Brooklyn Boulevard Corridor Study

DRAFT - Recommended Concept Report

City of Brooklyn Center

Prepared by:

SRF Consulting Group, Inc.

January 2013

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Concept Overview

The recommended concept for this segment of Brooklyn Boulevard (north of Trunk Highway 100 to Interstate 694) was developed to address the issues identified as part of the planning process, in addition to the findings listed in the existing conditions report. The recommended ultimate concept described here is a long term vision, with some portions to be phased in using interim concepts. In essence, the recommended concept has embraced the corridor's vision and goals, which were established early on in the planning process.

Additional guidance has also been given by elected leaders and policy makers, in addition to public input. For instance, the Planning Commission passed a resolution (Planning Commission Resolution 2012-22) supporting the draft design concepts for the 2012 Brooklyn Boulevard Corridor Study on November 29, 2012. This resolution serves as a supporting document to the study, which provides recommendations for future land use and design considerations along the corridor.

Concept Development

The recommended geometric layout was developed over the course of the study in cooperation with Technical Advisory Committee (TAC) members. Early drafts were presented and discussed at TAC meetings and at the first public open house, then refined to respond to stakeholder input. A summary of the recommended concept is illustrated in Figure 1 and detailed layouts can be found in Appendix A.

In essence, the geometric layout incorporates a balance between the required functions of an "A Minor" Arterial (mobility and access) connecting Interstate 694 (I-694) to Trunk Highway 100 (TH 100), and providing local access to adjacent businesses and connecting neighborhoods. The layout also incorporates aesthetic components as well as multi-modal transportation needs, including vehicles, bicycles, pedestrians, and transit. These elements are discussed in greater detail throughout this report.

It is also important to recognize the various components that informed the recommend geometric layout. For instance, the Existing Conditions Report helped inform the recommendations prescribed throughout this section. The recommended geometric layout was also guided by the following transportation components:

Roadway Capacity and Speed

Concept development began with consideration of the roadway's capacity and appropriateness of the speed limit for the context of the roadway. Based on existing and future regional traffic modeling, along with traffic operations review, it was determined the existing four-lane roadway provides sufficient vehicular capacity and does not require expansion at this time.

The existing posted speed of 40 miles per hour (mph) design north of TH 100 and 35 mph south of TH 100 also seems appropriate; however, the posted speed is typically determined based on a speed study. The 35-40 mph speeds falls within the low speed regime of MnDOT and Minnesota State Aid manuals for roadway facility design. The

low speed regime allows more flexibility in lane width and turn-lane lengths on the roadway and with clear zone requirements to fixed objects behind the curb. Therefore, the layout incorporates 11-foot lanes to preserve the lower speed character of the roadway while also providing opportunity to increase amenities behind the curb, such as widened boulevards, plantings, wider sidewalk/trail width, and transit amenities, such as benches and/or shelters

Between 49th Avenue and TH 100 is a slightly different character of roadway with a slightly lower posted speed limit of 35 mph and several single family residence accesses directly to Brooklyn Boulevard. Traffic volumes in this area are markedly lower as well. This segment provides the connection to Minneapolis south of 49th Avenue.

Access Management

Access points along the corridor have a significant effect on how the roadway operates and serves the public. In this case, Brooklyn Boulevard is classified as an "A Minor" Arterial. One purpose for this type of roadway is to provide mobility for vehicular traffic and connect other principal arterials, such as TH 100 and I-694. In order to maintain the corridors function and mobility, various access points were consolidated or eliminated for the recommended concept.

More importantly, direct access to Brooklyn Boulevard was recommended to be consistent with Hennepin County's access spacing guidelines of full access every 1/4 mile and partial access every 1/8 mile. The geometric layout developed for the project meets the intent of Hennepin County access spacing guidelines and calls for a raised median throughout the corridor from TH 100 to I-694.

Furthermore, the intersection geometry is based on traffic analysis at various intersections along the corridor. Turn lanes are set to accommodate future traffic projections as the area grows and redevelops. Dual left turn lanes at 58th from Brooklyn Boulevard are included to accommodate traffic moves to important destinations, such as the Brooklyn Center Transit Center and the redevelopment of Brookdale Mall area.

Existing access points were also reviewed and compared with future land use plans. For instance, future land use along Brooklyn Boulevard do not include single family residences, and therefore, those access points are recommended to be closed or consolidated. Other existing direct access points to businesses along the corridor may be limited to right in/right out only. Public roadway intersections, with minor exceptions, will have full access. The greatest impact to access will be between 58th Avenue (Bass Lake Road) and 63rd, where no median exists today.

Access revision will occur over time as land use changes, and consequently, the corridor will need to change over time as well. Several alternative geometric concepts for particular areas have been developed and are illustrated on the layout to demonstrate the implementation over time.

Pedestrian Facilities

The existing corridor includes four through lanes with turn lanes at several intersections. Raised medians are present in limited areas; however none are currently in place between

just north of 58th Avenue to just south of 63rd Avenue. The result in this area is an overall roadway width of 76 feet or more with no refuge for a pedestrian to cross. In most cases, the existing sidewalks along Brooklyn Boulevard are immediately adjacent to the curb or have minimal separation (3 feet to 5 feet) which leads to an uncomfortable feeling for pedestrians in this area. Between TH 100 and Bass Lake Road however, adequate boulevard widths exist and allow more separation between the vehicular traffic and pedestrians along the sidewalk.

Furthermore, the geometric layout incorporates 11-foot lanes to preserve the lower speed character of the roadway while also providing opportunity to increase amenities behind the curb such as widened boulevards, plantings, wider sidewalk/trail width, and transit amenities such as benches and/or shelters.

Bicycle Facilities

On-street bike lanes were studied but are not recommended (see Trail and Sidewalk Concept) with the traffic volume and speed present in the corridor. An off-street shared use trail will provide a bicycle facility separated from traffic throughout the corridor.

Traffic Operations

A year 2030 "Build" traffic analysis was completed using Highway Capacity Software (HCS), which used the same methodology as for the existing conditions. As part of this analysis, improvements were identified to improve the operation and safety of the entire corridor for all modes of transportation. The improvements are identified in the recommendations section of this report (see Page 5). The HCS results for this analysis are shown Table 1.

Table 1: Year 2030 "Build" Peak Hour Capacity Analysis
Level of Service Results for Brooklyn Boulevard (CSAH 152)

INTERSECTION	Level of Service	
	A.M. Peak	P.M. Peak
65th Avenue North	C	C
63rd Avenue North	B	C
Bass Lake Road (CSAH 10)	C	D
56th Avenue North*	A/B	A/B
55th Avenue North	B	C
TH 100 North Ramp	B	B
TH 100 South Ramp	B	C
51st Avenue / Lilac*	A/B	A/C
50th Avenue North*	---	---
49th Avenue North	---	---

*Unsignalized intersection; Overall LOS/Worst Movement

Concept Recommendations

A series of recommendations have been proposed based on sound planning decisions and supporting technical analysis (e.g., crash analysis, safety review, geometric review, traffic analysis, 20 year traffic projections). However, the recommended improvements have not been approved by the appropriate agencies that have jurisdiction of the roadway. Thus, additional analysis may be needed to gain approvals. In the meantime, this report offers the following recommendations to the corridor and is summarized in Figure 1:

Left and right-turn lanes for a 35 - 40 MPH roadway (turn-lanes maybe longer based on capacity needs or storage requirements)

- Desired Standard (40 MPH): 315 feet (this includes full width turn-lane and taper)
- Desired Standard (35 MPH): 280 feet (this includes full width turn-lane and taper)
- Minimum Standard: 235 feet (this includes full width turn-lane and taper)

The minimum standard length assumes an allowable 10 MPH deceleration in the through lane. Recommend that desired standard turn lanes be installed at a minimum. Consideration should be given to 10:1 or 5:1 tapers to provide more storage than taper length.

I-94 South Ramp Intersection

- Modify the I-94 off-ramp from a free channelized right-turn lane to a stop condition channelized right-turn lane.

65th Avenue North

- Add a northbound right-turn lane of desired standard length.
- Revise the southbound right-turn lane from an auxiliary lane from the I-94 ramp to a 300 to 500 foot right-turn lane (full width).

63rd Avenue North

- Provide right-turn lanes on the northbound and southbound approaches of desired standard length, although the northbound right-turn lane should start after the West Fire Station access.
- Remove the split-phasing on the cross-street and replace with a permissive-only phase. Consider providing an eastbound leading left-turn phase (with 3rd car detection). With this being a signalized intersection, modify the eastbound and westbound approach to provide a left-turn lane, thru lane and a right-turn lane. The lane for the right-turn movement for westbound is desirable, but not imperative.

62nd Avenue North, 61st Avenue North, 60th Avenue North/Admiral Lane and 59th Avenue North

- Provide right-turn lanes on the northbound and southbound approaches on a case-by-case basis and where space is available. Implementation could occur as right-of-way becomes available during redevelopment.
- A future traffic signal may be warranted at 61st Avenue based on future redevelopment. Other factors to consider are pedestrian crossings of Brooklyn Boulevard and transit locations at this intersection.

Bass Lake Road (CSAH 10)

- Add a second southbound left-turn lane (300 feet in length).
- Extend westbound left-turn lane from 125 feet to at least the standard length.
- Remove the northbound "auxiliary" lane from 56th Avenue North and replace with 300 to 500 foot right-turn lane.
- Provide a right-turn lane into the Cub Foods/Wells Fargo access. Because of the intersection spacing between 56th Avenue North and this access, this right-turn lane will likely be shorter than the minimum standard length.
- Extend eastbound turn lanes to provide 250 feet of storage (this will likely require purchase of home(s). Consider purchasing them as they become available on the south side of Bass Lake Road.
- Remove all three channelized right-turn islands and provide a stop condition.

56th Avenue North

- Modify westbound right-turn lane to a stop condition with no add lane.
- Extend southbound left-turn lane to 400 feet of full width with taper.
- Modify northbound right-turn channelized island to be a yield condition or modify the island (on the northside) to provide only one entering lane from the southbound left-turn movement (may need additional analysis).
- Extend the northbound right turn lane to the desired standard length.

55th Avenue North

- Remove westbound and northbound channelized right-turn islands and provide a stop condition.
- Extend northbound and southbound left-turn lanes to provide desired standard length.
- Realign the west frontage road to provide greater intersection spacing from Brooklyn Boulevard.

TH 100 North Ramp

- No recommendations but need to consider auxiliary lane from the TH 100 South Ramp to 55th Avenue North.

TH 100 South Ramp

- Modify off-ramp channelized right-turn lane to a stop condition and remove auxiliary lane to the north.
- Modify the northbound channelized right-turn onto the freeway on-ramp to tighter radius.
- Add the fourth approach (eastbound) and provide access to North Lilac Drive. Remove this access from 51st Avenue.
- Signalize the intersection.

51st Avenue North

- Provide connection to the TH 100 south ramp via Lilac Drive.
- Provide a southbound left-turn lane of desired standard length.

50th and 49th Avenue North

- Could consider three-lane section, but may need Minneapolis to continue a similar roadway section.
    - A three-lane section with shoulders (thru, shared left, thru) may be of benefit in this area as there are several direct residential accesses to Brooklyn Boulevard. The shared left lane would assure that a left turning vehicle would not impede a thru lane, as is currently the case. Also the use of shoulders in this section would allow adequate room to accommodate vehicles that make frequent stops (delivery/garbage trucks, mail service, etc.) and thru traffic. The shoulders could also be utilized for on street bicycle traffic.

Other Private Access

- Provide right-turn lanes to private access locations based on case-by-case basis. Higher volume driveways may need right-turn lanes to provide a safer intersection.

Concept Components

In addition to the recommended improvements, the concept includes various components that address pedestrian and bicycle needs, which blend together transportation improvements with future land use decisions. These concept components are discussed in greater detail throughout this section.

Proposed Land Use Transition Areas

Over the years, Brooklyn Boulevard has evolved into an "A Minor" Arterial roadway with high traffic volumes. This, along with the need to improve safety along the corridor, created a situation where parcels with direct access to Brooklyn Boulevard are no longer desired. In addition, the existing roadway traffic volumes, higher travel speeds, and shallow house setbacks along Brooklyn Boulevard are typically not perceived by single-family households as a desirable environment. It is the City's long-term goal to redevelop single-family parcels along Brooklyn Boulevard to land uses better suited for this roadway, where higher traffic volumes would be seen as a benefit, rather than a drawback, to the adjacent land use. As noted earlier, additional guidance is given in a Planning Commission Resolution (#2012-22) dated November 29, 2012 in respect to potential redevelopment efforts along the corridor.

As part of the future roadway reconstruction concept, several parcels have been identified as potential future land use transition areas and are located in the following seven areas:

West Side of Brooklyn Boulevard

- Intersection of 55th Avenue/Brooklyn Boulevard Service Road
- 55th Avenue to 57th Avenue
- South of Bass Lake Road
- Admiral Lane to 61st Avenue
- 61st Avenue to 62nd Avenue
- 62nd Avenue to 63rd Avenue
- 63rd Avenue to Halifax Drive

East of Brooklyn Boulevard

- 61st Avenue
- North of 62nd Avenue
- North of 65th Avenue

The future land use transition areas were analyzed to determine preliminary parcel redevelopment parameters that might affect future redevelopment for the intersection of 55th Avenue/Brooklyn Boulevard Service Road and the site illustrated in Figures 2 - 5. For all of the

land use transition areas, future land use change and access transition would be contingent upon willing sellers and private market demand.

Since several of the existing parcels are configured for single-family use, these parcels would need to be assembled in order to create a parcel or parcels large enough to support an alternate land use that would be desirable along the Brooklyn Boulevard corridor. It is assumed that future redevelopment would comply with existing zoning setbacks and be buffered from the adjacent existing residential uses.

Intersection of 55th Avenue/Brooklyn Boulevard Service Road

As part of the roadway reconstruction concept, the service road west of 55th Avenue would be realigned west so the 55th Avenue/service road intersection is closer to Northport Elementary School. The conceptual service road realignment would significantly impact five parcels, such that these parcels would likely not be able to support future redevelopment. The remnant land at this intersection can be used to enhance the streetscape treatment and provide entrance nodes to Northport Elementary School and adjacent neighborhood.

55th Avenue to 57th Avenue

The Brooklyn Center Planning Advisory Commission, as part of Planning Commission Resolution 2012-22, recommended that all five single-family parcels located between 55th Avenue and 57th Avenue be considered a land use transition area. Two of these parcels are proposed to be impacted by the 55th Avenue/Service Road intersection realignment referenced above.

South of Bass Lake Road

Service Road Access Option (see Figure 2)

The proposed land use transition area south of Bass Lake Road is comprised of five parcels. These parcels would need to be assembled into one or two parcels to provide flexibility for future redevelopment.

Access could occur from multiple points along the Brooklyn Boulevard Service Road or from 57th Avenue. The access drive on 57th Avenue would need to be setback 120 feet from the service road. The main internal circulation would most likely occur between 57th Avenue the service road cul-de-sac.

Expanded Parcel Option

To provide additional flexibility for redevelopment, an alternate option could potentially include abandoning the Brooklyn Boulevard service road north of 57th Avenue to the existing cul-de-sac and allowing this land to be absorbed into a new parcel assembly.

The main access with this alternate option would be limited to 57th Avenue. However, internal circulation could potentially be more flexible and provide better opportunities for redevelopment.

Expanded Transition Area Option

In Planning Commission Resolution 2012-22, the Planning Advisory Commission identified the single-family residential units located south of 57th Avenue and those between 57th Avenue and 58th Avenue/Bass Lake Road as a land use transition area. Additional detail on potential future land uses to be considered by the City can be found in Planning Commission Resolution 2012-22.

