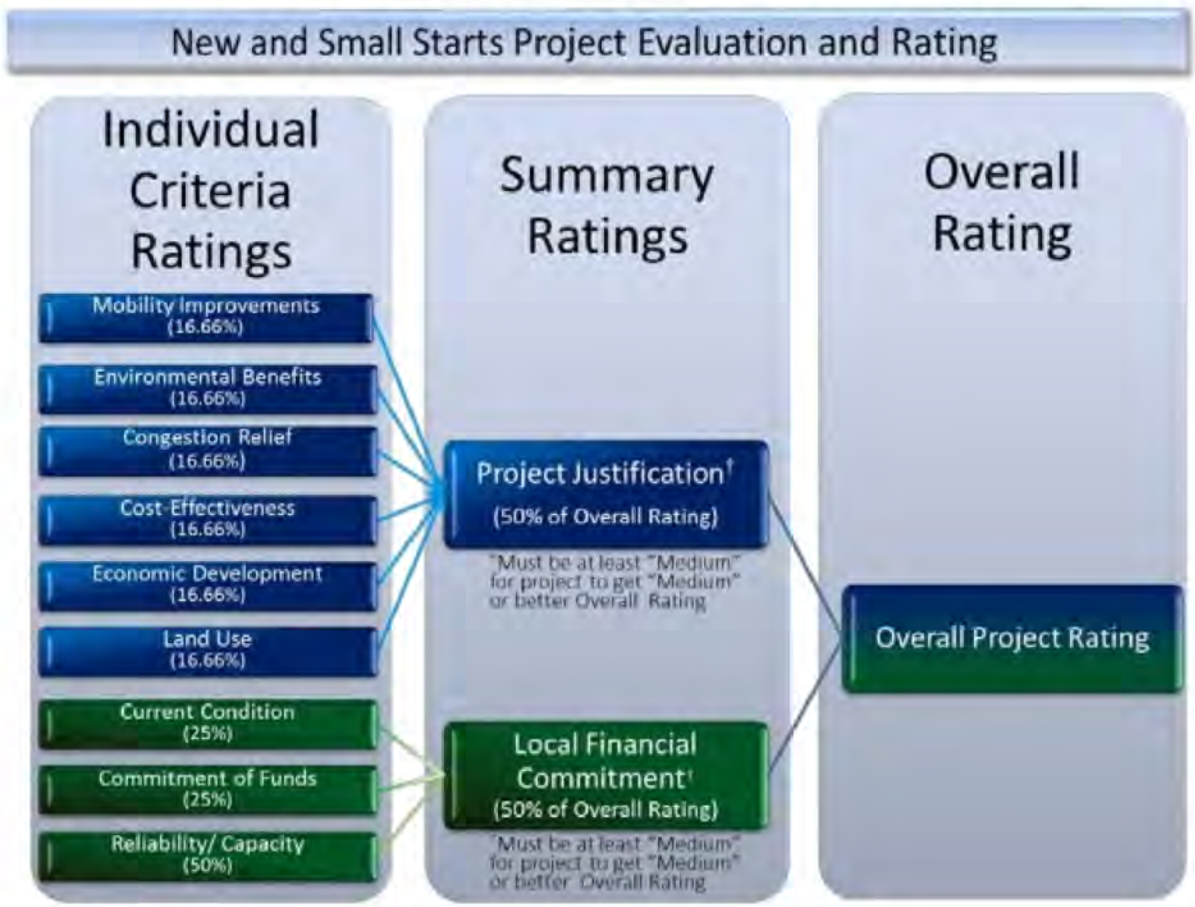
8.2.1 Project Evaluation Components

The current project evaluation process is documented in FTA's "Reporting Instructions for Section 5309 New Starts Criteria, June 2019" and "Reporting Instructions for the Section 5309 Small Starts Criteria, June 2019." This guidance provides prospective project applicants with information on how the FTA evaluates and rates projects applying for New Starts and Small Starts funding. The rating established by the FTA is the combination of two, equally weighted summary ratings: Project Justification and Local Financial Commitment.

A minimum of a "medium" rating on both the project justification and on the local financial commitment is necessary in order to earn an overall medium or better project rating. These summary ratings are further broken down by individual evaluation criteria. Each of the evaluation criteria are rated on a five point scale, from low to high. At the conclusion of the assessment, all the scores are combined to produce an overall project rating. Figure 23 below presents an overview of the rating process and associated weighting of criteria.

This guidance will be subject to changes that are implemented from the "Proposed Interim Policy Guidance Federal Transit Administration Capital Investment Program, June 2016."

Figure 23: Evaluation and Rating Process



Source: FTA

8.2.2 Project Justification Criteria

The FTA evaluates all potential projects seeking New Starts funding against six, equally weighted project justification criteria. These are described in detail below.

- **Mobility Improvements** – This criterion considers the project's total number of trips, with a heavier weighting for those trips that would be made by transit-dependent persons. These persons are defined by FTA as those within a household who do not have access to a car.

The calculation is determined by adding together the estimated number of transit trips on the project taken by non-transit dependent persons and the number of transit trips on the project taken by transit dependent persons multiplied by a factor of two.

