



Warrensville/Van Aken Station Area Plan



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Prepared for:



SHAKER
HEIGHTS

RMS
INVESTMENT CORPORATION



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Executive Summary

The City of Shaker Heights, the Greater Cleveland Regional Transit Authority (GCRTA) and RMS Investment Corporation (RMS) joined together to further study the new end-of-the-line Warrensville Station on the RTA Blue Line and prepare a plan for the site. The purpose of the Warrensville/Van Aken Station Area Plan and Traffic Analysis (Plan) is to coordinate RTA light rail station and bus circulation needs with private development to create a vibrant, walkable mixed-use district within a functional transportation network. The desired outcome of the Plan is to enhance public transportation and maintain roadway traffic operations while maximizing developable land and customer experience, considering the immediate development opportunities and long-term development as well. Implementation of this Plan, along with the preceding plans and projects, is expected to revitalize the community by successfully integrating bus and rail transit within the new development and increasing the accessibility and circulation of existing vehicular traffic, bicyclists and pedestrians, with the provision of a safe intermodal site.

Existing Conditions

The Warrensville/ Van Aken Station Area is one of two primary commercial districts in the City of Shaker Heights (City). The Van Aken District was built in the late 1940s and has a significant retail and office presence, but is out of character with the high-quality residential areas in Shaker Heights. The predominant existing land use around the station is retail commercial. The City has identified the station area as a primary redevelopment opportunity, supported by the site's commercial mixed-use district zoning designation.

The Warrensville/Van Aken Station is the current terminus of RTA's Blue Line and acts as a de facto intermodal hub between the Blue Line and bus Route 5 (Chagrin Boulevard to Lander Circle), Route 14 (Downtown Cleveland to Warrensville / Van Aken via Kinsman Road/Chagrin Boulevard) and Route 41-41F (East Cleveland to Noble Road via Warrensville Center Road). The Warrensville / Van Aken Station is one of the highest transfer activity locations in RTA's system with 1,400 total weekday transfers. This high volume of transfers is particularly significant because it represents high volumes of both bus-rail and bus-bus transfers. The bus terminal at the Warrensville / Van Aken Station is inadequate and undersized, and is currently only capable of accommodating four buses. The facility cannot be expanded at its current location due to constraints of both the Blue Line infrastructure to the south (the third track) and private development to the north. RTA needs a minimum of six, and ideally would have eight, bus bays at the site for loading/unloading passengers and parking buses during layovers. Overlaps between arriving and departing buses, and potential increases in service frequency on the routes, mean that at least two bays are required for each of the three routes.

Plan Development

The Warrensville/Van Aken Station Plan was developed over the course of two, two-day workshops held in November and December 2014 followed by a full project team meeting in January 2015 to determine the specific recommendations. The plan development workshops included key members and technical staff from the project sponsor organizations including the City of Shaker Heights, RTA and RMS. As a nexus of transportation and development activity, the Van Aken District and the Warrensville/Van Aken Station Area have specific design considerations, parameters and constraints. These parameters are defined by the main components of the station area:



- **Bus Operations** - With the clear importance of the Warrensville/Van Aken Station for three bus routes and as a bus transfer hub, the bus design parameters focused on three key elements: bus parking capacity (bus stops), site geometry, and bus ride/transfer experience (proximity of transfer points, walkability, convenience, ease of access, and minimizing pedestrian-vehicle conflicts).
- **Rail Operations** - Rail design considerations, parameters, and constraints focused on maintaining rail operations at the Warrensville/Van Aken Station while using the configuration of the rail infrastructure to integrate RTA operations within the Van Aken District. Specific considerations are locations of the substation, third track and crossover as well as the platform. Replacement of the substation is in RTA's Capital Plan with design beginning in 2015 and construction occurring in 2016.
- **Site Development** - Development design parameters focused on creating a high-quality, livable and walkable development with a transit-friendly public realm that integrates well into the surrounding neighborhood. Specific parameters include maintaining the integrity of the street grid; accommodating minimum parcel dimensions to maintain buildable envelopes on lots; incorporating public realm and urban design upgrades that integrate transit and development; and ensuring transit is an integral part of the site that is visible from the street.

Traffic Operations

A review of previously completed traffic studies was performed as part of the traffic assessment included in the development of the Warrensville/Van Aken Station Area Plan. The purpose of this review is to ensure traffic volumes previously developed for the proposed site are comparable to the expected traffic volumes for the current, more refined development plan. Comparable trip generation results indicate that previously completed intersection operation analysis within the study area will likely operate as expected. However, it is recommended that a traffic impact study be developed for the site since all of the previous studies anticipated a single access point along Farnsleigh Road. An updated traffic study that incorporates the more refined site layout plans that depict multiple access points along Farnsleigh Road, Warrensville Center Road and Chagrin Boulevard should be evaluated to more accurately assess the site impact and integration within the surrounding roadway network

Van Aken District Development and Station Plan

Redevelopment of the Van Aken district, as envisioned, will transform the area into a vibrant, walkable, mixed-use neighborhood destination that integrates into the surrounding Shaker Heights community. Key goals of the site redevelopment are to create an iconic transit station experience that serves as a connector to existing neighborhoods; provides diverse retail, educational, arts and civic opportunities; and serves as a central gathering place for the Van Aken District and broader Shaker Heights communities. The redevelopment will occur in three main phases, based on construction, transit and development opportunities and constraints.



Interim Phase

The Interim Phase includes the site's infrastructure that will be in place in December 2015, which coincides with the completion of the Warrensville/Chagrin intersection reconfiguration. The transportation infrastructure, notably the roads to accommodate the bus routes and the transfer area, will, for the most part, reuse existing pavement and stay within the existing right-of-way. The current rail infrastructure will remain in place. Retaining the roadway and rail infrastructure in place minimizes utility impacts while providing acceptable site function. Key construction elements for the Interim Phase of the station area plan include:

- Warrensville/Chagrin intersection reconfiguration (currently under construction)
- Bus roadway infrastructure essentially contained within existing Van Aken right-of-way
- East-west bus access road to Warrensville (for #41S) from the bus transfer location
- Bus access road to Chagrin Boulevard (for #41S)

Phase 1

Phase 1 is the initial phase of the Van Aken District redevelopment, located in the area to the north of the existing Blue Line rail lines. The transportation infrastructure for Phase 1 will build from the Interim Phase and the current rail infrastructure will continue to remain in place. Phase 1 is driven by site development, construction of the east-west access road to Warrensville and signalization of that intersection, and relocation of the substation. Planned completion of Phase 1 is expected in 2017. Key construction elements for Phase 1 of the station area plan include:

- Substation relocation (expected in 2016)
- East-west site access road to Warrensville
- Traffic signal at east-west road/Warrensville intersection

Phase 2

Phase 2 completes redevelopment of the site bounded by Warrensville Center Road, Chagrin Boulevard, and Farnsleigh Road, focusing on the area to the south of the RTA tracks. The transportation infrastructure includes reconfiguration of the RTA track, with relocation of the crossover and third track to the west of the Van Aken/Farnsleigh intersection and the consolidation of the Blue Line's Warrensville and Farnsleigh Stations with the construction of a new transit station and the relocation of the station platform. Relocation of the rail facilities will require substantial utility relocation. Additionally, the bus road will be realigned along the reconstructed station platform and new internal roads to provide internal circulation will connect with the Farnsleigh/Winslow and the Chagrin/Lomond intersections. This realignment also necessitates significant relocation of utilities and RTA catenary poles. The schedule for completion of Phase 2 is projected as potentially 2020-2025. Key construction elements for Phase 2 of the station area plan include:

- Relocation of rail crossover
- Relocation of third track
- Consolidation of the Warrensville/Van Aken and Farnsleigh stations with construction of a new station and platform close to the Van Aken/Farnsleigh intersection
- New bus roadway aligned with the rail lines and immediately adjacent to the new station and platform
- Pedestrian infrastructure, including sidewalks and related features, to facilitate transit transfer connectivity



Bicycle and Pedestrian Accommodations

The Van Aken District development and the Warrensville/Van Aken Station play an important role in continuing the City's efforts and connecting bicycle and pedestrian access to other transport modes. The Van Aken District will serve as a center of activity that attracts people from the surrounding neighborhoods as well as a busy intermodal hub. Given its location within Shaker Heights, pedestrian features are necessary on both sides of all streets within the site, along with provision of safe, well-designed pedestrian crossings and streetscape elements to add to the walkability of the area.

RMS does not plan to provide bike lanes within the site, however, bicycle amenities such as bike racks, and possibly bike lockers should be provided within the site and particularly near the transit hub. Such features would encourage bicycle use for people traveling to the site as their final destination as well as to the bus and rail transit for continuation of their trip to their ultimate destinations elsewhere in the county.

Parking

Parking facilities are an integral part of the overall transportation system. It is important to provide appropriately sized and properly designed parking facilities to accommodate the needs of the district, including the mixed-use development as well as transit.

Given the variability in the estimating process, the parking projections should not be interpreted as precise numbers but as an indication of the possible demand level. The actual parking demand may be reduced as a result of transit use, pedestrian and bicycle trips, and an effective parking management program. Additionally, the peak demand for each of the land uses may not overlap (particularly office and residential). For those reasons, the total parking demand is estimated to be 1,570 parking spaces. Potential reductions of 10%, 20% and 40% may be reasonable based upon alternate mode and parking management reductions.

Cost Estimate

As part of this study, a planning level cost estimate has been prepared for various phases of site build out. The costs shown in this estimate represent an estimate of probable planning level construction costs provided in good faith and with reasonable care. The plan does not take into account changes or escalation factors in the costs of labor, materials, or equipment, nor over competitive bidding. The provided cost estimate does not include right of way, utility relocation costs (other than noted) or construction engineering and inspection costs. The planning level cost estimates are **Phase 1 - \$4,682,200** and **Phase 2 - \$18,170,700**. Costs for the Interim Phase will be completed by others. A breakdown of costs identified for the major elements within each phase are shown in **Table 9-1**.

Funding Plan

The City of Shaker Heights, RTA, and other governmental entities, together with the developer of the site, will seek funding from a variety of public and private sources to provide funding for the infrastructure changes that are proposed to support the development. The City, RTA and the developer have begun exploring funding options with funding agencies and sources. The City, RTA and the developers will develop a funding package, likely including funding from a variety of Federal, state, local, and private sources, to complete funding of the proposed infrastructure improvements.



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1 Project Background

1.1. Introduction & Project Purpose

The City of Shaker Heights, the Greater Cleveland Regional Transit Authority (GCRTA) and RMS Investment Corporation (RMS) joined together to further study the new end-of-the-line Warrensville Station on the RTA Blue Line and prepare a plan for the site. The purpose of the Warrensville/Van Aken Station Area Plan and Traffic Analysis (Plan) is to coordinate RTA light rail station and bus circulation needs with private development to create a vibrant, walkable mixed-use district within a functional transportation network.

The desired outcome of the Plan is to enhance public transportation and maintain roadway traffic operations while maximizing developable land and customer experience, considering the immediate development opportunities and long term development as well. The Plan evaluates the features and accommodations associated with rail, bus, vehicles, bicycles and pedestrian; and it provides recommendations on successful integration on site. The recommendations target three core objectives:



Figure 1-1: Aerial image of the Warrensville/Van Aken Station area and the Van Aken District

- Functionality of the site
- Integration of the site within the surrounding neighborhood
- Functionality of bus and rail transit operations

Implementation of this Plan, along with the preceding plans and projects, is expected to revitalize the community by successfully integrating bus and rail transit within the new development and increasing the accessibility and circulation of existing vehicular traffic, bicyclists and pedestrians, with the provision of a safe intermodal site. Increased accessibility will also promote demand for retail, office and residential development within and near the site. The Plan consists of five primary components:

- 1) Warrensville/Van Aken station site plan
- 2) Traffic operations and analysis
- 3) Parking demand analysis
- 4) Cost estimate
- 5) Funding and implementation plan



2. Project History

The Warrensville/Van Aken area is undergoing transformation with the reconfiguration of the Warrensville/Chagrin/Northfield/Van Aken intersection that is currently under reconstruction. This project initiates the vision for change set forth by the City's Strategic Investment Plan (2000), and the Warrensville/Van Aken TOD Study (2008). These studies evaluated specific redevelopment and transit and traffic flow issues in the area. Their advancement has led to the design and construction associated with the \$19M reconfiguration of the Warrensville/Chagrin/Northfield/Van Aken intersection, which converts the existing 6-leg intersection into a conventional 4-leg intersection by relocating Northfield Road to the south and closing Van Aken Boulevard at Farnsleigh Road. These studies also led to the \$90M commitment by RMS to proceed with Phase I of their mixed-use redevelopment plan for the Van Aken District. These efforts and related studies were used to inform the development of this Plan. A brief description of the referenced studies reviewed for the development of this Plan is provided below.

Shaker Heights Strategic Investment Plan (2000)

The Shaker Heights Strategic Investment Plan (SIP) was prepared in 2000 to evaluate how best to leverage City assets to encourage private investment, while maintaining the desired residential character of the City. Community outreach during plan development conveyed that residents felt that improvements could be made to increase neighborhood amenities, such as the availability and quality of retail, open space, and rental housing. Key priorities identified in the SIP are to make Shaker Heights a more walkable community and provide increased opportunities for mixed-use development. Additionally, the SIP highlights the Van Aken/Warrensville Center/Chagrin area as a prime redevelopment location for the creation of a mixed-use town center. The goals outlined in the SIP were evaluated to ensure consistency with the Plan recommendations.

Warrensville/Van Aken Transit-Oriented Development Plan and Traffic Study (2008)

Traffic impacts from the proposed development on the surrounding roadway network were studied in the 2008 TOD Study. This study was reviewed for this Plan to compare the trip generation and distribution methods and data used to develop the site's peak period traffic projections. Clarification of the size (square footage of each type of land use) and access points for the proposed development enable a refined assessment of traffic impacts. A review of the previously completed intersection capacity analysis was completed to verify acceptability of anticipated traffic operations at the intersections of Warrensville Center Road / Chagrin Boulevard, Chagrin Boulevard / Farnsleigh Road, Farnsleigh Road / Van Aken Boulevard and Warrensville Center Road / Farnsleigh Road.

The 2008 Warrensville/Van Aken TOD Development Plan included a traffic study for the proposed site and associated roadway and RTA reconfiguration alternatives. As part of this study, the Northeast Ohio Areawide Coordinating Agency (NOACA) was provided with existing traffic count information, development information, and roadway and transit reconfiguration information. NOACA used this information to update their regional transportation model and provide design year traffic volumes for intersection analysis.



Warrensville/Van Aken Intermodal Transit Center Program Plan (2010)

Following the priorities identified in the 2008 TOD Development Plan, the 2010 Intermodal Transit Center Program Plan provided a conceptual plan for the redevelopment of the Van Aken station on the southeast quadrant of the Warrensville Center Road / Chagrin Boulevard intersection. It addressed how the station would accommodate extension of the Blue Line light rail transit, bus circulation, bus/rail interface, and other key components of an intermodal transit center. Program and analysis information from this plan informed the development of the new station area Plan for the northwest quadrant of the Warrensville/Chagrin intersection.

Warrensville/Chagrin/Van Aken-Northfield Intersection Reconstruction

The Warrensville/Chagrin intersection was studied again in 2010 as part of the CUY-422-8.88, PID 85207 intersection improvement project. Intersection operations were once again evaluated as part of this project since the previous study for the 2008 Warrensville/Van Aken TOD Development Plan did not include a Northfield Road connection to Chagrin Boulevard, which was the preferred intersection reconfiguration. The intersection reconfiguration traffic analysis was also considered in the development of this Plan.

GCRTA Blue Line Corridor Alternatives Analysis Study

GCRTA's Blue Line Extension Project analyzed options for extending a form of high capacity transit service beyond the Warrensville/Chagrin intersection. The project proposed a short extension of the Blue Line rail line to a new intermodal transit center on the southeast quadrant of the Warrensville/Chagrin intersection, with high frequency bus service (bus rapid transit) extending south on Northfield Road to the Randall Park Mall site adjacent to I-480 and extending south on Northfield Road then west on Harvard Road to Chagrin Highlands and the I-271 interchange. While the Blue Line Extension Project is currently on hold, RTA has the desire to both improve its service in the short term, and thereby increase bus traffic to the Warrensville/Van Aken station, while keeping its options open for rail extension south of Chagrin Boulevard in the event of changes in the development market in the Chagrin Highlands and former Randall Park Mall areas.

These six plans have been incorporated into the Warrensville/Van Aken Station Area Plan and the assessment of the functionality of the site.



3. Existing conditions

3.1. Current Site

Understanding the details of how a mixed-used transit-oriented site will function is critical to its successful implementation. The Warrensville/Van Aken Station Area is one of two primary commercial districts in the City of Shaker Heights. The Van Aken District was built in the late 1940s and has a significant retail and office presence, but is out of character with the high-quality residential areas in Shaker Heights. The predominant existing land use around the station consists of approximately 160,000 SF of retail commercial land use. The City has identified the station area as a primary redevelopment opportunity, supported by the site's commercial mixed-use district zoning designation. According to the Shaker Heights zoning code, this zoning classification is intended to "encourage a compact mix of retail, service, office, housing, and public activities to coexist in a manner that reflects human scale and emphasizes pedestrian orientation, taking advantage of the convenience provided by multi-modal transportation." The district is currently home to over 1,500 jobs, including the University Hospital Health System Management Services Center with 1,000 employees. There are also two strip shopping centers, the existing Warrensville/Van Aken Station serving RTA bus routes (#5, #14, and #41) and the Blue Line light rail transit, and a number of office, retail and apartment buildings. In addition, there is an abundance of surface parking, particularly north of the existing station. The Van Aken Center shopping center and its parking lot will be redeveloped as part of the RMS Phase I redevelopment of the Van Aken District.



Figure 3-1: RTA System Map
Van Aken District served by #5, #14, #41 (#41F)

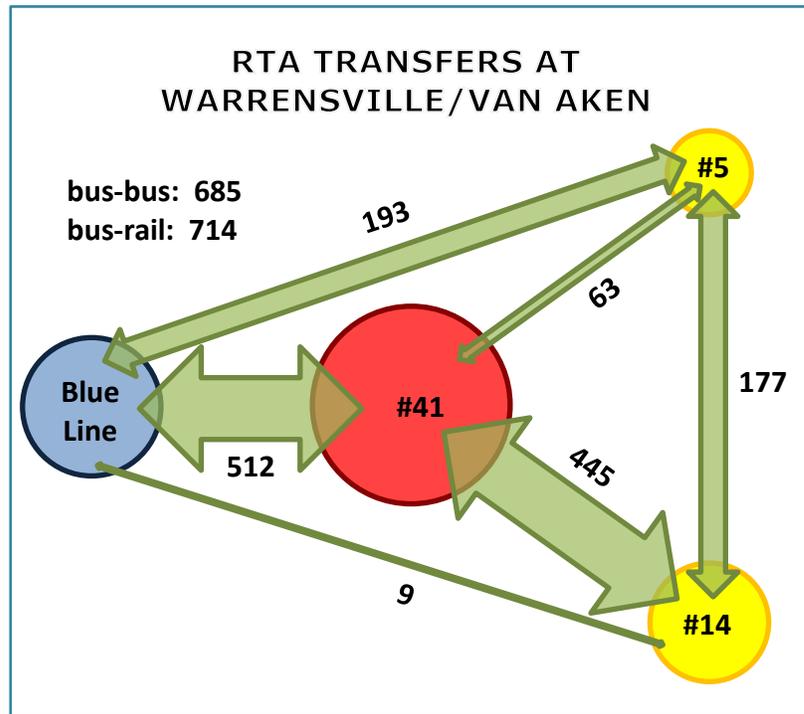


Figure 3-2: Illustration of bus-bus and bus-rail transfers in the Warrensville/Van Aken station area



3.2. Transit Operations

The Warrensville/Van Aken Station is the current terminus of RTA’s Blue Line. The station includes a third track commonly used for maintenance equipment, a substation required for rail power and a crossover required for rail car activity and maintenance activity. The station is in proximity to the Farnsleigh Station that is located to the west of Farnsleigh Road and acts as a de facto intermodal hub between the Blue Line and bus Route 5 (Chagrin Boulevard to Lander Circle), Route 14 (Downtown Cleveland to Warrensville / Van Aken via Kinsman Road/Chagrin Boulevard) and Route 41-41F (East Cleveland to Noble Road via Warrensville Center Road). Historically the bus/rail interface occurred on Van Aken Boulevard within the large median separating northeast and southwest travel lanes. With the removal of the Van Aken Boulevard leg from the intersection (CUY-422-8.88, PID 85207) it was proposed that the bus/rail interface point be relocated to the northwest quadrant of the Warrensville Center/Chagrin Boulevard intersection. Further development of plans to redevelop the Van Aken site concluded that the northwest quadrant of the Warrensville Center/Chagrin Boulevard intersection would be ideal for office space. With this new development, further evaluation is needed to determine the appropriate location for on-site bus operations. Currently the Blue Line’s Warrensville/Van Aken Station is an end of the line station.

The Blue Line operates at a ten minute headway during the AM and PM peak periods, and at 30 minutes at other times. Route 14 operates at a headway of 15 minutes during the peak and midday period, dropping to 30 minutes after 6:00 PM. Route 41 operates at a headway of 30 minutes all day, while routes 5 operates at a headway of 30 minutes during the peak period and 60 minutes off-peak. The routes are illustrated in the RTA system map in **Figure 3-1**. RTA completed an Alternatives Analysis study in 2013 that proposed extending bus rapid transit service from Harvard and Northfield Roads, south of the station, along Van Aken Boulevard to Shaker Square and University Circle. RTA is currently not proposing to implement this service.

Currently, the Warrensville/ Van Aken Station is one of the highest transfer activity locations in RTA’s system with 1,400 total weekday transfers. This high volume of transfers is particularly significant because it represents high volumes of both bus-rail and bus-bus transfers, as illustrated in **Figure 3.2**. The illustration at right shows the volume of transfers at the station area. The smallest number of transfers is between Route 14 and the Blue Line. Transfers between the Blue Line and Route 41, and Route 41 and Route 14, are much higher. This is because along much of their alignment, Route 14 and the Blue Line are essentially parallel routes operating between downtown and Warrensville-Van Aken. **Table 3-1** displays the approximate weekday average for transfers occurring by direction at the Warrensville / Van Aken Station.

Table 3-1 WEEKDAY TRANSFERS (by line and direction)	
Transfer From/To	Transfers
5W to BW	90
BE to 5E	103
5W to 14W	76
14E to 5E	101
5W to 41N	18
41S to 5E	16
5W to 41S	13
41N to 5E	16
14E to BW	7
BE to 14W	2
14E to 41N	79
41S to 14W	70
14E to 41S	151
41N to 14W	145
41N to BW	216
BE to 41S	220
41S to BW	28
BE to 41N	48
TOTAL WEEKDAY TRANSFERS	1,400

Note: The above ridership data is approximate for an average weekday based on the 2013 On-Board Survey.



Although bus travel and bus-to-bus transfers are important at the Warrensville / Van Aken Station, the bus terminal at the station is undersized. This facility is currently only capable of accommodating four buses, which is inadequate for current bus route operations, let alone an increase in capacity needed to meet growing demand south and east of the station or to allow for implementation of bus rapid transit or other new services at the station. In addition, the facility cannot be expanded at its current location due to constraints of both the Blue Line infrastructure to the south (the third track) and private development to the north. Future station area development must take into account the need for a pleasant, welcoming and efficient transfer experience.

RTA needs a minimum of six, and ideally would have eight, bus bays at the site for loading/unloading passengers and parking buses during layovers. Routes 14 and 5 terminate at and have layovers at the station. Overlaps between arriving and departing buses on these two routes, and potential increases in service frequency on the routes, mean that at least two bays are required for each of these routes. Route 41 passes through the station in both directions. Although Route 41 does not lay over in this location, the two buses could arrive at the station at the same time, meaning that two passenger dropoff and pickup bays are required for that route as well. The size of the buses is another consideration that impacts the layout of the site. Currently, all of the routes using the site use standard 40 foot transit coaches. However, due to high ridership on routes 14 and 41, RTA is considering operating 60 foot articulated coaches on those routes. Any future BRT service also would presumably use 60 foot articulated coaches. While these coaches pose no complications in terms of turning movements—their maneuverability is similar to that of 40 foot coaches—they do require longer platforms to park and load/unload passengers and to allow buses to pull in and out of the parking area along the platform without backing. This adds to the length of bus passenger platforms and expands the footprint of the transit operations within the site.

3.3. Roadway Reconstruction and Traffic Operations

The Warrensville/Van Aken Station is immediately adjacent to the six-legged intersection of Warrensville Center Road/Northfield Road/Van Aken Boulevard/Chagrin Boulevard. This intersection is currently being reconstructed to configure it as a standard 4-legged intersection. The reconstruction will be complete by December 2015. The reconfiguration will allow modification of the traffic signal to improve operational efficiency with improved levels of service for most movements. The reconstruction project includes pavement, curb, and utility relocation and replacement, as well as adjustments to traffic signal timing, sidewalk replacement, driveway aprons, and other aesthetic improvements. Traffic volumes at the intersection will be reduced from 45,150 vehicles per day to a projected 37,800 vehicles per day. Traffic data and analysis are available in the 2008 TOD Plan and Traffic Study. The reconstruction of the intersection is one of the first steps in the redevelopment process of the Van Aken district.



4. Warrensville / Van Aken Station Plan Development

4.1. Plan Development Process

The Warrensville/Van Aken Station Plan was developed over the course of two, two-day design workshops held in November and December 2014 followed by a full project team meeting in January 2015 to determine the specific recommendations. The plan development design workshops included key members and technical staff from the project sponsor organizations – City of Shaker Heights, RTA and RMS, as seen in **Figure 4-1**.

The first workshop began with a discussion of design considerations and operational requirements for key aspects of the plan, including bus system features and operations, rail features and operations, and site development features. These parameters, or ground rules, framed the development of the general concepts. The first day started with a technical meeting which was attended by the key members and technical staff. The project team and select staff from the sponsor organizations then met for the remainder of the day and the first part of the second day to develop concepts that fit within the defined parameters. At the end of the workshop, the concepts were presented to the key members and technical staff for discussion and feedback. Concepts were refined in a similar format at the second workshop. The full project team meeting in January 2015 focused on decision-making and establishing the preferred plan.

4.2. Design Considerations, Parameters and Constraints

As a nexus of transportation and development activity, the Van Aken District and the Warrensville/Van Aken Station Area have specific design considerations, parameters and constraints, as established in the planning process. These parameters are defined by the main components of the station area: bus operations, rail operations, and the site development.

Bus

With the clear importance of the Warrensville/Van Aken Station for three bus routes and as a bus transfer hub, the bus design parameters focused on three key elements: bus parking capacity (bus stops), site geometry, and bus ride/transfer experience. Bus considerations included:

- Parking capacity for up to eight buses, with a goal of accommodating four articulated buses (60 ft.) and four 40 ft. buses, and a minimum requirement of accommodating four articulated buses and two 40 ft. buses.