Admiral Lane to 61st Avenue (see Figure 3)

Brooklyn Boulevard Frontage only Option

The proposed land use transition area north of Admiral Lane is comprised of eight single-family residential parcels extending north to 61st Avenue. The shallow depth of the parcels would require the parcels to be assembled into one parcel to maximize redevelopment flexibility.

Access drives could only occur off of Admiral Lane and 61st Avenue. The access drive off of Admiral Lane would require a minimum setback from Brooklyn Boulevard of 100 feet. The access drive off of 61st Avenue would require a minimum 120 foot setback from Brooklyn Boulevard. Main internal circulation would occur between the Admiral Lane and 61st Avenue access drives.

Expanded Transition Area Option

The Planning Advisory Commission recommended that this transition area be expanded to include the single-family parcels between Admiral Lane and 61st Avenue that face onto Ewing Avenue. Additional detail on potential future land uses to be considered by the City can be found in Planning Commission Resolution 2012-22.

61st Avenue to 62nd Avenue

Another potential land transition area on the west side of Brooklyn Boulevard identified by the Planning Advisory Commission includes all of the parcels located between 61st Avenue and 62nd Avenue. Additional detail on potential future land uses to be considered by the City can be found in Planning Commission Resolution 2012-22.

62nd Avenue to 63rd Avenue

The Brooklyn Center Planning Advisory Commission recommended that a conceptual plan for a revised parking layout and access drive for the commercial properties between 62nd Avenue and 63rd Avenue be developed to accomplish the boulevard treatment and off-street trail along the west side of Brooklyn Boulevard. The Planning Advisory Commission also recommends that the Brooklyn Center Economic Development Agency (EDA) consider the acquisition of the vacant commercial lot (6245 Brooklyn Boulevard) south of 63rd Avenue to promote the redevelopment of three commercial parcels located between 62nd Avenue and 63rd Avenue (Planning Commission Resolution 2012-22).

North of 63rd Avenue (see Figure 4)

The proposed land use transition area north of 63rd Avenue is comprised of five single-family residential parcels extending north to Halifax Drive. In order to provide maximum flexibility for redevelopment, these parcels would need to be assembled into one parcel.

The access drive off of 63rd Avenue should be located west of existing Ewing Lane and be setback from Brooklyn Boulevard approximately 150 feet. The access drive off of Halifax Drive would require at least a 100 foot setback from Brooklyn Boulevard. Main internal circulation would occur between the 63rd Avenue and Halifax Drive access drives. The Planning Advisory Commission recommended that this transition area be expanded to include the single-family parcels between 63rd Avenue and Halifax Drive that face onto France Avenue and three single-family residential parcels north of Halifax Drive between France Avenue and Brooklyn Boulevard (6349 and 6353 Halifax Drive and 6357 Brooklyn Boulevard). Additional detail on potential future land uses to be considered by the City can be found in Planning Commission Resolution 2012-22.

61st Avenue East of Brooklyn Boulevard (see Figure 5)

The proposed land use transition area east of Brooklyn Boulevard and across from 61st Avenue is comprised of four commercial parcels and a portion of a multi-family residential parcel. The transition concept includes the extension of 61st Avenue east of Brooklyn Boulevard and the creation of a new cul-de-sac. Three of the four existing commercial parcels could remain, with parcel access provided to the cul-de-sac. One commercial parcel would be significantly impacted by the new cul-de-sac. This parcel could potentially be redeveloped if it could be combined with the remnant portion of the multi-family parcel directly south of it into a new parcel.

The Planning Advisory Commission, as part of Planning Commission Resolution 2012-22, recommended that this transitional area be expanded to include two residential properties (6142 and 6136 Brooklyn Boulevard) and the Iman Hussain Islamic Center located immediately north of the transitional area illustrated in Figure 5.

62nd Avenue East of Brooklyn Boulevard

Three residential parcels (6200, 6206, and 6234 Brooklyn Boulevard), located between 62nd Avenue and Brooklyn Center Fire Station, were identified as a transitional area by the Planning Advisory Commission (Planning Commission Resolution 2012-22).

65th Avenue East of Brooklyn Boulevard

A land use transition area comprised of four commercially zoned properties located in the Northeast quadrant of Brooklyn Boulevard and 65th Avenue was identified by the Planning Advisory Commission (Planning Commission Resolution 2012-22).

Proposed Pedestrian/Bicycle Enhancements

While sidewalks already line both sides of Brooklyn Boulevard for a vast majority of the study area, the location of many of the sidewalks directly adjacent to the roadway, narrow sidewalk widths at several locations, and limited opportunities to safely cross Brooklyn Boulevard do not create an environment that is supportive of walking. The corridor also lacks bikeway facilities. However, there are a number of destinations in close proximity to Brooklyn Boulevard that could be accessed via walking or biking if safe, comfortable, and convenient non-motorized facilities were available to potential users.

For example, Brooklyn Boulevard is situated next to several community destinations that city residents may wish to access by walking or bicycling. Two elementary schools (Garden City and Northport) and five neighborhood parks (Cahlander, Garden City, Wangstad, Northport, and Happy Hollow) are all located one block or less from Brooklyn Boulevard (see Figure 6, Trail/Sidewalk Network Concept). The commercial core of Brooklyn Center (Shingle Creek Crossing along with neighboring businesses and restaurants) abuts Brooklyn Boulevard. Finally, the Brooklyn Center Transit Station is located in close proximity to the corridor.

Planned Bikeways in Adjacent Communities

The City of Minneapolis has an existing and several planned bikeways that would be easily accessed from a new bikeway along Brooklyn Boulevard. Currently, an on-street bike lane exists on 49th Avenue, east of Brooklyn Boulevard. The City of Minneapolis Bicycle Master Plan shows a planned off-street trail along Osseo Road and a planned signed bike route along Queen Avenue that will connect up with the Shingle Creek Regional Trail. At the time of this study, another study initiated by Transit for Livable Communities and followed by the City of Minneapolis and Hennepin County is investigating the feasibility of implementing on-street bike lanes on Osseo Road.

The existing and planned Minneapolis bikeways, the Twin Lakes Regional Trail, and the Shingle Creek Regional Trail, combined with a new bikeway along Brooklyn Boulevard will create several recreational loop trails and commuter route connections. There are no other planned trails in other adjacent communities that would influence planned bikeways along Brooklyn Boulevard.

Bikeway Facility Alternatives and Evaluation

To help accommodate the needs of pedestrians and bicyclists, this study explored various trail and sidewalk enhancements. The evaluation of alternatives is summarized below:

On-street bike lane

The feasibility of providing on-street bicycle lanes or paved shoulders along Brooklyn Boulevard was evaluated. The reconfiguration of travel lanes from four to three between 49th Avenue and 51st Avenue would allow for the provision of an on-street facility, while maintaining the existing roadway width. Between 51st Avenue and the northbound TH 100 ramps, on-street bike lanes would require additional road width, but no additional right-of-way. The segment of Brooklyn Boulevard south of TH 100 has lower existing and forecasted traffic volumes than Brooklyn Boulevard north of TH 100. Based on a 35 - 40 mph vehicle speed and projected traffic volumes greater than 10,000 ADT on a two lane roadway, the MnDOT Bikeway Facilities Design Manual (2007), provides guidance that a 6-foot bike lane could be considered for a roadway under MnDOT jurisdiction.

Projected traffic volumes north of TH 100 are higher than projected traffic volumes south of TH 100. Planned travel lanes also increase to four lanes. Based on a 35 - 40 mph vehicle speed and projected traffic volumes greater than 20,000 ADT on a four lane roadway, the MnDOT Bikeway Facilities Design Manual (2007), provides guidance that a 6-foot bike lane could be considered for a roadway under MnDOT jurisdiction. Given that four proposed travel lanes are proposed for Brooklyn Boulevard north of TH 100 as part of this study, the provision of an on-street bikeway would require the City to acquire additional right-of-way. An analysis of the existing roadway network in this area indicates limited opportunities for on-street bikeway connections north to Brooklyn Park, due to the suburban street network and limited opportunities to cross I-694. If an on-street bikeway was desired to make a connection to Brooklyn Park from northwest Brooklyn Center, it would likely need to occur on Brooklyn Boulevard.

Off-street multi-use trail

An off-street multi-use trail could be located on either the east or west side of Brooklyn Boulevard. Locating the trail on the east side of Brooklyn Boulevard would provide convenient access to the City's commercial core, Garden City Park and Garden City Elementary School. Two small existing trail segments already exist along the west side of Brooklyn Boulevard. One segment extends north from the transit park and ride facility, under I-694 to 69th Avenue. A portion of the Twin Lakes Regional Trail extends along the west side of Brooklyn Boulevard between 52nd Avenue and 55th Avenue. A trail on the west side would provide convenient access to Northport Elementary School and four neighborhood parks.

Proposed Bikeway Facilities

Along Brooklyn Boulevard

The study concluded that an off-street multi-use trail should be located on the west side of Brooklyn Boulevard, extending the full length of the study area from 49th Avenue to I-694. The trail is recommended to be buffered from the roadway with a 10-foot minimum boulevard to enhance user comfort and safety. Cross sections on Figures 7, 8 and 9 depict Brooklyn Boulevard with an off-street multi-use trail along the west side of the road. Placing the multi-use trail on the west side provides convenient access to four neighborhood parks and one elementary school. It also takes advantage of two existing trails along the west side of the roadway. A connection to the Twin Lakes Regional Trail will provide a continuous trail connection to another neighborhood park, Twin Lakes Park and ultimately a connection to the City of Robbinsdale. A trail on west side also extends the existing trail north of I-694 south to the Twin Lakes Regional Trail without making bicyclists cross Brooklyn Boulevard.

An on-street bikeway is not included in the concept plan for the following reasons. The vehicular travel speeds, along with the existing and projected traffic volumes, along Brooklyn Boulevard between TH 100 and I-694 would not provide a comfortable bicycling environment or a safe environment for inexperienced bicyclists. Community input received indicated support for an off-street trail, but did not indicate a desire for an on-street facility. Finally, there are no existing or planned on-street bikeways north of I-694 to connect to. The provision of an off-street multi-use trail as the primary bicycle facility within the corridor has received support from Hennepin County.

South of TH 100, existing and projected traffic volumes would be more conducive to an on-street bikeway. When Brooklyn Boulevard south of TH 100 is reconstructed, the City of Brooklyn Center and Hennepin County should coordinate with the City of Minneapolis to gain a current understanding of Minneapolis' plans for implementing bike facilities along Osseo Road to see if opportunities exist to provide a consistent bike facility for Osseo Road and for Brooklyn Boulevard south of TH 100.

Connecting to Brooklyn Boulevard

The City of Brooklyn Center is starting to establish a network of bikeways throughout the community (see Figure 6). Currently, 63rd Avenue is lined on both sides with sidewalks. 63rd Avenue provides a key east-west connection through the community. West of Brooklyn Boulevard, 63rd Avenue will provide a direct connection to a planned transit station along Bottineau Boulevard in Brooklyn Center. East of Brooklyn Boulevard, 63rd Avenue provides a direct connection to Centennial Park, City Hall and the Hennepin County Government Center complex. The City may want to consider converting one of the sidewalks along 63rd Avenue to a multi-use trail to better facilitate east-west bicycling across the city.

Proposed Sidewalks

Along Brooklyn Boulevard

This study recommends that a sidewalk be located on the east side of Brooklyn Boulevard, extending the full length of the study area from 49th Avenue to I-694. The sidewalk is recommended to be buffered from the roadway with a 10-foot boulevard to enhance user comfort and safety. Locating the sidewalk along the east side of the road will provide convenient access to Garden City Park and Garden City Elementary School. It will also provide convenient access to the City's commercial core. Cross sections on Figures 7, 8 and 9 depict Brooklyn Boulevard with a sidewalk along the east side of the road.

Connecting to Brooklyn Boulevard

The City of Brooklyn Center has established a strong network of sidewalks throughout the community. This study includes a proposed realigned intersection at Admiral Lane/60th Avenue. The City may want to consider the construction of a sidewalk along Admiral Lane, 60th Avenue, and a short segment of Vincent Avenue to make a convenient connection to Centennial Park (see Figure 6, Trail/Sidewalk Network Concept). The City may also want to consider including a sidewalk along the extension of 61st Avenue east of Brooklyn Boulevard and then a short off-street extension of the sidewalk east to Beard Avenue.

Proposed Intersection Safety Enhancements

Median refuge islands

In order to enhance pedestrian safety, the concept includes extending roadway median islands to intersection crosswalks. While traffic signals are typically timed to provide pedestrians adequate time to fully cross the roadway in one signal phase, at times pedestrians misjudge the time needed to cross. The extended median islands provide a safe refuge for pedestrians to wait until the next pedestrian crossing signal phase.

Countdown timers

Another intersection crossing approach that enhances pedestrian safety is the use of countdown timers at traffic signals. The countdown timers provide pedestrians with the remaining time on the pedestrian signal phase. This allows pedestrians to make better decisions whether there is enough time left to safely cross the intersection.

Proposed future traffic signal at 61st Avenue/Brooklyn Boulevard intersection

Pedestrians and bicyclists should cross Brooklyn Boulevard at signalized intersections. Currently, there is one stretch of Brooklyn Boulevard extending between Bass Lake Road and 63rd Avenue where there is not a traffic signal. Pedestrians prefer not to make a detour to cross at a signalized intersection. The lack of a signal in this roadway segment discourages pedestrian movement and likely encourages pedestrians to venture an unsafe crossing either mid-block or at

an unsignalized intersection. Most of the east-west sidewalks in the City's sidewalk network intersect Brooklyn Boulevard at a signalized crossing. This is not the case at 61st Avenue, where the sidewalk west of Brooklyn Boulevard leads pedestrians to an unsignalized intersection. 61st Avenue is located between Bass Lake Road and 63rd Avenue and could fill the gap in the signal spacing. Therefore, installing a signalized intersection at 61st Avenue will enhance pedestrian access and safety.

55th Avenue Regional Trail Crossing Analysis

The Twin Lakes Regional Trail currently crosses Brooklyn Boulevard at grade on the south side of 55th Avenue at a signalized intersection. The crossing is at a point where the trail transitions from a lower traffic residential neighborhood on the west side of Brooklyn Boulevard to a busier commercial environment to the east. South of 55th Avenue, the existing trail route parallels the west side of Brooklyn Boulevard. The trail runs east-west along 55th Avenue, and then north-south again along Xerxes Avenue. Maintaining the existing at-grade crossing was considered as an option in the future roadway redesign. The study also evaluated three grade-separated crossing alternatives for crossing Brooklyn Boulevard (see Figure 10).

- Alternative A - pedestrian bridge at 55th Avenue
- Alternative B - pedestrian bridge midway between 55th Avenue and TH 100
- Alternative C - underpass near TH 100 bridge

Alternative Crossing Route A

In Option A, the trail route would parallel the west side of Brooklyn Boulevard as it does today to a pedestrian bridge crossing at the 55th Avenue intersection. In order to provide the required vertical clearance beneath the pedestrian bridge, the trail would climb a structured switchback in the median on the west side of Brooklyn Boulevard just south of 55th Avenue. On the east side, the surrounding area is currently occupied by commercial properties. Acquisition of right-of-way in the southeast quadrant of the intersection would permit construction of a helix ramp to return the trail to grade.

Alternative Crossing Route B

On the west side Brooklyn Boulevard, instead of paralleling the roadway between 53rd Avenue and 55th Avenue as in Option A, the trail in Option B would begin to climb vertically near 53rd Avenue permitting construction of a pedestrian bridge approximately midway between 55th Avenue and 53rd Avenue. Two straight ramps paralleling Brooklyn Boulevard would ascend and descend on either side of Brooklyn Boulevard. The right-of-way on the east side of Brooklyn Boulevard would be too narrow to accommodate the pedestrian bridge ramp, a 10-foot boulevard and a six-foot sidewalk south of 55th Avenue.