- **Economic Development** – The evaluation process for this criterion examines a number of topics: transit supportive plans and policies within the project area, the demonstrated performance of those plans and policies, and the policies and tools in place to preserve or increase the amount of affordable housing in the project corridor.
- **Environmental Benefits** – The environmental benefits measure for New Starts projects is the sum of the monetized value of the benefits resulting from the changes in air quality and Greenhouse Gas (GHG) emissions, energy use, and safety divided by the same annualized capital and operating cost of the project as used in the cost-effectiveness measure (described in the next bullet). The FTA multiples the resulting ratio by 100 and expresses the environmental benefit measure as a percentage. The measure is similar for Small Starts; however, the benefits are divided only by the annualized FTA capital grant amount instead of the total annualized capital cost and operating cost. This provides a rating advantage for Small Starts projects under this criterion since the denominator in the equation (annualized cost) is limited to the FTA capital cost contribution. No operating costs are included, providing another rating advantage for Small Starts projects. Both the New Starts and Small Starts are rated using the same set of evaluation thresholds.
- **Cost-Effectiveness** – The FTA measures cost-effectiveness of a project submitted for New Starts evaluation and rating by calculating the annual capital and operating and maintenance cost per passenger on the project. As with environmental benefits, the Small Starts calculation considers only the annualized FTA grant amount instead of the total annualized capital cost and operating cost. The FTA evaluation thresholds applied in this measure differ between New and Small Starts projects, however, which largely offsets the Small Starts annualized capital cost advantage. The cost limitation to the FTA grant amount (omitting operating costs) provides the opportunity for Small Starts projects to increase ridership by improving service without impacting the cost element of the rating. This would enhance the cost-effectiveness rating, although the additional costs associated with expanded service may impact the financial viability of the project.
- **Land Use** – The land use measure for New Starts projects includes an examination of existing corridor and station area development; existing corridor and station area development character; existing station area pedestrian facilities, including access for persons with disabilities; existing corridor and station area parking supply; and proportion of affordable housing. Potential changes to the affordable housing evaluation are outlined in the Proposed Interim Guidance distributed by FTA for review in April 2015.
- **Congestion Relief** – The FTA has not applied a measure for congestion relief at this time. Therefore, FTA has assigned a medium rating for this criterion for all projects. A proposed approach to measure congestion relief is documented in the Proposed Interim Guidance, and will likely be applied in the future.

8.2.3 Local Financial Commitment Criteria

The FTA evaluates all potential projects seeking New Starts funding against three Local Financial Commitment criteria. These are described in detail below.

- **Current Capital and Operating Condition** (25 percent of Local Financial Commitment Rating) – The evaluation of this measure is based upon the average feet age (if applicable), bond ratings if given within the last two years, the current ratio of current assets to current liabilities, and recent service history including whether there have been significant cuts in service. In arriving at a current condition rating, the majority of the emphasis will be placed on the feet age and current ratio. The bond rating and service history will have less emphasis.
- **Commitment of Capital and Operating Funds** (25 percent of Local Financial Commitment Rating) – The evaluation of this measure will be based on the percentage of funds (both capital and operating) that are committed or budgeted versus those considered only planned or unspecified. If there are significant private contributions, such involvement would increase the commitment of funds rating one level. The FTA will determine on a case by case basis whether private contributions are significant based on the unique arrangements that may be presented. Private contributions can include outside investments that result in cost-effective project delivery, financial partnering, and other public-private partnership strategies.
- **Financial Capacity and Reasonableness of Assumptions** (50 percent of Local Financial Commitment Rating) – The evaluation of this measure will be based upon whether capital and operating planning assumptions are comparable to historical experience, the reasonableness of the capital cost estimate of the project, adequacy of meeting state of good repair needs, and the project sponsor's financial capacity to withstand cost increases or funding shortfalls.

8.2.4 New Starts Versus Small Starts Programs

The main advantage of the New Starts program over the Small Starts program is the ability to pursue federal funding at the 60 percent level regardless of the total project capital cost. The allowable ratio is actually 80 percent; however, competition has driven the maximum feasible federal request to 50 percent or less.

Projects with a total capital cost of under $300 million that request $100 million in Section 5309 funds can benefit in several ways. Ideally, the total project cost would be $180 million or less so that the federal share can still reach 50 percent. As noted earlier, Small Start projects can be implemented more quickly, partially because the federal process is somewhat less rigorous. This provides quicker realization of project benefits and reduces the impact of inflation on project capital costs.

Also noted earlier, the FTA evaluation process has evolved in a manner that favors projects with a large number of short trips over those with a smaller number of longer trips. This effectively makes longer systems with commuter rail operating characteristics less attractive. The Small Starts projects can offset this bias to some extent since the environmental benefits and the cost effectiveness consider only the federal capital request rather than the total cost, and do not include the operating costs. This allows Small Starts projects to increase service frequency (and operating costs) in order to attract higher ridership without increasing the cost component of the evaluation. The financial plan must still consider the total costs, however. It may be prudent to evaluate projects that are eligible for Small Starts under both Small and New Starts scenarios.