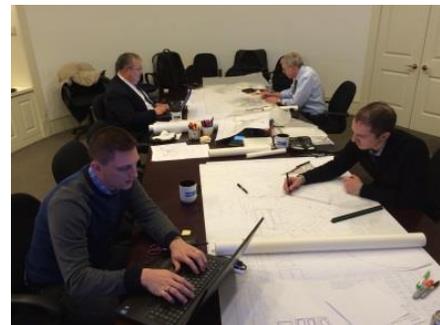


Figure 4-1: Design Workshops



- Site geometrics (minimum requirements)
 - 10 ft. platform width to accommodate loading and alighting passengers
 - 40 ft. spacing between buses
 - 23 ft. carriageway to accommodate bus parking and passing
 - 50 ft. outside bus turning radius
 - 30 ft. inside bus turning radius
- Site layout that minimizes bus and pedestrian conflicts
- Site layout that minimizes walking distance for bus-bus and bus-rail transfers
- Bus routing and travel patterns that minimize travel time impacts
- Kiss-and-ride transit drop off area with parking for at least two vehicles

Design elements for the bus rider experience considered bus-bus and bus-rail transfers (proximity of transfer points, walkability, convenience, ease of access, and minimizing pedestrian-vehicle conflicts) and bus travel time.

Bus operations for each of the bus routes were assessed to ascertain the necessary roadway connectivity to provide acceptably efficient routing. Site layouts with varying degrees of connectivity were assessed, specifically considering an east-west connection to Warrensville Center Road and a north-south connection to Chagrin Boulevard. The results of the analysis indicated the following:

- East-west connection to Warrensville Center Road
 - Signalization: Bus operations require traffic signal control for inbound and outbound left turns. Right turns in and out do not require signal control.
 - An east-west connection to Warrensville is required to provide acceptable routing of southbound Route 41.
- North-south connection to Chagrin Boulevard
 - Signalization: This access cannot be signalized due to its proximity to the Warrensville/Chagrin intersection. Permitted bus movements include inbound and outbound right turns and inbound left turns. Outbound left turns cannot be accommodated.
 - A north-south connection to Chagrin Boulevard is required to provide acceptable routing of all three existing bus routes (routes 5, 14, and 41).

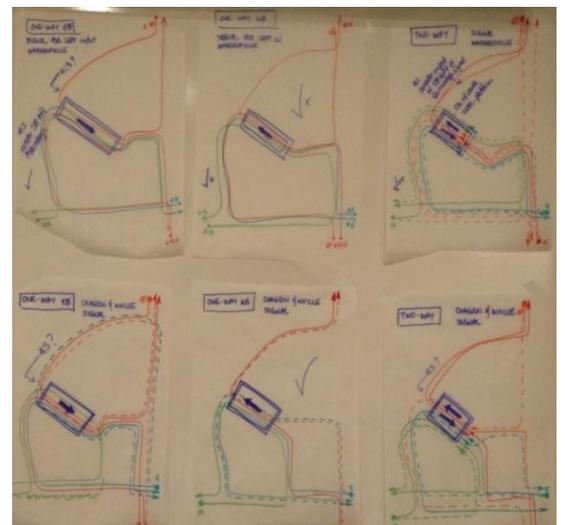
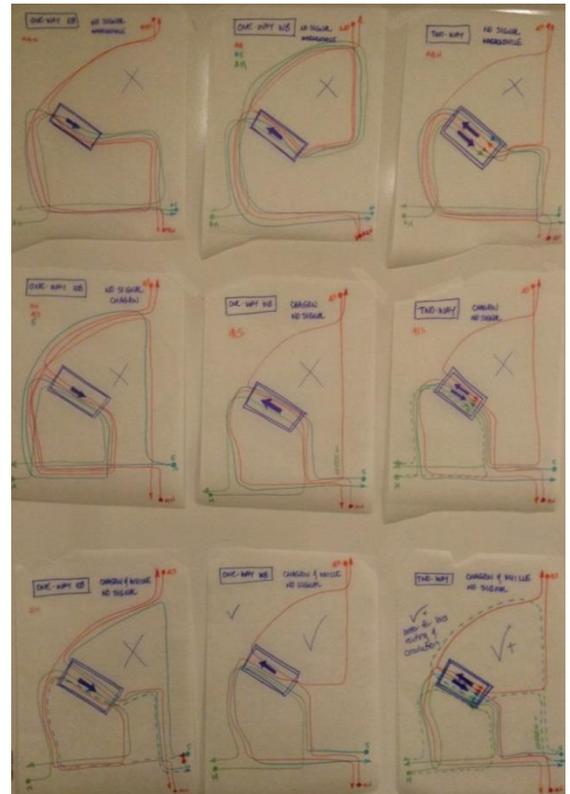


Figure 4-2: Graphical assessment of bus routes with and without access to Warrensville and Chagrin. Acceptable configurations are noted with checks.



Rail

Rail design considerations, parameters, and constraints focused on maintaining rail operations at the Warrensville/Van Aken Station while using the configuration of the rail infrastructure to integrate RTA operations within the Van Aken district. Specific considerations are locations of the substation, third track and crossover as well as the platform.

The rail platform parameters include a 300 foot platform with an additional 30 ft for an impact attenuator. A center platform design is preferred. Head (end of) platform loading is considered acceptable and having pedestrian crossovers at both ends of the platform is an important design element.

Operational constraints of the third track require it to be co-located with the cross-over. Geometry requirements for the third track include a 75 turnout with a minimum length of 280 feet. Replacement of this rail infrastructure is not currently in RTA's Capital Plan. External funding would be needed to relocate and/or replace these items.

Replacement of the substation is in RTA's Capital Plan with design beginning in 2015 and construction occurring in 2016. RTA is currently working with the City of Shaker Heights and RMS to determine a replacement location that fits with the goals of this station area plan while still providing the functionality that RTA requires to power the rail line. From the budgetary perspective, RTA's Capital Plan allows for replacing this substation in place. The relocation of the substation will require additional utility costs to relocate the AC and DC electrical feeds to the new substation location. This cost will be at the expense of the developer. The additional utility relocation costs associated with the substation are not included in the \$3M replacement estimate. RTA is working with CEI to determine a cost estimate for the relocation based on the possible new locations discussed at the April 13 meeting.

Site Development

Development design parameters focused on creating a high-quality, livable and walkable development with a transit-friendly public realm that integrates well into the surrounding neighborhood. Specific parameters included:

- Maintain the integrity of the street grid
- Accommodate minimum parcel dimensions to maintain buildable envelopes on lots
- Incorporate public realm and urban design upgrades that integrate transit and development
- Ensure transit is an integral part of the site that is visible from the street

The development parameters all point toward an integrated urban experience. The incorporation of transit into the overall site design is seen as a way to encourage future development. The arrangement of transit features is intended to avoid a massive bus parking area and enable pedestrian flow within the development site. Due to planned programs and activities within the site, bus routes will not run on internal roads to the north and northwest of the station to accommodate closures for special events.



5. Traffic Operations

A review of previously completed traffic studies was performed as part of the traffic assessment included in the development of the Warrensville/Van Aken Station Area Plan. The purpose of this review is to ensure traffic volumes previously developed for the proposed site are comparable to the expected traffic volumes for the current, more refined development plan. Comparable trip generation results indicate that previously completed intersection operation analysis within the study area will likely operate as expected. The following section outlines the evaluated plans and provides a comparison.

2008 Warrensville/Van Aken TOD Development Plan

A traffic study was completed for the proposed site and associated roadway and RTA reconfiguration alternatives as part of the development of the 2008 Warrensville/Van Aken TOD Development Plan. Trip generation for the proposed site was developed using the information provided in **Table 8-1**. As part of the 2008 study, NOACA was provided with existing traffic count information, development information and roadway and transit reconfiguration information. NOACA used the information to update their regional transportation model and provide design year traffic volumes for intersection analysis. It was assumed the loading of the site volumes would occur at a single access point along Farnsleigh Road. Since design year traffic volumes were provided by NOACA, traditional methods for developing design year traffic volumes, specifically adding the generated trips to the background traffic, were not used in the 2008 study. However, it is anticipated that the process of updating the regional transportation model with the appropriate socio-economic data resulted in a similar number of trips being added to the transportation network as previously calculated using trip generation methods.

Table 8-1: 2008 WARRENSVILLE / VAN AKEN TOD DEVELOPMENT PLAN

Development	ITE Code	Size	AM Peak		PM Peak	
			Enter	Exit	Enter	Exit
High Rise Apartments	222	500 DU	38	113	45	20
General Office Building	710	250,000 ft ²	344	47	51	291
Shopping Center	820	160,000 ft ²	-	-	-	-
Total			382	160	96	310

2010 CUY-422-8.88, PID 85207

The Warrensville/Van Aken intersection was studied in 2010 as part of the CUY-422-8.88, PID 85207 intersection improvements project. Intersection operations were evaluated again as part of this project since the preferred intersection reconfiguration did not include a Northfield Road connection to Chagrin Boulevard, as was previously studied as part of the 2008 Warrensville/Van Aken TOD Development Plan.

The preferred configuration differed from the previous configuration that was analyzed, with the elimination of the Northfield Road connection to Chagrin Boulevard. Traffic volumes were redistributed using the previously established design year NOACA volumes and trip generation volumes for the preferred configuration. Since the intersection reconfiguration project was primarily funded by ODOT, the redistributed traffic volumes were submitted to ODOT's Office of Multi-Modal Planning and certified traffic volumes were developed. Included in the certified traffic was the proposed site with ADT, AM and PM traffic volumes. **Table 8-2** summarizes the expected trips created by the proposed site based on certified traffic developed as part of CUY-422-8.88, PID 85207. Similar to the 2008 Warrensville/Van Aken TOD Development Plan, it was assumed the loading of the site volumes would occur at a single access point along Farnsleigh Road.



Table 8-2: TRAFFIC VOLUMES - 2010 CUY-422-8.88, PID 85207				
Certified Traffic Entering and Exiting Volumes	AM Peak		PM Peak	
	Enter	Exit	Enter	Exit
Total	430	230	240	370

Warrensville/Van Aken Station Area Plan

As part of this Warrensville/Van Aken Station Area Plan, site volumes were projected and compared to previously developed volumes to determine the appropriate level of analysis for the site. Updated site development land use information was provided by RMS. Trip generation was performed for the development using *ITE's Trip Generation Manual, 9th Edition*. **Table 8-3** summarizes the expected AM and PM trips that are predicted for the site. For comparison to the previous studies, reduced shopping center trips were generated since the total square footage of the shopping center will be less in the build condition than in the existing condition. The predicted site-generated trips are fairly similar to previously anticipated traffic volumes, so the above calculated trips were not distributed throughout the study area and no additional operational analysis was conducted.

Table 8-3: 2014 TRAFFIC VOLUMES - WARRENSVILLE/VAN AKEN STATION AREA PLAN						
Development	ITE Code	Size	AM Peak		PM Peak	
			Enter	Exit	Enter	Exit
High Rise Apartments	222	305 DU	23	83	79	48
General Office Building	710	250,000 ft ²	350	48	60	298
Shopping Center	820	(29,000) ft ²	(34)	(20)	(91)	(98)
Total			339	111	48	248

Summary

Several methods of trip generation have been used to develop trips for several different site development options to determine the impacts of the proposed site on the adjacent roadway network. **Table 8-4** summarizes these volumes and methods.

Table 8-4: Trip Generation Analyses Overview				
TRIP DEVELOPMENT	AM Peak		PM Peak	
	Enter	Exit	Enter	Exit
2008 Warrensville/Van Aken TOD Development Plan Total (NOACA Developed Volumes)	382	160	96	310
2010 CUY-422-8.88, PID 85207 Total (Certified Traffic Volumes)	430	230	240	370
2014 Warrensville/Van Aken Station Area Plan Total (ITE Trip Generation 9 th Edition Volumes)	339	111	48	248

Based on the volumes developed as part of this study and as compared to previously developed volumes, the site is expected to generate a similar number of trips as previously assessed by the different studies associated with this site. The overall trip generation volumes are similar to previous analyses; however, it is recommended that a traffic impact study be developed for the site since all of



the previous studies anticipated a single access point along Farnsleigh Road. An updated traffic study that incorporates the more refined site layout plans that depict multiple access points along Farnsleigh Road, Warrensville Center Road and Chagrin Boulevard should be evaluated to more accurately assess the site impact and integration within the surrounding roadway network.



6. Van Aken District Development and Station Plan

6.1. Phasing

Redevelopment of the Van Aken district, as envisioned, will transform the area into a vibrant, walkable, mixed-use neighborhood destination that integrates within the surrounding Shaker Heights community. Key goals of the site redevelopment are to create an iconic transit station experience that serves as a connector to existing neighborhoods; provides diverse retail, educational, arts and civic opportunities; and serves as a central gathering place for the Van Aken district and broader Shaker Heights communities. The redevelopment will occur in three main phases, based on construction, transit and development opportunities and constraints, as described below.

6.2. Interim Phase (December 2015)

The Interim Phase includes the site's infrastructure that will be in place in December 2015, which coincides with the completion of the Warrensville/Chagrin intersection reconfiguration. The transportation infrastructure, notably the roads to accommodate the bus routes and the transfer area, will, for the most part, reuse existing pavement and stay within the existing right-of-way. The current rail infrastructure will remain in place. The roadway location and retaining the rail infrastructure in place minimizes utility impacts while providing acceptable site function. Key construction elements for the Interim Phase of the station area plan include:

- Warrensville/Chagrin intersection reconfiguration (currently under construction)
- Bus roadway infrastructure essentially contained within existing Van Aken right-of-way
- East-west bus access road to Warrensville (for #41S) from the bus transfer location
- Bus access road to Chagrin Boulevard (for #41S)

An illustration of the Interim Phase is shown in **Figure 6-1**. A cross section toward the northwest portion of the bus/rail and transfer area is shown in **Figure 6-2**. Note that this cross section remains unchanged and is an accurate representation for Phase 1.

Traffic Operations

The traffic operations for the Interim Phase are governed by the reconstruction of the Warrensville/Chagrin intersection. Traffic operations within the project area during a majority of the interim phase will be under some sort of maintenance of traffic scheme. Traffic operations along Warrensville Center Road and Chagrin Boulevard will be under various MOT scenarios associated with the construction of the Warrensville/Chagrin intersection reconfiguration project. Site construction will also be underway beginning in 2015; infrastructure associated with the development of Phase 1 of construction will begin. Overall traffic impacts are minimal with a majority of the circulation impacts being associated with bus circulation. Reconfigurations to the north parking lot of the Wald-Fisher property are recommended to improve bus circulation and maximize available parking. Overall circulation within in the lot is still maintained.

Van Aken Boulevard, between Farnsleigh Road and Warrensville Center Road/Chagrin Boulevard, will be closed to traffic and the former eastbound side of Van Aken will be reconfigured to accommodate bus traffic and the bus transfer area with traffic flow in a one-way westbound direction. Construction of the north-south access that connects the bus roadway (former Van Aken) with Chagrin will be aligned to coincide with the existing Walgreens access drive on the south side of the Wald-Fisher property development. The existing section of the southern parking lot along eastbound Van Aken will be



reconfigured as head in, perpendicular parking to allow for two-way flow in that parking area. Ingress and egress access to the southern parking lot will be unrestricted from Farnsleigh Road. Access to the southern parking lot from the Chagrin access drive will have a restricted right-only turn on to westbound Chagrin Boulevard. The reason for this access restriction is to provide safe and clear operations for the intersection of the Chagrin access drive, the southern parking lot, and the entrance to the bus roadway. The bus operations are described in the next section, but it is worth noting that there will be a separate outbound access drive connecting the Chagrin access drive with Warrensville to efficiently and acceptably accommodate southbound Route 41. Although RMS is currently negotiating with Walgreens for a shared access drive, if an agreement cannot be reached, the buses would be accommodated on a new driveway located immediately east of the Walgreens driveway. There would be no access between the new site access drive and the Walgreens parking lot or the Wald-Fisher parking lot along Van Aken.

Overall traffic operations within the vicinity of the site will considerably improve with the completion of the Warrensville/Chagrin Intersection Reconfiguration Project. The reconstruction of the 6-legged intersection to a traditional 4-legged intersection will reduce cycle length and general congestion along both Chagrin Boulevard and Warrensville Center Road.

Transit Operations

Rail operations and infrastructure would remain unchanged from the pre-existing condition under the Interim Phase. The rail crossover would remain on the southeastern side of Farnsleigh, track lengths would remain the same, and the platform would remain between the two active tracks (the northern and center tracks). Passengers would continue to access the platform from its northern and southern ends. The interim configuration also allows the substation to remain in place until it is relocated through RTA's substation replacement program.

Bus operations would change significantly from the present condition. **Figure 6-3** shows the interim development and station layout, and shows layover points and traces movements through the site for the various bus routes. The proposed plan and configuration:

- Creates a bus-only westbound access road to the south of the tracks, approximately following the present alignment of the southbound lanes of Van Aken Boulevard, would provide circulation, storage, and bus-to rail and bus-to-bus transfer locations for most of the buses entering the site.
- Allows for much closer bus-to-rail transfers and a much safer arrangement for both bus-to-rail and bus-to-bus than the present layout allows.
- Allows for up to six buses (up to four 60-foot articulated buses and two additional 40 foot vehicles) to park or lay over within the site.

Routes 5, 14 and northbound Route 41(41N) would stop along the platform immediately south of the rail tracks. These routes would enter the site from the driveway at Chagrin Boulevard towards the eastern end of the site.

- Routes 5 and 14 would lay-over while Route 41N would drop-off and pick up passengers along the platform before continuing on its route.
- Routes 5 and 14 would turn left at Farnsleigh; Route 14 turning right and Route 5 turning left at Chagrin Boulevard.
- Route 41N would turn right at Farnsleigh before turning left at Warrensville Center Road.



- Transferring passengers could connect among these routes or with the Blue Line without crossing a roadway.

Southbound Route 41 (41S) trips would follow a different pattern and would stop at a different location.

- Route 41S would turn right from Warrensville to Chagrin and into the site at the driveway near the eastern end of the site.
- Route 41S would stop at a separate platform across from the end of rail platforms, near the present bus pick-up, drop-off and layover point.
- After picking up and dropping off passengers, 41S trips would proceed east out of the site along a driveway that connects to Warrensville Center Road. The 41S would then make a right turn to continue its operation along Warrensville.
- Transferring passengers would cross the internal roadway to connect with the other transit services accessing the site.

Warrensville/Van Aken Station Area Plan

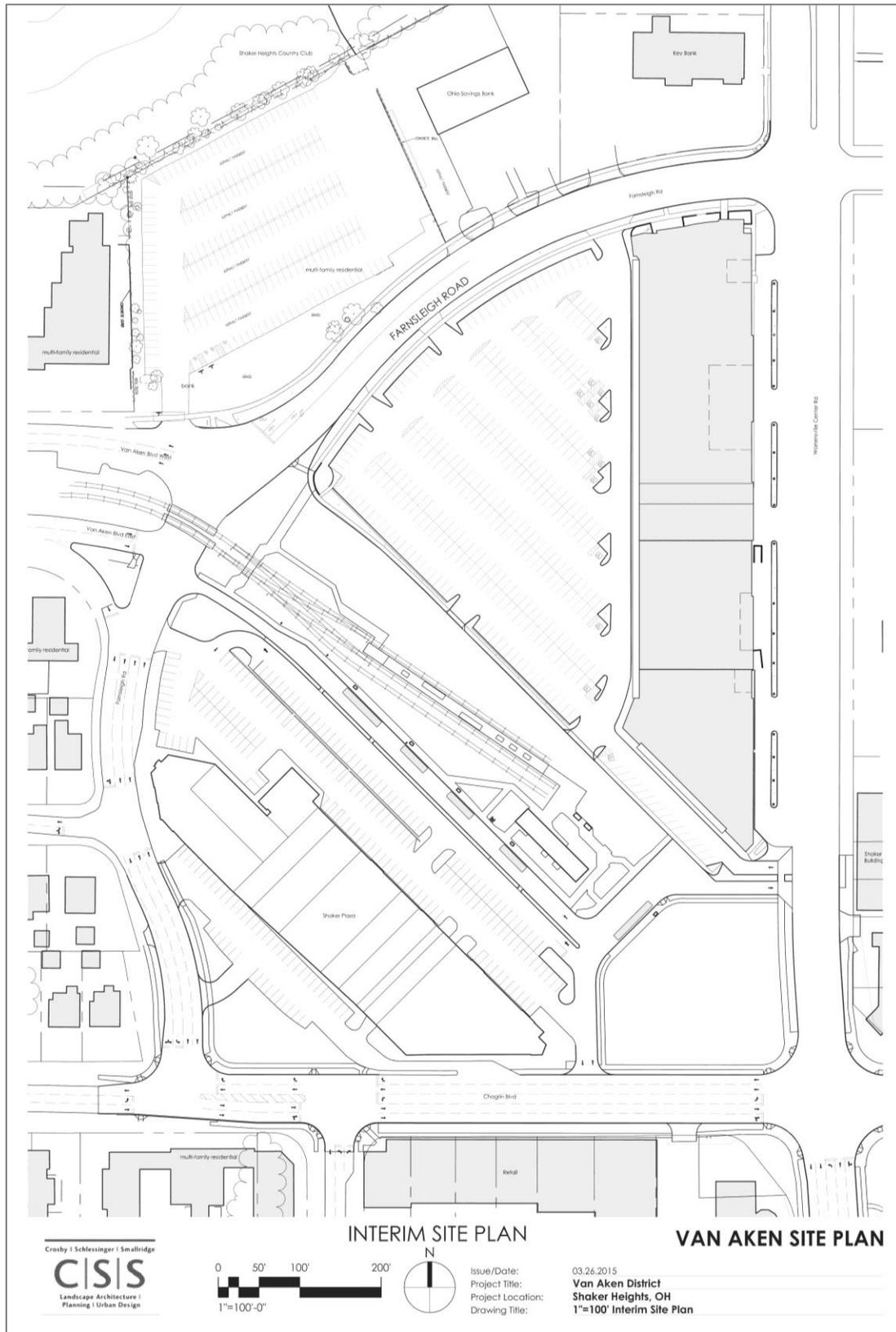


Figure 6-1: Interim Site Plan

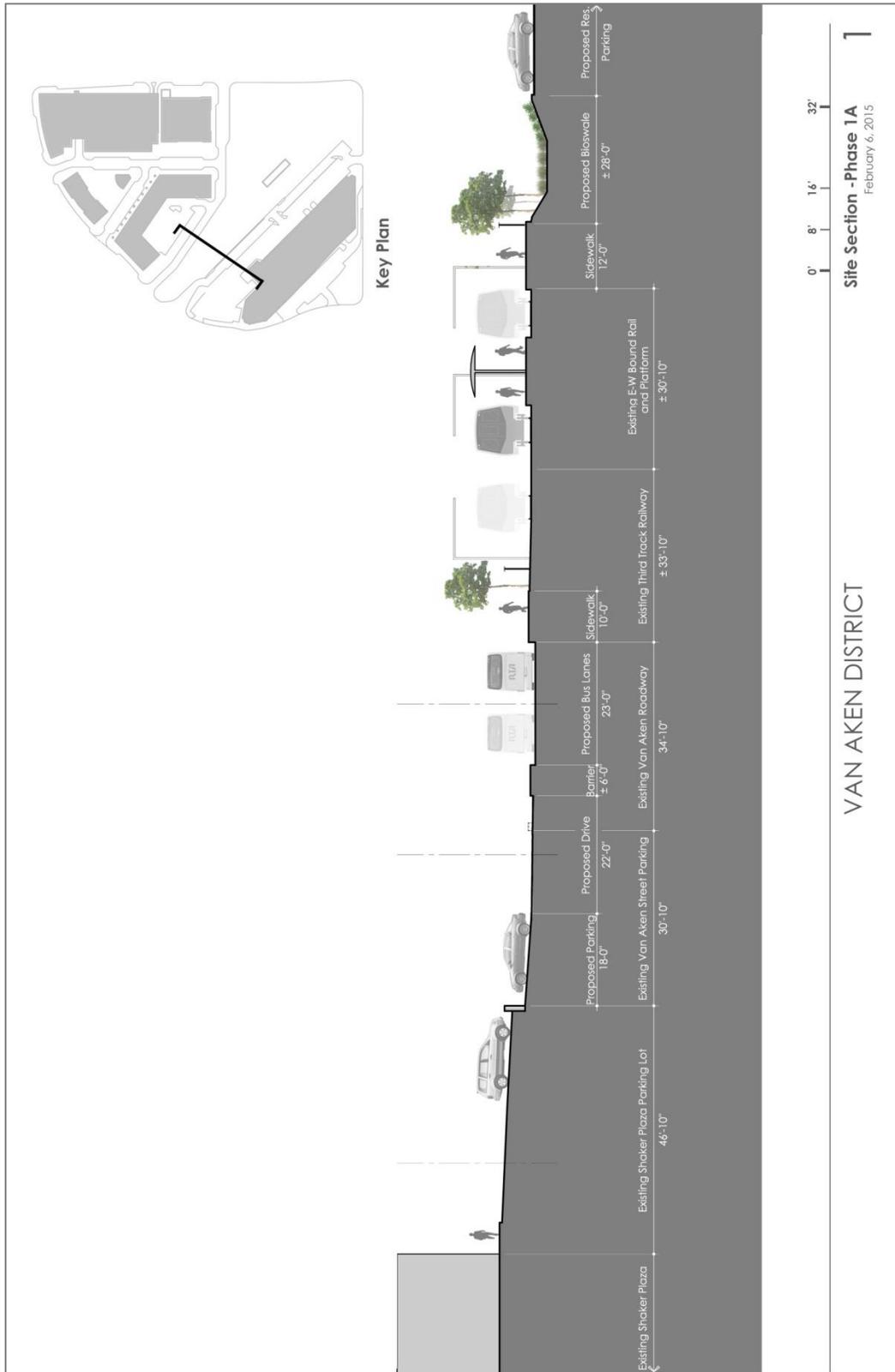


Figure 6-2: Interim Cross Section

Warrensville/Van Aken Station Area Plan



Figure 6-3: Interim Bus Routing



6.3. Phase 1 (2017)

Phase 1 is the initial phase of the Van Aken district redevelopment, located in the area to the north of the existing Blue Line rail lines. The transportation infrastructure for Phase 1 will build from the Interim Phase and the current rail infrastructure will continue to remain in place. Phase 1 is driven by site development, construction of the east-west access road to Warrensville and signalization of that intersection, and relocation of the substation. Planned completion of Phase 1 is expected in 2017. Key construction elements for Phase 1 of the station area plan include:

- Substation relocation (expected in 2016)
- East-west site access road to Warrensville
- Traffic signal at east-west road/Warrensville intersection

An illustration of Phase 1 is shown in **Figure 6-4**. A cross section toward the northwest portion of the bus/rail and transfer area is shown in **Figure 6-5**. (The Phase 1 cross section is the same as the Interim.)

Traffic Operations

Most of the overall traffic operational changes will take place during Phase 1 of development. The major changes to operations are:

- Proposed North-South Site Road – Phase 1 of development will include a north-south road connecting Farnsleigh Road to Chagrin Boulevard, running parallel to Warrensville Center Road. It is anticipated that this will be the main access road for the development and major site parking lots will be accessed from this road. The new intersection created at Farnsleigh Road is expected to allow full turning movements and will be stop controlled in the northbound direction along the new north-south road. The intersection created with Chagrin Boulevard (in a similar location to the existing Walgreens drive apron) is expected to be restricted to left and right into the site and right only out of the site. Allowing southbound left turns out of the proposed north-south road to eastbound Chagrin Boulevard is not recommended due to the intersection proximity to Warrensville Center Road.
- Proposed East-West Site Road – Phase 1 of development will also include a new east-west connection and intersection with Warrensville Center Road. This will facilitate access to and circulation within the site. It is anticipated that the newly created intersection will allow for full turning movements and that a new traffic signal will be installed to safely accommodate these movements. Due to existing site limitations, there is limited flexibility in the placement of the proposed intersection. In its proposed location, the intersection will shorten the proposed left turn storage lane along Warrensville Center Road (proposed as part of the Warrensville/Chagrin intersection reconfiguration project). During peak periods of the day (AM and PM rush hour) there may be times where queuing extends past the proposed intersection, creating the potential for intersection blocking. It is difficult to determine what the actual southbound queue lengths will be upon the completion of the Warrensville/Chagrin intersection reconfiguration project. These queue lengths should be studied in more detail at the completion of the Warrensville/Chagrin intersection reconfiguration project as part of the Van Aken district traffic impact study.