Alternative Crossing Route C

In Option C, the trail route would cross the southbound entrance ramp to TH 100 and pass through a new culvert under Brooklyn Boulevard through the TH 100 overpass bridge embankment. This route would put trail users in close proximity to the high-speed freeway. The trail would than ascend again to cross the TH 100 exit ramp at grade heading north along Xerxes Avenue.

Crossing Recommendation

While the grade-separated crossing options considered would provide some additional degree of safety, an at-grade crossing at the signalized 55th Avenue intersection, as currently exists, would provide adequate pedestrian and bicyclist accommodations for less cost and with fewer right-of-way and property impacts. The tight spatial constraints would restrict the geometries of the grade-separated crossings to low design speeds and thereby not afford a significant increase in the efficiency of the crossing. Any crossing at a location other than 55th Avenue, as in alternative crossing routes B and C, would be counter to desired bicycle circulation patterns by requiring trail users to backtrack a short distance before continuing on. Lastly, the existence of a signalized intersection at 55th Avenue, along with proposed median refuge islands and crossing signing and striping, will provide safety measures for the trail crossing. For these reasons, an at-grade crossing of Brooklyn Boulevard at 55th Avenue is recommended. Should future redevelopment occur along the east side of Brooklyn Boulevard between 55th Avenue and TH 100, the City should investigate the feasibility of implementing a grade-separated crossing of Brooklyn Boulevard into the redevelopment project to improve the access, convenience, and safety needs of local residents and regional trail users,

Streetscape Character

Precedent Streetscape Treatments

Streetscape elements proposed for Brooklyn Boulevard build upon recently constructed streetscapes on Bass Lake Road and Xerxes Avenue. Brooklyn Boulevard continues to reinforce the identity of this district as the community's commercial core. Streetscape elements such as street lights, maintenance strips, fencing and bus stops continue the vocabulary already established for the district.

Proposed new gateway monuments reference the architectural style of the City's existing gateway monument located at 49th Avenue, while also providing updated materials and expression of the original monument (see Figure 11, Gateway Concept Sketch).

Community Gateways

The experience of entering the City of Brooklyn Center occurs when drivers exit either I-694 or TH 100 and turn onto Brooklyn Boulevard. Gateway monuments are proposed at these two key locations to announce visitors' and residents' entrance into the community (see Figure 12, Streetscape Opportunities). Community gateways start to establish the design vocabulary and unique character of the corridor. A gateway monument similar to the one shown in Figure 11 is proposed for the I-694 gateway. The TH 100 bridge, which is planned to be re-decked in the near future, is envisioned to function as the TH 100 gateway. The new bridge deck, including associated bridgeheads, fencing and lighting, should incorporate design elements common to the Brooklyn Boulevard corridor. A third monument is proposed for the southeast quadrant of the Bass Lake Road and Brooklyn Boulevard intersection as this marks the primary entrance to the commercial core from Brooklyn Boulevard.

Character Segments

In response to future land use character and future street character, the Brooklyn Boulevard corridor was defined as a series of three character segments that served as a guide through the corridor study to produce the preliminary streetscape concepts. The segments are labeled A through C starting from I-694 and proceeding south to 49th Avenue (see Figure 12).

Segment A

Segment A extends from I-694 to 59th Avenue. Future land use along this portion of the corridor will continue to be predominantly commercial and office uses, interspersed with single-family and multi-family residential uses until these parcels transition to a new use.

Brooklyn Boulevard between I-694 and 65th Avenue was recently reconstructed. Several modifications could be made to better integrate the streetscape character of this stretch of roadway with the remainder of Segment A. It is recommended that the existing paving be removed from the median north of 65th Avenue and replaced with a median treatment consistent with the rest of Segment A. The ornamental lighting poles could be replaced with ornamental poles that match the rest of the corridor. The existing poles could be put in storage and used as replacement poles for Brooklyn Boulevard north of I-694. Boulevards should be planted with street trees where they currently do not exist. Finally, the installation of a gateway element at the I-694 off-ramp will help connect this segment with the rest of the Brooklyn Boulevard corridor.

The typical section between 65th Avenue and 59th Avenue has two vehicle travel lanes in each direction separated by a median island of varying width. The typical section also includes a 10-foot trail with a 10-foot turf boulevard on the west side and a 6-foot walk with a 10-foot turf boulevard on the east side. This proposed streetscape section would impact the existing right-of-way (see Figure 7).

Streetscape design for Segment A would respond to the commercial nature of the corridor (see Figure 13, Streetscape Design Elements) and would include:

- Turf grass with street trees
- Maintenance strip
- Sidewalk or trail
- Sidewalk access to bus stops
- Ornamental lighting without banners

Median treatment options would include:

- Ornamental lighting without banners
- Colored pavement and bollards in the narrow medians
- Turf grass with street trees and a maintenance strip in wide medians
- Landscape planting beds at the end of turf grass areas

Segment B

Segment B extends from 59th Avenue to TH 100. Future land use along this portion of the corridor will continue to be commercial along the east side Brooklyn Boulevard and a mixture of commercial, single-family and multi-family residential on the west side of Brooklyn Boulevard.

The typical section from 59th Avenue to TH 100 has two vehicle travel lanes in each direction separated by a median island of varying width. The typical section also includes a 10-foot trail with a 10-foot minimum turf boulevard on the west side and a 6-foot walk with a 10-foot turf boulevard on the east side. This proposed streetscape section would not impact the existing right-of-way (See Figure 8, Cross Sections 2a and 2b). South of Bass Lake Road, a wide median island on the west side of Brooklyn Boulevard provides opportunities to include additional street trees along the corridor, some topographic variation, meandering of the multi-use trail and potential stormwater treatment rain gardens. A representative layout of this portion of Segment B near Bass Lake Road is depicted in Figure 11, Brooklyn Boulevard/ Bass Lake Road Intersection Streetscape Concept.

Streetscape design for Segment B would emphasize the commercial importance of this segment and include the highest concentration of streetscape elements (see Figure 13, Streetscape Design Elements). The boulevard treatment would include:

- Turf grass with street trees
- Maintenance strip
- Sidewalk or trail
- Sidewalk access to bus stops
- Ornamental lighting with banners

Median treatment options would include:

- Ornamental lighting with banners
- Colored pavement and bollards in the narrow medians
- Turf grass with street trees and a maintenance strip in wide medians
- Landscape planting beds at the end of turf grass areas

The TH 100 overpass bridge defines the south end of Segment B. This bridge is planned to be re-decked in the near future, which allows for the incorporation of design elements that are common to the Brooklyn Boulevard corridor into the new deck, such as bridgeheads, fencing and lighting (see Figure 14, TH 100 Overpass Bridge Re-decking). As part of the re-decking design process, additional study should be performed to determine whether the walkway deck width can be slightly widened to provide space for a low barrier wall and lighting on the outside edge of the walkway as shown in Figure 14.

Segment C

Segment C extends from TH 100 to 49th Avenue. Future land use along this portion of the corridor will continue to be single-family and multi-family residential with a few light industrial and commercial parcels closer to TH 100.

Between TH 100 and 51st Avenue, land use is comprised of light industrial and commercial with some multi-family housing. The roadway has two vehicle travel lanes in each direction separated by a median island of varying width. The typical section in this portion of Segment C includes a 10-foot trail and 10-foot turf boulevard on the west side and a 6-foot walk and a turf boulevard of varying width on the east side. This proposed streetscape section would stay within the existing right-of-way.

The area between 51st Avenue and 49th Avenue transitions to a residential neighborhood. Driveway access points would remain and the roadway section would use a three lane configuration reinforcing the neighborhood street character. The typical section between 51st Avenue and 49th Avenue also includes a 10-foot trail with a 10-foot turf boulevard on the west side and a 6-foot walk with a 10-foot turf boulevard on the east side. This proposed streetscape section would impact the existing right-of-way (see Figure 9).

Streetscape design elements for Segment C would be minimal (see Figure 13, Streetscape Design Elements). The boulevard treatment would include:

- Turf grass with street trees
- Maintenance strip
- Sidewalk or trail
- Sidewalk access to bus stops
- Ornamental lighting without banners at intersections

Median treatment options would include:

- Ornamental lighting without banners at intersections, as needed
- Colored pavement in the narrow medians
- Turf grass with street trees and a maintenance strip in wide medians

Intersection Enhancements

Intersections along Brooklyn Boulevard receive one of three different streetscape treatment types (primary, secondary and no treatment), based on their role in providing community gateways, wayfinding, and streetscape character (see Figure 12, Streetscape Opportunities).

Primary intersections are located at community gateways to announce arrival and entrance to the City or arrival to the City's commercial core. Primary intersections receive the highest level of streetscape treatment and may include large gateway monuments, heightened landscape plantings, seating and trash receptacles, and fencing/screening of adjacent parking lots. An illustration of a representative primary intersection is found on Figure 11, Brooklyn Boulevard/Bass Lake Road Intersection Streetscape Concept.

Secondary intersections are located at signalized intersections that are not primary intersections. These intersections include enhancements that create a pleasant environment for pedestrians as they wait to cross Brooklyn Boulevard. They also announce key cross streets for turning vehicles. Secondary intersections receive some streetscape treatment, but not to the same extent as primary intersections and may include small monuments and landscape plantings.

Both primary and secondary intersections will have marked crosswalks at signalized intersections with other pedestrian crossing enhancements as warranted at the intersections (see Figure 13, Streetscape Design Elements).

Transit Components

Transit is an important component of the transportation infrastructure within the Brooklyn Boulevard Corridor study area. A total of 10 bus routes operate on portions of Brooklyn Boulevard. In March 2012, service was increased on Route 723. Currently, there are no plans for additional increased transit service along Brooklyn Boulevard; however, the following sections describe recommended improvements to bus stops to encourage increased transit use.

Bus Stop Spacing

Currently, there are 45 bus stops within 1/4-mile of the Brooklyn Boulevard corridor. There are 18 bus stops directly on Brooklyn Boulevard. Metro Transit's current bus stop spacing policy is to provide one of the following options:

- No more than eight stops per mile
- One stop every long city block
- One stop every two short city blocks

Bus stop spacing in the Brooklyn Boulevard corridor is approximately eight stops per mile. This type of spacing provides the greatest amount of access to transit customers by minimizing the distance users need to travel to a bus stop. No additional bus stops are needed along Brooklyn Boulevard. As development occurs, consideration should be given to the placement of buildings closer to Brooklyn Boulevard and to the placement of parking farther from the roadway. Building in this manner provides better access for transit customers to adjacent land uses.

Currently, no bus stops are located on Brooklyn Boulevard between Bass Lake Road and 55th Avenue because there is no bus service along this section of Brooklyn Boulevard. Bus service is provided along Xerxes Avenue between Bass Lake Road and 55th Avenue to serve Brookdale and the future Wal-Mart at Shingle Creek Crossing.

Bus Stop Placement

Bus stops can be located on the near-side of an intersection, the far-side after the bus has passed through an intersection, or at a mid-block location. Bus stop location is based on a number of factors. Some of these factors include adjacent land uses, impact on intersection operations, intersecting bus routes, physical roadside constraints (utilities, driveways, etc.), and traffic control devices.

Along Brooklyn Boulevard, the majority of the bus stops are located at the near-side of an intersection; however, there are a few bus stops along the corridor that are at far-side and mid-block locations. Many of the existing bus stop locations along the corridor have been placed in appropriate locations; however, a few locations have been identified as problematic and needing to be relocated. These locations are:

- Brooklyn Boulevard between 63rd Avenue and Halifax Drive (southbound) - the existing bus stop is located at a mid-block existing pull-out. It is recommended that this bus stop be relocated to the near-side of the intersection at 63rd Avenue. It is also recommended that the existing bus pull-out be removed.
- Brooklyn Boulevard between 61st Avenue and 62nd Avenue (northbound) - the existing bus stop is located at a mid-block existing pull-out. It is recommended that this bus stop be relocated to the near-side of the intersection at 62nd Avenue in the proposed right-turn lane.
- Brooklyn Boulevard and Admiral Lane (southbound) – There are two existing bus stops at Admiral Lane; one located at the near-side of Admiral Lane, and a second approximately 300 feet south of Admiral Lane. The existing bus stop located at the near-side of the intersection, is directly outside a residential property. This bus stop should be relocated to the far-side of the intersection in the proposed right-turn lane that provides access to the Cross of Glory Church. Because of the close proximity of the relocated bus stop to the second existing bus stop, it is recommended that these two stops be consolidated into one bus stop location (eliminating the second bus stop).
- Brooklyn Boulevard and 60th Avenue (northbound) - due to the realignment of 60th Avenue, the existing bus stop is recommended to move from the existing location to the near-side of the realigned 60th Avenue.
- Brooklyn Boulevard and TH 100 (northbound) - the existing bus stop is located at the middle of the block. Mid-block bus stops are not recommended unless they provide direct access to a destination, or there is no other location to place the bus stop. Mid-block bus stops encourage customers to jaywalk (cross mid-block, rather than at an intersection) which results in unsafe conditions. It is recommended that this bus stop location be moved to the near-side of 55th Avenue to provide customers with the opportunity to cross at the intersection. Consideration was given to moving the stop further south; however, due to the close proximity of the freeway exit ramp, this was not recommended.
- Brooklyn Boulevard and 51st Avenue (southbound) - the existing bus stop is located at the far-side of the intersection, directly outside a residential property. Buses regularly stop to load/unload passengers, causing conflicts with mainline motorists. Further highlighting the problem is that as vehicles are waiting to turn left onto 51st Avenue or Lilac Drive, there is the potential for a bus to be loading/unloading in the adjacent lane. This creates a complete stoppage of all motorists. The proposed roadway concept includes a shoulder along Brooklyn Boulevard. This would allow buses to partially pull into the shoulder while loading and unloading customers. It is recommended that this bus stop location remain in the current location because with the addition of the shoulder, buses are not stopped completely in the through-lane. Leaving

the bus stop in the current location also is an advantage because it encourages customers to cross the street at the intersection rather than mid-block.

Bus Pull-Outs

A bus pull-out, or bus bay, is a specifically constructed area separated from the general travel lanes to provide for boarding and alighting of passengers. This design allows through traffic to flow freely without the obstruction of a stopped bus. Bus pull-outs can be located at either the far-side or near-side of an intersection; however, far-side intersection placement is desirable because it avoids conflicts with right-turning vehicles. When placement of a pull-out at the far-side of an intersection is not possible, near-side pull-outs can be placed in right-turn lanes with low turn volumes.

Some of the advantages and disadvantages of pull outs are described in the following sections.

Bus Pull-Out Advantages

- Dedicated bus pull-outs allow for minimized traffic congestion on the roadway because other moving vehicles are not obstructed by the bus.
- Pull-outs are generally conducive to an auto-oriented roadway design.
- Pull-outs allow riders at high-boarding locations (20-40/hour) to board and exit in a protected area, and can reduce immediate rider/pedestrian safety issues.
- Provides a protected area away from moving vehicles for the stopped bus.
- Mid-block and far-side (immediately after intersection) pull-outs do not obstruct pedestrian activity or traffic control devices.
- Pull-outs help avoid problems with sight distances, such as hills or curves, which would prevent traffic from stopping safely behind a stopped bus.
- Pull-outs are useful at locations where buses will be expected to layover at the end of a trip (this is not applicable to the Brooklyn Boulevard Corridor).