See the FTA's Fact Sheet for Fixed Guideway Capital Investment Grants, Chapter 53 Section 5309: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/5309_Capital_Investment_Grant_Fact_Sheet.pdf

8.2.5 Updates to Program per Iowa DOT

The FTA's Capital Investment Grants (CIG) program, is a discretionary grant program whereby projects are selected for funding based on eligibility and merit. The FTA bases its discretionary funding allocation decisions for the CIG program on a variety of factors including the extent of the local financial commitment, project readiness, and geographic diversity, and considers the extent value capture, private contributions, and other innovative approaches to project development and delivery are used, including public-private partnerships.

For CIG projects, such as New Starts, Small Starts, Core Capacity, awards of federal grants currently cannot exceed 51 percent of the project's cost. For projects with an estimated construction cost exceeding $50 million, federal loans such as Transportation Infrastructure Finance and Innovation Act (TIFIA) or Railroad Rehabilitation & Improvement Financing (RRIF) are a funding option; however, federal loans (TIFIA and RRIF) previously counted as non-federal sources, but are no longer counted as part of the local share of a project cost, and must be considered part of the overall federal contribution. *Future projects that budget TIFIA for non-federal local match, will be affected by this change*. The Small Starts that are larger than $50 million, are eligible to use TIFIA for a funding option.

9 Commuter Rail Governance and Organization Planning

This section provides a general summary of the common commuter rail organization and governance models that are used by U.S. rail transit agencies and that could potentially be used for system ownership; management; procurement and construction; operations; and maintenance of a potential commuter rail service on the CRANDIC Corridor right-of-way between Iowa City and North Liberty. The summary identifies and describes typical organizational methods and governance structure currently employed by U.S. commuter rail system agencies and considers the general operating basis and implications of each method. The discussion in this section also considers the potential for establishment of a Regional Transportation Authority (RTA) or Regional Transportation District (RTD) inclusive of Johnson County, Iowa.

9.1 Summary of Common U.S. Transit Agency Governance Models and Organizational Considerations

Commuter rail operators can either operate over a network of privately owned rail corridors (owned by a public transit agency or state or local agency, for example) or can operate by agreement over rail corridors owned by a host freight railroad. Many commuter rail carriers (transit agencies) operate through partnerships with a government agency or transportation authority.

Governance methods are used by transit agencies to define system ownership, management, procurement (e.g., passenger rail locomotives and cars, etc.), construction, operations, and maintenance of a commuter rail or other rail transit service. While establishment of governance and related organizational models must be custom-tailored to the characteristics, needs, and opportunities for a given region and rail transit service and through considerable coordination between stakeholders, this section identifies and describes the five most common governance models that are used by U.S. transit agencies and various organizational considerations to better address growing regional transit demand and transportation planning and operations needs. Note that several U.S. transit agencies operate commuter rail and/or other rail transit services using these methods below[58].

- **State Transit Agency –** Entity created by a state government; transit operations owned, funded, and managed by the state[59].
- **General Purpose Transit Authority or District –** Entity usually with a funding mechanism that is created under state law via the joint approval of leaders and voters in multiple local jurisdictions[60].
- **Special Purpose Regional Transit Authority or District –** Entity created by a special act of the state legislature that applies only to a specific single region in the state[61].
- **Municipal Transit Agency –** Assumption of transit services by an existing local government as part of its municipal functions, and without special state legislation[62].
- **Joint Exercise of Power or Joint Powers Authority –** Entity created from agreements between two or more existing local governments to create a new transit agency by jointly exercising the powers they each possess to build or operate transit[63].

Table 31 describes the five most common governance models in the context of the authority for creation and provides examples of transit agencies in the U.S. that are currently using each governance model.

[58] *Regional Organizational Models for Public Transportation (Final Report)*; Transit Cooperative Research Program, 2011

[59] Ibid.

[60] Ibid.

[61] Ibid.

[62] Ibid.

[63] Ibid.

Table 31: Most Common Transit Agency Governance Models, Authority for Creation, and Example U.S. Agencies

Governance Model	Authority for Creation	U.S. Transit Agency Examples
State Transit Agency	State powers	• Maryland • Massachusetts • New Jersey • Rhode Island
General Purpose Transit Authority or District	General state law or enabling statutes, coupled with local initiative	• Texas (metropolitan, urban, rural) • Washington State Public Transit Benefit Areas • Ohio Transit Authorities (Cleveland, Akron, Cincinnati, Toledo, Columbus, OH) • Florida County Transit Districts • New Mexico RTAs (e.g., North Central New Mexico Regional Transportation Transit District)
Special Purpose Regional Transit Authority or District	Special statutes (i.e., special act of state legislature)	• BART (San Francisco Bay Area, CA) • WMATA (Washington, DC) • UTA (Salt Lake City, UT) • RTD (Denver, CO) • CTA, Pace, Metra (Chicago, IL)
Municipal Transit Agency	Existing local government (City, County) powers	• Honolulu Transit (City of Honolulu, HI) • CATS (Charlotte, NC) • City of Phoenix Public Transit Department, AZ • SF Muni – City and County of San Francisco, CA • King County Metro (Seattle, WA)
Joint Exercise of Powers or Joint Powers Authority	Local arrangements	• JPB/Caltrain (Santa Clara, San Mateo, San Francisco Counties, CA) • TRE (DART and Fort Worth Transit) • VRE (Northern Virginia and Potomac and Rappahannock Transportation Commissions)