If the intersection of the new east-west site road with Warrensville is not signalized, outbound left turns should not be permitted. Originally, buses were expected to turn left at that intersection, so lack of signalization would restrict that movement. However, with the provision



of the one-way bus roadway along the Blue Line tracks and the preference for bus stop locations in that area rather than on the internal site roads, bus operations would not be affected if the new Warrensville intersection is not signalized.

- Bus Access Drive and Farnsleigh Road Intersection – Signal upgrades will need to be made to this new intersection to accommodate bus operations. Ideally buses would exit this drive during an exclusive phase that is only called when a bus actuates the signal. Upgrades to this signal could potentially be completed during the Interim Phase or during Phase 1. Upgraded signing can be implemented until signal upgrades are in place.

In addition to the summary and recommendations provided on the traffic operations associated with the site development, it is also recommended that a site specific traffic impact study be developed to document overall impacts the site will have on the adjacent roadway network. It is also recommended that the study be complete once the Warrensville/Chagrin intersection reconfiguration project is complete to obtain more accurate results of the impacts.

Transit Operations

As in the interim plans, rail operations and infrastructure would remain unchanged from the pre-existing condition under the Phase 1 plan. **Figure 6-6** shows the Phase 1 development and station layout, bus layover points and movements through the site for the bus routes. The chief difference between the interim and Phase 1 plans is the relocation of the driveway connecting the internal roadway network to Warrensville Center Road, which moves further north from its site in the interim plan. Moving this roadway slightly extends the length of operation within the site for southbound Route 41, which uses that relocated driveway to exit the site. However, all other bus operations and facilities under the Phase 1 plan are identical to the interim plan, including the alignment of the bus lane south of the tracks. This bus lane will remain in the same location as the interim location and will be shifted to a location parallel to the tracks during Phase 2.

To facilitate the use of bus and rail transportation, the RTA will require two Kiss-N-Ride parking spots to allow for dedicated pick up and drop off locations for users. These spots will be within proximity to rail station and bus platform at a location acceptable to the RTA. The exact location will be determined once the final parking configurations for Phase 1 are developed.

Warrensville/Van Aken Station Area Plan

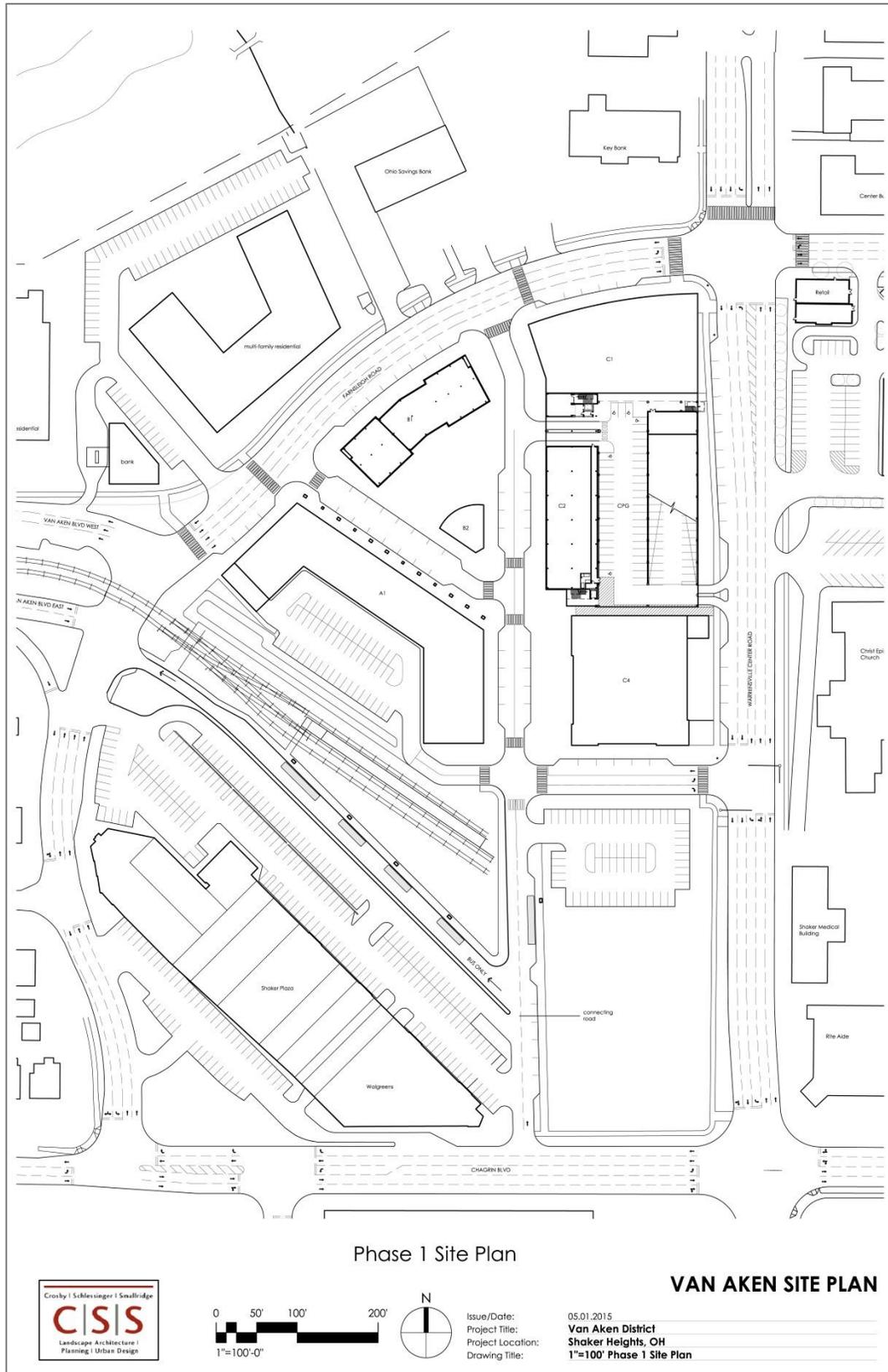


Figure 6-4: Phase 1 Site Plan

Warrensville/Van Aken Station Area Plan

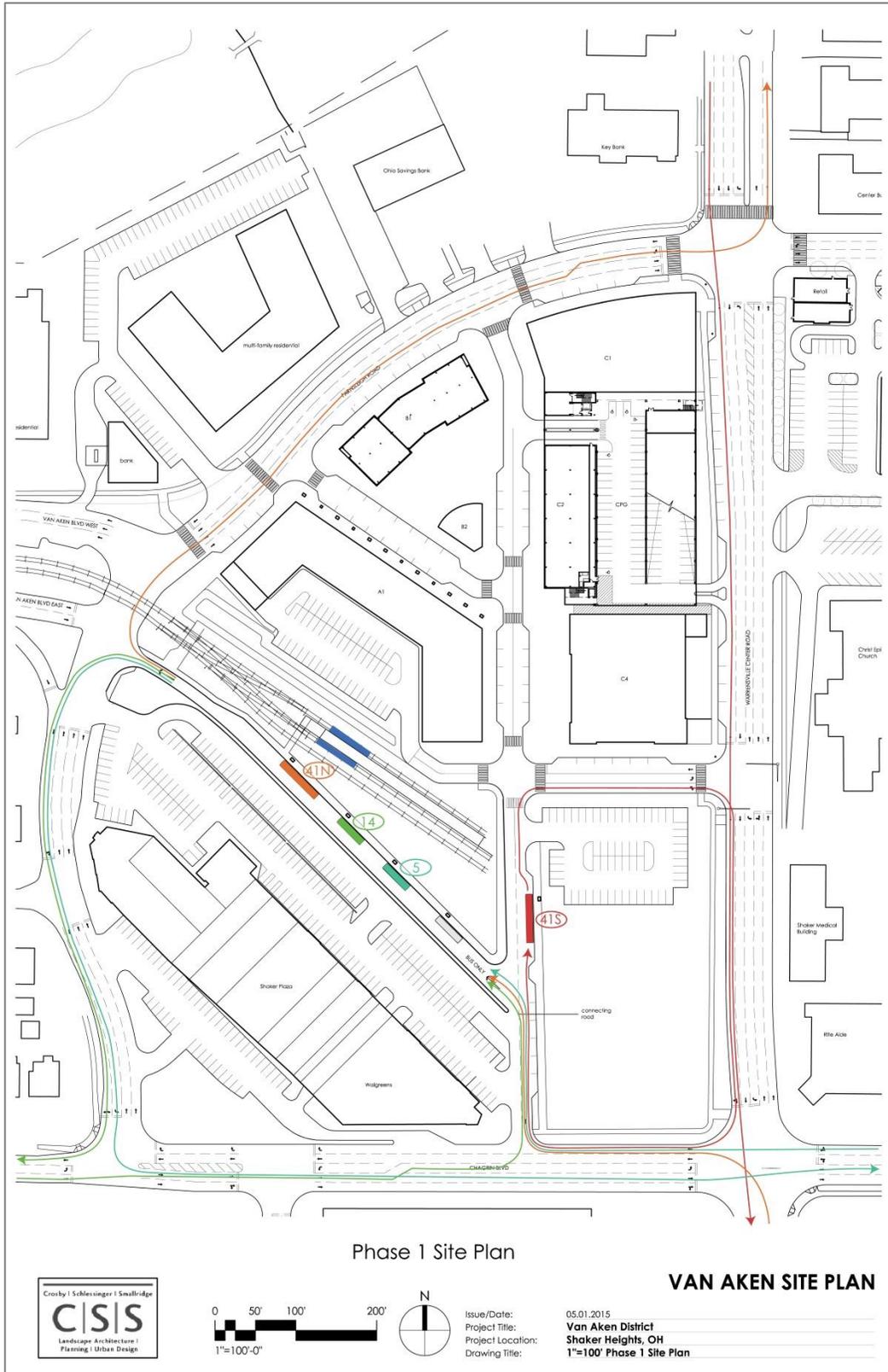


Figure 6-6: Phase 1 Bus Routing With Signal at Warrensville/Site Access Intersection



6.4. Phase 2

Phase 2 completes redevelopment of the site bounded by Warrensville Center Road, Chagrin Boulevard, and Farnsleigh Road, focusing on the area to the south of the RTA tracks. The transportation infrastructure includes reconfiguration of the RTA track, with relocation of the crossover and third track to the west of the Van Aken/Farnsleigh intersection and the consolidation of the Blue Line's Warrensville and Farnsleigh Stations with the construction of a new transit station and the relocation of the station platform. Relocation of the rail facilities will require substantial utility relocation. Additionally, the bus road will be realigned along the reconstructed station platform and new internal roads to provide internal circulation will connect with the Farnsleigh/Winslow and the Chagrin/Lomond intersections. This realignment also necessitates significant relocation of utilities and RTA catenary poles. The schedule for completion of Phase 2 is projected as potentially 2020-2025. Key construction elements for Phase 2 of the station area plan include:

- Relocation of rail crossover
- Relocation of third track
- Consolidation of the Warrensville/Van Aken and Farnsleigh stations with construction of a new station and platform (with new attenuator) close to the Van Aken/Farnsleigh intersection
- New bus roadway aligned with the rail lines and immediately adjacent to the new station and platform
- Pedestrian infrastructure, including sidewalks and related features, to facilitate transit transfer connectivity

An illustration of Phase 2 is shown in **Figure 6-8**.

Traffic Operations

Completion of Phase 2 provides improved site access and circulation on the south part of the site (the Wald-Fisher property). The internal access roads will connect with the existing Chagrin/Lomond intersection to the south and the extension of Winslow from the west and into the site. This creates a grid network that will effectively move traffic on site and into and out of the surrounding neighborhoods. These roads will also provide additional opportunities for bus circulation, giving RTA added operational flexibility for route choice. It is anticipated that full turning movements will be accommodated at the Chagrin/Lomond intersection and that signal upgrades will be implemented to accommodate the additional traffic approach.

The bus road in the bus/rail transfer area will be reconstructed adjacent to the reconstructed station and platform. This will facilitate both bus-bus and bus-rail transfers. The bus road would remain one-way westbound to consolidate passenger access to the north side of the road, enhancing bus-bus transfers, and minimizing the pedestrian traffic across that road.

In addition to the infrastructure improvements that impact traffic operations, an increase in traffic volumes generated by Phase 2 of development could also impact operations within the vicinity of the site. Since there are many unknowns about the specifics of Phase 2 development, it should be anticipated that additional traffic analysis and recommendation implementations will be needed once the site is fully operational.



Transit Operations

Phase 2 of development brings several changes to rail operations within the site. The following elements are key to revised transit operations:

- Relocation of rail crossover – The relocation of the rail crossover to the west of Farnsleigh Road allows for the Warrensville Station to be moved further to the west. The westerly movement of the station allows for additional development/green space along the north-south site road.
- Relocation of third track – Along with the relocation of the crossover, the third track would also be relocated to the west of Farnsleigh Road. Keeping the third track and cross over in proximity of one another is important to RTA operations. The third track relocation reduces the overall rail footprint within the site.
- Consolidation of the Warrensville/Van Aken and Farnsleigh stations with construction of a new station and platform (with new attenuator) close to the Van Aken/Farnsleigh intersection. The relocation of the third track and cross over would prohibit keeping both the Warrensville/Van Aken and Farnsleigh stations open. The new station near the Van Aken/Farnsleigh intersection will be able to serve both the site as well as the existing Farnsleigh station users. **Figure 6-7** shows the location of the proposed consolidated station and other rail infrastructure relocations.

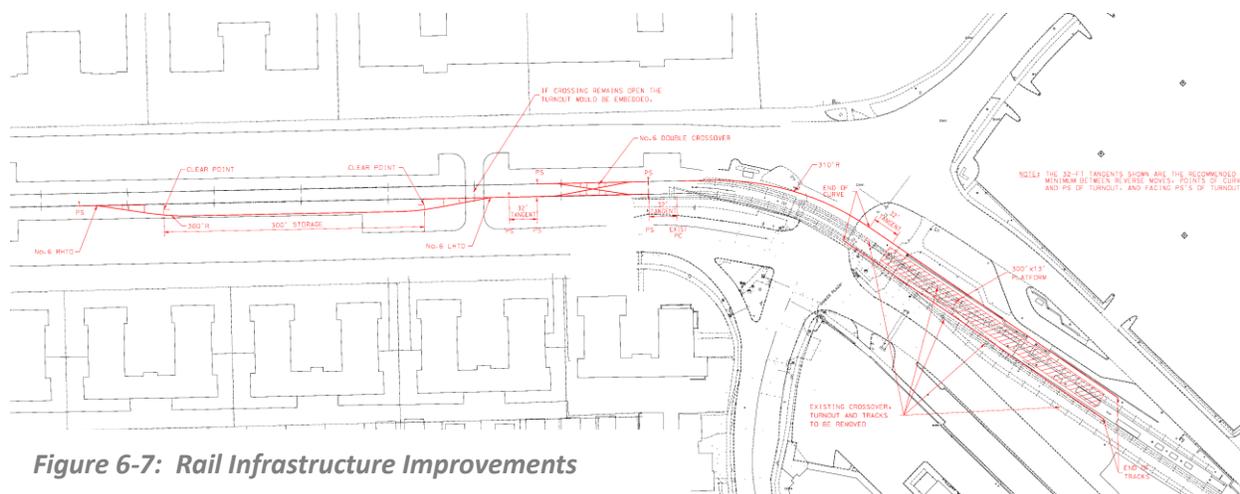


Figure 6-7: Rail Infrastructure Improvements

Bus operations would be similar to the Phase 1 plan except for the relocation of the bus platforms. **Figure 6-9** shows the Phase 2 development and station layout, bus layover points and movements through the site for the bus routes. As in the interim and Phase 1 plans, the configuration allows for up to six buses (up to four articulated and two standard vehicles) to park on the site. Unlike in the earlier plans, the bus-only northbound access road to the south of the tracks would be more closely aligned to the Blue Line tracks, and the removal of the substation building would allow for the straightening of the north-south access road connecting to Chagrin Boulevard. The Phase 2 plan would allow for even shorter bus-to-rail and bus to bus transfer walk distances than under the interim plan or Phase 1 plans.

To facilitate the use of bus and rail transportation, the RTA will require two Kiss-N-Ride parking spots to allow for dedicated pick up and drop off locations for users. These spots will be within proximity to rail station and bus platform at a location acceptable to the RTA. The exact location will be determined once the final parking configurations for Phase 1 are developed.



Figure 6-8: Phase 2 Site Plan

Warrensville/Van Aken Station Area Plan

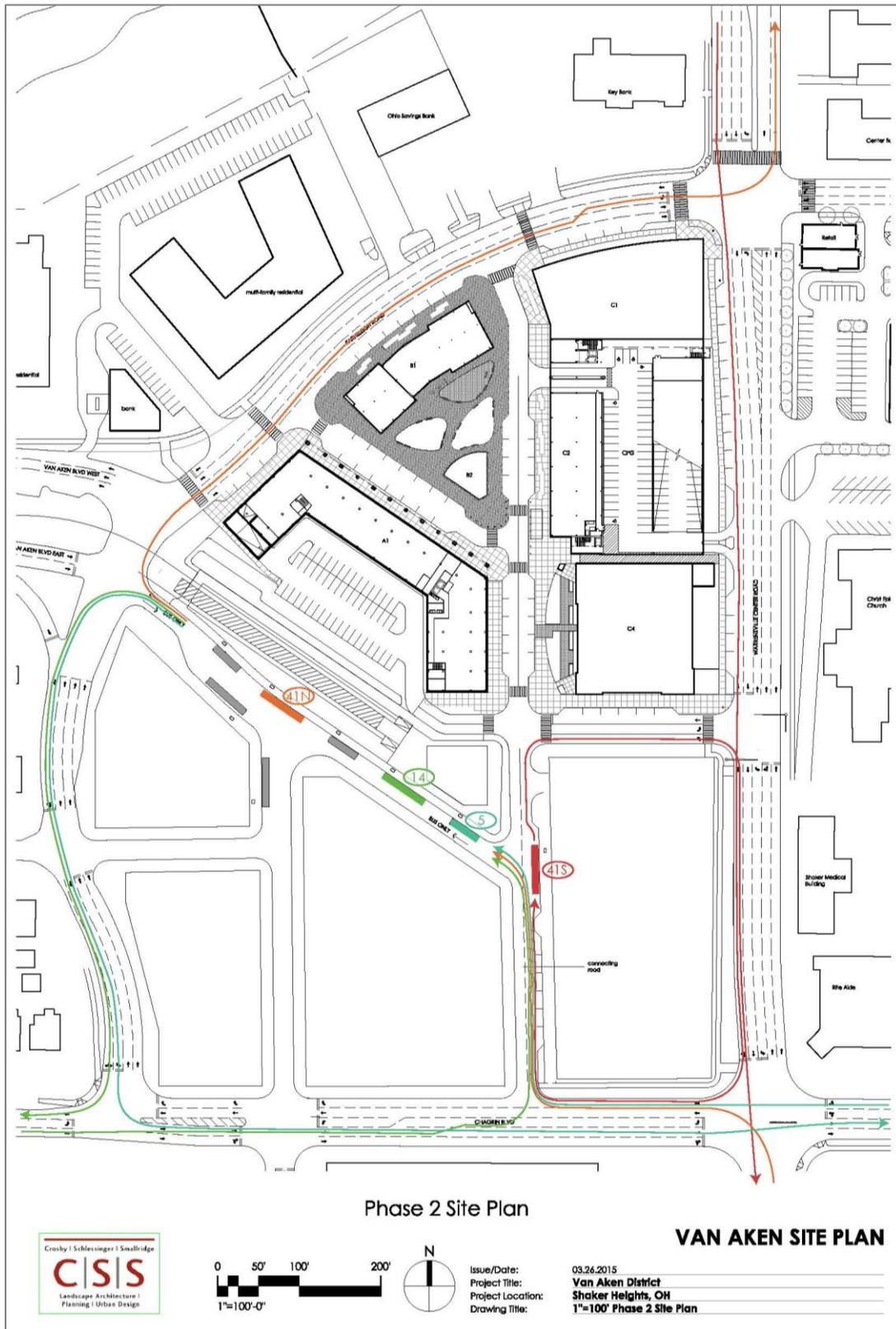


Figure 6-9: Phase 2 Bus Routing



7. Bicycle and Pedestrian Accommodations

Shaker Heights has taken proactive steps over the years to improve opportunities for non-motorized forms of transportation throughout the City. In 2008, the City developed a bike route plan to connect key points of interest in the City. Most recently, Shaker Heights was awarded an Honorable Mention as a Bicycle Friendly Community by the League of American Bicyclists for these efforts in Spring 2014.

The Van Aken District development and the Warrensville/Van Aken Station play an important role in continuing the City's efforts and connecting bicycle and pedestrian access to other transport modes. As a rejuvenated mixed-use development, the Van Aken district will serve as a center of activity that attracts people from the surrounding neighborhoods as well as a busy intermodal hub. It is important that people traveling to and through the district from places within easy walking and bicycling distance feel safe, comfortable and easily able to get to the district without having to get in a car. This will not only improve the attractiveness and livability of the district but will also help reduce unnecessary motor vehicle trips and the associated congestion.

The transportation infrastructure for the Van Aken District creates a solid foundation for bicycle and pedestrian accommodations. Given its location within Shaker Heights, pedestrian features are necessary on both sides of all streets within the site, along with provision of safe, well-designed pedestrian crossings and streetscape elements to add to the walkability of the area. Bicycle facilities should be provided that connect to existing and planned bicycle infrastructure. This includes connection to Van Aken, which will be posted with Bikes May Use Full Lane and Change Lanes to Pass signs. Additionally, the Eastside Greenway Plan, a regional plan that is currently under development, has identified South Belvoir Road as a key missing link. The south end of this link extends from South Belvoir Road to the west on Farnsleigh and connecting to Thornton Park and Warrensville Center Road. It is important that the City consider this future regional greenway connection and provide the infrastructure that connects to it at the Warrensville/Farnsleigh intersection. With the reconstruction of the Warrensville/Chagrin intersection and the associated closure of Van Aken to the east of Farnsleigh, traffic volumes on Farnsleigh will increase. The City considered provision of bike lanes on Van Aken but is not in favor of this treatment because of impacts to pedestrian crossing distances. Provision of a cycle track would be an alternative treatment that would appropriately accommodate recreational cyclists and provide the necessary bicycle connectivity in the district. A potential location for the proposed cycle track is along the south and east side of Farnsleigh, along the border of the RMS development from Warrensville to Chagrin. This location has fewer crossings and provides good circulation and access along the perimeter of the redevelopment site.

RMS does not plan to provide bike lanes within the site; however, bicycle amenities such as bike racks, and possibly bike lockers should be provided within the site and particularly near the transit hub. Such features would encourage bicycle use for people traveling to the site as their final destination as well as to the bus and rail transit for continuation of their trip to their ultimate destinations elsewhere in the county.



8. Parking

Parking facilities are an integral part of the overall transportation system. It is important to provide appropriately sized and properly designed parking facilities to accommodate the needs of the district, including the mixed-use development as well as transit. With the planned extension of the Blue Line as bus rapid transit, the Van Aken District would require less parking than if it were to function as an end of the line facility which would be expected to function somewhat like a park-and-ride facility. In either case, providing sufficient parking will be essential for accommodating existing transit riders and encouraging more transit use at the site, as well as accommodating the parking needs of surrounding development.

Parking facility design is based on effective supply, parking demand, utilization, occupancy, duration and turnover. Parking availability and pricing are key determinants in mode choice. The parking program builds from the analysis completed for the Shaker ITC study, given the similarities between the two projects.

8.1. Background Information on Parking Demand

The following fundamental concepts were applied to the parking plan.

Parking Demand for Transit Center

The transit-related parking demand was referenced from the Shaker ITC study which estimated demand based on the available information in the NOACA 2007 Transit Network Guide and coordination with GCRTA's planning staff.

Parking Demand for TOD

The peak parking demand for the proposed TOD land uses (residential, office and retail) in urban settings was estimated based on the information and parking generation rates provided in ITE's *Parking Generation, 4th Edition*.

Shared Parking

Smart growth and transit oriented development incorporate a "park once" mentality that encourages drivers to park in a central location and proceed on foot to their destinations, taking advantage of the pedestrian-friendly environment. The resulting reduction in parking demand is reflected in the concept of shared parking. Shared parking allows for a reduction in parking provision based on the theory that parking demand peaks will vary among neighboring land uses and that automobile trips will be reduced by the number of pedestrian trips that occur between land uses.

Walkability

Providing pedestrian connectivity between land uses and high quality pedestrian amenities is an important component of transit oriented development. Large stretches of pavement and parking that require pedestrians to walk long distances are not consistent with transit oriented development principles.

Transit Supportive Parking and Site Layout

Parking should not be the first thing a person sees when approaching a TOD site; it should be accessible but not a predominant feature of the site. For example, consideration should be given to vehicle access locations (driveways), pedestrian access, curb cuts, opportunities for landscape buffers, mixed-use development opportunities with parking structures, and consideration of below-grade or partial below-grade structures to minimize height and visual impact. Good design features greatly improve the impact



of parking garages on the community and the environment. Street alignment and wrapping with retail supports a lively pedestrian environment. Shared parking between transit stations and other uses can reduce that amount of parking that is necessary. Parking management strategies can also be applied to encourage smart growth: strategically applying parking spaces for both on-street and off-street facilities; recognizing parking location, cost, supply/demand issues; creating pedestrian-friendly orientation and access, and de-emphasizing automobile access with block placement, orientation, and ground floor land use activation. The encouragement of transit use and reduction in parking is also facilitated by the incorporation of Kiss-N-Ride locations where riders can easily be dropped off and picked up without the need for a long term parking location. Effective implementation of transit supportive parking policies and programs is facilitated by engaging stakeholders in defining the problems and developing context-sensitive parking solutions.

Parking Management Strategies

Parking management can significantly reduce the number of necessary parking spaces, while providing additional benefits of improved user quality of service, more accessible land use patterns, reduced motor vehicle traffic, congestion, accidents and pollution, more attractive communities, and better mobility for non-drivers. Parking management strategies can increase parking facility efficiency as well as reduce parking demand. Strategies that can increase parking facility efficiency include:

- Sharing parking
- Regulating parking
- Establishing more accurate and flexible parking standards
- Establishing parking maximums
- Providing remote parking and shuttle services
- Implementing smart growth policies
- Improving walking and cycling conditions
- Increasing the capacity of existing parking facilities

Strategies that can reduce parking demand include:

- Implementing mobility management
- Pricing parking correctly
- Improving parking pricing methods
- Providing financial incentives to reduce demand
- Unbundling parking (i.e., do not automatically include parking with apartment rental)
- Reforming parking taxes
- Providing bicycle facilities

There are also a number of strategies that support parking demand management, including:

- Using technology to inform drivers of parking locations and available capacity
- Improving user information and marketing
- Improving enforcement and control
- Establishing transportation management associations and parking brokerage
- Establishing overflow parking plans
- Addressing spillover problems
- Improving parking facility design and operation



Research has shown that individual parking strategies typically reduce parking requirements by five to 15 percent, while a cost-effective, integrated parking management program can often reduce parking requirements by 20 to 40 percent and improve user convenience. It would be beneficial for Shaker Heights and GCRTA to work together to develop an integrated parking management program for the ITC and surrounding development.