Bus Pull-Out Disadvantages

- Traffic volumes greater than 1,000 vehicles/hour during a peak period make it difficult to maneuver a bus back into the travel lane from a pull-out.
- Due to the challenge of re-entering traffic, delays to transit service (reduced speed and reliability/on-time performance) are likely to occur.
- Pull-outs are difficult and expensive to relocate; it can be more challenging to locate a pull-out on both sides of a street which may cause some confusion for riders that would expect consistent infrastructure at a stop.
- Near and far-side pull-outs contribute to frequent wide intersection crossings along the roadway. These crossings increase the distance a pedestrian must cross through an intersection, which may increase safety issues and decrease the perceived walkability of corridor.

- Mid-block pull-outs are often undesirable because of a lack of pedestrian access, which is unwelcoming to transit users.
- Near-side pull-outs (immediately prior to intersection) may cause right-turn conflicts with other vehicles.

Currently, there are three bus pull-outs on Brooklyn Boulevard. They are located at:

- 61st/62nd Avenue (northbound)- mid-block
- 61st Avenue (southbound)- far-side of the intersection
- 59th Avenue (northbound)- far-side of the intersection

In the future transit concept, it is recommended that the bus pull-outs on Brooklyn Boulevard be removed. This is recommended because removing the bus pull-outs and allowing buses to remain in the travel lane eliminates the need for buses to merge in and out of traffic; thus providing for a faster travel time for transit customers. Removing the existing pull-outs also helps provide consistency in the corridor. Because pull-outs are not provided for at every bus stop location, there may be a potential traffic/safety concern for vehicles travelling behind a bus and expect the bus to pull out of the travel lane into a pull-out. As a part of the future roadway concept, a 10-foot boulevard is proposed between the edge of the roadway and the sidewalk. This boulevard along with the sidewalk width provide for an adequate pedestrian/transit patron distance from vehicles, eliminating the need to provide pull-outs for the sake of creating a delineated space for transit users.

Passenger Amenities at Bus Stops

Passenger amenities at bus stop locations play a role in a person's decision to use transit. Passenger amenities are installed at select bus stop locations to improve passenger comfort and the attractiveness of transit as an alternative mode of transportation. A number of factors are considered when determining what type of passenger amenities should be included at a bus stop. These factors include:

- Average daily boardings
- Proximity to trip generators
- Passenger transfer activity
- Planned neighborhood improvements
- Community requests

Some of the main passenger amenities that are considered at bus stop locations include:

- Passenger shelters
- Benches
- Trash receptacles
- Lighting
- Bicycle racks and/or Bicycle lockers

- Intelligent transportation systems (ITS) features:
  - Real time signage
  - Emergency buttons or call boxes
- Landscaping features

Depending on the number of transit customers using a bus stop and the amount of available space, a bus stop may be as simple as a signpost along a sidewalk, or more complex with a large paved area with a bus shelter and other amenities.

Metro Transit's standard for providing bus shelters is a minimum daily boarding of 25 customers for areas outside of Minneapolis and Saint Paul. Currently, the only bus stop with a Metro Transit shelter is at Brooklyn Boulevard and TH 100. Another location that currently meets Metro Transit's shelter threshold but does not have a shelter installed is at Brooklyn Boulevard and 51st Avenue.

As a part of the future transit concept development, passenger amenities are recommended at all bus stop locations. Bus shelters and passenger amenities should be placed behind the sidewalks or trails when feasible. In some locations, this might require additional right of way and/or easements. Three levels of amenities were developed:

1. Low volume boarding locations (less than 10 average weekday boardings)
2. Medium volume boarding locations (between 10 and 25 average weekday boardings)
3. High volume boarding locations (greater than 25 average weekday boardings)

Figure 15 shows the average weekday boardings at each bus stop location on Brooklyn Boulevard. The types of amenities included in the various levels are described in more detail below:

Low Volume Boarding Locations

At low boarding bus stop locations, a bench, trash receptacle, and landscaping elements are proposed as shown in Figure 16 and Figure 17. Concept B shown in Figure 17 is only recommended in locations where the bus stop is located in a shoulder or a right turn lane.

Medium Volume Boarding Locations

At medium boarding bus stop locations, two benches, trash receptacle, and landscaping elements are proposed as shown in Figure 18 and Figure 19. Concept B shown in Figure 19 is only recommended in locations where the bus stop is located in a shoulder or a right turn lane.

High Volume Boarding Locations

At high boarding bus stop locations, a passenger shelter, a bench, trash receptacle, a bicycle locker and bicycle racks, and landscaping elements are proposed as shown in Figure 20.

Lighting

Lighting affects transit customers' perception of safety and security at a bus stop, as well as the use of the site by non-transit customers. Lighting can enhance a person's sense of comfort and security, especially in the evening and late-evening. Bus stops should be coordinated with existing street lights to provide a minimum level of lighting and security; however, if feasible, lighting should be incorporated at medium and high boarding locations.

Regional Transitway Connections

No transitways are being developed in the Brooklyn Boulevard Corridor study area; however, a potential connection to the regional transitway network via the Chicago Avenue Arterial Bus Rapid Transit (BRT) Corridor is being studied by Metro Transit as a follow-up to the Arterial Transitway Corridors Study (ATCS). Metro Transit is studying options along both Penn Avenue and Emerson/Freemont Avenues. The Chicago Avenue Corridor would potentially connect to the Brooklyn Center Transit Center (BCTC) and would affect Brooklyn Boulevard between 49th Avenue and Xerxes Avenue. If arterial BRT stations are identified along this segment of Brooklyn Boulevard, the elements listed in the physical concept plans would be incorporated. The ATCS is described in more detail in the following section.

Arterial Transitway Corridors Study

Metro Transit completed the ATCS, a year-long study of improvements along some of the Twin Cities' most heavily traveled transit corridors. The purpose of the ATCS was to develop a facility and service plan to enhance efficiency, speed, reliability, customer experience, and transit market competitiveness on 11 high-demand urban corridors.

Faster service is accomplished by reducing customer boarding and traffic signal delays and stopping at fewer locations. An improved customer experience is achieved by adding stations, using information technology, and improving service reliability and vehicle comfort. Physical concept plans were developed during the ATCS to define how the various characteristics of arterial BRT would be applied. The physical concept plans include the following:

- Mixed-traffic runningways
- Transit signal priority
- Roughly half-mile station spacing
- Stations located at far-side of intersections where possible
- Curb extensions on road segments with on-street parking; curbside stations where no parking is present today
- Nine-inch raised curbs for "near-level" boarding
- Premium vehicles with all-door boarding
- Stations sized to match demand and fit site conditions
- Modular station shelter design with a distinctive Rapid Bus brand

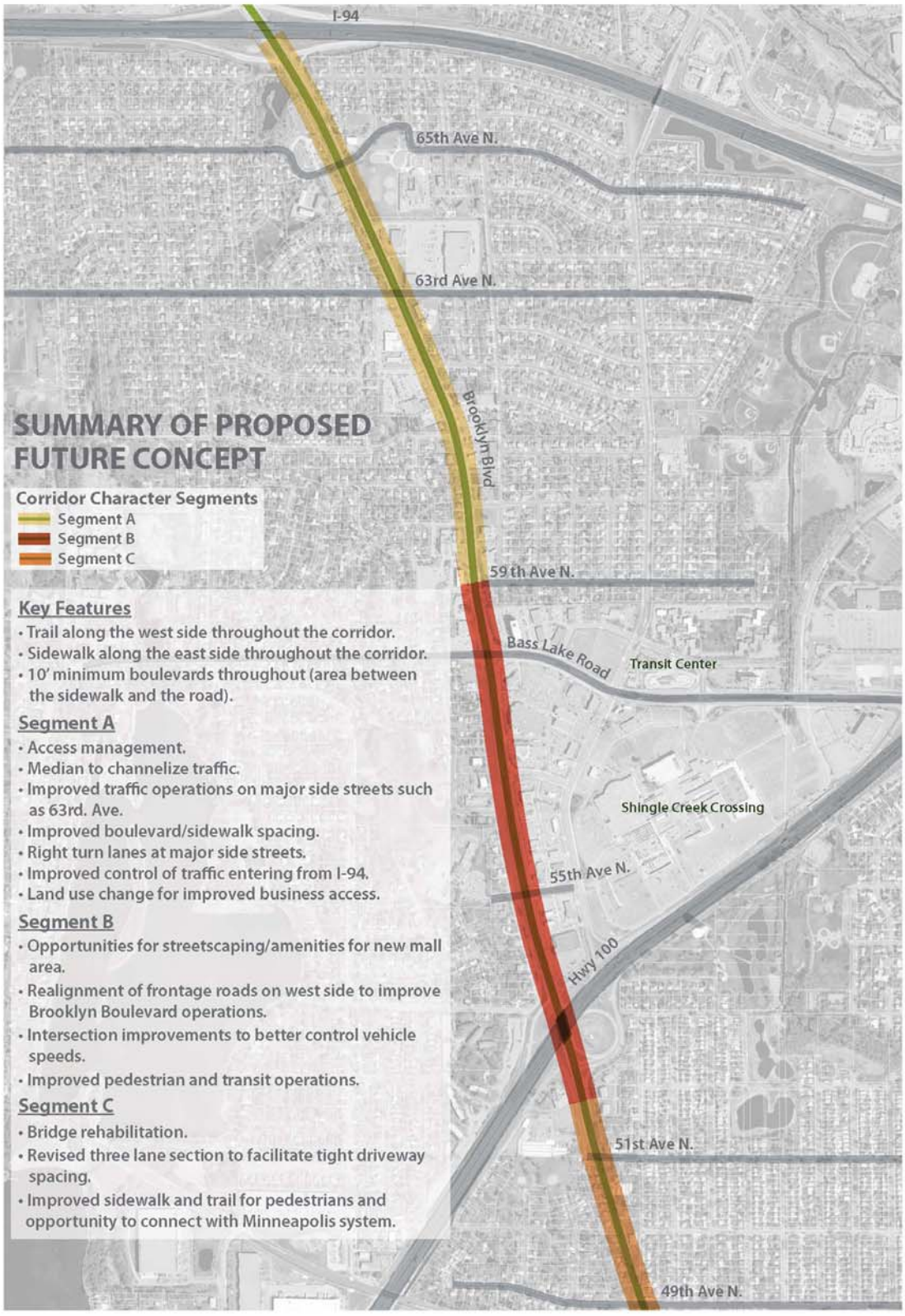
- Off-board fare collection using ticket vending machines
- Foundational transitway components at stations

One of the 11 corridors that were studied in the ATCS was the Chicago Avenue Corridor. The primary route that operates in the Chicago Avenue Corridor is the Route 5. Route 5 begins at the BCTC. There are two primary weekday route patterns- one that runs between BCTC and 38th Street, and one that runs between north Minneapolis and the Mall of America.

The ATCS identified that further study of this corridor is needed to examine the potential to extend the Chicago Avenue arterial BRT to duplicate the Route 5, traveling on Emerson-Fremont through north Minneapolis and up to BCTC. Once Metro Transit has completed its analysis, coordination with the City and County would be necessary to incorporate the elements of the transitway at proposed stations and along Brooklyn Boulevard.

Figures and Appendix

Figure 1: Summary of Recommended Concept



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Land Use and Access Transition Area (South of Bass Lake Road)

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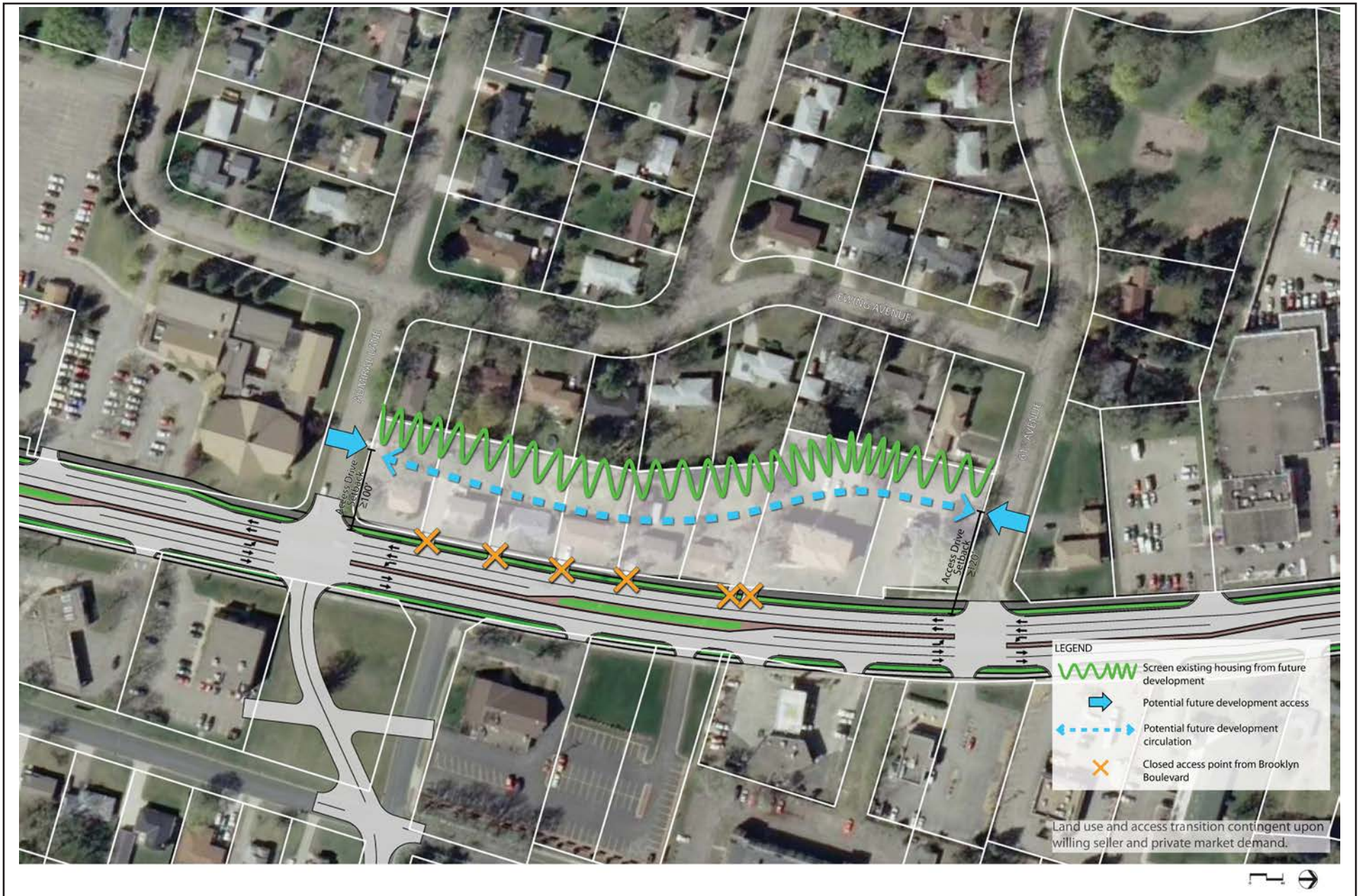
City of Brooklyn Center

Figure 2



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Land Use and Access Transition Area (Admiral Lane to 61st Avenue)

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Figure 3

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Land Use and Access Transition Area (63rd Avenue to Halifax Drive)