Source: Regional Organizational Models for Public Transportation (Final Report); Transit Cooperative Research Program, 2011

For the five most common governance models described above, the following organizational components for public agencies operating commuter rail service in the U.S. have been identified[64]:

- **System Ownership –** Commuter rail system is often owned by a state, regional, or local agency. Note that the rail corridor over which the commuter rail service is operated can be owned by a state, regional, or local agency; host freight railroad(s); or other parties.

[64] *NCHRP Report 657 (Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors)*; National Cooperative Highway Research Program, 2010

- **System Management** – Commuter rail system is often managed by a state, regional, or local agency. Commuter rail agencies are often led by a commission or board and a management staff overseeing multiple components of the day to day operation of the commuter rail service.
- **System Construction** – Commuter rail system capital (construction) projects are often led by a state, regional, or local agency. On a shared-use corridor owned by a host freight railroad, the commuter rail agency will often contract with the freight railroad to complete capital projects (e.g., rail and signal replacement).
- **System Procurement** – Commuter rail system procurement (e.g., locomotives, passenger cars, rail, etc.) is often led by the state, regional, or local agency managing the commuter rail system, and can also be facilitated through a third-party contractor. Note that commuter rail agencies can own or lease their passenger rail equipment.
- **System Operations and Maintenance** – Commuter rail system operations and maintenance (e.g., train operations; equipment maintenance; dispatching; track, bridge, and signal maintenance; etc.) are often contracted out to the host freight railroad or a third-party contractor. Note that all O&M functions may be bundled and contracted out to a single contractor or contracted out as separate functions to two or more contractors.

9.2 Potential for Establishment of a RTA or RTD Inclusive of Johnson County, Iowa

In the context of a potential governance and organizational model that could be used for system ownership; management; procurement and construction; operations; and maintenance of a potential commuter rail system on the CRANDIC Corridor right-of-way between Iowa City and North Liberty, this section considers the potential for establishment of a Regional Transportation Authority (RTA) or Regional Transportation District (RTD) solely for Johnson County, Iowa. The potential of Johnson County to establish a joint RTA or RTD with adjacent Linn County, Iowa, will also be considered.

9.2.1 Summary of Principal Current Johnson County Transit Agencies

There is at present no RTA or RTD inclusive of Johnson County, Iowa. Fixed-route public transit services are instead operated independently by various agencies in Johnson County, Iowa, area. Those agencies currently operating transit services in Iowa City, Coralville, and North Liberty and the in the vicinity of the Iowa City-North Liberty CRANDIC Corridor right-of-way under study for commuter rail implementation include:

- **Iowa City Transit** – Owned and operated by the City of Iowa City with policy direction from the City Council. Operates fixed-route bus transit service within Iowa City and University Heights and contracts out ADA paratransit service to Johnson County SEATS[65].
- **University of Iowa CAMBUS** – Owned and operated by the University of Iowa. Operates fixed-route bus transit service within in the University of Iowa campus and select areas of

[65] *Iowa Commuter Transportation Study*, Iowa Department of Transportation (December 2014)

Iowa City, University Heights, and Coralville and a demand-response door-to-door ADA paratransit service through the Bionic Bus[66].

- **Coralville Transit –** Owned and operated by the City of Coralville and governed through a City Administrator to the Transit Manager. Operates fixed-route bus transit services within Iowa City (primarily in Downtown and to the University of Iowa Hospitals), Coralville, and North Liberty and contracts out paratransit service to Johnson County SEATS[67].

None of the transit agencies listed above have operated or currently operate commuter rail service or other rail transit services in Johnson County.

9.2.2 Existing Iowa Statutes for Regional Transit Authority and Regional Transit District Formation

There are presently two primary statutes in the State of Iowa Code that provide for the formation and operation of Regional Transit Authorities or Regional Transit Districts that could potentially provide for an agency to operate a commuter rail service – Iowa Code Chapter 28E (Joint Exercise of Governmental Powers) and Iowa Code Chapter 28M (Regional Transit Districts)[68]. These statutes are described in the following sections.

Relevant Sections of Iowa Code Chapter 28E (Joint Exercise of Governmental Power)

The Joint Exercise of Governmental Powers provided in Chapter 28E of the Iowa Code is used by various government entities to provide services for several functions statewide. Generally, Chapter 28E allows any government agency to jointly conduct any activity with another government agency provided that each agency has the power to undertake the particular activity. Sections of Iowa Code Chapter 28E that are particularly relevant to the formation of a public transit agency are identified in this section.