Pricing Impacts

According to ITE's *Parking Generation, 4th Edition*, one of the more significant factors affecting parking demand could be the elasticity of demand to pricing. Although only limited research has been done, it indicates that parking demand elasticity ranges between -0.1 and -0.6 with -0.3 being the most frequently cited value. A parking demand elasticity of -0.3 means that parking demand decreases by 3 percent for every 10 percent increase in parking cost. Parking elasticity information is useful when pricing is already in place. Little data on demand elasticity exist for the situation when free parking becomes priced parking.

Parking Supply Impacts

Parking supply is generally perceived to be full by users when more than 90% of the spaces are full, based on guidance in ITE's *Parking Generation, 4th Edition*. Other observations indicated that the occurrence of illegal parking tends to increase significantly as parking occupancy exceeds 80% over a large area. This affects parking supply and customer service rather than parking demand. This perception can be modified by using intelligent transportation systems (ITS) technologies to inform drivers of the location and available capacity of parking facilities in the area.

8.2. Parking Generation

The purpose of the parking study is to determine the appropriate amount of parking to support the development. The site build out (Phase 2) is expected to include the following land uses:

- High density residential (305 dwelling units)
- Office (250,000 SF)
- Retail (142,000 SF)
- Transit station intermodal hub

Area Type

Parking demand is categorized by area type: Urban, Suburban and Rural. The Warrensville/Van Aken station area and Van Aken district in general is classified as Urban. Urban is further broken down into three sub-categories: Central Business District, Central City Not Downtown (CND) and Suburban Center (SBC), as defined below. Based on the definitions, the Van Aken district fits best into the SBC or possibly the CND land use.

- **Central Business District (CBD)** is the downtown area for a city. CBD characteristics include good transit service, parking garages, shared parking, an extensive pedestrian sidewalk network, multi-story buildings, priced parking and a wide range of land uses (including mixed-use sites).
- **Central City, Not Downtown (CND)** is the area outside the downtown area of a larger city. This area has greater land use density than suburban sites, but is substantially less dense than the CBD. The intent of this area designation is for the areas around central cities (for example Seattle, Atlanta, San Francisco, or Washington DC) where travel characteristics are likely to be unlike suburban conditions.



- **Suburban Center (SBC)** areas are those downtown areas of suburbs that have developed CBD characteristics but are not the central city of a metropolitan region. These activity centers have characteristics that may include good transit service, a mix of surface and structured parking, connected streets, a connected pedestrian network, and a mix of land uses. Without distinctive transit, pedestrian and shared/consolidated parking features, the SBC designation should not be used in lieu of suburban. Examples include Bellevue WA, Las Colinas TX and Walnut Creek CA.

Parking Demand Methodology

Parking demand is based on the amount and type of land use in the study area. As previously mentioned, parking demand for the Van Aken district is based on information provided by the previous Shaker ITC plan as well as parking generation rates and guidelines for urban development in ITE’s *Parking Generation, 4th Edition*. Specific parking generation rates are described in the next section. Where possible, the parking demand estimates are generally reflective of sites with access to transit, except as noted. Given the shared use nature of the site as well as the lack of overlap in peak periods parking demand between the office and residential land uses as well as the easy access to transit, it is reasonable to reduce the total estimated parking demand. Additionally, reductions due to linked trips (internal trip capture) are likely based on conditions of the area and the types and combinations of planned uses. Some uses lend themselves to linked trips; for example, office workers or shoppers may walk to lunch or dinner at nearby restaurants. Parking demand is also reduced by trips made by transit, bicycle or walking. Demographics are closely linked to non-motorized trips, as documented by the U.S. Department of Transportation’s National Bicycling and Walking Study. A younger average age predicts an increased likelihood of bicycling and walking. Transit trips are dependent upon proximity of transit service, population density, and transit dependent population. For all the reasons mentioned above, potential reductions in total parking demand are provided.

Estimated Parking Demand

Parking demand for the residential, office and retail development is developed from ITE’s *Parking Generation, 4th Edition*. The parking demand rates for the residential land use is based on high-rise

Table 8-1 PARKING DEMAND ESTIMATES	
Land Use	Parking Spaces
Residential (305 DUs)	450
Office (250 KSF)	560
Retail (142 KSF)	360
Transit	200
Subtotal	1,570
10% reduction	1,410
20% reduction	1,260
40% reduction	940

apartments (ITE code 222), reflecting a mix for Central City, Not Downtown (CND) and urban Central Business District (CBD) sites for weekdays. Occupancy rates will obviously influence parking demand. Parking demand estimates are based on the identified ITE land use codes, using urban data for residential and office. The retail (shopping center) data sources are predominantly suburban so the parking demand for this site is likely over-estimated. (Note: Retail parking demand is based on data from non-December weekday data.)

Given the variability in the estimating process, the parking projections should not be interpreted as precise numbers, but as an indication of the possible

demand level. The actual parking demand may be reduced as a result of transit use, pedestrian and bicycle trips, and an effective parking management program. Additionally, the peak demand for each of the land uses may not overlap (particularly office and residential). For those reasons, the total parking demand is presented in **Table 8-1** along with potential reductions of 10%, 20% and 40%, which may be reasonable based upon alternate mode and parking management reductions.



9. Cost Estimate

As part of this study, a planning level cost estimate has been prepared for various phases of site build out. The costs shown in this estimate represent an estimate of probable planning level construction costs provided in good faith and with reasonable care. Michael Baker has no control over the costs of labor, materials, or equipment, nor over competitive bidding. The provided cost estimate does not include right of way, utility relocation costs (other than noted) or construction engineering and inspection costs. The planning level cost estimates for the Phase 1 and Phase 2 alternatives are shown in **Table 9-1**, with costs identified for the major anticipated elements within each phase. Costs for the Interim Phase will be completed by others.

Interim

By December of 2015 the Warrensville/Chagrin intersection improvements project will be complete and various components of the site development will be in place. With the development beginning to take shape during 2015, it was important to understand the costs associated with accommodating bus circulation and improving transfer areas, particularly since the recommended improvements differ from the plans developed as part of the Warrensville/Chagrin intersection improvement project.

Since the site development plans became available before the completion of several transit associated improvements included in the Warrensville/Chagrin intersection improvements project, the project team had the opportunity to revise these plans and provide the contractor currently under contract with a change order. The opportunity of using the change order process to implement many of the interim recommendations provided a low cost option to accommodate both future site development and transit operations.

The interim recommendations found within this study are currently being designed by the engineering team who originally prepared the bid documents for the Warrensville/Chagrin intersection improvements project. It is anticipated that the only costs associated with this alternative would be the difference in cost between the original design (corner bus loop at the Warrensville/Chagrin intersection) and the recommended design.

Phase 1

Beginning in 2016, after the completion of the Warrensville/Chagrin intersection improvements project and once a majority of the needed site infrastructure is constructed, Phase 1 of the site development will be underway. Phase 1 consists of 12 acres of mixed-use redevelopment with 135 residential units; 60,000 square feet of office space; and 90,000 square feet of restaurant and retail space. Additional site infrastructure will also be constructed during Phase 1 of development.

Two major infrastructure improvements drive costs during Phase 1 of construction:

- **North-South Road Construction** – The construction of the proposed north-south roadway connecting Chagrin Boulevard and Farnsleigh Road, running parallel to Warrensville Center Road and serving as the primary internal site route requires the reconstruction of RTA’s existing electrical substation. The existing substation is currently located on the proposed alignment of the proposed road. The reconstruction of the new substation would need to be in a different location also requiring the relocation of existing electrical feeders.
- **East-West Road Construction** – Creating the east-west connection to Warrensville Center Road is important for the success of the site. It is expected that with the addition of this road and the



proposed intersection with Warrensville Center Road a traffic signal will be installed to accommodate safe access to the site.

Many of the transit improvements that being implemented as part of the interim improvements can remain in service as part of Phase 1 of development. It is expected that once the site begins to transform during Phase 1 of development that some enhancements will be made to some of the transit waiting areas and some additional pedestrian connections will be incorporated.

Phase 2

Upon the completion of Phase 1 and contingent on the developer's schedule of securing tenants, Phase 2 of the site development will be underway. Phase 2 consists of completing the build-out the 12 acres of mix use redevelopment with a total 305 residential units; 250,000 square feet of office space; and 142,000 square feet of restaurant and retail space. Additional site infrastructure will also be constructed during Phase 2 of development, primarily south of the existing RTA transit tracks.

Several major infrastructure improvements drive costs during Phase 2 of construction:

- Bus Operations – As part of Phase 2 development general bus operations will remain the same, however the alignment of the Interim and Phase 1 bus transfer area will be obsolete. Phase 2 of site development will require the bus operations and transfers to occur more parallel to the existing rail tracks. Proposed changes to the rail operations will also require the bus transfer area to be shifted further to the north.
- Rail Operations – To enhance site experiences Phase 2 of development proposes several major changes to existing RTA rail operations. The proposed rail infrastructure changes are the major costs associated with Phase 2 development and include:
 - Relocation of rail crossover
 - Relocation of third track
 - Consolidation of the Warrensville/Van Aken and Farnsleigh stations with construction of a new station and platform (with new attenuator) close to the Van Aken/Farnsleigh intersection
- Site Access Improvements – Similar to Phase 1 of development, Phase 2 will introduce a new intersection with Chagrin Boulevard at Lomond Boulevard. The intersection will require improvements to the existing signal. Phase 2 development will also require signal timing upgrades at other intersections within the vicinity of the site.
- Site Finishing – The proposed estimate has budgeted for various enhancements to the overall site including landscaping, streetscaping and the inclusion of plazas and art.
- Utility Relocations – It is anticipated that the relocation of the third track and the realignment of the bus transfer area will result in relocating several overhead electrical power poles and several RTA catenary lines.



Table 9-1: Warrensville/Van Aken Station Area Plan Cost Estimate				
	Interim*	Phase 1	Phase 2	Remarks
Bus Operations				
Bus Roadway on Existing Van Aken		\$0	\$0	Implement in Interim
Bus Roadway on Final Alignment		\$0	\$200,000	Phase 1-Use Interim. Phase 2-Construct new alignment.
Sidewalk		\$5,000	\$50,000	Phase 1-Variouse tie ins. Phase 2-new walk, new alignment
Drainage Improvements		\$0	\$25,000	Phase 1-Use Interim. Phase 2-Construct new Drainage.
Transit Waiting Environments (shelters)		\$20,000	\$120,000	Phase 1-Repurpose Ex. Phase 2- 6 locations (\$20K ea.)
Subtotal Bus Operations		\$25,000	\$395,000	
Rail Operations				
Substation Relocation		\$3,000,000	\$0	Required for Phase 1 Implementation
Cross-over Relocation		\$0	\$3,000,000	
3rd Track Relocation		\$0	\$2,000,000	
Rail Alignment Changes at Farnsleigh		\$0	\$1,500,000	
Road Crossing (Farnsleigh)		\$0	\$1,000,000	
New Open Air Station and Platform		\$0	\$3,000,000	Includes new impact attenuators
Station Consolidation		\$0	\$1,000,000	Demolition and consolidation of existing stations
Subtotal Rail Operations		\$3,000,000	\$11,500,000	
Site Entrance/Exit Improvements				
New Traffic Signal at Warrensville Road		\$150,000	\$25,000	Required for Phase 1 implementation Phase 1-New Signal. Phase 2-Timing adjustments
Signal Modifications at Lomond/Chagrin		\$0	\$75,000	Phase 2. Includes Farnsleigh/Chagrin signal modifications
Signing and Pavement Marking Upgrades		\$20,000	\$20,000	Various changes required for signal work
Subtotal Site Enter/Exit		\$170,000	\$120,000	
Finish Treatments				
Pedestrian Lighting		\$0	\$100,000	Phase 1-Interim lighting. Phase 2-New ped lighting
Plaza Landscaping		\$0	\$100,000	Phase 1-No landscaping. Phase 2-New landscaping
Plaza Hardscaping		\$0	\$100,000	Phase 1-No hardscaping. Phase 2-New hardscaping
Subtotal Finish Treatments		\$0	\$300,000	
Utility Relocations				
RTA Catenary Relocation		\$0	\$500,000	Required for final bus operations alignment Phase 2 - New alignment with utility conflicts
Private Utility Relocations		\$0	\$250,000	Poles on north side of Van Aken Phase 2 - New alignment with utility conflicts
Subtotal Utility Relocation		\$0	\$750,000	
Miscellaneous				
Maintaining Traffic		\$50,000	\$25,000	
Surveying		\$20,000	\$75,000	Phase 1-Roadwork. Phase 2-roadwork, station, track
Mobilization		\$200,000	\$400,000	
Erosion Control		\$25,000	\$50,000	Construction only (no site stormwater management)
Subtotal Miscellaneous		\$295,000	\$550,000	
Estimate Project Subtotal		\$3,490,000	\$13,615,000	
Design		\$349,000	\$1,361,500	10% design fee
Contingency		\$1,047,000	\$4,084,500	30% contingency
Inflation		\$145,200	\$1,911,500	Interim-0% (2015). Ph 1-3.2% (2016). Ph 2-10.8% (2018)
Total Probable Construction Costs		\$4,682,200	\$19,611,000	

* Interim costs to be provided by others.



10. Funding Plan

The City of Shaker Heights, RTA, and other governmental entities, together with the developer of the site, will seek funding from a variety of public and private sources to provide funding for the infrastructure changes that are proposed to support the development. The City, RTA and the developer have begun exploring funding options with funding agencies and sources. The following is a list of some of the major potential public sources of funding from transportation sources. Other public and private sources may also be available for this project, and will be examined by the City, RTA and the developers. The City, RTA and the developers will develop a funding package, likely including funding from a variety of Federal, state, local and private sources, to complete the proposed infrastructure improvements.

Federal Funding Sources

The Federal government has a number of programs that could provide funding for the improvements proposed for the site. The United States Department of Transportation (USDOT) and its divisions the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) have a number of programs that provide partial funding for transportation improvements, including the transit and roadway improvements identified for the area. Funding under some of these programs is at the discretion of the Ohio Department of Transportation (ODOT) and/or the Northeast Ohio Areawide Coordinating Agency (NOACA), the region's Metropolitan Planning Organization (MPO). Others require direct application to USDOT or its divisions. Many of these programs are competitive. In addition, some Federal grant programs that are not directly related to transportation (and are not administered by USDOT) offer grants that can be used to support transportation investments. The following are descriptions of some of the potential Federal programs for which the proposed improvements may be eligible. Many of these programs require completion of environmental documentation prior to application, and grants generally require a non-Federal share of at least 20% of the project cost.

The Congestion Mitigation and Air Quality Improvement (CMAQ) program is a long-standing FHWA program aimed at transportation projects that contribute to air quality improvements and relieve traffic congestion, particularly in areas (like northeast Ohio) that are air quality non-attainment or maintenance areas. All CMAQ projects must demonstrate three primary elements of eligibility: transportation identity, emissions reduction, and location in or benefitting a nonattainment or maintenance area. The program is administered by ODOT but eligible projects also must be included in a Metropolitan Planning Organization (MPO) transportation plan and transportation improvement program (TIP). The next available window for funding locally is for 2021-2022.

Transportation Alternatives Program (TAP) is an FHWA program that funds alternative transportation programs and projects, which are not related to roadway capacity. These include pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former divided highways. These funds are allocated by ODOT under a statewide program, with input from NOACA. The NOACA region receives about \$1.5 million per year to invest in alternative transportation projects under this program.

New Starts is FTA's primary program for funding new fixed-guideway transit projects or extensions. The program has three separate programs: New Starts, for new fixed guideway systems or extension projects above \$250 million in total costs; Core Capacity projects, which are substantial investments in an existing fixed-guideway corridor that is at capacity today or will be in five years, and where the



proposed project will increase capacity by not less than 10 percent; and Small Starts, which is for new systems or extensions of less than \$250 million in total cost, and for which \$75 million or less is being requested from FTA. New Starts is a nationally competitive program. RTA completed an Alternatives Analysis project for a Blue Line Corridor extension in 2013. However, RTA has not applied to FTA for approval to move into the next phase of the funding process. The improvements now being proposed at Warrensville-Van Aken would not be eligible for New Starts funding as a stand-alone project, but potentially could be eligible as part of a larger corridor enhancement project.

TIGER Grants are an annual program sponsored by USDOT since 2009. It is a nationally competitive program that provides funding for transportation projects that promise to help achieve critical national objectives, such as improving community livability and sustainability and explore ways to deliver projects faster and at lower costs. TIGER grants generally require “project readiness,” including completion of environmental documentation and design, prior to application to ensure that funding is used expeditiously. The application process includes a benefit-cost analysis that must meet specific program guidelines. The TIGER program is generally highly over-subscribed, with requests far exceeding the available funding, which comprised \$600 million nationally in 2014. RTA has been exceptionally successful in securing TIGER grants in the past, receiving a \$10.5 million grant for the University-Cedar Rapid Station in 2010 and a \$12.5 million grant for the new Mayfield Road Rapid Station in 2012.

Community Development Block Grants (CDBG) are grants made to local governments by the Federal Department of Housing and Urban Development (HUD). CDBG is a flexible program that provides communities with resources to address a wide range of unique community development needs, including transportation projects, to help develop communities and their living environments, and provide economic opportunities, primarily for low-and moderate-income persons. Shaker Heights currently does not receive funding under the program, but may be eligible for funding. CDBG funding can be used as part of the non-Federal match required for other Federal funding programs.

State of Ohio

The Transportation Review Advisory Council (TRAC) is a nine member board that oversees a competitive process for investing in major transportation projects. TRAC invests in projects with a cost of more than \$12 million, and focuses on projects that expand transportation capacity, including both roadway and transit projects. Evaluation criteria include reduction of traffic congestion, cost benefit analysis, air quality benefits, intermodal connectivity, and economic development benefits. Specific criteria related to transit include the increase in peak period capacity and reduction in (automotive) vehicle miles traveled, essentially through diversion of auto trips to transit. The City of Shaker Heights applied for TRAC funding in 2011 for improvements related to the Blue Line Extension Project, which proposed a new station on the opposite (south-eastern) corner of the Warrensville-Van Aken Intersection. This project was not funded. TRAC is currently accepting applications for funding for the 2015-2018 period.

ODOT Jobs and Commerce Grants made to transportation projects that promote intergovernmental and public-private collaboration in transportation investments. The program is administered by ODOT’s Office of Jobs and Commerce and is competitive on a statewide basis. It offers grants of up to \$250,000 that can comprise up to 10% of project costs of projects of more than \$10 million in total cost. The program’s selection criteria is evenly divided between demonstrated job creation or retention benefits, and prompt expenditure of funds. The grants could be used as part of the non-Federal match required by most Federal transportation funding projects.



11. Appendix

Workshop 1
November 17-18, 2014

Workshop 1 Follow-Up
November 20, 2014

Workshop 2
December 15-16, 2014

Project Meeting
January 27, 2015

*Warrensville/Van Aken
Station Area Plan*



Workshop 1
November 17-18, 2014

*Warrensville/Van Aken
Station Area Plan*



**Workshop 1 Follow-Up
November 20, 2014**

*Warrensville/Van Aken
Station Area Plan*



Workshop 2
December 15-16, 2014

*Warrensville/Van Aken
Station Area Plan*



**Project Meeting
January 27, 2015**

*Warrensville/Van Aken
Station Area Plan*



Workshop 1
November 17-18, 2014

Workshop 1, Day 1

November 17, 2014

Workshop Attendance on Day 1					
Workshop Introduction	Workshop	Progress Update	Organization	Name	email
X	X	X	Shaker Heights	Joyce Braverman	Joyce.Braverman@shakeronline.com
X	-	X	Shaker Heights	Ann Klavora	Ann.Klavora@shakeronline.com
X	-	X	RMS	Luke Palmisano	LPalmisano@rmscorporations.com
-	-	X	GCRTA	Mike Schipper	MSCHIPPER@gcrta.org
X	-	X	GCRTA (planning)	Maribeth Feke	MFEKE@gcrta.org
X	X	X	GCRTA (planning)	Valerie Shea	VSHEA@gcrta.org
X	-	X	GCRTA (operations)	John Palagyi	jpalagyi@gcrta.org
X	-	X	GCRTA (engineering)	Joe Shaffer	jshaffer@gcrta.org
X	-	-	GCRTA (operations)	Joel Freilich	JFREILICH@gcrta.org
X	-	-	GCRTA (rail)	Dennis Rehfuss	drehfuss@gcrta.org
X	-	X	Bialosky	Jack Bialosky Jr	jack@bialosky.com
X	-	X	Bialosky	Brad Valtman	bvaltman@bialosky.com
X	X	X	Bialosky	David Craun	dcraun@bialosky.com
X	X	X	Baker	Nancy Lyon-Stadler	nlyonstadler@mbakerintl.com
X	X	X	Baker	Jim Shea	Jim.Shea@mbakerintl.com
X	X	X	Parsons Brinckerhoff	Tim Rosenberger	Rosenberger@pbworld.com
X	X	X	CSS	Skip Smallridge	ssmallridge@cssboston.com

Introduction Meeting, GCRTA Board Room

8:30-10:30 a.m., November 17, 2014

Purpose: Understand constraints and desired conditions for all elements of the project area to set the framework for concept development.

- ◇ Welcome, introduction and roles
- ◇ Project overview and objectives
- ◇ Project schedule
- ◇ Workshop agenda and schedule
- ◇ RTA preferences and requirements
 - Bus ops
 - Accommodate all movements, don't add much time to ops
 - Need signal to access site
 - 8 bus layover (existing, broken downs), 40 ft bus + 40 ft gap
 - Some accommodation for artic (60 ft), 40 ft , need 2-4 artic bays
 - Don't like sawtooth bus bays
 - OK to have boarding platform betw bus bays
 - Current design – enter and exit from intersection, would like to maintain
 - No addition to route miles is free – burden to rider and burden to operator
 - Compare to existing and approved design
 - 3 bus bays
 - Capacity to simultaneously board 8 buses
 - Predictable bus arrival/departure
 - Bus/rail and bus/bus transfer

- 41 uses bus loop
- Current/approved plan – what RTA likes
- Joel: Need to achieve what is planned/approved, required for comparison
- Joe: Preserve ability to extend rail function through intersection
- Tim: Blue Line extension via BRT
- Jack: Building could come down, planning building in that space as part of phase 2, Joe C. said building could go there but could come down in the future

Rail (Dennis)

- Relocate crossover? West of Farnsleigh station, would be confusing to customers
- Need to accommodate 3-car train, Joe will send design standards
- Substation needs to be near end of line, electrical ties to Warrensville (north-south), above ground
- Ok to put in another building. Could it be at Farnsleigh/Warrensville? Needs space for transformers (12x60 substation plus 20x20 for yard)
- Need comfort station for bus operators
- Need kiss-and-ride area (2-3 cars)
- Train schedule – often next train is there before the current train has left; current site is able to store broken down train, need to maintain. Needs to be at the end for the line
- Need yard track for work equipment storage, etc. A lot of work happens midday. 3rd track is for broken downs and equipment (and sometimes staging for St Patty's day, etc.)
- Existing track capacity is sufficient, can't lose it
- 2 tracks for boarding/alighting
- 3rd track (no platform needed)
- All need to store trains 3 cars long
- Boarding and alighting preferred for bus only (no cars in same area)
- Internal roads, ok to mix bus/traffic if low speed, buses able to get out into traffic stream
- Integrate walkability
- Boarding and alighting must be ADA
- Bike accommodations
- Jack – whole point of project is to make more walkable
- Need access to substation
- Existing: Restroom, break room, janitorial area, maintenance for line, substation (getting transformers in/out, clearance requirements); serves bus and train operators, Men & Women (similar to Brook Park Station)
- Bay for snow removal equipment
- Substation – could be two structures, needs to be close to track (feeds & returns as close to rail line as possible)
- Underground? All cabling could go underground, preferred U/G (cabling, station has to be above ground bcs of drainage concern)
- Need rail passenger platform betw the two tracks
- Skip asked about head platform – RTA doesn't have one, concern with people overrunning train (Joe), Jack – gives people visual opp for identity, could be urban plaza,
- Joe – open to considering head platform but concerned with trains running over pedestrians (cited Chicago example)
- Joyce – 8 bus bays? What was proposed in Blue Line Extension? Tim – recall 5 for existing ops, 3 new for BRT

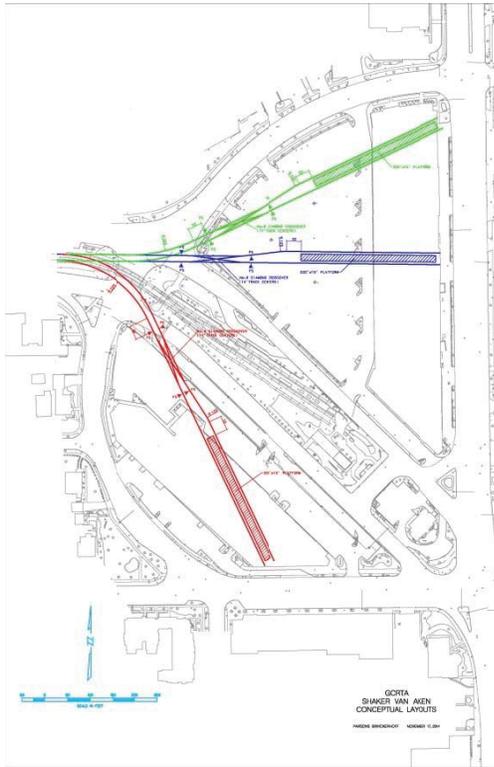
- OK to consider keeping 41 on Warrensville? Joel says it is a requirement to go into the station
 - Bus access outbound, prefer signal but not required for right turns, required for left turns
 - Tim – Blue Line study considered building a station on Warrensville for #41
 - Envision intermixing of bus/traffic – ok; don't want normal traffic in bus drop off area; don't want bus/rail transfers to have to cross vehicular traffic. The area should read like a mixed-use downtown area
 - Luke – want to maximize opportunity for TOD and commercial development. Prefer integration as successful town center
- ◇ Van Aken district preferences and requirements
- RTA/transit area is placeholder [as shown on the current illustrations]
 - Portion of shopping center (fresh market) is retained, north and south is redeveloped, along with parking area
 - Create new public space, integrate the site
 - Take the difficult triangle, incorporate interior infrastructure to create walkable space, new downtown for Shaker
 - Create wville edge and farnsleigh edge
 - Green/hardscape mix
 - Good ped access up and through the site
 - Primary grid – parallel artery to wville, most important interior road with opp to extend south to chagrin (with Phase 2), align with exiting drive access by Walgreens, purpose is to facilitate development of wville/chagrin corner; also add connection to farnsleigh
 - Phase 2: grid/blocked development between transit and chagrin
 - Signal control at new road/wville needs to be signalized
 - N-S road primary purpose is to provide access to develop corner (wville/chagrin)
 - Wville is 5-lane road
 - Mixed use (commercial/retail, office, residential)
 - Land use – comparison to what was analyzed in 2008 study
 - Skip: question on N-S street alignment?
 - Constraints: existing Fresh Market box
 - Want to support >100KSF in office land use
 - Offset west by Fresh Market and parking structure is fixed, to south there is flexibility to shift some, understanding city wants a 3-bay parking structure for future office on corner of site (NW at wville/chagrin)
 - Want to provide internal roadway connection betw north and south sections of site (south as it exists)
 - Jack – understand transformer isn't going to move in Phase 1,

Workshop, Baker Conference Room

10:30 a.m.-3:30 p.m.