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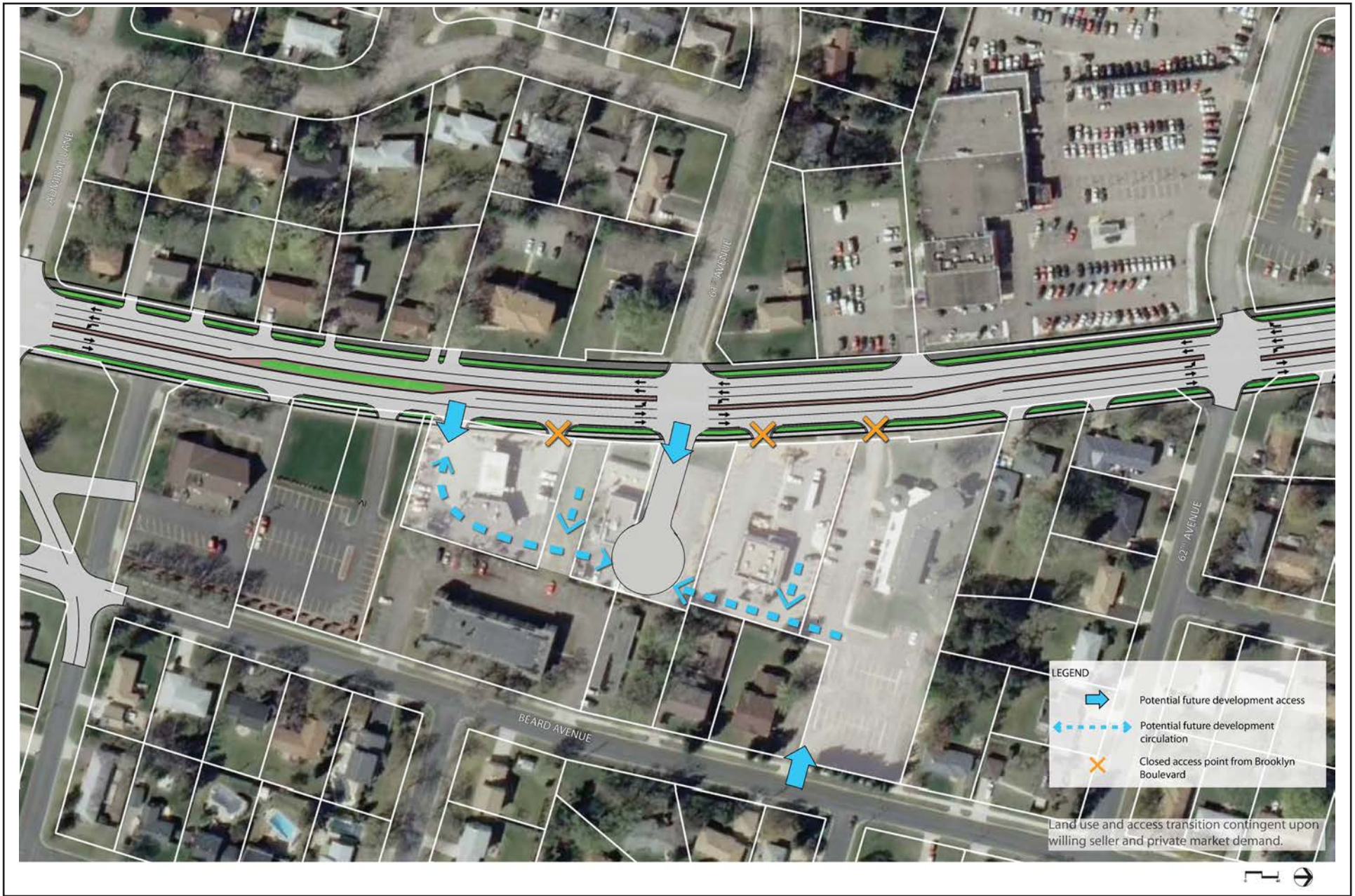
Figure 4



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Land Use and Access Transition Area (61st Avenue East of Brooklyn Boulevard)

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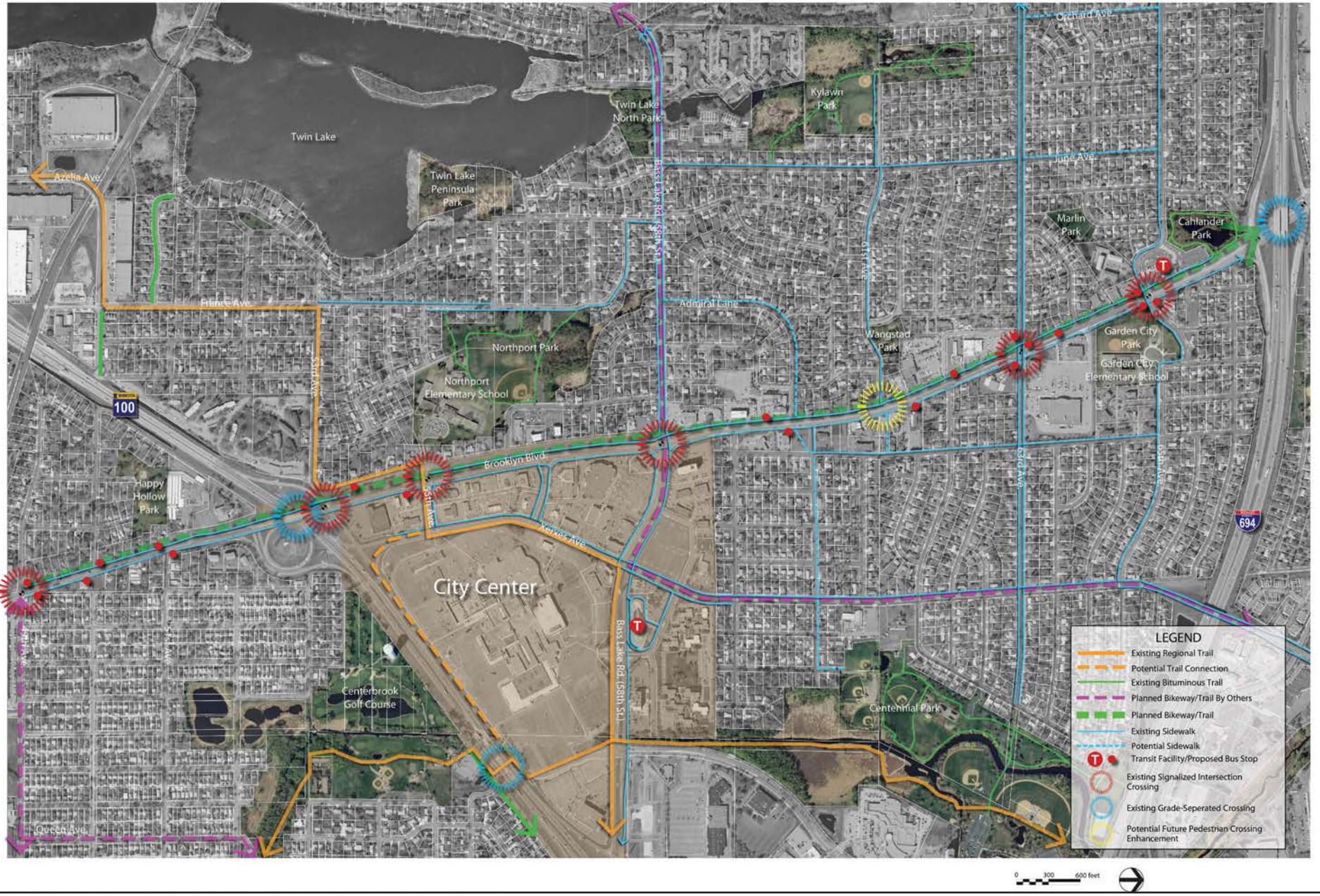
Figure 5



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Brooklyn Boulevard Trail/Sidewalk Network Concept

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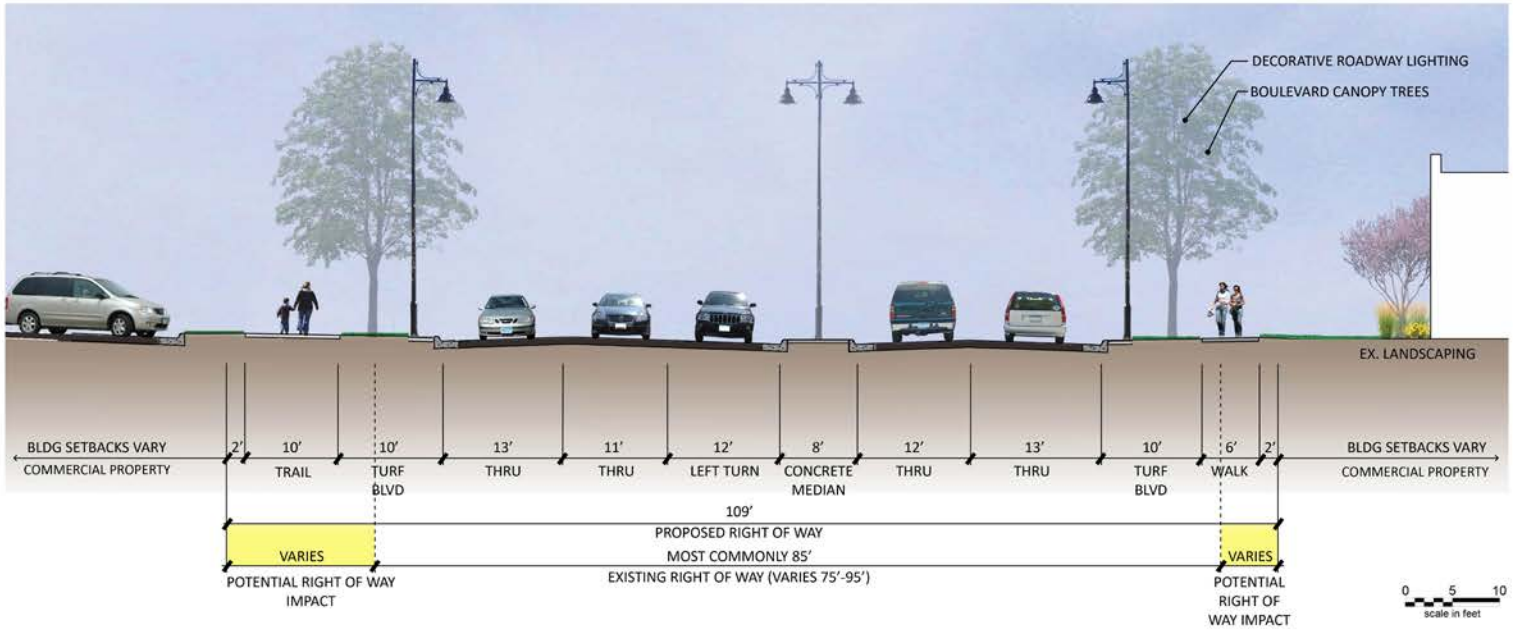
Figure 6

Typical Streetscape Cross Section 1

Segment A *Between 59th Ave. and 65th Ave. - Looking North*



Note: a number of easements exist along property frontages beyond the right of way shown here

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Streetscape Cross Sections

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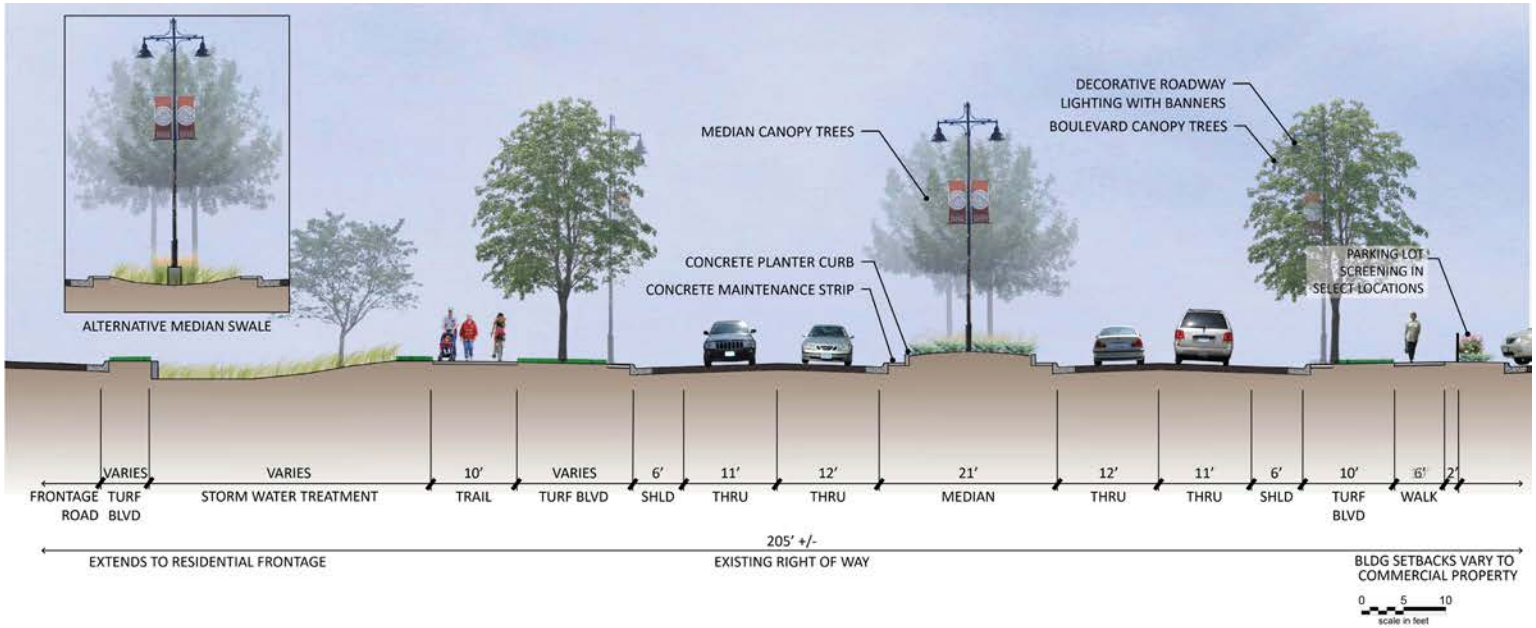
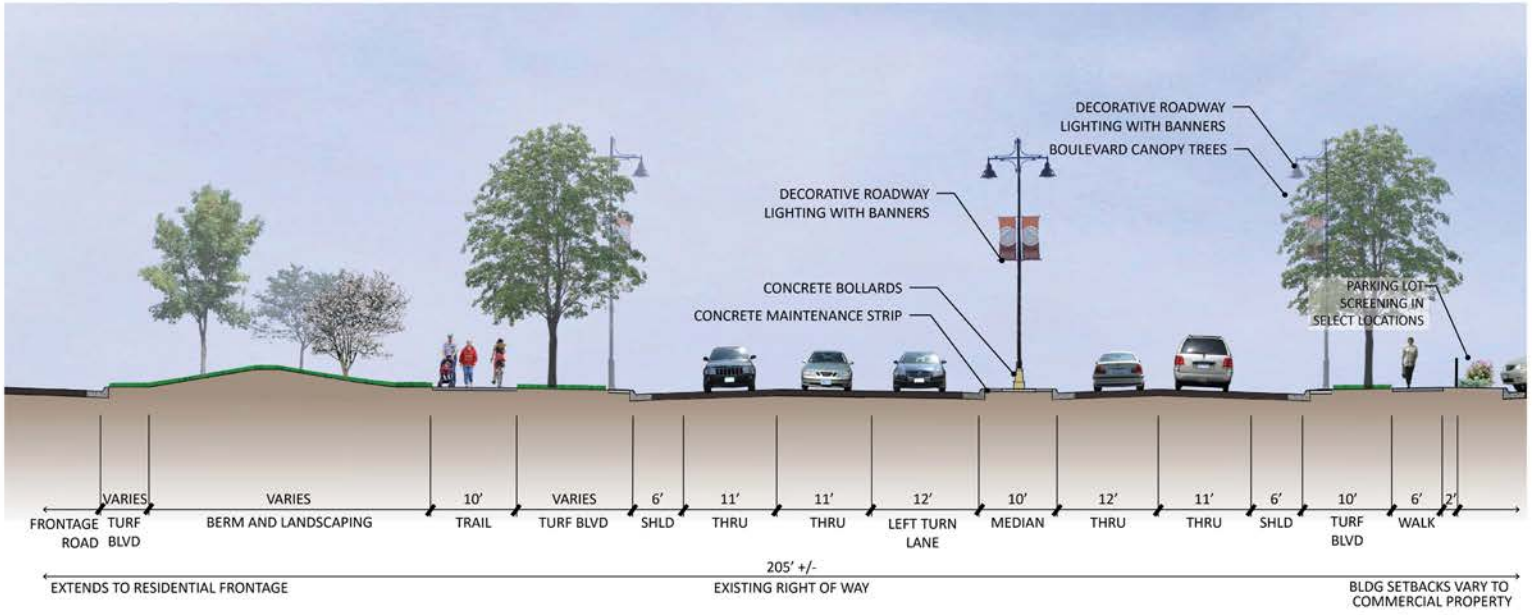
Figure 7