Iowa Code Chapter 28E Section 4 (Agreement with Other Agencies)

Iowa Code Chapter 28E.4 specifically grants authority for public agencies of the state to enter into an agreement with each other[69]. Agreements developed in this manner have been used across Iowa to provide services through public agencies, such as fire protection, law enforcement, fire protection, city utilities, libraries, and public transit (including transit agencies in the Des Moines Area and Ames). These agreements contain information about the powers of the public agency; its roles and responsibilities; and how it is organized, managed, and overseen.

Iowa Code Chapter 28E.4 states[70]:

"Any public agency of this state may enter into an agreement with one or more public or private agencies for joint or cooperative action pursuant to the provisions of this chapter, including the creation of a separate entity to carry out the purpose of the agreement. Appropriate action by

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[66] Ibid.
[67] Ibid.
[68] 2016 Corridor MPO (Cedar Rapids, Iowa) Transit Study – Existing Conditions and Recommendations; July 2016
[69] https://www.legis.iowa.gov/docs/ico/chapter/28E.pdf
[70] Ibid.

ordinance, resolution or otherwise pursuant to law of the governing bodies involved shall be necessary before any such agreement may enter into force."

Iowa Code Chapter 28E Section 17 (Transit Policy – Joint Agreement – City Debt)

Iowa Code Chapter 28E Section 17 offers details related to inter-governmental agreements for the provision of public transit services, as stated below[71]:

> 1. It is the public policy of this state to encourage the establishment or acquisition of urban mass transit systems and the equipment, maintenance, and operation thereof by public agencies in cooperation with, and with the assistance of the urban mass transportation administration of the United States department of transportation, pursuant to the provisions of the Urban Mass Transportation Act of 1964, as amended, Title 49, U.S. Code section 5301 et seq., which requires unification or official coordination of local mass transportation services on an area-wide basis as a condition of such assistance.
>
> 2. An agreement between one or more cities and other public agencies for this purpose may be made and carried out without an election and the agency created thereby may jointly exercise through a board of trustees as provided by the agreement all the rights, powers, privileges and immunities of cities related to the provision of mass transportation services, except the authority to incur bonded indebtedness.
>
> 3. *a*. A city which is a party to a joint transit agency may issue general corporate purpose bonds for the support of a capital program for the joint agency in the following manner:
>
> (1) The council shall give notice and conduct a hearing on the proposal in the manner set forth in section 384.25. However, the notice must be published at least ten days prior to the hearing, and if a petition valid under section 362 is filed with the clerk of the city prior to the hearing, asking that the question of issuing the bonds be submitted to the registered voters of the city, the council shall either by resolution declare the proposal abandoned or shall direct the county commissioner of elections to call a special election to vote upon the question of issuing the bonds. Notice of the election and its conduct shall be in the manner provided in section 384.26.
>
> (2) If no petition is filed, or if a petition is filed and the proposition of issuing bonds is approved at the election, the council may proceed with the authorization and issuance of the bonds.
>
> 3. *b*. An agreement may provide for full or partial payment from transit revenues to the cities for meeting debt service on such bonds.
>
> 3. *c*. This subsection shall be construed as granting additional power without limiting the power already existing in cities, and as providing an alternative independent method for the carrying out of any project for the issuance and sale of bonds for the financing of a city's share of a capital expenditures project of a joint transit agency, and no further proceedings with respect to the authorization of the bonds shall be required.

[71] https://www.legis.iowa.gov/docs/ico/chapter/28E.pdf

Relevant Sections of Iowa Code Chapter 28M (Regional Transit Districts)

Iowa Code Chapter 28M offers specific details about RTDs related to their creation, bonding authority, powers and commission membership, tax levy, and other considerations[72].

The primary eligibility criteria for development of an RTD by a county or by two or more contiguous counties relates to county population as outlined in the excerpt of Iowa Code Chapter 28M.2 below[73]:

1. A county with a population in excess of one hundred seventy-five thousand and participating cities may create, by chapter 28E agreement, a regional transit district in the county pursuant to this chapter. Two or more contiguous counties and participating cities may create, by chapter 28E agreement, a regional transit district pursuant to this chapter if one of the counties has a population in excess of one hundred seventy-five thousand. A district shall consist of the unincorporated area of any participating county and the incorporated area of any city in the county that does not have an urban transit system. However, a city without an urban transit system may decline, by resolution forwarded to the board of supervisors, to participate in a regional transit district.

Iowa Code Chapter 28M also provides the following additional details about RTDs [74,75]:

- RTDs possess the same powers and rights of other county government agencies in Iowa.
- RTDs have the power to issue revenue bonds or general obligation bonds to establish, construct, reconstruct, repair, equip, remodel, extend, maintain, and operate works, vehicles, and facilities.
- RTDs are not created by voter approval, although public input is a critical component of RTD development.
- RTDs are managed and governed by an appointed commission; RTD commission members are appointed by participating member communities.
- RTDs have the responsibility and power to develop annual budgets, establish fare schedule, and collect fares, and control and tax revenues paid to RTD.
- RTD can levy taxes annually not exceeding 95 cents per $1,000 of the assessed value of all taxable property in the RTD. Taxes are to be used for operations and maintenance of the RTD, payment of debts, and creation of a reserve fund.