Purpose: Developed overall concepts for the station area plan and related site development.

Possible rail alignments. The locations shown constrict site development

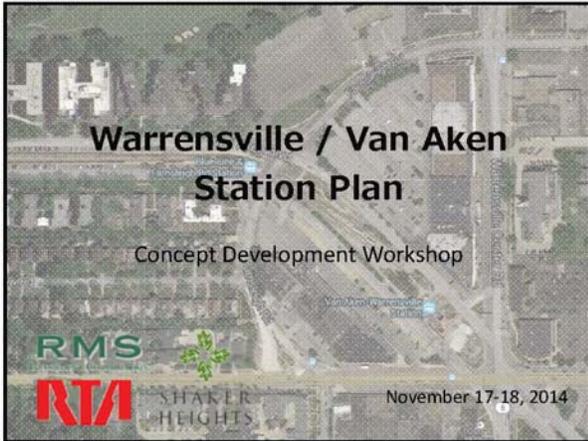


Workshop 1, Day 2 November 18, 2014

Ideas (presented in powerpoint, included after Day 1 presentation)

- Substation is not specifically identified in the budget. Could be prioritized. Could go modular to lessen the design length.
- 41 artics in both directions – artics could also be on the 14. 4 artics and 4 regular busses.
- Consider bringing 41S to Chagrin instead of through the development. Check walking distances and travel times for the 41S
- Concerns of loitering in front of businesses.
- Schedule of events/funding needs to become clearer. Substation may not be moved in time for interim conditions.
- Questions on signaling internal road with Chagrin Boulevard. Would likely not be approved by ODOT on US route.
- Keeping 41 S on Warrensville Road – City and RMS is interested in this option.
- Boarding/staging areas may change based on realigning the internal road around sub station.
- Long crossing distances for 2-bay bus loading area.
- 3rd track relocation – combine Farnsleigh & Warrensville stations, locate 3rd track on north side of tracks to west of Farnsleigh (parking demand for St Dominics and operational considerations, per John P.)

- Eliminate Long Term 1
- Short Term 1 vs. Short Term 2:
 - Short term 2 doesn't impact development potential of SE corner office site, greater development flexibility
 - Short term 2 is longer bus diversion
 - Short term 1 puts buses in front of SE corner office site
 - Investigate opportunity to develop Short term 1 as 1A, then Short term 1B as Short term 2 using Van Aken
 - Map bus routes for Short Term 1 and 2 to assess impact to bus operations
 - Develop Short Term 2 as a realistic short term that doesn't move anything (substation, crossover, 3rd track, use EB Van Aken pavement, signalization at Van Aken/Farnsleigh, access to Wald-Fisher property)
 - Investigate Short Term 2 with 2-lane, two-way bus ops on EB Van Aken (using existing pavement)
 - Investigate Short Term 2 with 2-lane, one-way (with island) bus ops on EB Van Aken (using existing pavement)
- Need to consider 67R (bus route that runs when Blue Line is shut down), back and forth on Van Aken
- Long Term options
 - Long Term 2 could realign bus flow to direct east-west
 - Consider bus garage over bus transfer for all long term options
 - Illustrate Concept 1, Phase 2 as long term option (does not require relocation of tracks) – new Long Term 5
- RMS will look at Long Term 2, 4 and 5
- RTA investigate potential timing and availability to relocate substation and to relocate crossover
- Internal road with substation in its current location does not allow for functional use of SE parcel for development
- Short term 1 is a non-starter if substation cannot be relocated prior to construction of internal road. Joyce will investigate opportunity to delay construction based on conversation with roadway contractor
- Short term 1 is better than short term 2 for bus ops/routing
- Determine soonest transformer can move
- Determine if roadway can be delayed
- Is there an alternative where buses on internal road (ST1) can be moved to another location if SE office is build and Wald-Fisher is in place
- Long Term 4 is preferred. Map how to get to LT 4 via ST1 and/or other ST option(s)
- Build schedule (construction, substation relocation, crossover relocation)
- Consider Skips alt



AGENDA

1. Welcome, introductions and roles
2. Project overview and objectives
3. Project schedule
4. Workshop agenda and schedule
5. RTA preferences and requirements
6. Van Aken district preferences and requirements
7. Discussion & questions (operations, site layout)
8. Vision for this station area plan

Project Purpose

Vision
 Prepare a Station Area Plan for the new end-of-the-line Warrensville Station on the RTA Blue Line that coordinates RTA light rail station and bus circulation needs with private development to create a vibrant, walkable mixed-use district within a functional transportation network.

Goal
 Enhance public transportation and maintain roadway traffic operations while maximizing developable land and customer experience, considering the immediate development opportunities and long term development as well.

Project Schedule

Month	Milestone
Oct	Step 1: Project Kick-Off
Oct-Nov	Step 2: Research & Analysis
Nov	Step 3: Concept Development Workshop
Nov-Dec	Step 4: Refine Concepts
Dec	Step 5: Identify Preferred Concept & Funding Strategy
Jan-Feb	Step 6: Prepare Plan

Workshop #1

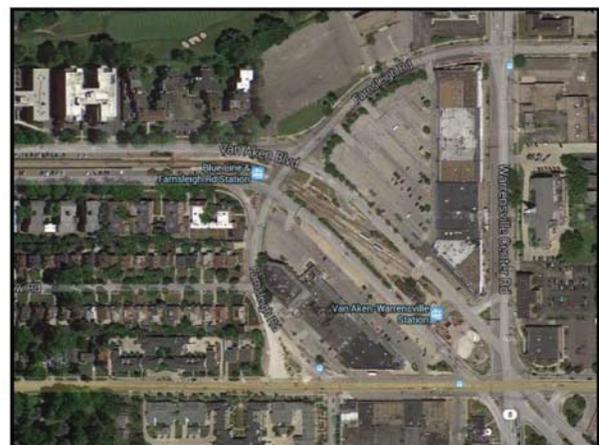
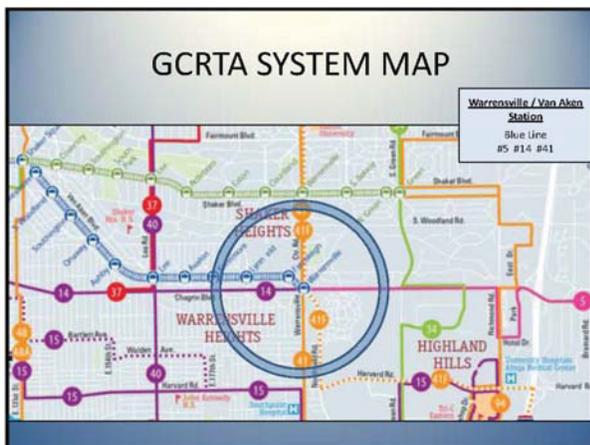
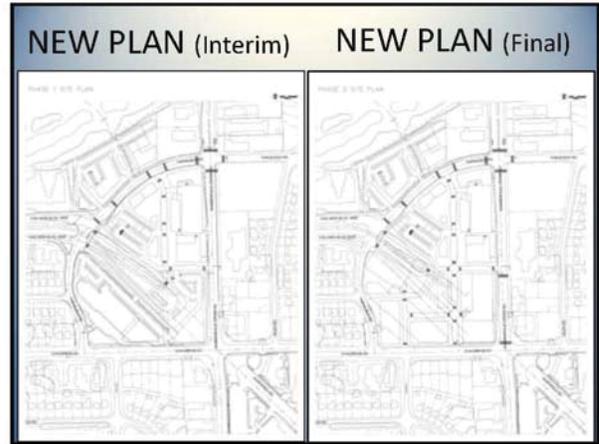
Monday, Nov 17

8:30 am - 11:30 am Technical meeting at RTA
 11:30 am - 5:00 pm Concept development workshop at Baker

Tuesday, Nov 18

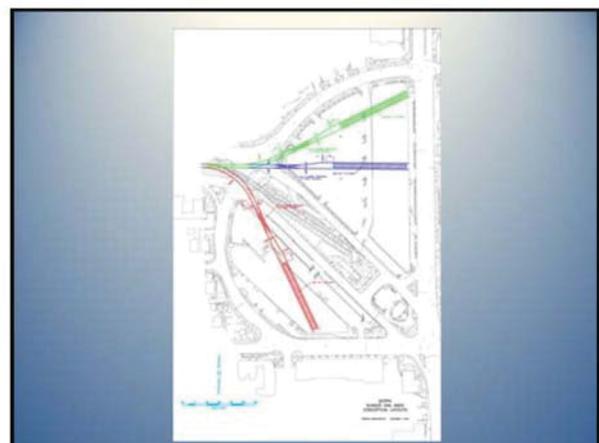
8:30 am - 3:00 pm Concept development workshop at Baker
 3:00 pm - 5:00 pm Presentation of concepts at Baker





DISCUSSION

- Meeting Objective: Share operational requirements (not generate solutions)
- Funding constraints will be considered in concept evaluation. Don't eliminate ideas now because of funding concerns.





RAIL DESIGN PARAMETERS

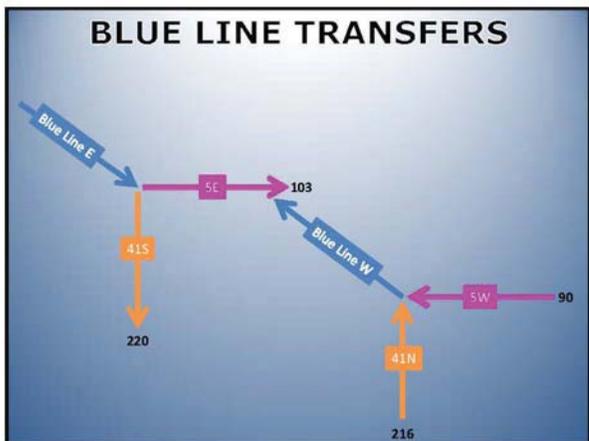
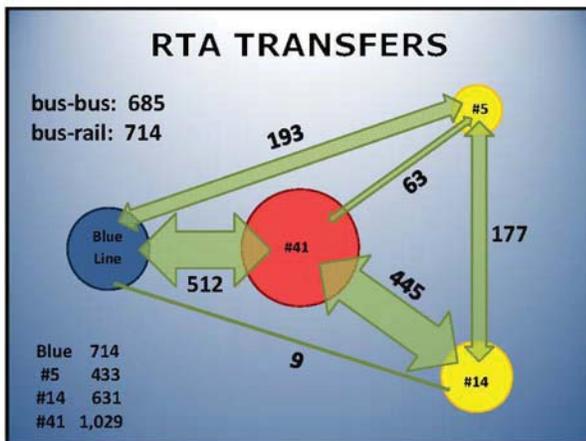
- 300 ft platform + 15/20 ft attenuator
- Pedestrian crossovers at both ends of platform
- Crossover replacement scheduled ± 8 years out
- Substation replacement soon (<5 yrs), schedule can be accelerated
- 3rd track requires 75 ft turnout
- 3rd track min length 280 ft
- Center platform preferred
- Head platform loading is acceptable

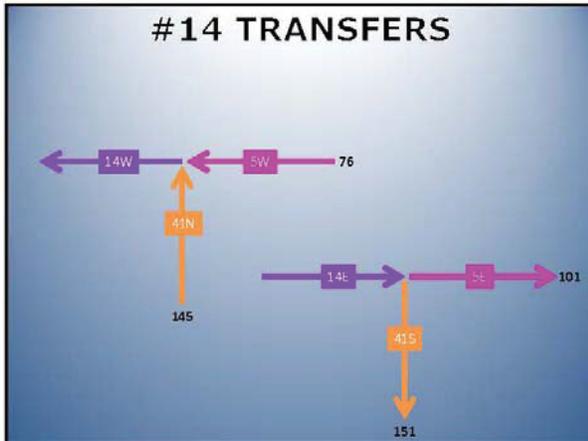
BUS DESIGN PARAMETERS

- Tim's goal: 4 artics + 4 x 40 ft
(RTA: 2 artics + 6 x 40 ft)
- 10 ft platform for loading/alighting
- 40 ft spacing between bus
- 23 ft carriageway for passing
- Bus turning radii: Outside/inside 50 ft/30 ft
- Minimize bus-ped conflict
- Minimize travel time impacts
- Provide kiss-and-ride area (2-3 vehicle storage)

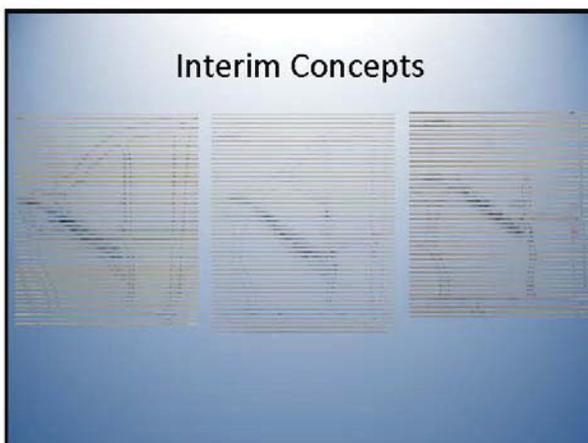
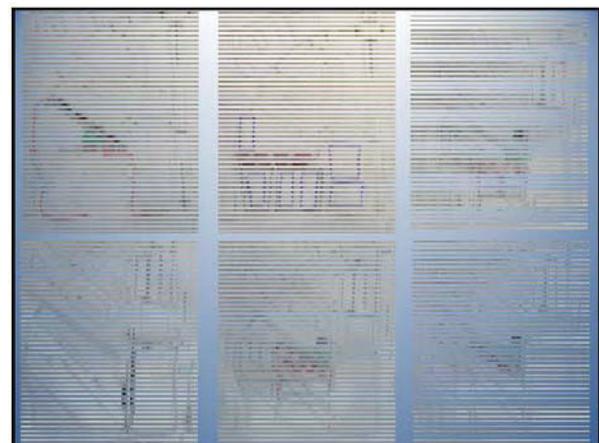
DEVELOPMENT DESIGN PARAMETERS

- Integrity of street grid
- Accommodate minimum parcel dimensions
- Public realm integrates transit and development
- Transit integral part of site and visible from street
 - Integrate transit within site development, designed to encourage future development
 - Avoid massive bus parking area
 - Integrated urban experience
 - Transit doesn't inhibit pedestrian flow within the site





- ### Ridership Conclusions
- Bus-bus and bus-rail transfers are equally important
 - Development expected to increase destination riders



- ### General Items
- Relocate substation
 - Relocate crossover
 - Relocate 3rd track
 - Optimizes opportunity to interconnect transit within development
 - Parking garage & bus operations
 - Combine Warrensville & Farnsleigh Stations

Collocate Bus + Parking



Boulder, CO

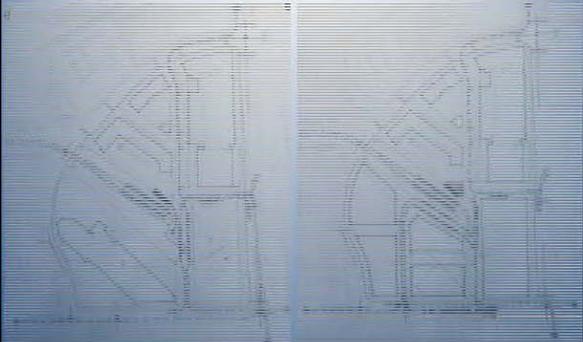
- Bus bays on ground level and on-street
- Vehicle parking on upper levels
- Transit well-integrated within the site
- Minimizes visual impact of transit

Normal Intermodal Center

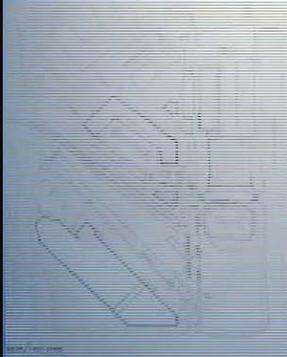


Normal, IL

Concept 1 Phase 1 & Phase 2

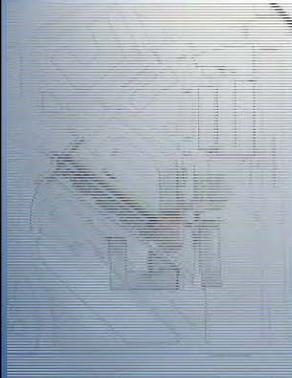


Short Term 1



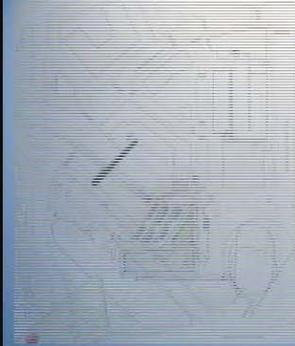
- Bus circulation near corner
- Interior road
- Relocate substation
- Minimal track work (at end, public interface)
- Would benefit from shorter rail platform
- Also works for long term
- Transit waiting area along Phase 2 retail (SE corner of site)

Short Term 2

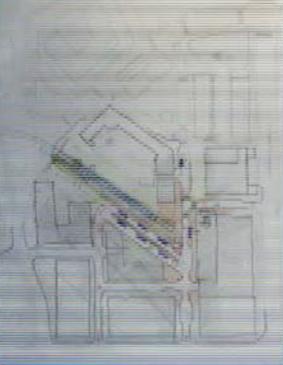


- Relocate substation
- Optional crossover relocation (to gain green space)
- Single curb bus boarding
- Center rail platform
- Wald-Fisher parking along Van Aken likely becomes inaccessible
- Also works long term

Long Term 1

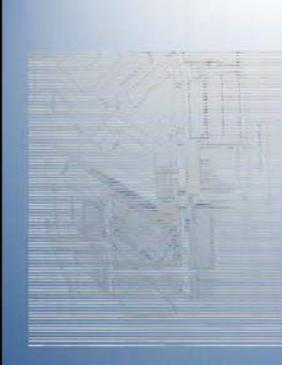


- Relocate substation
- Relocate crossover
- Combine Farnsleigh Stn
- Massed bus depot area, consolidated bus ops



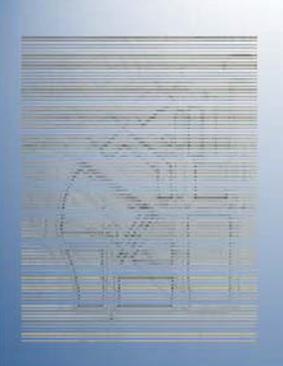
Long Term 2

- Substation relocation
- Optional crossover relocation (to gain green space)
- 2 bus platforms
- Transit frontage on west side of interior road
- Short bus circulation
- Center platform
- Relocate 3rd track to Farnsleigh (preferred for development) or north side



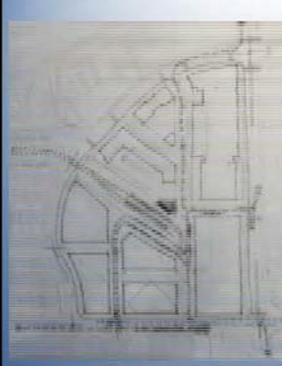
Long Term 2 with Garage

- Substation relocation
- Optional crossover relocation (to gain green space)
- 2 bus platforms
- Integrate transit in parking garage
- Short bus circulation
- Center platform
- Relocate 3rd track to Farnsleigh (preferred for development) or north side



Long Term 4

- 2-way bus ops, minimizes transit footprint
- Odd parcels for development
- Relocate substation
- Relocate crossover



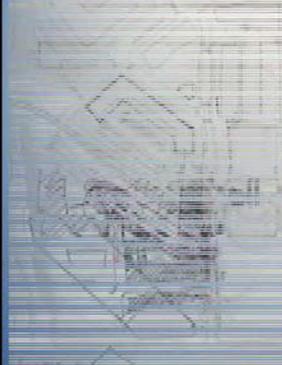
Long Term 5

- Does not require relocation of track or crossover
- Relocation of substation is required



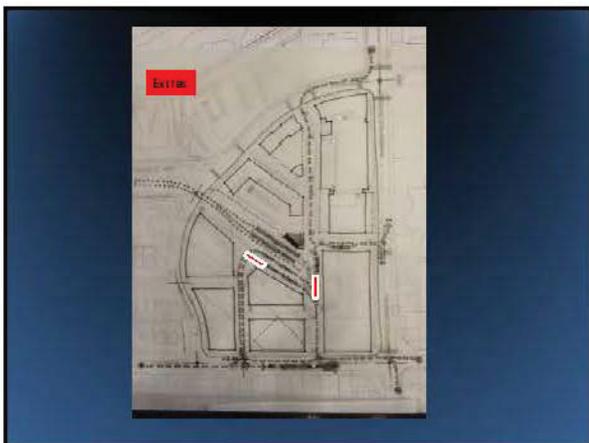
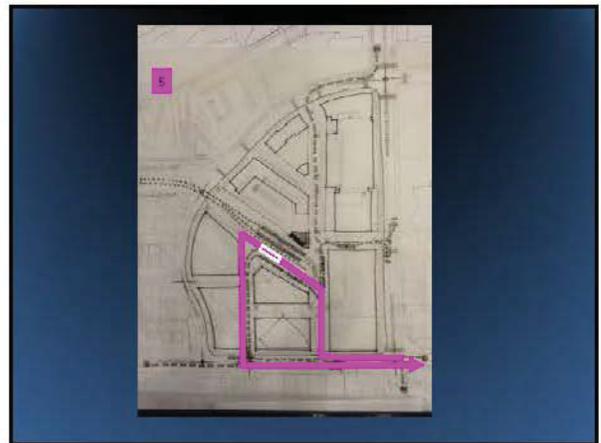
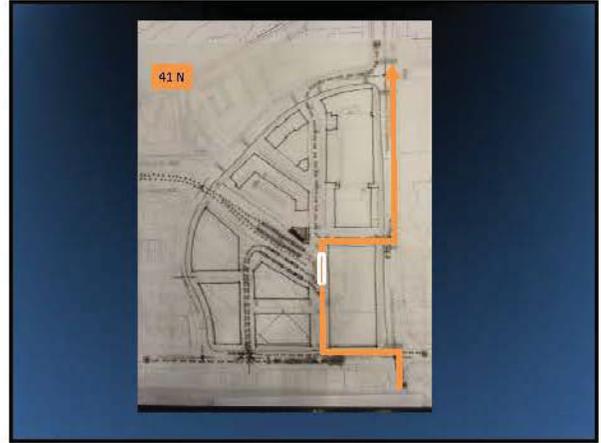
Transition from ST 1 to LT4

- Does not require relocation of track or crossover
- Relocation of substation is required
- Walgreens is in place, partial demo of Wald-Fisher



Skip's 5A

- Does not require relocation of track or crossover
- Relocation of substation is required
- Walgreens is in place, no demo of Wald-Fisher



*Warrensville/Van Aken
Station Area Plan*



**Workshop 1 Follow-Up
November 20, 2014**

*Warrensville / Van Aken Station Plan
Workshop 1 Follow Up Actions
November 20, 2014*

1. Develop sketch plan for realigned rail to south (rail alignment from Phil).
 - Realignment to south is non-starter, hits Walgreens.
 - Incorporate shorter platform (Phil's drawing)
2. Create/modify concept that does not require immediate construction of new interior road. We probably also need to sketch the transit in/out from Farnsleigh/Van Aken to illustrate the unacceptable impact to bus operations. Might need to use both sides of rail station or fit in a turnaround.
3. Create scaled sketches of the Phase 1 and Phase 2 concepts that remain under consideration to verify operational feasibility. Show bus routing/travel patterns for all bus routes.
 - Distribute ("hide") the extra bus spaces on the site; locate the spaces that will actually be used by the #5, #14 and #41 at a central location
4. There may be other spin-off concepts from the stuff we did at the very end of the meeting. One-way and two-way bus flow around a circulator (or in/out) configure reminiscent of preferred plan from 2010 Shaker ITC study.
5. For the remaining feasible concepts, prepare a complete list of features, advantages and drawbacks. Include impacts to Walgreens, remainder of Wald-Fisher site, and SE corner office/retail site Note if 3rd track relocation is necessary or desirable (this will matter for the schedule). Also, amount of road that needs to be built to a level to carry buses.
6. Based on planned land use types and sizes (get from RMS), trip gen and compare to traffic growth included in 2008 study. Compare volumes and anticipated distribution, particularly if 2008 study loaded the site differently.
7. Assess options moving forward from traffic perspective, both operational capacity (refer to 2008 study) and traffic flow/configuration. The Farnsleigh/Van Aken intersection is of concern for some alts as it has the potential to be goofy.
8. Create a table showing bus routing distances for each option. Include route distances for the current "approved" plan. This will really be most effective for comparison of options.
9. Create a schedule showing key items (relocate crossover, relocate substation, roadway construction, Phase 1 site construction, etc).

ASK JOYCE

Request land use types and sizes from RMS for Phase 1 and Phase 2 for trip gen and traffic analysis (probably need to go through Joyce).

Check with County and ODOT regarding bus loop. Mitigate need to develop/assess extra alternatives. What are they willing to support? We need to know that to prepare for the December workshop.

Ask Joyce for roadway construction schedule, including construction of bus loop and overall completion date.

ASK RTA

Ask RTA for info on substation, crossover and 3rd track relocation schedule, cost and assessment of feasibility/political will. (input into schedule)

QUESTIONS

1. What is diameter required for a 180° turn for a 40 ft and artic bus?

*Warrensville/Van Aken
Station Area Plan*



**Workshop 2
December 15-16, 2014**

Workshop 2, Day 1

December 15, 2014

Workshop Attendance on Day 1					
Workshop Introduction	Workshop	Progress Update	Organization	Name	email
X	X	X	Shaker Heights	Joyce Braverman	Joyce.Braverman@shakeronline.com
X	-	X	Shaker Heights	Ann Klavora	Ann.Klavora@shakeronline.com
X	-	X	RMS	Luke Palmisano	LPalmisano@rmscorporations.com
-	-	X	GCRTA	Mike Schipper	MSCHIPPER@gcrta.org
X	-	X	GCRTA (planning)	Maribeth Feke	MFEKE@gcrta.org
X	X	X	GCRTA (planning)	Valerie Shea	VSHEA@gcrta.org
X	-	X	GCRTA (operations)	John Palagyi	jpalagyi@gcrta.org
X	-	X	GCRTA (engineering)	Joe Shaffer	jshaffer@gcrta.org
X	-	-	GCRTA (operations)	Joel Freilich	JFREILICH@gcrta.org
X	-	-	GCRTA (rail)	Dennis Rehfuss	drehfuss@gcrta.org
-	-	X	GCRTA	Alyssa Deis	adeis@gcrta.org
-	-	X	Bialosky	Jack Bialosky Jr	jack@bialosky.com
X	-	X	Bialosky	Brad Valtman	bvaltman@bialosky.com
X	X	X	Bialosky	David Craun	dcraun@bialosky.com
X	X	X	Baker	Nancy Lyon-Stadler	nlyonstadler@mbakerintl.com
X	X	X	Baker	Jim Shea	Jim.Shea@mbakerintl.com
X	X	X	Parsons Brinckerhoff	Tim Rosenberger	Rosenberger@pbworld.com
X	X	X	CSS	Skip Smallridge	ssmallridge@cssboston.com
-	X	X	HNTB	Matt Wahl	mwahl@hntb.com

Introduction Meeting, GCRTA Board Room

8:30-10:30 a.m., December 15, 2014

Purpose: Reviewed Workshop 1 outcomes and discussed subsequent constraints and concepts that had evolved.