Typical Streetscape Cross Section **2a**
Adjacent City Center, Stormwater Treatment Alternative
Segment B *Between TH100 and 59th Ave. - Looking North*



Typical Streetscape Cross Section **2b**
Adjacent City Center, Median Berm Alternative
Segment B *Between TH100 and 59th Ave. - Looking North*



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Streetscape Cross Sections

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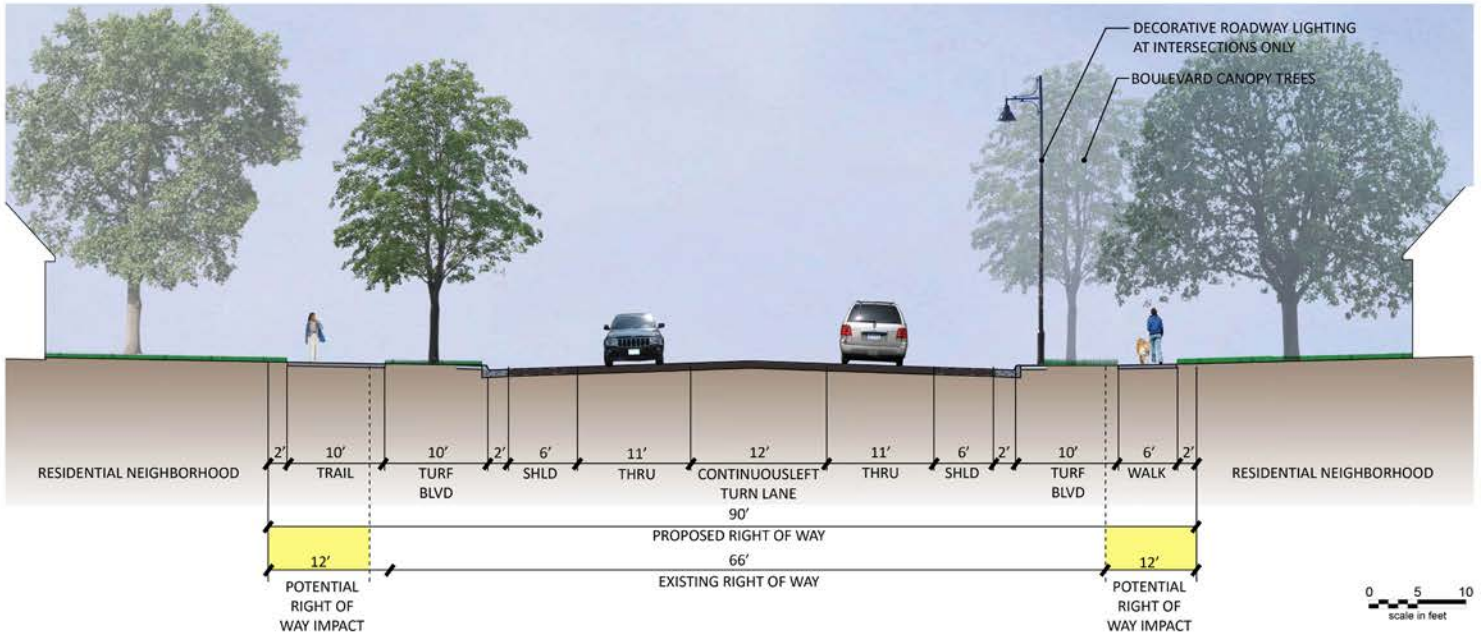
Figure 8

Typical Streetscape Cross Section **3**
Residential Area
Segment C *Between 49th Ave. and 51st Ave. - Looking North*



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Streetscape Cross Sections

Brooklyn Boulevard Corridor Study - *Recommended Concept Report*
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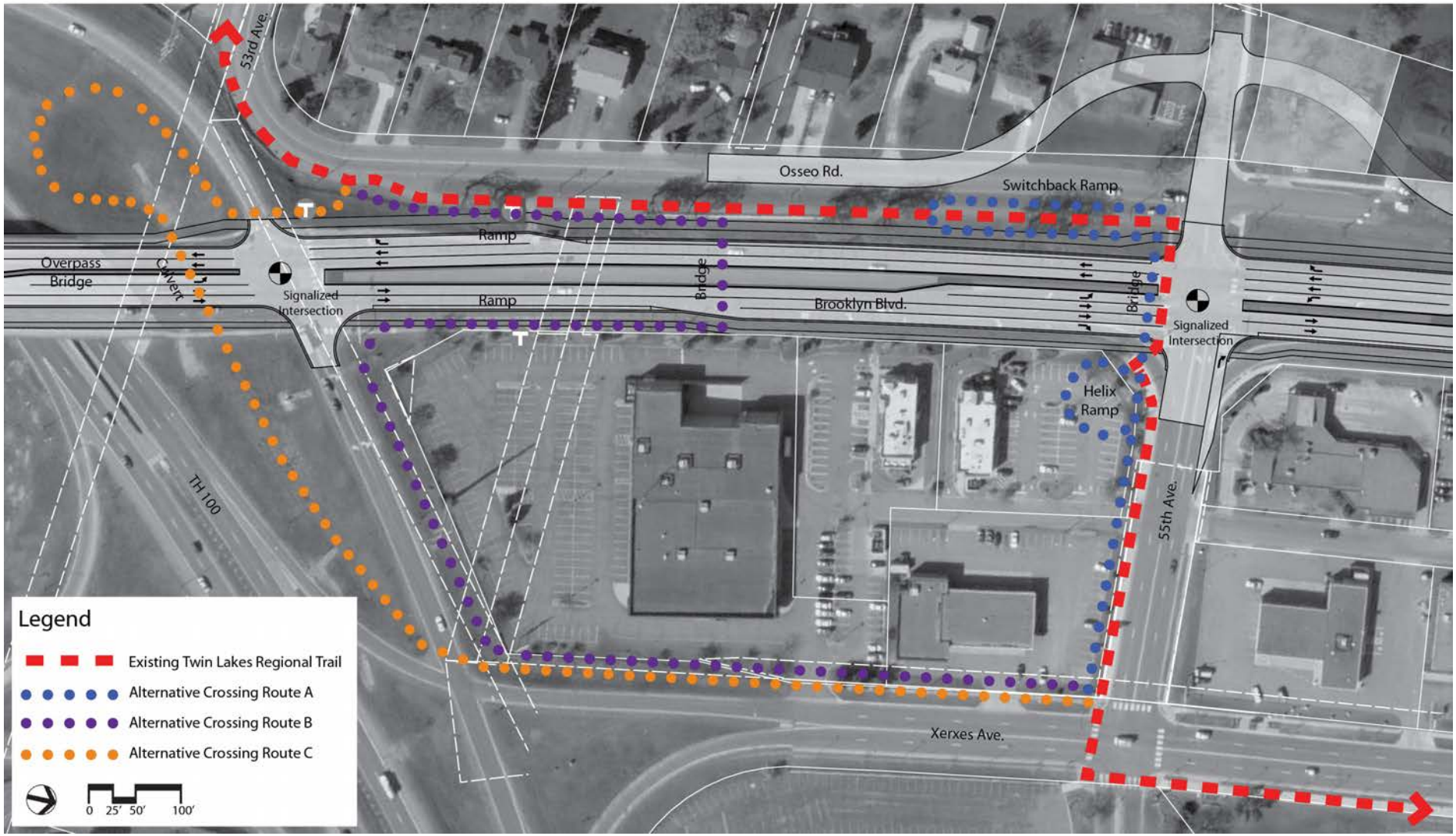
Figure 9



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Twin Lakes Regional Trail Grade Separated Crossing Options

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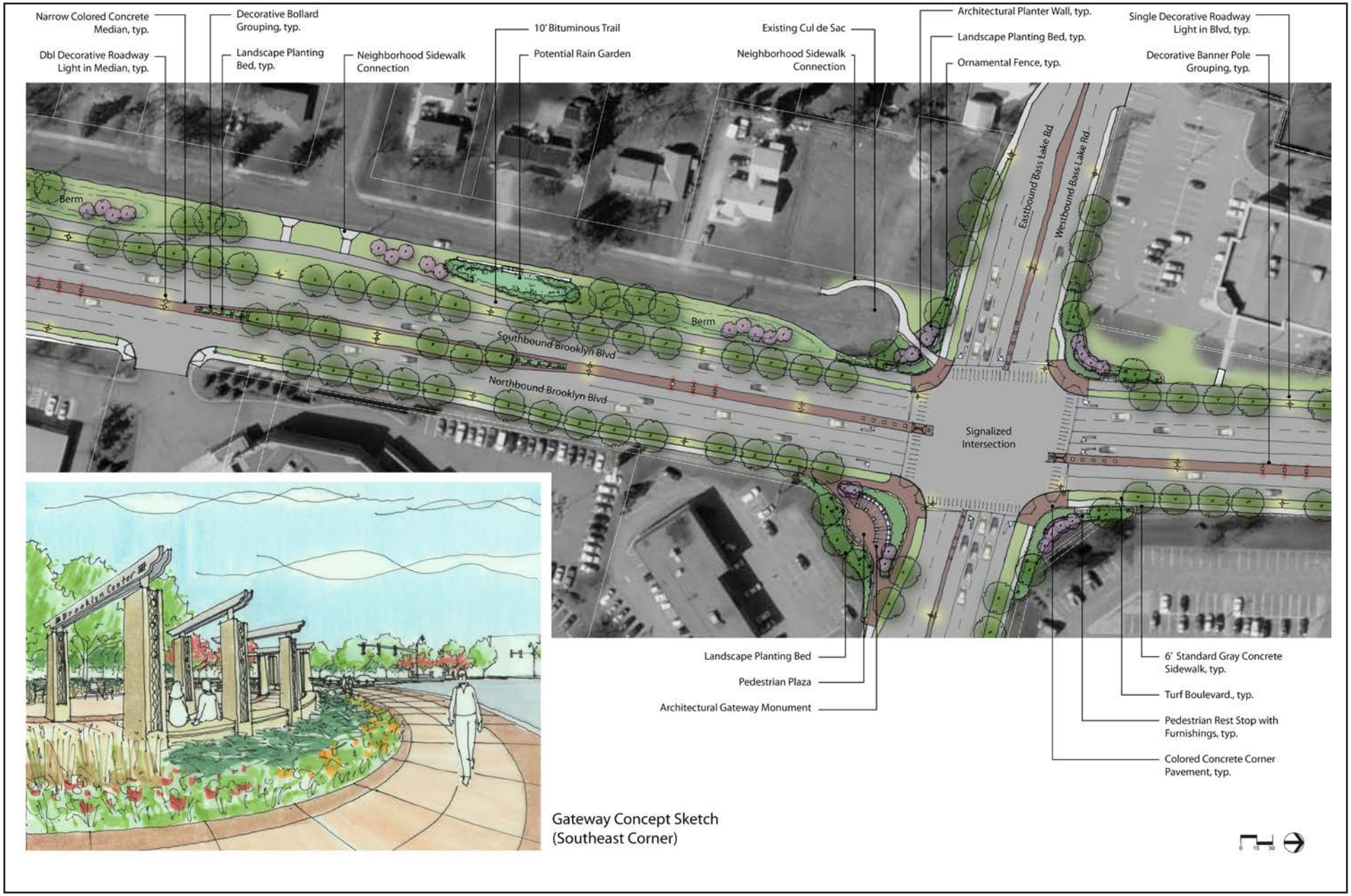
Figure 10



Gateway Concept Sketch
(Southeast Corner)

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Brooklyn Boulevard/Bass Lake Road Intersection Streetscape Concept

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Figure 11

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Brooklyn Boulevard/Bass Lake Road Intersection Streetscape Concept

Brooklyn Boulevard Corridor Study - *Recommended Concept Report*

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Figure 12

ALL SEGMENTS

- **Boulevard Treatment**
  - Maintenance Strip
  - Turf grass with street trees
  - Sidewalk or trail
  - Sidewalk access to bus stops


Intersection/Boulevard Lighting Without Banners


Intersection/Boulevard Lighting With Banners


Median Lighting Without Banners


Median Lighting With Banners


Boulevard Street Trees and Sidewalk

SEGMENT A- Between 59th Ave. and I-694/I-94

- **Enhanced Intersections**
  - Lighting without banners
  - Crosswalks at signalized intersections
  - Monuments (primary or secondary)
  - Plantings
  - Colored pavement
- **Median Treatment**
  - Lighting without banners
  - NARROW MEDIAN
    - Pavement with bollards
  - WIDE MEDIAN
    - Maintenance strip
    - Turf grass with street trees
    - Select ornamental planting areas


Primary Intersection Monument and Plantings


Secondary Intersection Monument and Plantings


Colored Paving, Crosswalks

SEGMENT B- Between TH100 and 59th Ave.