At present, the first RTA and the only RTD in the State of Iowa is Des Moines Area Regional Transit Authority (DART). The authority is located in Polk County – the most populous in the state and with a population in excess of the 175,000 threshold required to establish an RTD. DART used the rights and powers of Iowa Code 28E agreements and Iowa Code 28M to create and maintain the RTD[76].

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[72] https://www.lawserver.com/law/state/iowa/ia-code/iowa_code_chapter_28m

[73] https://www.lawserver.com/law/state/iowa/ia-code/iowa_code_28m-2

[74] 2016 Corridor MPO (Cedar Rapids, Iowa) Transit Study – Existing Conditions and Recommendations; July 2016

[75] https://www.lawserver.com/law/state/iowa/ia-code/iowa_code_chapter_28m

[76] 2016 Corridor MPO (Cedar Rapids, Iowa) Transit Study – Existing Conditions and Recommendations; July 2016

9.3 Potential for Establishment of an RTA or RTD Inclusive of Johnson County

This section considers the potential for establishment of a Regional Transportation Authority (RTA) or Regional Transportation District (RTD) solely for Johnson County, Iowa, as well as the potential of Johnson County to establish a joint RTA or RTD with adjacent Linn County, Iowa. A new or expanded RTA or RTD in the area could support the development of a commuter rail service on the CRANDIC Corridor between Iowa City and North Liberty.

At present, the only RTD in the State of Iowa is Des Moines Area Regional Transit Authority (DART). The authority is located in Polk County – the most populous in the state and with a population in excess of the 175,000 threshold required to establish an RTD. The only other Iowa county with a population of at least 175,000 is Linn County, which includes the Cedar Rapids Area. Public fixed-route bus transit services in the Cedar Rapids Area are operated by Cedar Rapids Transit and Linn County LIFTS operates paratransit services[77]. Cedar Rapids Transit has not operated and is not currently operating commuter rail service or other rail transit services in Linn County. The Corridor Metropolitan Planning Organization (Corridor MPO) inclusive of Cedar Rapids is currently considering the establishment of an RTA for Linn County, and the creation of an RTA would see the transfer of ownership of all property (including transit vehicles) from the City of Cedar Rapids to the new public agency[78]. This move is expected to help expand bus services in the region and realize other public benefits.

Phase 1 of the RTA Feasibility Study in Linn County resulted with a conclusion that no RTA would be established at this time, but that the local jurisdictions may work together in the future, as needed.

According to U.S. Census data, the population of Johnson County was 130,882 in July 2010, and was estimated at 149,210 in July 2017[79]. The county is one of the fastest-growing regions in the State of Iowa, yet does not currently meet the required 175,000 population threshold for establishment of an RTA or RTD according to the Iowa Code. Projections for population growth in Iowa suggest that Johnson County is anticipated to reach a population of 175,000 – and thus reach this minimum threshold – between 2025 and 2030[80].

Absent any short-term changes to Iowa Code that would lower the minimum population threshold, Johnson County has the option of deferring the establishment of an RTA or RTD solely for Johnson County until its population reaches 175,000 or it can consider entering into an Iowa Code 28E agreement with Linn County to establish a joint RTA or RTD that would include Johnson and Linn counties.

This joint agency could:

- Provide for a broadening of and greater coordination of current regional services operated by existing transit agencies in Iowa City, Coralville, and Cedar Rapids to deliver more efficient

[77] *Iowa Commuter Transportation Study*, Iowa Department of Transportation (December 2014)

[78] https://www.thegazette.com/subject/news/government/cedar-rapids-eyes-possibility-of-regional-transit-authority-20171128

[79] https://www.census.gov/quickfacts/johnsoncountyiowa

[80] https://www.iowadatacenter.org/datatables/CountyAll/co2010populationprojections20002040.pdf

and seamless service offerings that match the changing needs of the traveling public in the rapidly growing areas of Johnson and Linn counties.

- Provide for potential administrative, operating, maintenance, and procurement synergies between existing transit agencies in Johnson and Linn counties.
- Support the development of an initial phase of commuter rail service implementation on the CRANDIC Corridor between Iowa City and North Liberty in Johnson County (as identified and described in this study).
- Support a potential future commuter rail service extension from North Liberty north into Linn County and Cedar Rapids on the CRANDIC Corridor.
- Support the development of potential future express and local bus services and other transit services in Johnson and Linn counties that would connect the broader Iowa City/Cedar Rapids region to commuter rail service on the CRANDIC Corridor.

9.4 Potential Options for Access and Ownership of a Rail Corridor by a Public Transit Agency

This section provides general background on potential options for access to and ownership of a rail corridor by a public transit agency (which could be an RTA or RTD, or another agency type based on the five most common governance models presented earlier in this section), based on typical U.S. transit agency experience.

Commuter rail agencies must negotiate access with the owner of the rail corridor over which the service is planned, essentially purchasing the rail line capacity required for the service or purchasing the rail corridor required for the service. While several approaches have been employed by commuter rail agencies in the U.S., the three principal approaches are generally identified below[81]. Note that use of any of these approaches by a commuter rail agency or other public agency for gaining access to (or acquiring ownership of) the CRANDIC Corridor right-of-way between Iowa City and North Liberty would be subject to future coordination and negotiation between the CRANDIC, public agencies, and any other involved parties and could involve approval from the STB.