- ◇ Substation: The recommended plan must include a concept that does not require relocation of the substation because RTA will not be able to move the substation by the end of 2015 when the intersection reconfiguration is complete.
 - RTA will assess conditions of substations system-wide and will use that information to program the Capital Plan. The Capital Plan will be set in Aug 2015 and then entered into NOACA TIP process.
 - 2018 is soonest any new substation would be built. This may or may not include the substation for the Warrensville/Van Aken Station.
- ◇ Crossover: Rail crossover replacement is not included in RTA's Capital Plan.
- ◇ Bus Loop: The bus loop that is included in the current design plan (intersection reconstruction that is in progress) accommodates 3 bus stalls. RTA operations allow that additional buses could be stopped as they are headed into or out of loop (overflow accommodation).
 - AutoTURN at 10 mph only allows parking for 3 buses. The overflow parking, as discussed, would block the paths of other buses.
 - RTA is ok with provision of 5 bus parking spaces for short-term (Phase 1) plan (per Joel).

- ◇ Van Aken District Development: The RMS/Van Aken district development is planned in two phases. Construction of Phase 1 is planned to begin in the summer of 2015 and would be in place for up to 5 years prior to construction of Phase 2. Phase 1 is located generally north of the RTA Blue Line tracks and Phase 2 is located generally south of the tracks. Development constraints and conditions include the following elements:
 - Due to the development plan and related activities on the site, buses will not be able to be routed or travel on the north-south road north of the east-west access road or on the generally northwest-southeast access road that connects to Farnsleigh north of Van Aken.
 - RMS wants transit to be effectively integrated within the development, without making the site feel like a transit depot. To that end, relocation of the third track to the west of Farnsleigh and minimizing the footprint of the bus transfer area are desired.
 - Locations of the third track and substation are important considerations.

Input from the County and ODOT:

- ◇ Roadway
 - Non-performing the bus loop is supported
 - New road(s) must be within existing right-of-way to avoid impact to environmental document
 - Constructing the internal road south to Chagrin does not meet this requirement
- ◇ Traffic Signal
 - Study potential signal on Warrensville signal between Chagrin and Farnsleigh
 - Update HNTB Synchro model to assess traffic impacts with proposed new signal
 - Model RTA operations with new signal (90 sec cycle)
- ◇ Change Orders
 - Designed and to County by March 1 (May 1st is cut-off)
 - May include: non performing bus loop, adjusting the light timing, possibly adding a light at the new road, building a new road if we think it could work

Workshop, Baker Conference Room

10:30 a.m.-3:30 p.m.

Purpose: Developed revised concepts to incorporate newly identified constraints. Focused on big picture operational considerations (i.e., general access provisions and bus routing) to determine feasibility of general concepts.

The Warrensville/Chagrin intersection reconstruction will be complete by the end of 2015. It will not be possible to install a traffic signal simultaneously with the opening of the new intersection, so there will be a period of time (approximately 2-6 months, depending on weather) when the site's Warrensville access road would function as an unsignalized intersection, assuming the access road would be opened at the same time as the reconfigured Warrensville/Chagrin intersection. As such, bus turning movements would be restricted to right in/right out for the site's Warrensville access road. Based on that schedule constraint, the team determined that three phases of design concepts must be identified:

1. Interim (from opening of the reconfigured Warrensville/Chagrin intersection until construction of the signal at the new site access road intersection on Warrensville).
2. Phase 1 (initial site development, generally north of the RTA tracks)
3. Phase 2 (final site development, generally south of the RTA tracks)

The team focused on site functions and operations prior to getting into site layout details. Bus routing for the basic configurations listed below were considered. Bus routings for these three access configurations without and with a signal at the site's Warrensville access road intersection were sketched and assessed, as shown in the following figures.

- ◇ Access via Farnsleigh and Warrensville. Full movement access would be permitted at the Farnsleigh access. Warrensville access would be restricted to right in/out until it is signalized, at which time it would become a full movement intersection.
- ◇ Access via Farnsleigh and Chagrin. Full movement access would be permitted at the Farnsleigh access. Left turns out of the site onto Chagrin would not be permitted (right in, left in, right out would be permitted). The site access intersection on Chagrin cannot be signalized due to its proximity to the reconfigured Warrensville/Chagrin intersection.
- ◇ Access via Farnsleigh, Warrensville and Chagrin. Permitted turning movements would be as described for the previous two configurations.

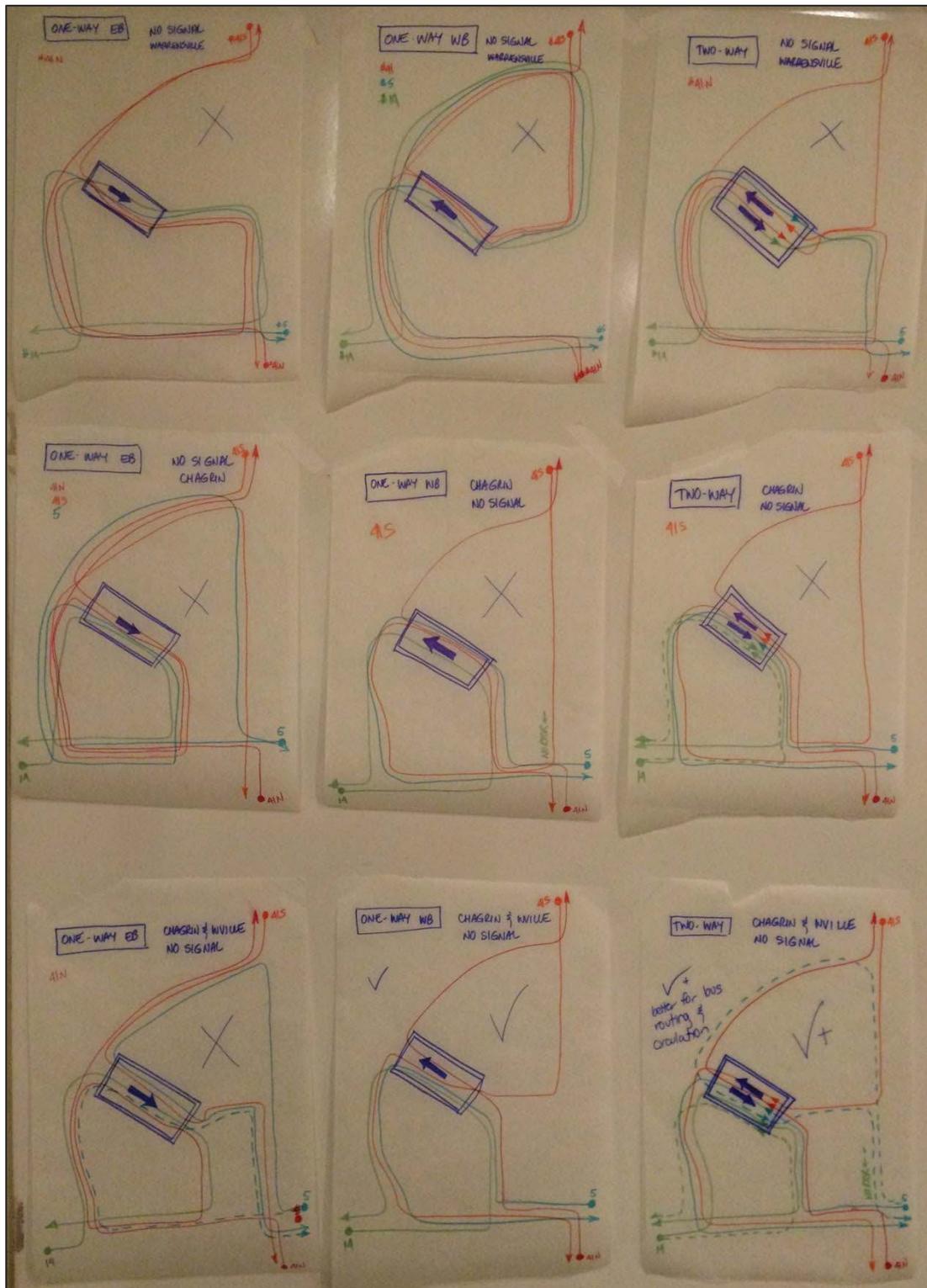


Figure 1: Bus Routing for the Three Access Options (unsignalized on Warrensville and Chagrin)
 Top Row: Access via Farnsleigh (signalized) and Warrensville (unsignalized).
 Middle Row: Access via Farnsleigh (signalized) and Chagrin (unsignalized).
 Bottom Row: Access via Farnsleigh (signalized), Chagrin (unsignalized) and Warrensville (unsignalized).

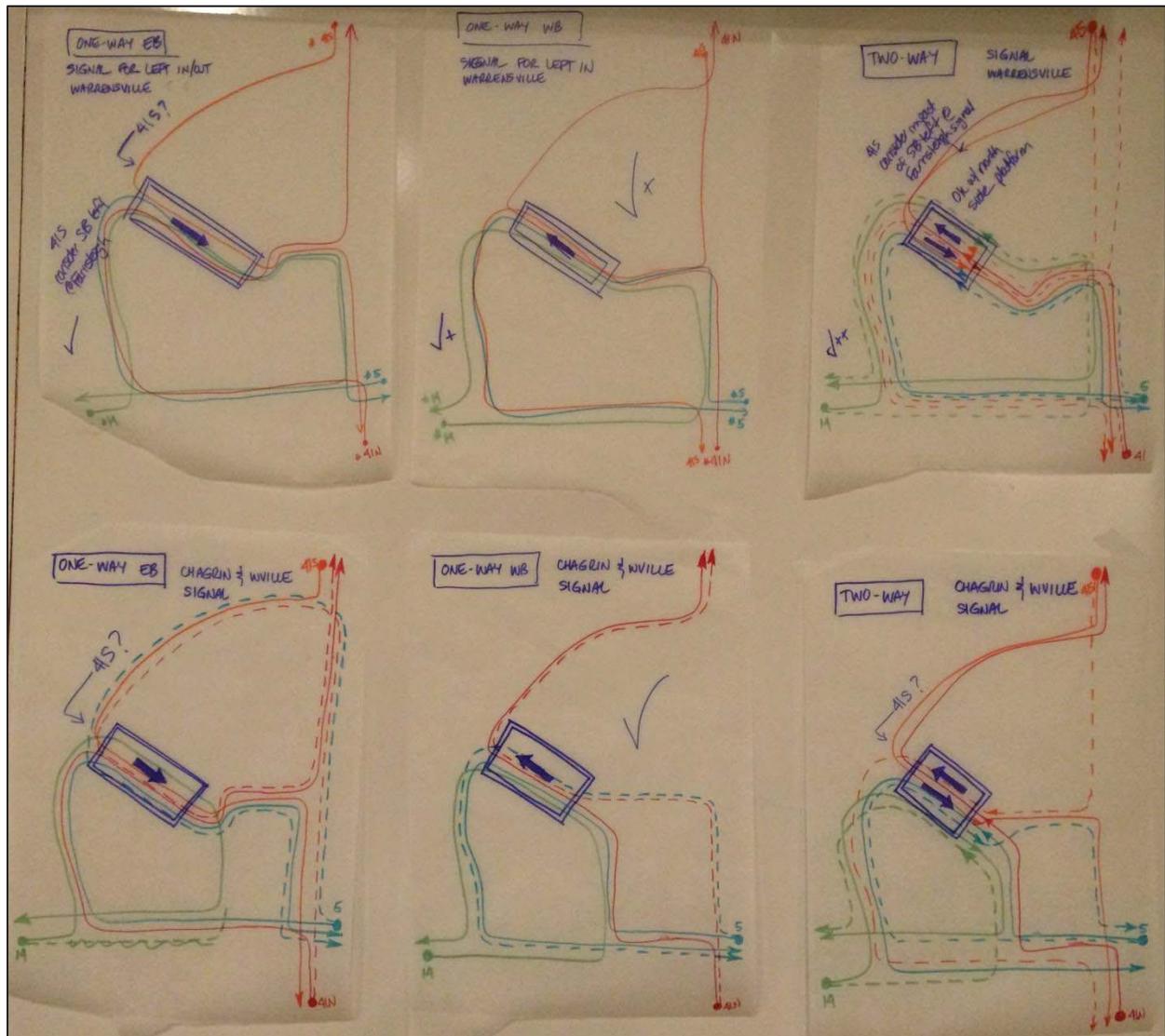


Figure 2: Bus Routing for the Three Access Options (unsignalized on Warrensville and Chagrin)
 Top Row: Access via Farnsleigh (signalized) and Warrensville (signalized).
 Bottom Row: Access via Farnsleigh (signalized), Chagrin (unsignalized) and Warrensville (signalized).

Workshop Progress Update, Baker Conference Room

3:30-5:00 p.m.

Purpose: Review general concept progress and determine which access patterns and bus routings would be acceptable.

The workshop team reviewed the general concepts and associated bus routing with other members of the project team. Key discussion points are noted below.

- ◇ The group agreed with the three development concepts that are needed to effectively address site development and transit operations within the identified schedule constraints.

1. Interim: From opening of the reconfigured Warrensville/Chagrin intersection in 2015 until construction of the signal at the new site access road intersection on Warrensville. RTA wants to be able to accommodate 4-5 buses (this is an increase over the current/designed plan that accommodates 3 buses without blocking bus flow).
 2. Phase 1: Initial site development, generally north of the RTA tracks. Includes north-south road connection to Chagrin and substation relocation. (Soonest for substation relocation is 2015.)
 3. Phase 2: Long term, complete site development, adds the Wald-Fisher property south of the RTA tracks. Includes north-south roadway connection at Chagrin/Lomond.
- ◇ Based on bus routing and operations associated with the different access configurations, the group agreed that site access must be provided at both Warrensville and Chagrin, with a preference for two-way operations for bus loading adjacent to the Blue Line rail platform. Additionally, it was noted that any bus circulation patterns that required an inbound left turn across the tracks from Farnsleigh to the site are undesirable for operational and safety reasons.
- ◇ Rail considerations, prioritized in order of preference and cost (high preference is high cost)
1. Relocate crossover and 3rd track west of Farnsleigh
 - *Combine Farnsleigh & Warrensville Stations*
 - *Shift Warrensville (site) platform to west, as far as possible*
 2. Relocate 3rd track to west
 - *South side of Farnsleigh Station (takes parking but not station)*
 - *Existing crossover and platform remain in place*
 3. Relocate 3rd track to north of existing platform
 - *Improves bus/rail transfer (for bus area south of rail which provides more efficient bus operations)*
 4. Do nothing
- ◇ Traffic operations
- Provide traffic signal on Warrensville for site access
 - *Options for providing northbound left access (SB double left, SB shorten left turn lane) may impact signal operations at new Warrensville/Chagrin intersection.*
 - *Signal needed for bus operations and for viability of site development*
 - *Signal not expected to meet OMUTCD peak hour warrant*
- ◇ Some concept sketches were reviewed and discussed, but there was general understanding and agreement that Day 2 of the workshop would be used to develop specific site layouts based upon the work done in Day 1.

Workshop 2, Day 2

December 16, 2014

Workshop Attendance on Day 2				
Workshop	Summary & Recs	Organization	Name	email
X	X	Shaker Heights	Joyce Braverman	Joyce.Braverman@shakeronline.com
-	X	Shaker Heights	Ann Klavora	Ann.Klavora@shakeronline.com
-	X	RMS	Luke Palmisano	LPalmisano@rmscorporations.com
-	X	GCRTA	Mike Schipper	MSCHIPPER@gcrta.org
-	X	GCRTA (planning)	Maribeth Feke	MFEKE@gcrta.org
X	X	GCRTA (planning)	Valerie Shea	VSHEA@gcrta.org
-	X	GCRTA (operations)	John Palagyi	jpalagyi@gcrta.org
-	X	GCRTA (engineering)	Joe Shaffer	jshaffer@gcrta.org
-	-	GCRTA (operations)	Joel Freilich	JFREILICH@gcrta.org
-	-	GCRTA (rail)	Dennis Rehfuss	drehfuss@gcrta.org
-	X	Bialosky	Jack Bialosky Jr	jack@bialosky.com
-	X	Bialosky	Brad Valtman	bvaltman@bialosky.com
X	X	Bialosky	David Craun	dcraun@bialosky.com
X	X	Baker	Nancy Lyon-Stadler	nlyonstadler@mbakerintl.com
X	X	Baker	Jim Shea	Jim.Shea@mbakerintl.com
X	X	Parsons Brinckerhoff	Tim Rosenberger	Rosenberger@pbworld.com
X	X	CSS	Skip Smallridge	ssmallridge@cssboston.com
-	X	HNTB	Matt Wahl	mwahl@hntb.com

Workshop, Baker Conference Room

8:30 a.m.-2:30 p.m.

Purpose: Incorporate concept details for general concepts that were identified as feasible at the end of Day 1.

The workshop team focused on generating concepts that built off the Day 1 outcomes, with plans for Interim (end of 2015, no signal on Warrensville), Phase 1 and Phase 2 with access via both Warrensville and Chagrin.

Workshop Summary & Recommendations, Baker Conference Room

2:30-4:30 p.m.

Purpose: Reviewed refined concepts, identify preferred concepts, and develop recommendations.

The workshop team reviewed the design concepts with other members of the project team, as shown on the pages below. Recommendations for the preferred design concept are listed below and are cumulative in their development (i.e., Phase 1 builds on Interim and Phase 2 builds on Phase 1).

◇ Interim:

- Site access via Farnsleigh, Chagrin and Warrensville
- Two-way bus flow along the south side of the rail platform
- Substation remains in place

- RMS will investigate opportunity to work with Walgreens for consolidated site access to minimize impacts of potential reconstruct of the north-south access road.

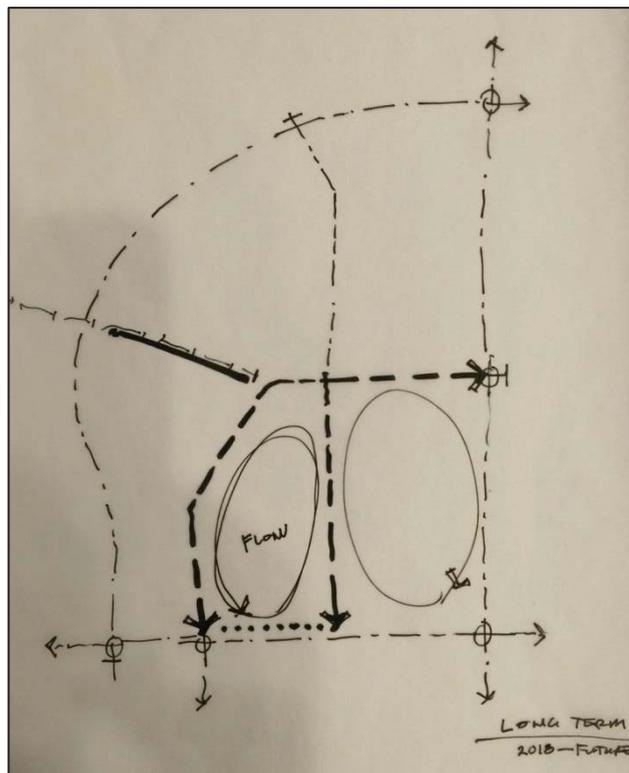
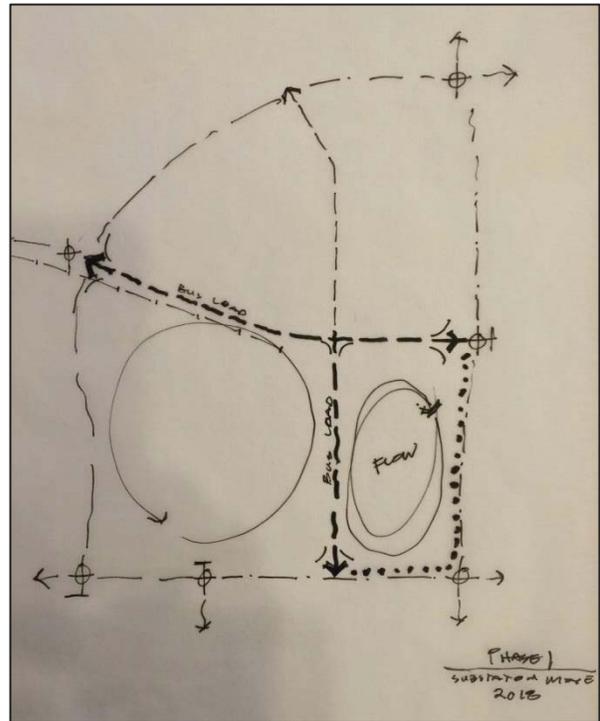
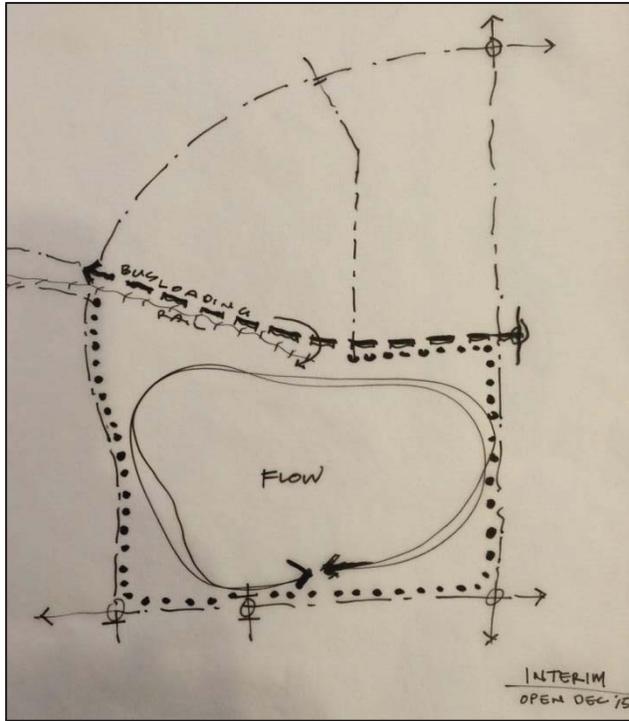
- ◇ Phase 1:
 - Signalize Warrensville access intersection

- ◇ Phase 2:
 - Relocate substation
 - Complete site buildout, providing internal circulation roadways while avoiding direct impacts to the Walgreens building.

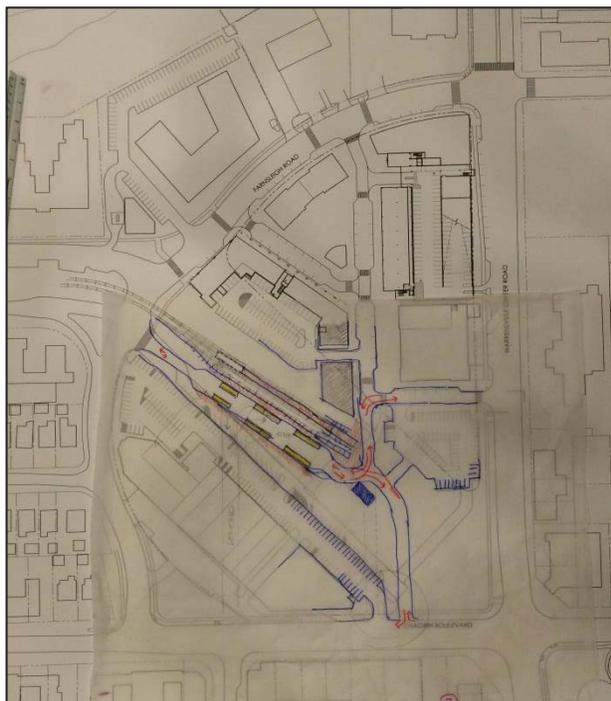
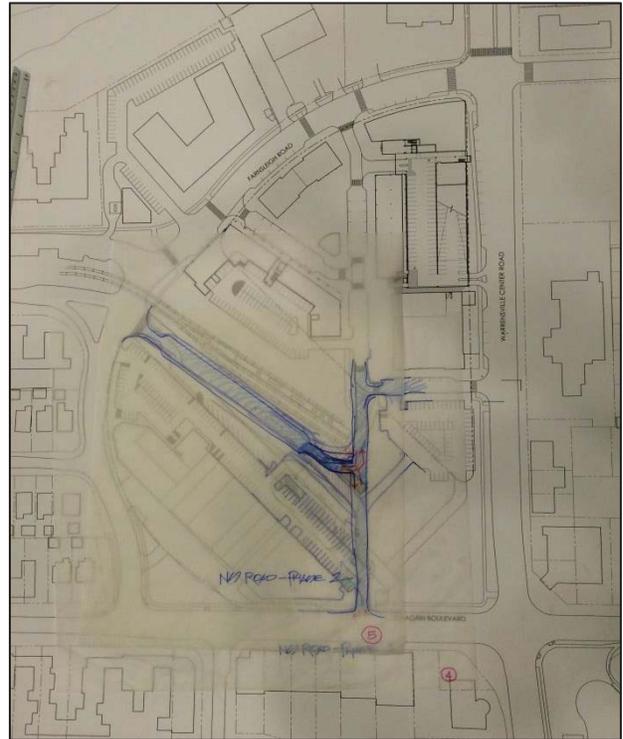
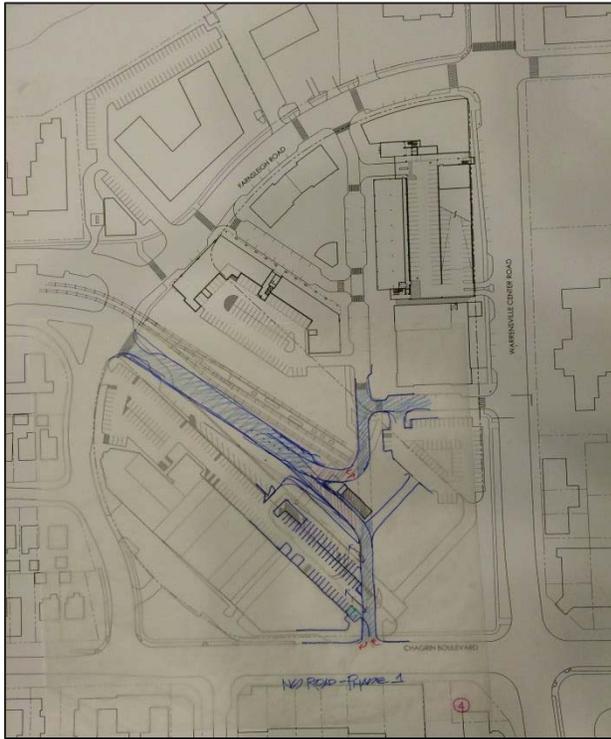
Additional considerations:

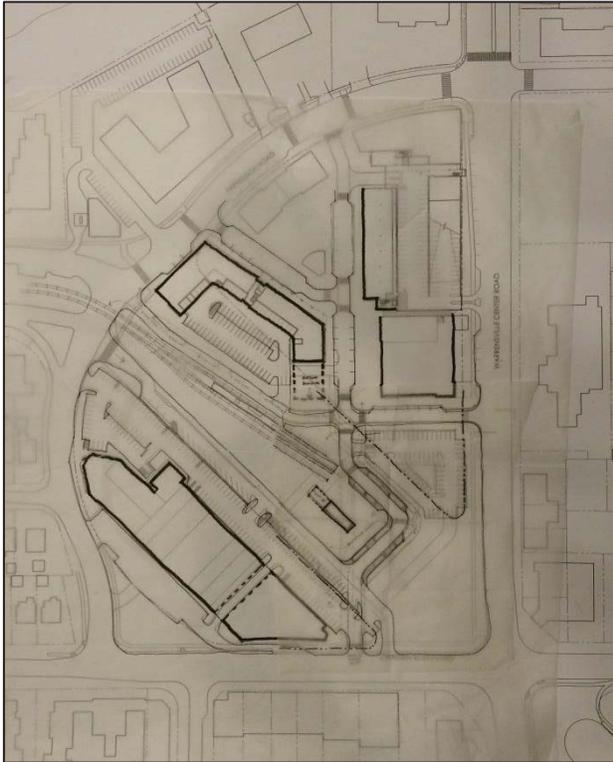
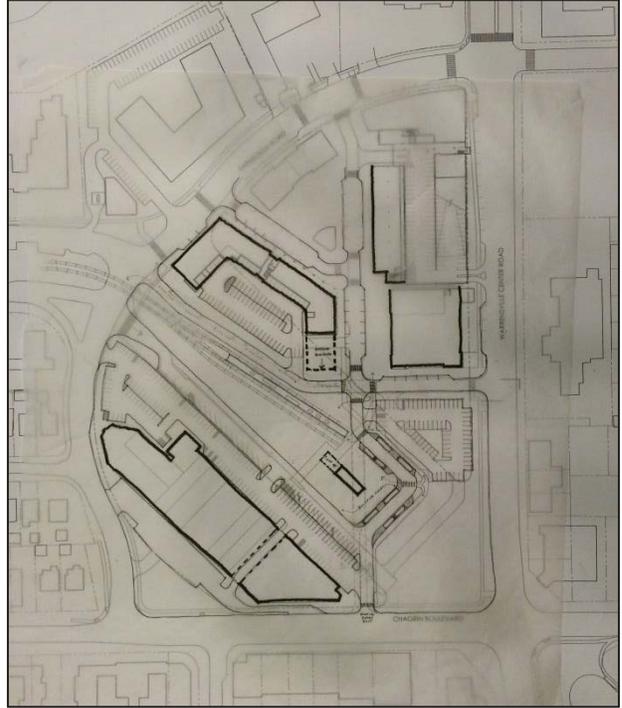
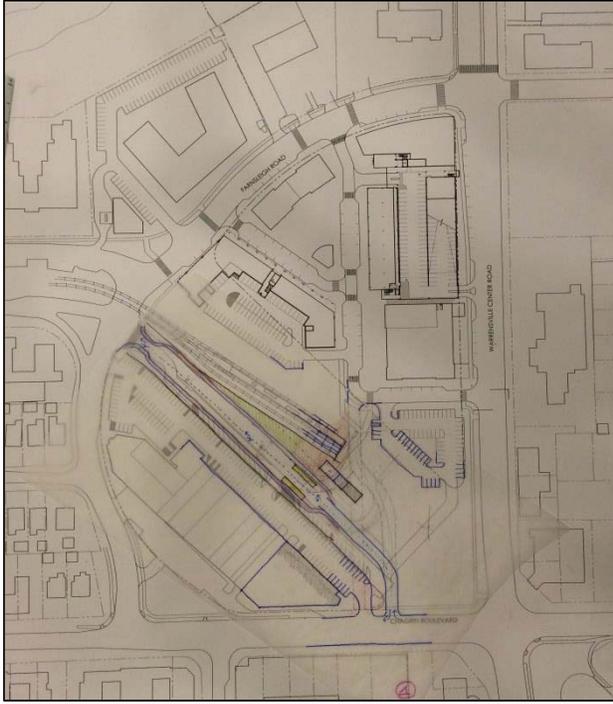
Relocation of the crossover and the third track to the west of Farnsleigh is feasible. It would necessitate consolidation of the Farnsleigh Station with the Warrensville/Van Aken Station. The expense to do this may be justifiable.