- **Enhanced Intersections**
  - Lighting with banners
  - Crosswalks at signalized intersections
  - Monuments (primary or secondary)
  - Plantings
  - Seating and trash receptacles (primary)
  - Colored pavement
  - Fencing/Screening (primary)
- **Median Treatment**
  - Lighting with banners
  - NARROW MEDIAN
    - Pavement with bollards
  - WIDE MEDIAN
    - Maintenance strip
    - Turf grass with street trees
    - Vegetated median (raised)
    - Select ornamental planting areas


Paved Median (includes bollards, colored paving)


Seating, Trash Receptacles and Plantings


Fencing/Screening (select locations)

SEGMENT C- Between 49th Ave. and TH100

- **Enhanced Intersections**
  - Lighting without banners
  - Crosswalks at signalized intersections
  - Monuments
  - Plantings
  - Colored pavement
- **Median Treatment**
  - Lighting without banners
  - NARROW MEDIAN
    - Pavement
  - WIDE MEDIAN
    - Maintenance strip
    - Turf grass with street trees


Paved Maintenance Strip


Select Ornamental Plantings (raised)


Select Ornamental Plantings (depressed)

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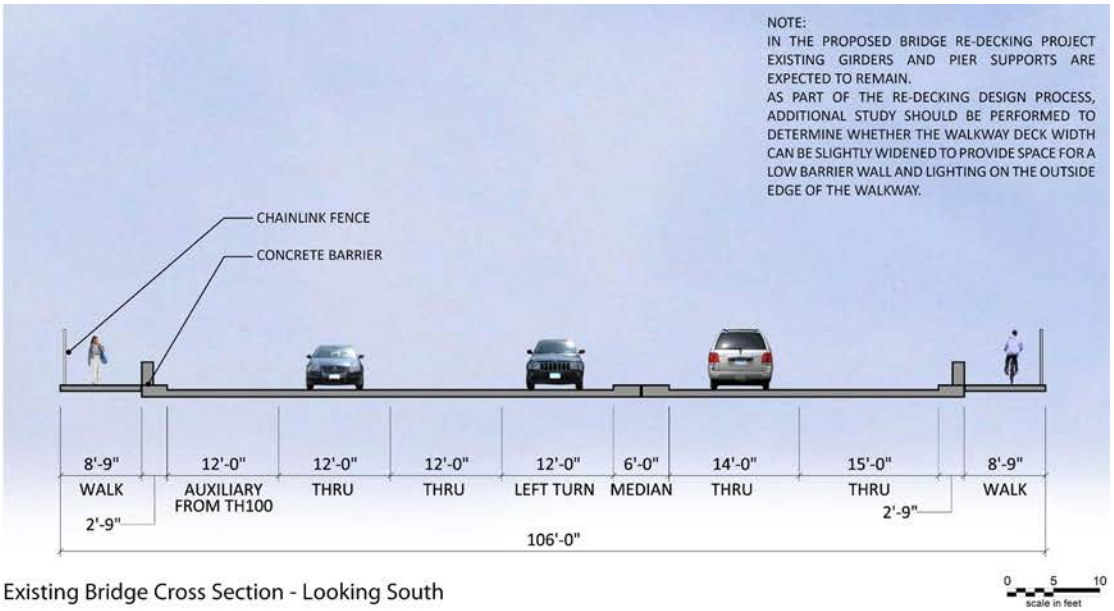
Streetscape Design Elements

Brooklyn Boulevard Corridor Study - *Recommended Concept Report*
City of Brooklyn Center

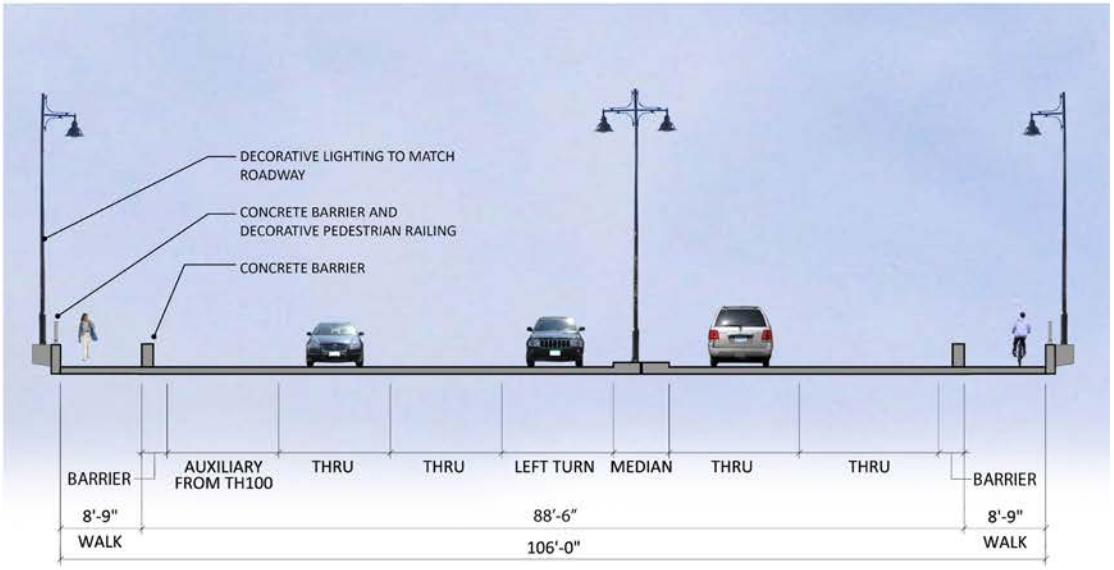
Figure 13

Existing Bridge Approach - Looking North



Existing Bridge Cross Section - Looking South

Concept Sketch on Trail Looking North



Proposed Bridge Cross Section

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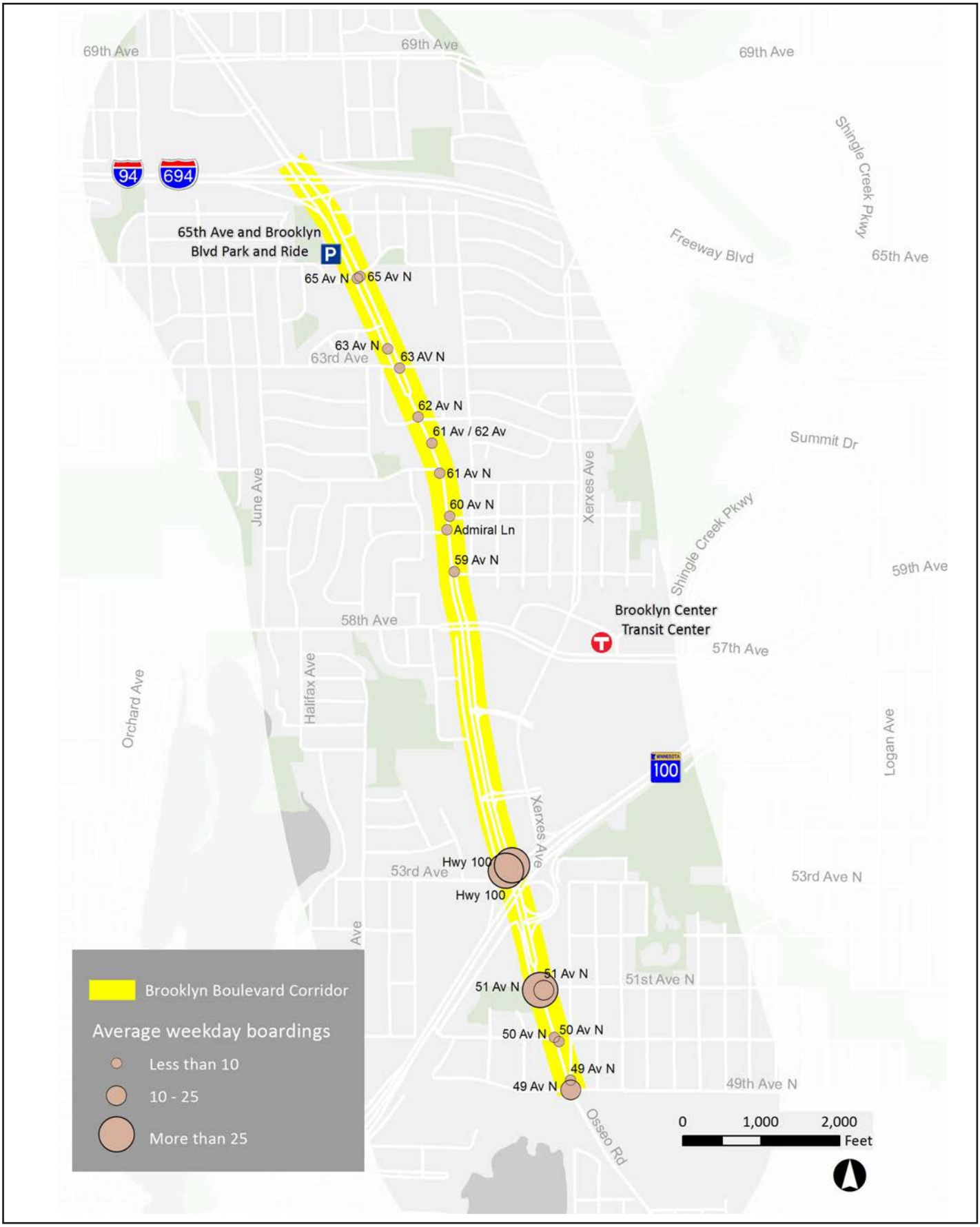
TH 100 Overpass Bridge Re-decking and Enhancement Options

Brooklyn Boulevard Corridor Study - *Recommended Concept Report*

City of Brooklyn Center

Figure 14



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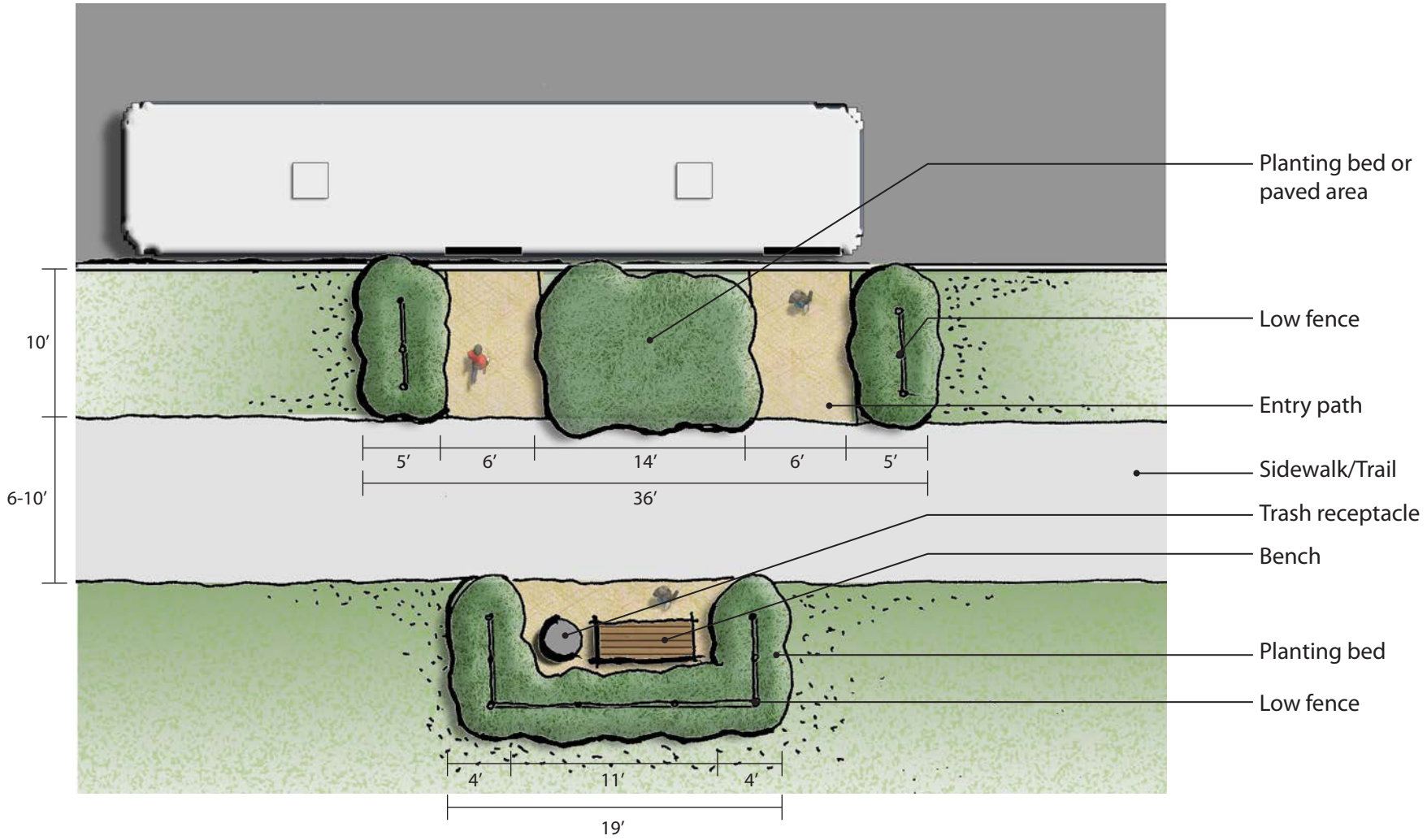
Brooklyn Boulevard Weekday Ridership

City of Brooklyn Center

Figure 15



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Low Volume Boarding Location Concept A

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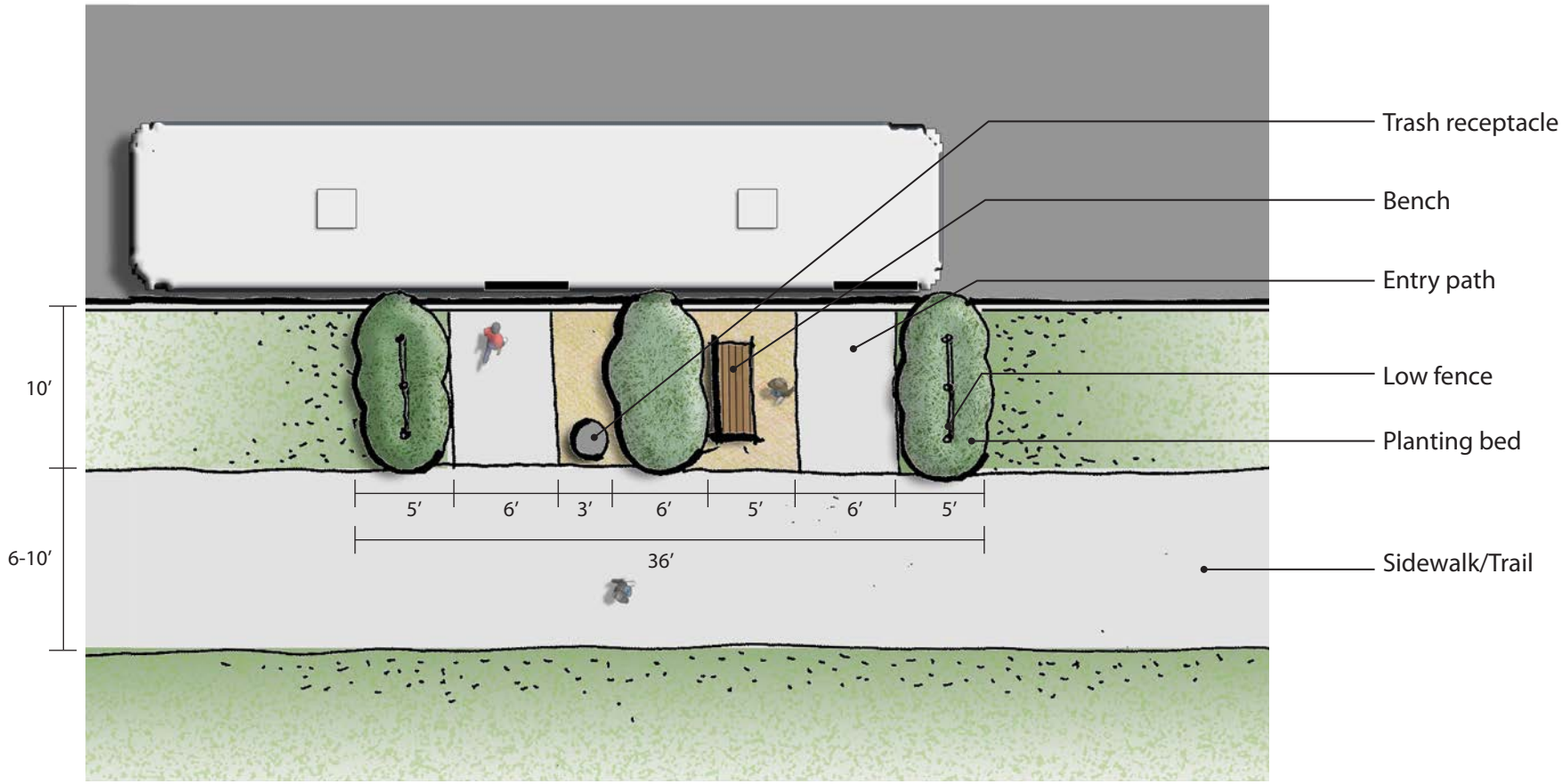
City of Brooklyn Center

Figure 16



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Low Volume Boarding Location Concept B