Commuter Rail Agency Purchases Right-of-Way from Freight Railroad

This approach is often employed when the commuter rail agency anticipates its service to be the primary rail corridor user and the freight railroad and other corridor owners, if any, are willing to sell the corridor to the commuter rail agency[82]. In many instances, the freight railroad would maintain some type of operating rights over the shared-use corridor to exercise its common carrier obligation to provide freight rail service to online shippers and/or operate through freight trains, often during defined windows that do not interfere with scheduled commuter rail operations. Operating rights and access fees for the freight railroad, as well as conditions with regard to capital investment in and maintenance of infrastructure (e.g., track and bridges/structures, wayside signal system, and

[81] *NCHRP Report 657 (Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors)*; National Cooperative Highway Research Program, 2010

[82] Ibid.

dispatching), liability, and other considerations, are specified in agreements between the parties[83]. Note that in some instances any such agreement may include multiple railroad owners.

In some instances, the rail corridor would be commuter rail only (rather than a shared-use arrangement) and no common carrier freight service would be offered by the former freight railroad corridor owner or any other freight railroad under contract. In this case, conditions with regard to capital investment in and maintenance of infrastructure, liability, and other considerations would be the sole responsibility of the commuter rail agency[84].

Commuter Rail Agency Negotiates Access to a Freight Railroad Corridor

This approach is often employed when a freight railroad desires to retain its ownership in a corridor owing to any number of factors typically related to freight railroad commercial, network, and competitive strategies; preservation of mainline and terminal capacity for current and anticipated future freight railroad operations and volumes; maintenance of freight rail service access to current and anticipated future freight shippers; and other proprietary considerations.

In an instance when a freight railroad does not wish to sell a corridor, commuter rail agencies must negotiate access to the corridor with the freight railroad via an agreement. In this case, the commuter rail agency is often responsible for the capital cost of the additional infrastructure to enhance the network capacity required to accommodate the commuter rail trains and to minimize any impacts on existing and anticipated future freight railroad trains in the shared-use corridor[85]. Commuter rail agencies will also typically pay access fees to the freight railroad that can be applied to various operating, infrastructure maintenance, and other costs in the corridor[86]. Additional conditions dictating liability and other considerations, are specified in agreements between the parties[87].

Commuter Rail Agency Develops Parallel Operations in a Right-of-Way Shared with a Freight Railroad

In this approach, a commuter rail agency typically purchases or leases its own right-of-way within the existing corridor right-of-way from the freight railroad and operates largely (or completely) on a rail line separate from the freight railroad[88]. While the commuter rail line and freight rail line are separate, both exist within the same right-of-way, and therefore agreements are often developed between the parties with regard to select infrastructure safety and maintenance considerations where the lines cross or at locations where the parallel rail lines cross a roadway at-grade[89]. Additional conditions dictating liability and other considerations, are specified in agreements between the parties[90]. This approach is not feasible for rail corridors with narrow right-of-way width or other site constraints, although adjacent right-of-way can be acquired to accommodate parallel operations, if available.

[83] Ibid.

[84] Ibid.

[85] Ibid.

[86] Ibid.

[87] Ibid.

[88] Ibid.

[89] Ibid.

[90] Ibid.

10 Next Steps

The next steps outlined below suggest one approach for advancing potential development of commuter rail on the CRANDIC Corridor between Iowa City and North Liberty. Specific details about the process outlined below are subject to ongoing project stakeholder coordination and approval.

Step 1: Develop Consensus Regarding Conclusions from the Recent Iowa City-North Liberty Commuter Rail Conceptual Feasibility Study and Stakeholder Outreach

MPOJC, Iowa DOT, CRANDIC, and other stakeholders should come to a consensus on recommendations for the preservation and promotion of the CRANDIC Corridor right-of-way between Iowa City and North Liberty as an asset for potential alternative transportation use (including commuter rail), as informed by applicable study in the region and this Study, related stakeholder outreach, and a general understanding of the current and potential future transportation needs of Johnson County within the context of future transportation planning and community and economic development for the region.

Step 2: Confirm Lead Agency for Potential Development of Commuter Rail on the CRANDIC Corridor

Any future efforts to develop commuter rail service on the CRANDIC Corridor between Iowa City and North Liberty would be the responsibility of a lead local agency. This local agency would be responsible for providing continuous leadership, maintaining preliminary coordination and communication between stakeholders and with the public, and working with state and local stakeholders and CRANDIC (via the CRANDIC Corridor Commuter Rail Study and Implementation Committee identified in Step 3 below) to pursue next steps and maintain momentum. The lead agency could potentially be an existing local agency or a new agency could be created. Confirmation of the lead agency is a priority.

Step 3: Establish CRANDIC Corridor Commuter Rail Study and Implementation Committee

A CRANDIC Corridor Commuter Rail Study and Implementation Committee would be organized to support the local lead agency to coordinate future activities and to galvanize support for the potential development of commuter rail on the CRANDIC Corridor between Iowa City and North Liberty.