These three figures show the general bus routing flow patterns for Interim, Phase 1 and Phase 2 conditions.

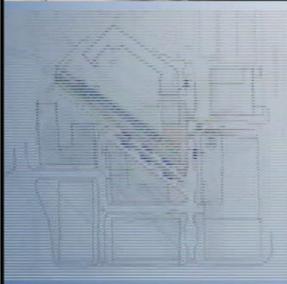
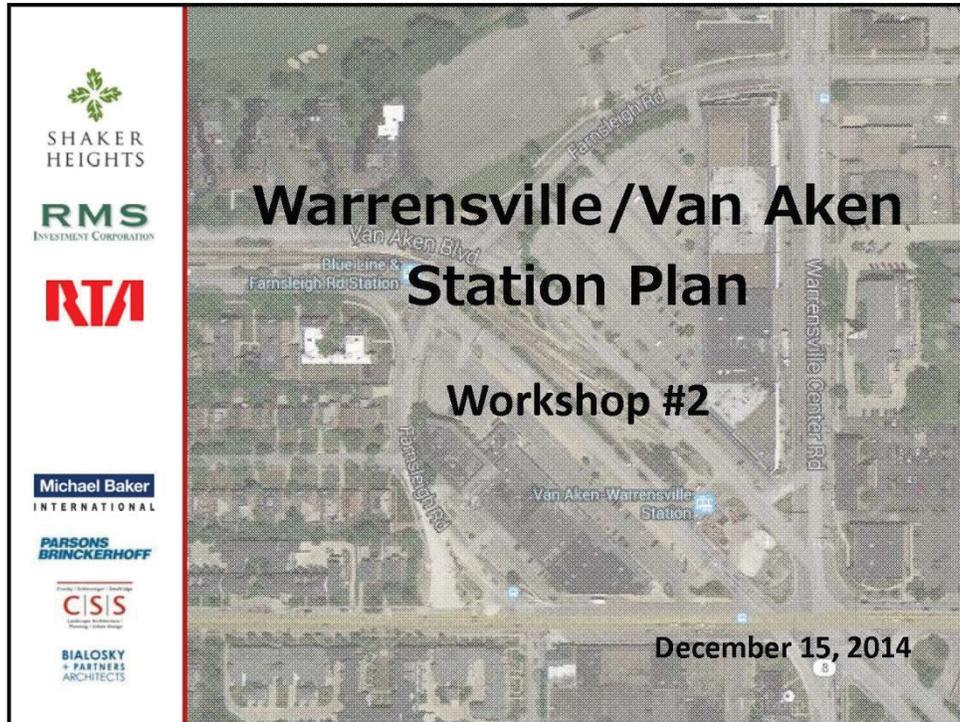


The following seven figures show the bus-rail transfer along the south side of the tracks for Interim and Phase 1 conditions. They show various options regarding substation location (remains in place, future relocation) and Chagrin access road configuration options with zero or minimal impacts to the Wald-Fisher property and Walgreens.





Day 1 Presentation at Introduction Meeting
(December 15, 2014 in RTA Board Room)



Agenda

Monday

- 8:30-9:30 Workshop Introduction
 - Workshop #1 outcomes
 - Design parameters & constraints
- 9:30-5:00 Workshop
 - Refine concepts

Tuesday

- 8:30-2:30 Workshop
 - Refine concepts
 - Develop recommendations
- 2:30-4:00 Summary & Recommendations

Rail Design Parameters

Platform

- 300 ft platform + 15/20 ft attenuator
- Center platform preferred
- Head platform loading is acceptable
- Pedestrian crossovers at both ends of platform

3rd Track & Crossover

- 3rd track requires 75 ft turnout
- 3rd track min length 280 ft
- Rail crossover replacement not in Capital Plan

Substation

- Substation replacement not scheduled
(if added to capital plan, soonest completion is 2018)

Bus Design Parameters

Parking Capacity

- 8 buses
Goal: 4 artics + 4 x 40 ft
Requested minimum: 2 artics + 6 x 40 ft

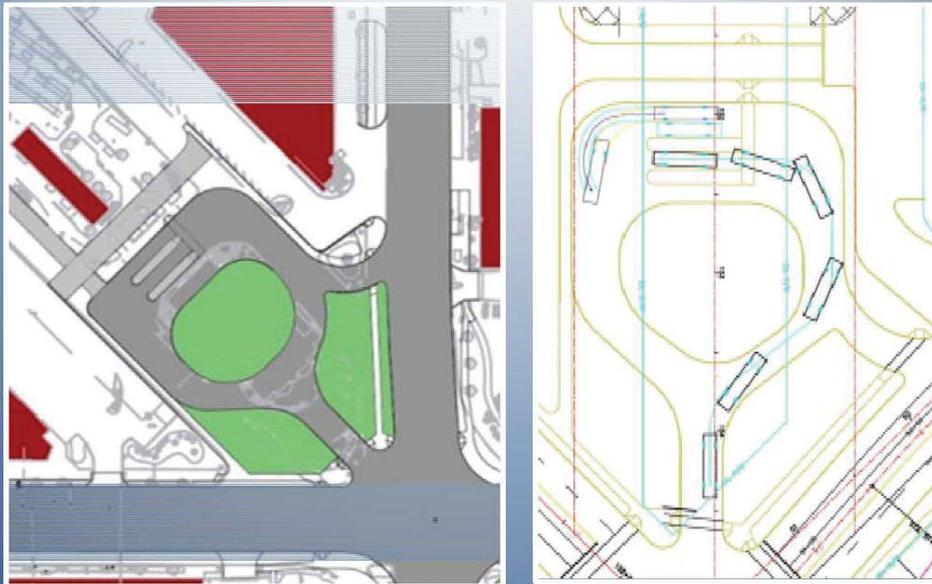
Geometrics

- 10 ft platform for loading/alighting
- 40 ft spacing between bus
- 23 ft carriageway for passing
- Bus turning radii: Outside/inside 50 ft/30 ft

Other

- Minimize bus-ped conflict
- Minimize travel time impacts
- Provide kiss-and-ride area (2-3 vehicle parking)

Bus Loop



Development Design Parameters

- Integrity of street grid
- Accommodate minimum parcel dimensions
- Public realm integrates transit and development
- Transit integral part of site and visible from street
 - *Integrate transit within site development, designed to encourage future development*
 - *Avoid massive bus parking area*
 - *Integrated urban experience*
 - *Transit doesn't inhibit pedestrian flow within the site*
 - *No buses on internal roads to north and northwest to accommodate closure for events*

ODOT & County Input

Roadway

- Non-performing the bus loop is supported
- New road(s) must be within existing right-of-way to avoid impact to environmental document
Constructing the internal road south to Chagrin does not meet this requirement

Traffic Signal

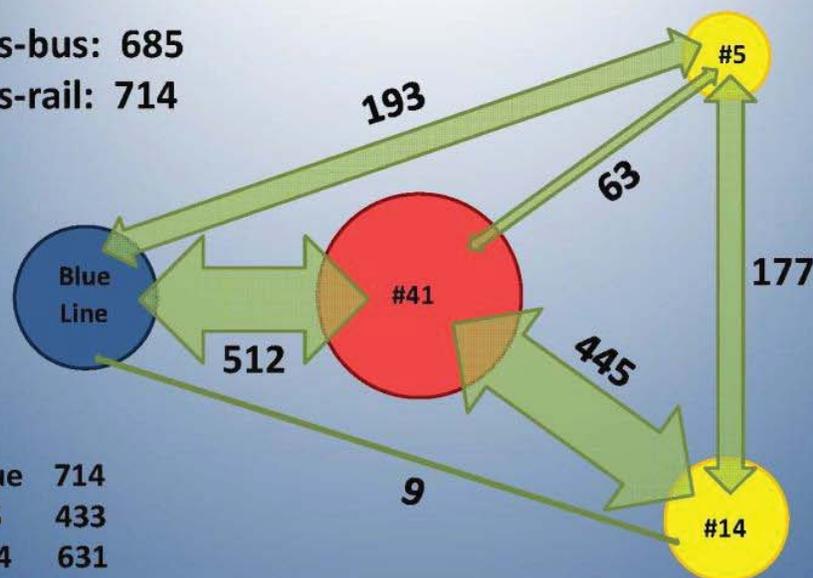
- Study potential signal on Warrensville signal between Chagrin and Farnsleigh
- Update HNTB synchro model to assess traffic impacts with proposed new signal
- Model RTA operations with new signal (90 sec cycle)

Change Orders

- Designed and to County by March 1 (May 1st is cut-off)
- May include: non performing bus loop, adjusting the light timing, possibly adding a light at the new road, building a new road if we think it could work

RTA TRANSFERS

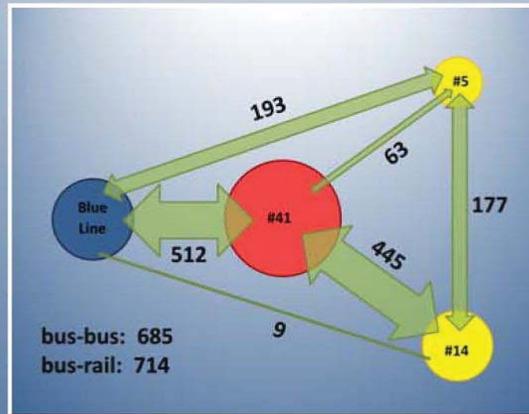
bus-bus: 685
 bus-rail: 714



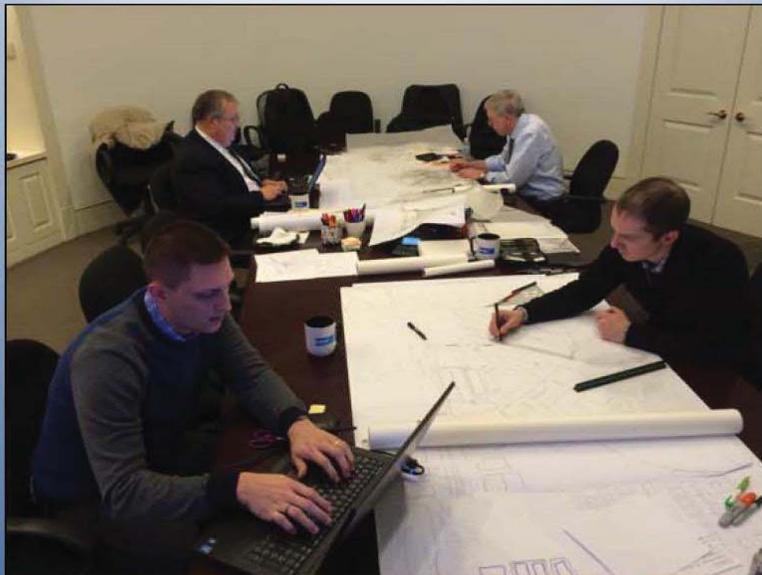
Blue	714
#5	433
#14	631
#41	1,029

Ridership Conclusions

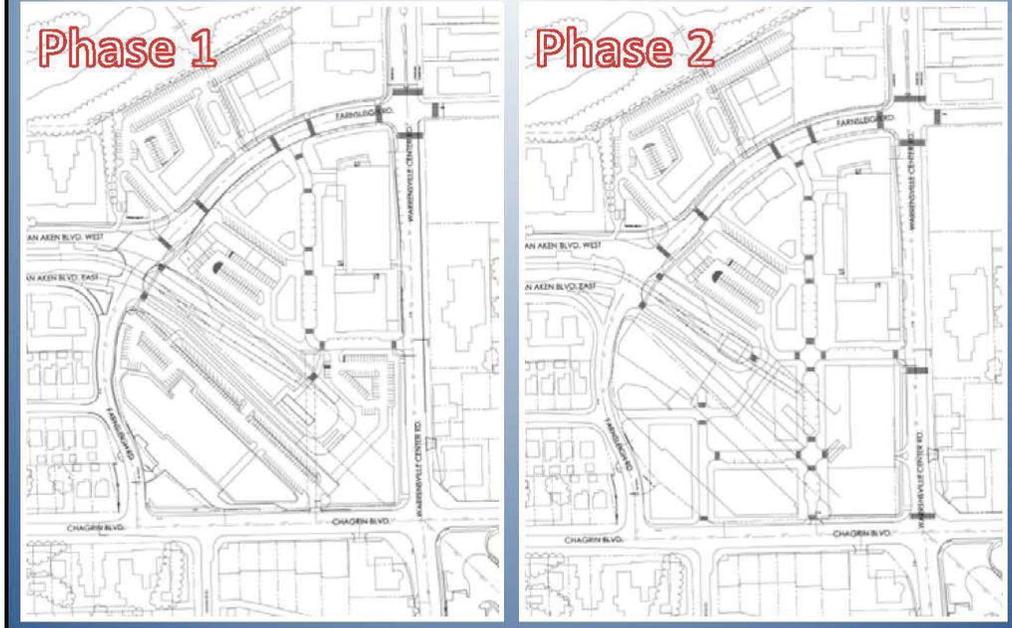
- Bus-bus and bus-rail transfers equally important
- Development will increase destination riders



Concept Development



Phased Development



General Items

Short term

- Site access and circulation
- Accommodate bus and rail transit

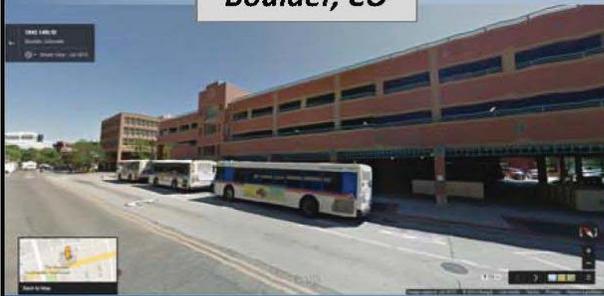
Long term

- Relocate substation
- Relocate crossover
- Relocate 3rd track
 - Optimize opportunity to integrate transit within development
 - Combine Warrensville & Farnsleigh Stations
- Parking garage & bus operations

Collocate Bus + Parking



Boulder, CO

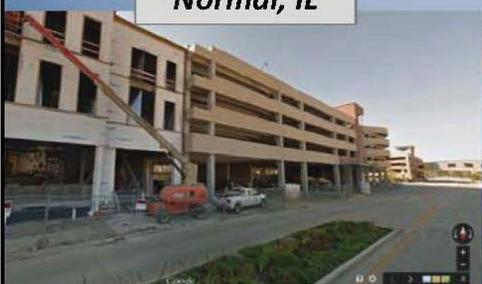


- Bus bays on ground level and on-street
- Vehicle parking on upper levels
- Transit well-integrated within the site
- Minimizes visual impact of transit

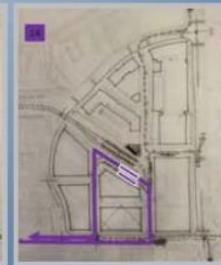
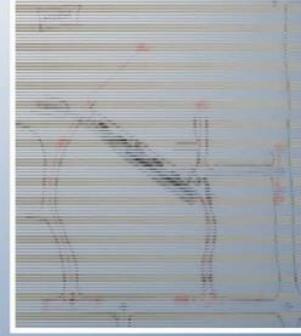
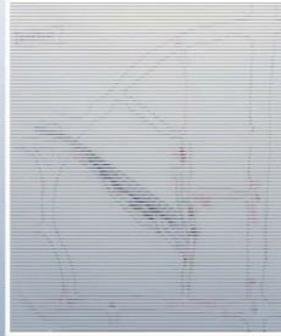
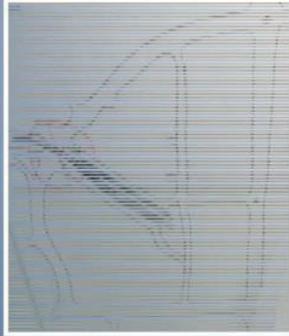
Normal Intermodal Center



Normal, IL



Interim Concepts

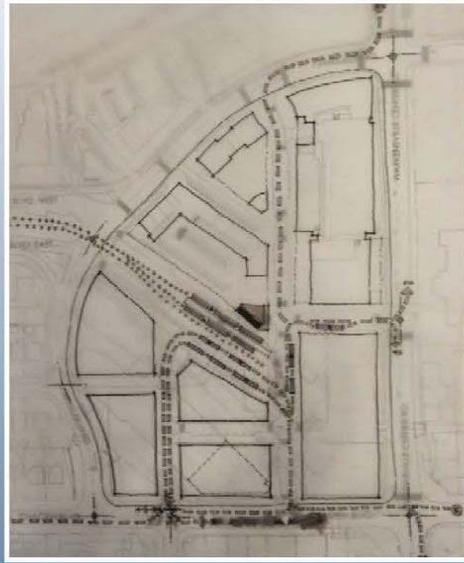


Short Term 1



- Bus circulation near corner
- Interior road
- Relocate substation
- Minimal track work (at end, public interface)
- Would benefit from shorter rail platform
- Also works for long term
- Transit waiting area along Phase 2 retail (SE corner of site)

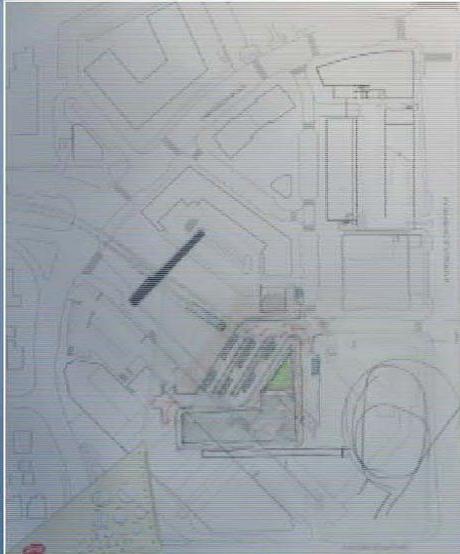
Option 1 Phase 1 (Short Term 1) & Phase 2



Short Term 2

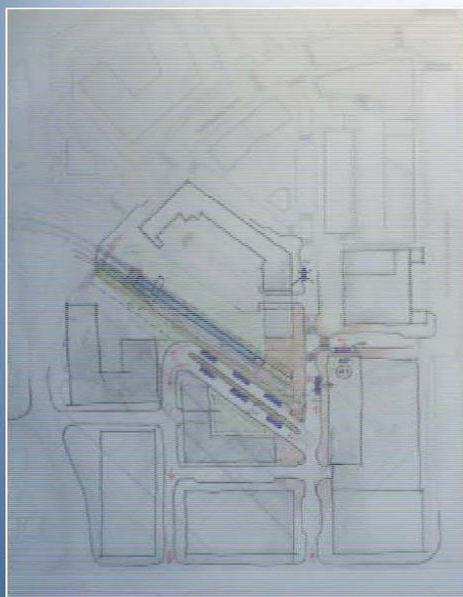
- Relocate substation
- Optional crossover relocation (to gain green space)
- Single curb bus boarding
- Center rail platform
- Wald-Fisher parking along Van Aken likely becomes inaccessible
- Also works long term

Long Term 1



- Relocate substation
- Relocate crossover
- Combine Farnsleigh Station
- Massed bus depot area, consolidated bus ops

Long Term 2

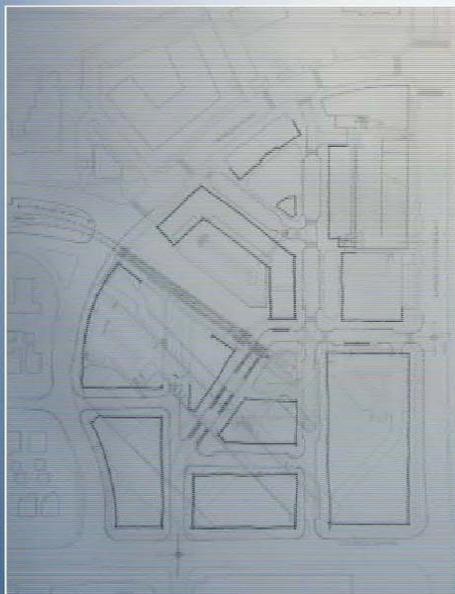


- Substation relocation
- Optional crossover relocation (to gain green space)
- 2 bus platforms
- Transit frontage on west side of interior road
- Short bus circulation
- Center platform
- Relocate 3rd track to Farnsleigh (preferred for development) or north side



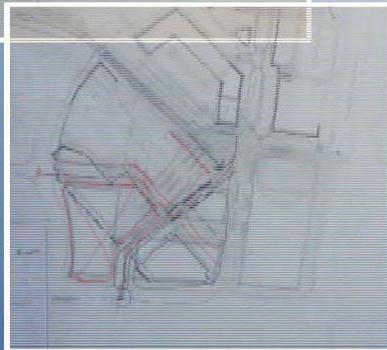
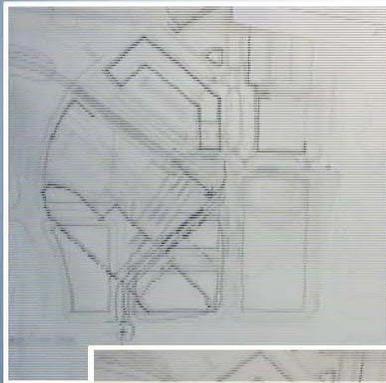
Long Term 2 with Garage

- Substation relocation
- Optional crossover relocation (to gain green space)
- 2 bus platforms
- Integrate transit in parking garage
- Short bus circulation
- Center platform
- Relocate 3rd track to Farnsleigh (preferred for development) or north side



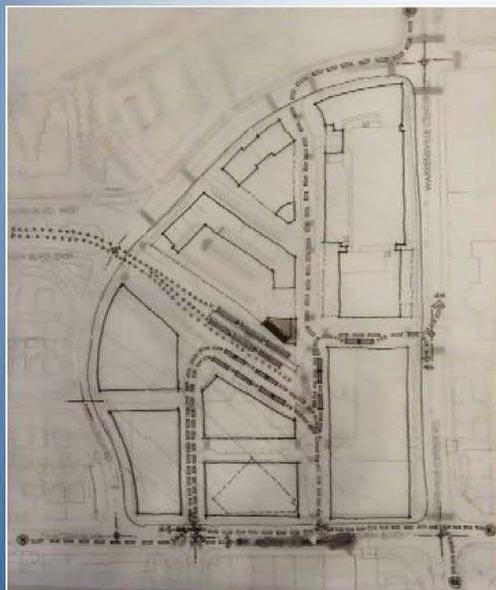
Long Term 4

- 2-way bus ops, minimizes transit footprint
- Odd parcels for development
- Relocate substation
- Relocate crossover



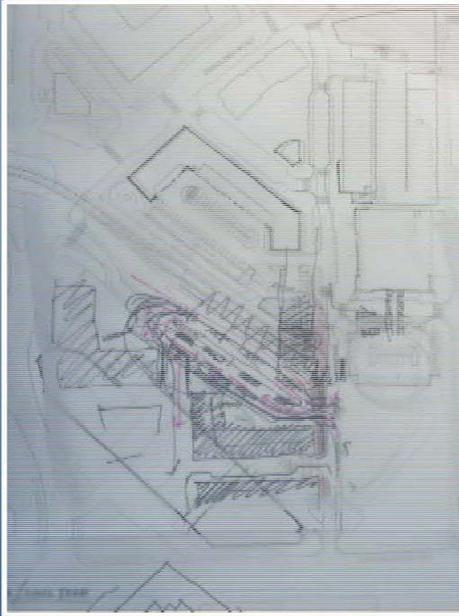
Transition from ST 1 to LT4

- Does not require relocation of track or crossover
- Relocation of substation is required
- Walgreens is in place, partial demo of Wald-Fisher



Long Term 5

- Does not require relocation of track or crossover
- Relocation of substation is required



Skip's 5A

- No relocation of track or crossover
- Relocate substation
- Walgreens is in place, no demo of Wald-Fisher

More Ideas/Concepts

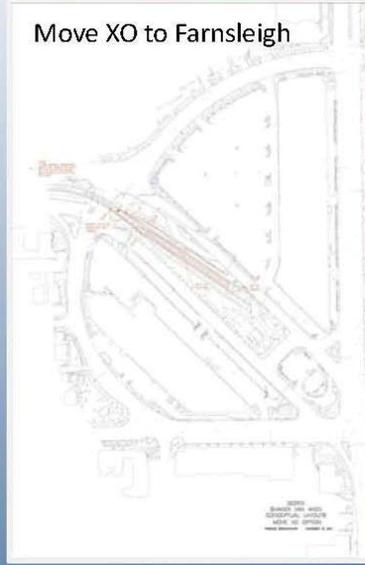


Track Alignments

Shift Rail West

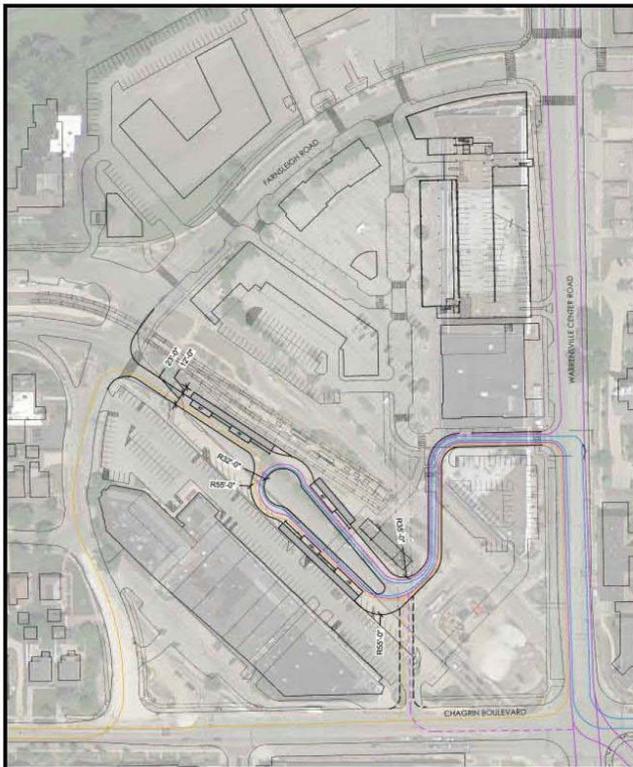


Move XO to Farnsleigh



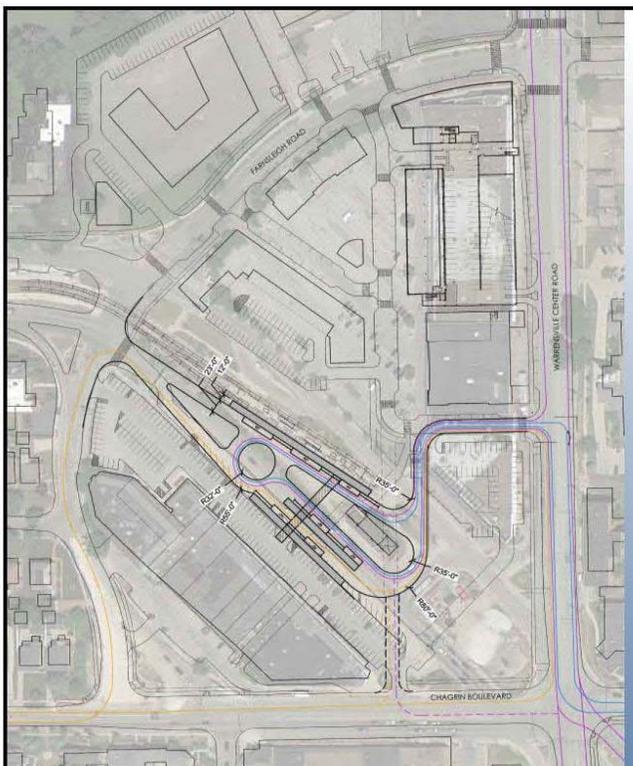
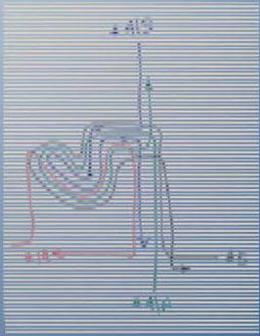
More Concepts – Phase 1





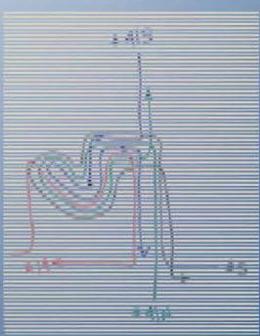
Phase 1 Option 1

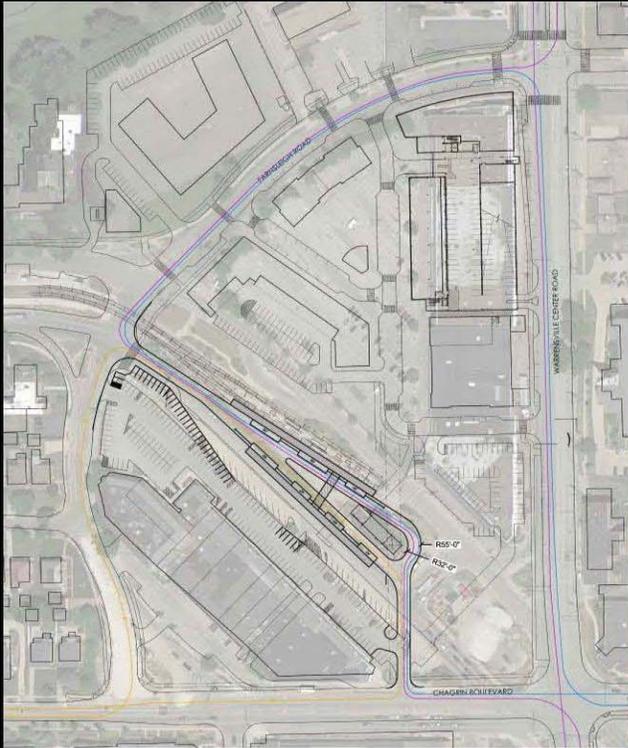
- Substation in situ
- Station on public land
- Access via east site road (no Chagrin access)



Phase 1 Option 2

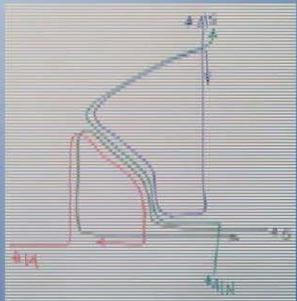
- Substation in situ
- Station on public land
- Access via east site road (no Chagrin access)





Phase 1 Option 4

- Substation in situ
- Station on public land
- Chagrin curb cut could be moved to east onto land currently used by RTA

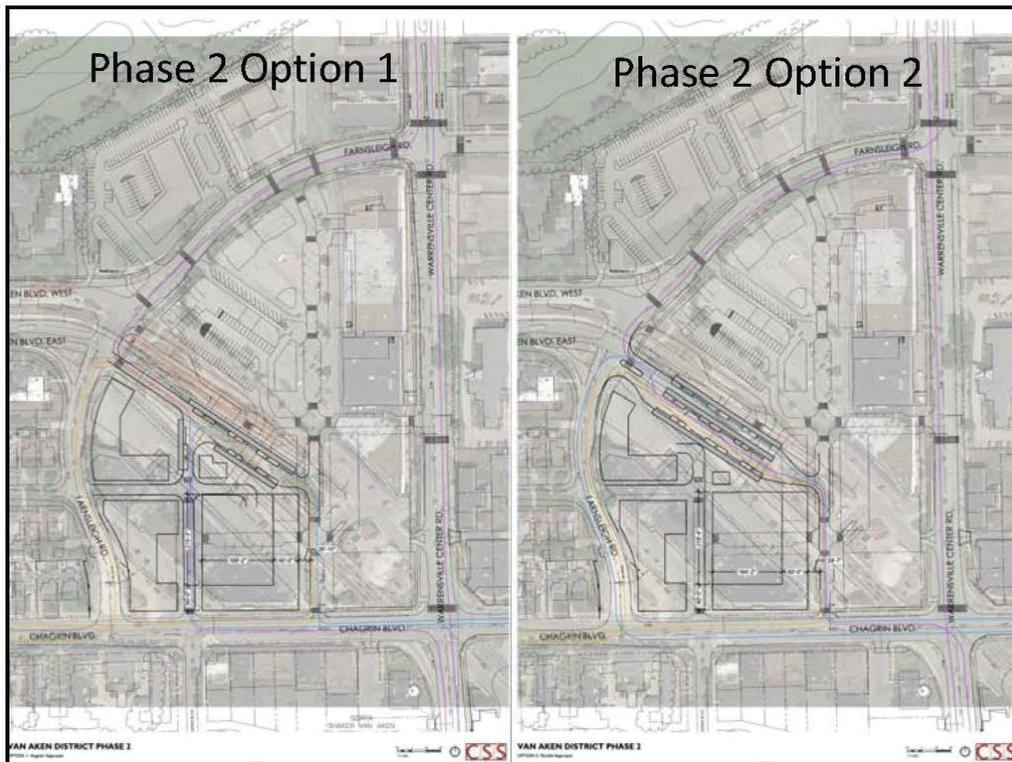
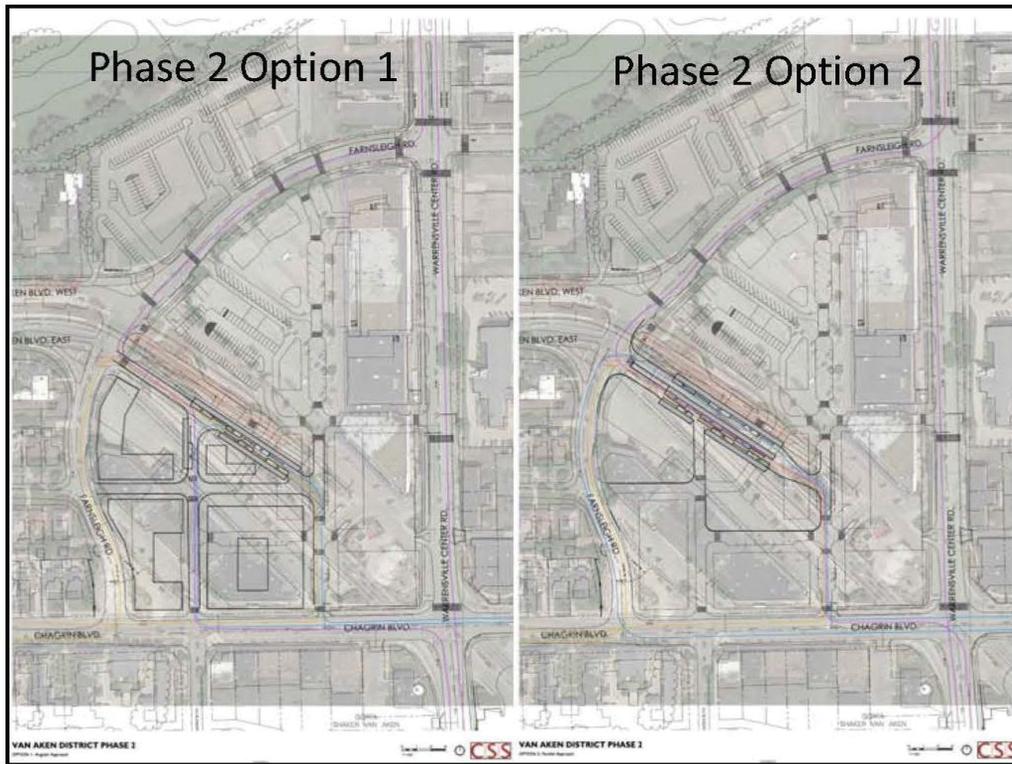


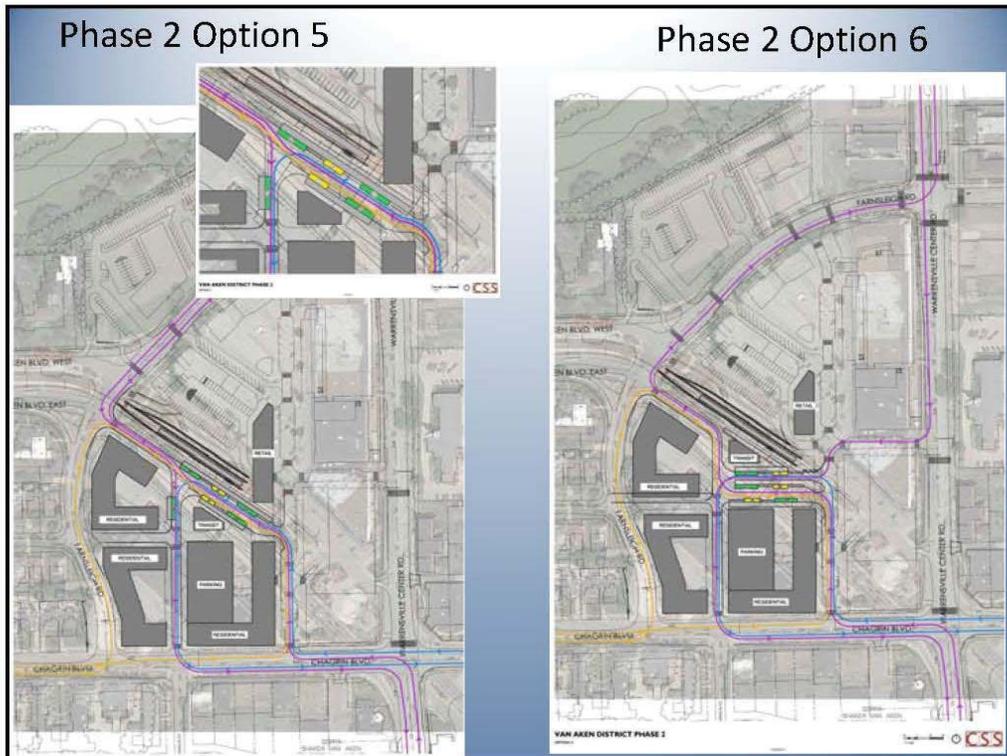
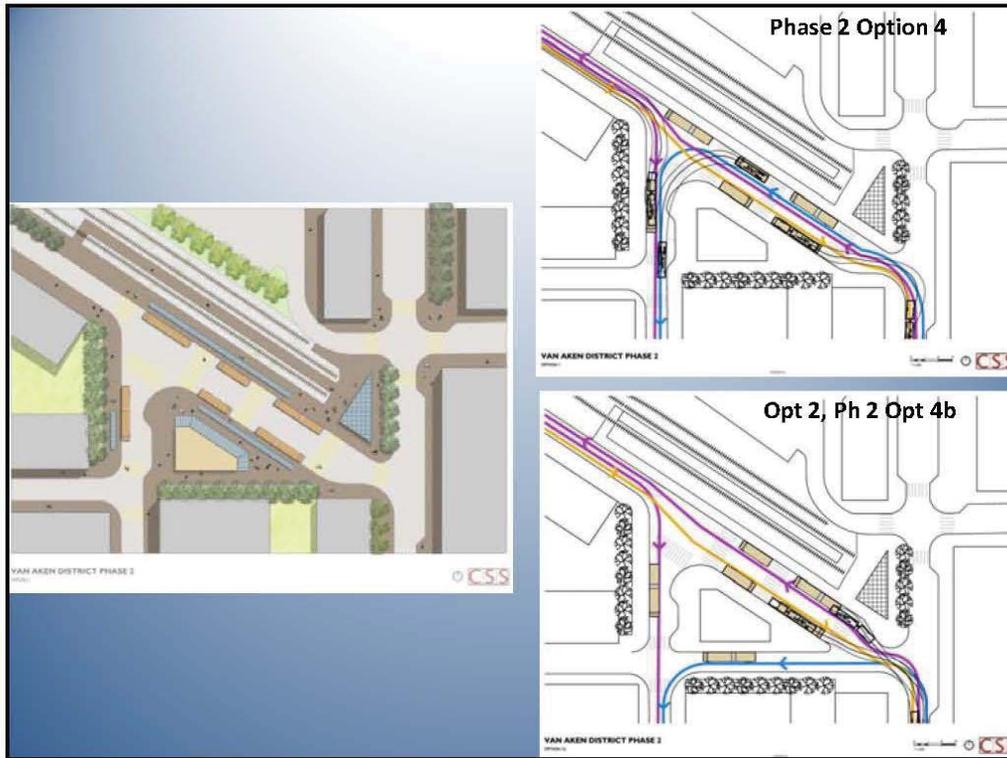
Phase 2 Option 1A



Phase 2 Option 2A

VAN AKEN DISTRICT PHASE 2
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Questions? Comments?

What else?

Discussion and Direction

Substation

- RTA assessing conditions of substations system-wide. Will use that information to program the Capital Plan. Capital plan will be set Aug 2015 and then entered into NOACA TIP process.
- 2018 is soonest any new substation could be built..

Tuesday

- 8:30-2:30 Workshop
 - *Refine concepts*
 - *Develop recommendations*
- 2:30-4:00 Summary & Recommendations

*Warrensville/Van Aken
Station Area Plan*



**Project Meeting
January 27, 2015**

Warrensville/Van Aken Station Plan
Assess and Finalize Concept

January 27, 2015

Logos: SHAKER HEIGHTS, RMS, RTA, Michael Baker INTERNATIONAL, PARSONS BRINCKERHOFF, CISIS, BIALOSKY PARTNERS ARCHITECTS

Agenda

1. Welcome and review meeting purpose
2. Review technical design parameters and constraints
3. Rail design considerations
 - Existing
 - Relocate third track
 - Relocate third track and crossover
4. Review concept and considerations
 - Interim (December 2015), Phase 1, Phase 2
 - Bus routing and intermodal transfers
 - Traffic operations and considerations
5. Discussion of concepts
6. Traffic operations
7. Project wrap up

Development Design Parameters

- Integrity of street grid
- Accommodate minimum parcel dimensions
- Public realm integrates transit and development
- Transit integral part of site and visible from street
 - Integrate transit within site development, designed to encourage future development
 - Avoid massive bus parking area
 - Integrated urban experience
 - Transit doesn't inhibit pedestrian flow within the site
 - No buses on internal roads to north and northwest to accommodate closure for events

1/27/2015

Bus Design Parameters

Parking Capacity

- 8 buses
- Goal: 4 artic + 4 x 40 ft
- Requested minimum: 2 artic + 6 x 40 ft

Geometrics

- 10 ft platform for loading/alighting
- 40 ft spacing between bus
- 23 ft carriageway for passing
- Bus turning radii: Outside/inside 50 ft/30 ft

Other

- Minimize bus-ped conflict
- Minimize travel time impacts
- Provide kiss-and-ride area (2-3 vehicle parking)

1/27/2015

Passenger Experience

bus-bus: 685
bus-rail: 714

Bus Ride Experience

- Travel time on the bus

Transfer Experience

- Bus-bus and bus-rail
- Proximity: walking distance
- Convenience, ease of access, general experience

1/27/2015

Rail Design Parameters

Platform

- 300 ft platform + 15/20 ft attenuator
- Center platform preferred
- Head platform loading is acceptable
- Pedestrian crossovers at both ends of platform

3rd Track & Crossover

- 3rd track requires 75 ft turnout
- 3rd track min length 280 ft
- Rail crossover replacement not in Capital Plan

Substation

- Substation replacement not scheduled (if added to capital plan, soonest completion is 2018)

1/27/2015

Rail Infrastructure

Existing

- Provide pedestrian access across 3rd track, at both ends of rail platform

Relocate 3rd Track

- Consolidate Warrensville and Farnsleigh Stations
- Facilitate access to both sides of rail platform

Relocate 3rd Track & Crossover

- Shift platform toward Farnsleigh
- Better site development opportunities

1/27/2015

Rail Infrastructure



Existing

- Provide pedestrian access across 3rd track, access at both ends of rail platform

1/27/2015

Rail Infrastructure

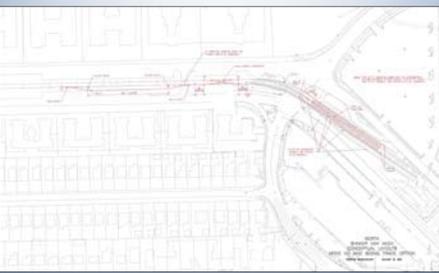


Relocate 3rd Track

- Consolidate Warrensville and Farnsleigh Stations
- Facilitates access to both sides of rail platform

1/27/2015

Rail Infrastructure



Relocate 3rd Track & Crossover

- Shift platform toward Farnsleigh
- Better site development opportunities

1/27/2015

Concept Development



1/27/2015

Phased Development

Interim (December 2015)

- North-south connection to Chagrin
 - Coincident with Walgreens driveway
 - Adjacent (no impact) to Walgreens driveway
- New road(s) within existing right-of-way

Phase 1

- East-west access to Warrensville, with traffic signal
- Relocate substation (*soonest possible in 2018*)
- Site development north of tracks
- Anticipated schedule? (*Fresh Market, east-west road and new signal*)

Phase 2

- Full site development
- Rail infrastructure modifications (if applicable)
- Anticipated schedule?

1/27/2015

Interim Concept A



- Two-way access on south side of rail platform
- Bus access via Farnsleigh and Chagrin
- Chagrin access shares Walgreens driveway **VERIFY**
- Traffic operations
- Bus routing

1/27/2015
HALL ASHBY DISTRICT PHASE 1
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Interim Concept B



- Two-way access on south side of rail platform
- Bus access via Farnsleigh and Chagrin
- Chagrin access separate from Walgreens driveway
- Traffic operations
- Bus routing

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HALL ASHBY DISTRICT PHASE 1
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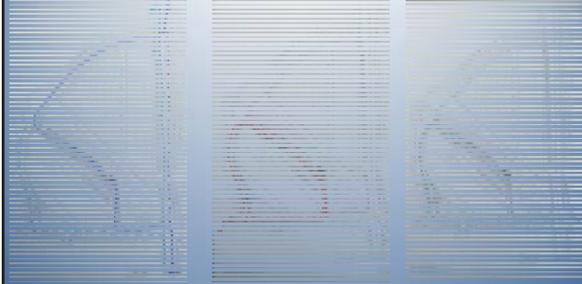
Interim Concept C



- One-way loop around rail platform
- Bus access via Farnsleigh and Chagrin
- Bus pick up/drop off could be north and south of platform or south only
- Traffic operations
- Bus routing

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HALL ASHBY DISTRICT PHASE 1
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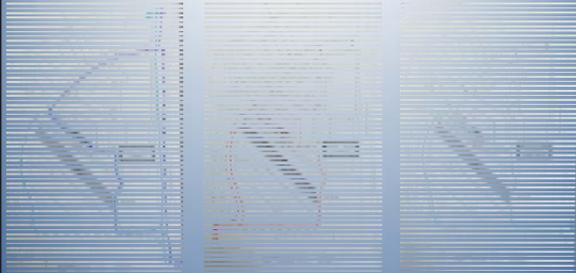
Interim Bus Routing (A & B)



#41 #14 #5

1/27/2015

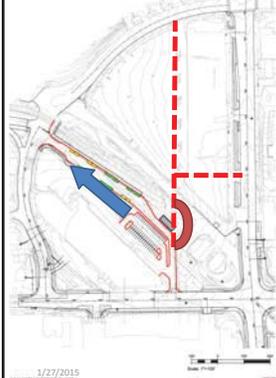
Interim Bus Routing (C)



#41 #14 #5

1/27/2015

Phase 1 Concept from Interim



- Wville access road & signal
- Relocate substation relocation (provide bus loop around substation if RMS & RTA schedules don't align)

1/27/2015
HALL ASHBY DISTRICT PHASE 1
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Phase 1 Concept A

- Two-way access on south side of rail platform
- Bus access via Farnsleigh, Chagrin, Warrensville
- Traffic operations
- Bus routing

Phase 1 Concept B

- One-way loop around rail platform
- Bus access via Farnsleigh and Chagrin
- Bus pick up/drop off could be north and south of platform or south only
- Traffic operations
- Bus routing

Phase 1 Bus Routing (A)

#41 #14 #5

Phase 1 Bus Routing (B)

#41 #14 #5

Phase 2

Ph2 Build Out Ph2 Transit Green Ph2 Transit Plaza

Phase 2 from Interim-Ph 1

Ph2 Build Out

- Relocate 3rd track
- Relocate x-over
- Realign bus drop off curb to align with tracks & platform
- Leave area south of busway as gray blob
 - Show additional N-S road with dashed line
 - If new N-S road goes in, how does that affect 1-way ops on busway? Can we make it 2-way for west section?
- North side service road 1-way WB with right out only at Farnsleigh, show with dashed lines.
- Blue arrow-restricted, orange arrow, open to public. Will that work?

Phase 2

Ph2 Transit Green

Phase 2

Ph2 Transit Plaza

Phase 2 Bus Routing

#41 #14 #5

Traffic Operations

- 2008 Warrensville/Van Aken TOD Development Plan

Development	ITE Code	Size	AM Peak		PM Peak	
			Enter	Exit	Enter	Exit
High Rise Apartments	222	500 DU	38	113	45	20
General Office Building	710	250,000 R ²	344	47	51	291
Shopping Center	820	160,000 R ²				
Total			382	160	96	310
- 2010 CUY-422-8.88, PID 85207

Certified Traffic Entering and Exiting Volumes	AM Peak		PM Peak	
	Enter	Exit	Enter	Exit
Total	430	230	240	370
- 2014 Warrensville/Van Aken Station Area Plan

Development	ITE Code	Size	AM Peak		PM Peak	
			Enter	Exit	Enter	Exit
High Rise Apartments	222	305 DU	23	83	79	48
General Office Building	710	401,300 R ²	512	70	89	419
Shopping Center	820	29,000 R ²	146	28	102	109
Total			681	181	270	376

Traffic Operations

Trip Development	AM Peak		PM Peak		
	Enter	Exit	Enter	Exit	
2008 Warrensville/Van Aken TOD Development Plan (NOACA Developed Volumes)	Total	382	160	96	310
2010 CUY-422-8.88, PID 85207 (Certified Traffic Volumes)	Total	430	230	240	370
2014 Warrensville/Van Aken Station Area Plan (ITE Trip Generation 9th Edition Volumes)	Total	489	125	66	378

- Proposed development expected to generate similar volume of peak hour trips
- Recommend traffic study for proposed development with proposed land use and trip generation
 - Provide accurate reflection of site access and associated traffic impacts

Project Wrap-Up

- Preferred concept
 - Interim (Dec 2015)
 - Phase 1
 - Phase 2
- Traffic operations
- Parking
- Bicycle & pedestrian access
- Funding strategies
- Cost estimate
- Documentation

1/27/2015

ODOT & County Input

Roadway

- Non-performing the bus loop is supported
- New road(s) must be within existing right-of-way to avoid impact to environmental document
 - Constructing the internal road south to Chagrin does not meet this requirement*

Traffic Signal

- Study potential signal on Warrensville signal between Chagrin and Farnsleigh
- Update HNTB synchro model to assess traffic impacts with proposed new signal
- Model RTA operations with new signal (90 sec cycle)

Change Orders

- Designed and to County by March 1 (May 1st is cut-off)
- May include: non performing bus loop, adjusting the light timing, possibly adding a light at the new road, building a new road if we think it could work

1/27/2015

Bus Routing (workshop #2)

Signal at Warrensville access

No signal at Warrensville access

1/27/2015