The Committee would include several local stakeholder agencies, companies, organizations, and jurisdictions in Johnson County. These stakeholders would include MPOJC, regional planning affiliations, current right-of-way owner and freight railroad operator Cedar Rapids & Iowa City Railway (CRANDIC) and its parent company Alliant Energy, municipalities, state agencies (including Iowa DOT), county agencies, universities and colleges, chambers of commerce, economic development agencies, major companies and employers, citizens' groups, and others. Participation by representatives of these entities would be subject to internal approval within each entity. The committee would coordinate at established regular intervals to maintain momentum, and would support the lead local agency on any future implementation activities. While future study and potential commuter rail implementation would be led by stakeholders at the local level and under the direction of an existing or potential future local public agency, it is anticipated that Iowa DOT would continue to support these efforts at the state and regional levels.

Step 4: Consider Potential for Pilot Commuter Rail Service on CRANDIC Corridor

In order to test proof of concept and gauge public interest in commuter rail service over the CRANDIC Corridor between Iowa City and North Liberty, a pilot commuter rail service (operating on longer 60 or 90-minute headways and with minimal temporary station facilities) could be operated for a trail period of up to one year. The CRANDIC Corridor Commuter Rail Study and Implementation Committee, MPOJC, CRANDIC, and other local stakeholders could lead coordination with potential service providers to operate the service.

Step 5: Conduct Additional CRANDIC Corridor Right-of-Way Study

The CRANDIC Corridor Study and Implementation Committee, in partnership with a broad array of public and private stakeholders in the region, would conduct preliminary study necessary to design, permit, and construct commuter rail implementation on the CRANDIC Corridor. The scope of future activities could include the development of additional supporting documentation for FTA funding opportunities; conceptual engineering for infrastructure and facilities; comprehensive capital and operations and maintenance cost estimates; environmental review and related documentation; final operating plan and equipment plan; maintenance plan; financial plan; benefit-cost analysis; and other efforts. These study components would likely be eligible as supporting documentation for any future federal or state grant applications to secure funding for implementation of alternative use in the CRANDIC Corridor right-of-way. Subsequent CRANDIC Corridor right-of-way study should inform, and be informed by, and be integrated with other local, county, regional, and state planning initiatives and programs.

Step 6: Identify and Pursue Preferred Funding and Financing Options for Implementation of Commuter Rail on the CRANDIC Corridor

The local lead agency, in cooperation with the CRANDIC Corridor Commuter Rail Study and Implementation Committee, would coordinate with federal, state, and local agencies and local private partners to determine the potential for public-private partnerships and funding availability to support development of commuter rail on the CRANDIC Corridor. In order for the project to be eligible to receive federal funding, a public agency (which is often the lead agency) may need to be identified or a new agency created to administer and manage the funding. It may be preferable to expand an existing Regional Transit District (RTD) or establish a new RTD or similar mechanism to manage funding, if awarded in the future, and to spearhead design, permitting, construction, and operations and maintenance of a commuter rail service on the CRANDIC Corridor.

Step 7: Determine Potential Phased Implementation of Commuter Rail on the CRANDIC Corridor Based on Local Priorities and Funding Availability

Demand for commuter rail service and the initial eligible federal, state, and local funding sources may or may not be sufficient to fully develop service operating on 30-minute headways over the CRANDIC Corridor between Dubuque Street in Iowa City and the Penn Street in North Liberty in a single project phase. Phased implementation of a commuter rail service could be employed to match demand and available funding to design and construct it, and also to bolster local support for broader implementation in the CRANDIC Corridor. A first phase of implementation with less frequent service (every 60 or 90 minutes), which would require less passenger train equipment and potentially diminished infrastructure investment may be considered. Subsequent implementation phases could allow for additional commuter train frequencies (to the 30-minute headways sought) and/or stations, as demand increases in the future. Passenger rail equipment procurement and select infrastructure improvements could also be phased, as funding becomes available.

Step 8: Develop a Plan for Development of Commuter Rail on the CRANDIC Corridor

In consideration of the recommendations, established priorities, and the outcomes of ongoing study; preliminary information on funding needs, availability, and eligibility; and the potential for phased implementation, a comprehensive implementation plan should be developed that specifically lists the steps to implement preferred alternative use on the CRANDIC Corridor. The plan will be developed by the lead agency with support from the CRANDIC Corridor Commuter Rail Study and Implementation Committee through the analysis of potential strategies for design, funding, and implementation of the commuter rail service. The implementation plan should be in concert with other local, county, regional, and state planning initiatives and programs.

Step 9: Evaluate Potential Impacts of Commuter Rail on Existing Ridership of Area Transit Agencies

A subsequent study could be conducted to examine how commuter rail may potentially impact ridership of area transit agencies. This analysis could potentially be completed by the regional MPO(s) and Iowa DOT, with support from the local transit agencies, so that the study methodology and aggregate data are controlled in order to effectively measure the overall regional impact on the systems.