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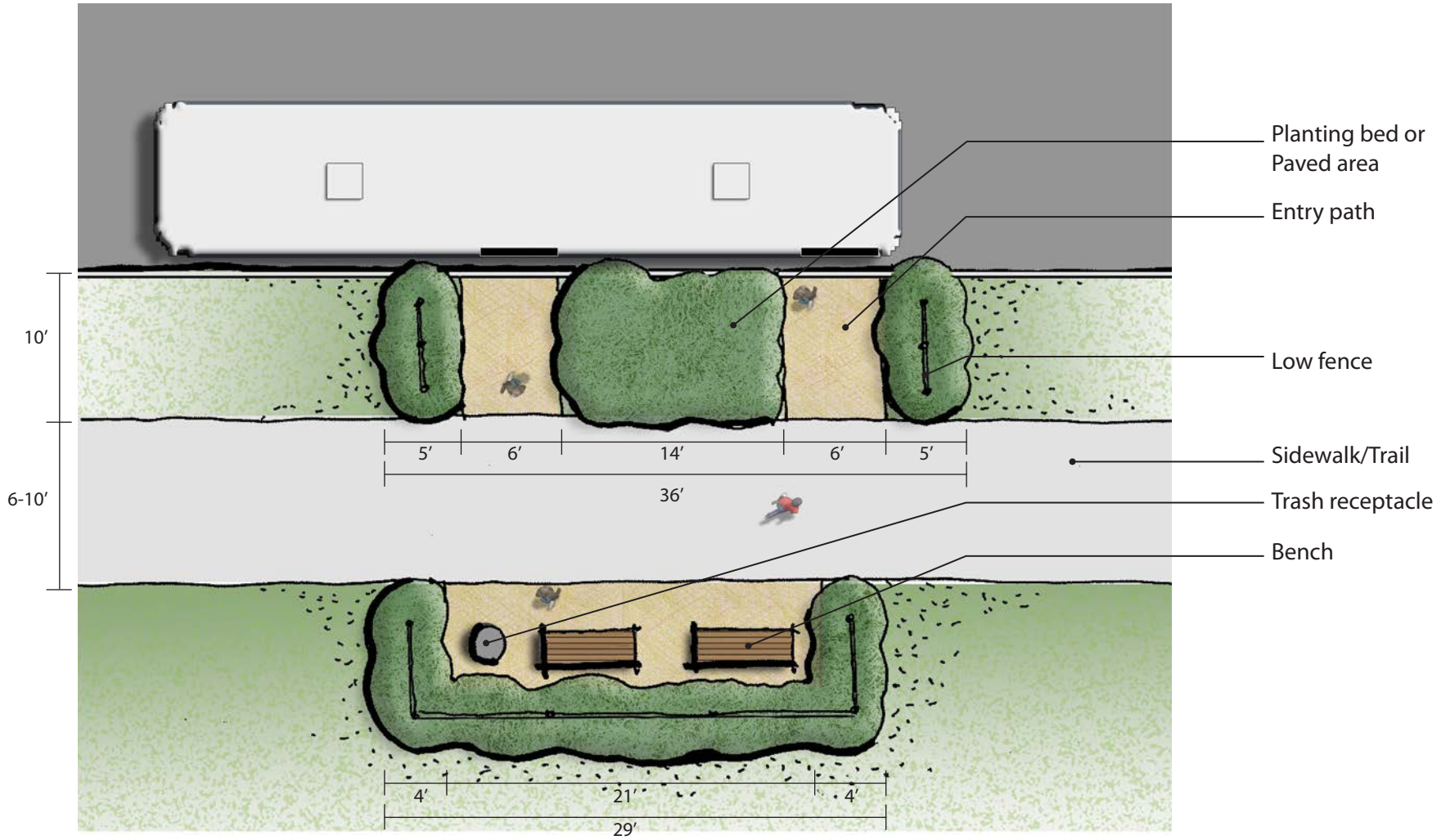
City of Brooklyn Center

Figure 17



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Medium Volume Boarding Location Concept A

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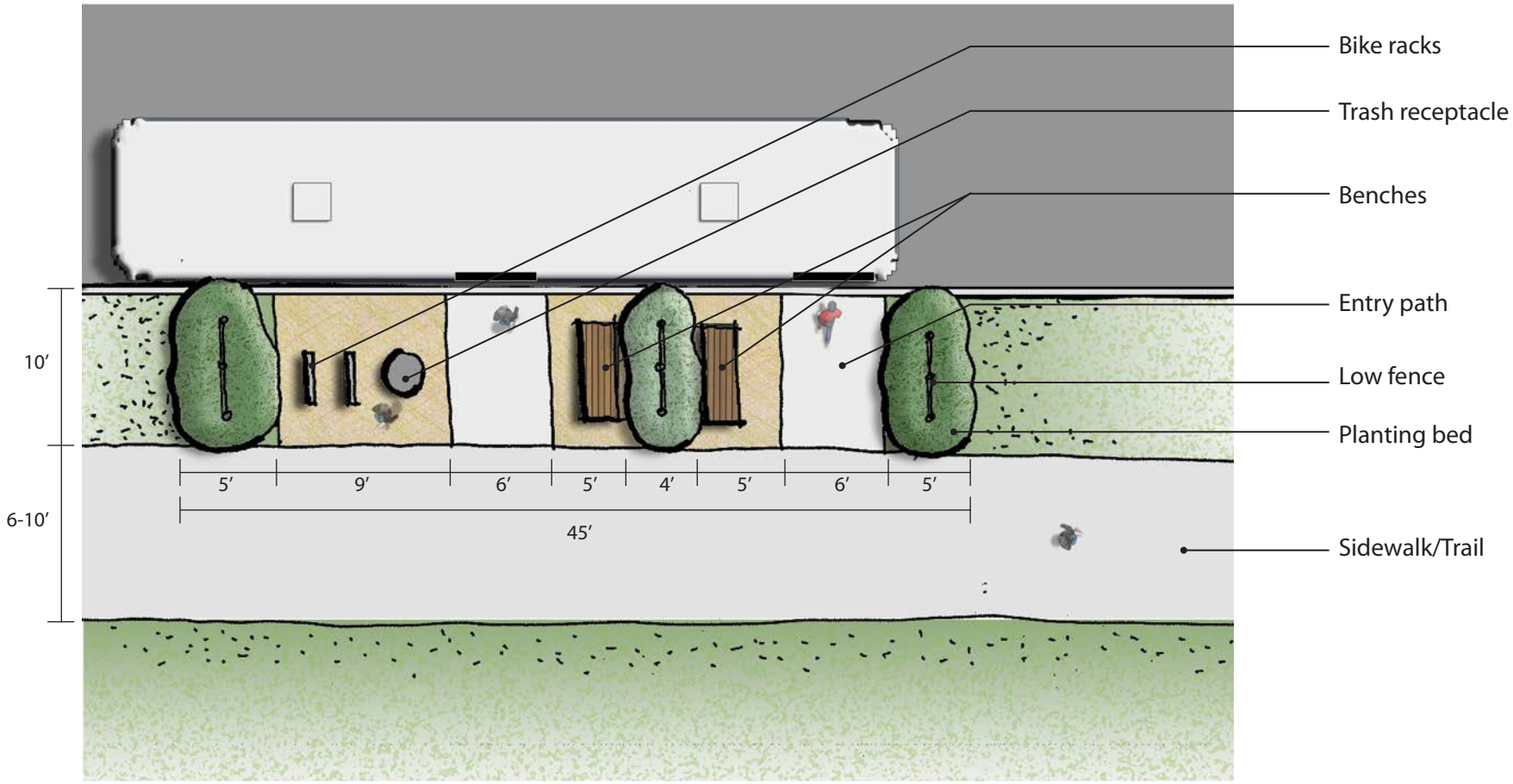
City of Brooklyn Center

Figure 18



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Medium Volume Boarding Location Concept B

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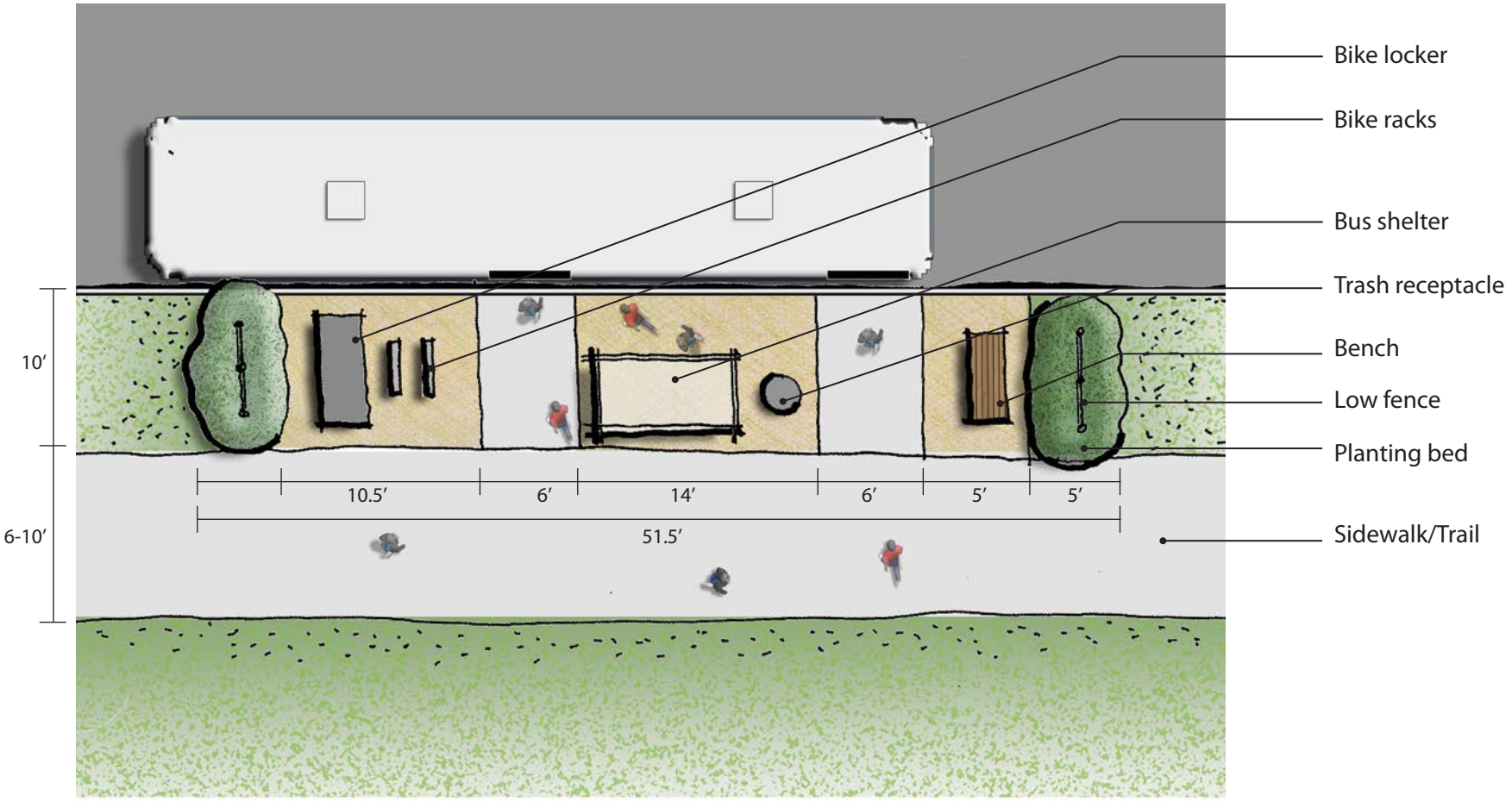
City of Brooklyn Center

Figure 19



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High Volume Boarding Location Concept

Brooklyn Boulevard Corridor Study - *Recommended Concept Report*
City of Brooklyn Center

Figure 20

Appendix

Figure 1: 48th Avenue to 51st Avenue

Figure 2: 51st Avenue to TH 100

Figure 3: TH 100 to 55th Avenue

Figure 4: 56th Avenue

Figure 5: Bass Lake Road

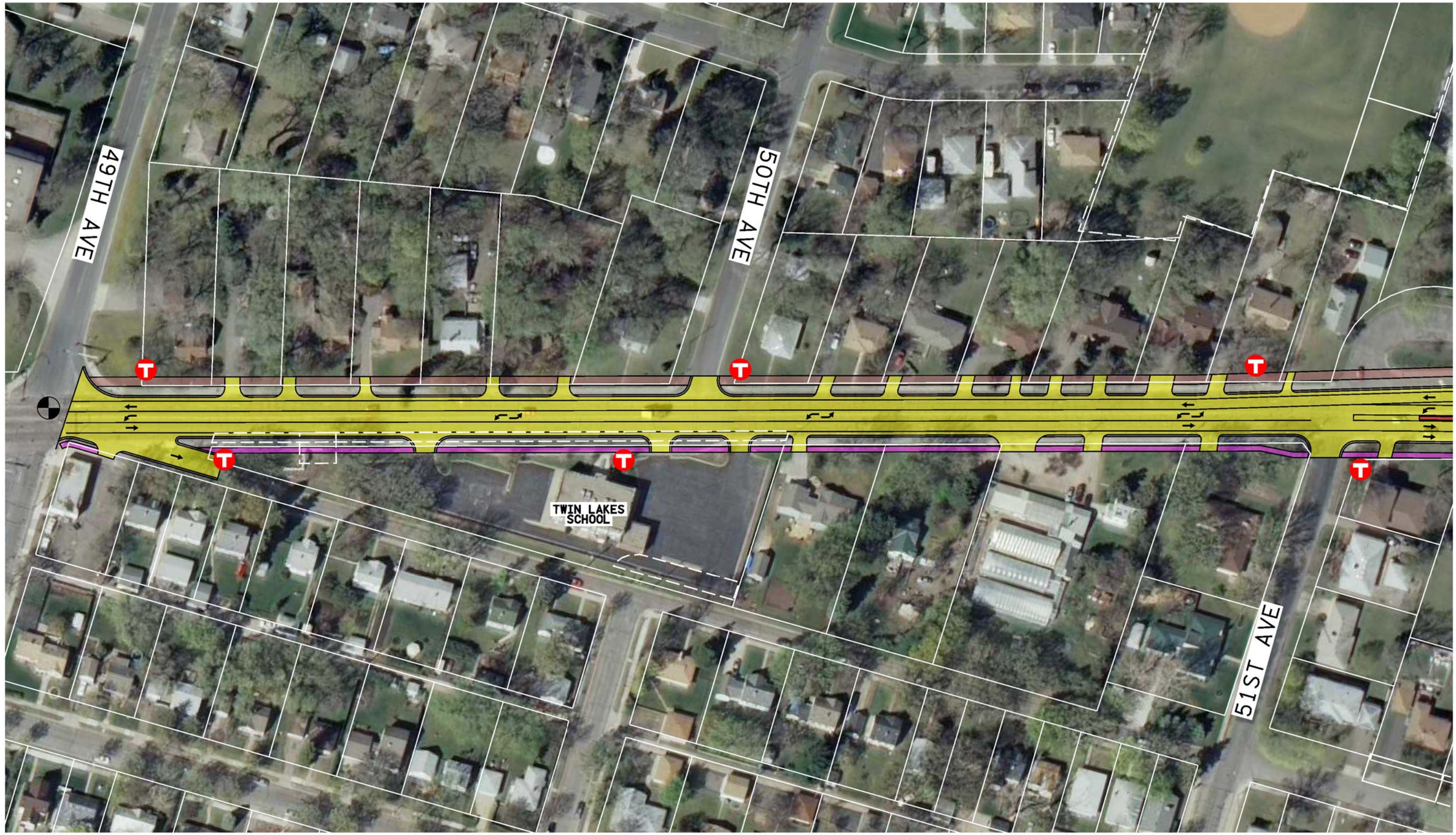
Figure 6: Admiral Lane to 61st Avenue

Figure 7: 62nd Avenue to 63rd Avenue

Figure 8: 63rd Avenue

Figure 9: 63rd Avenue to 65th Avenue

Figure 10: 65th Avenue to I-94



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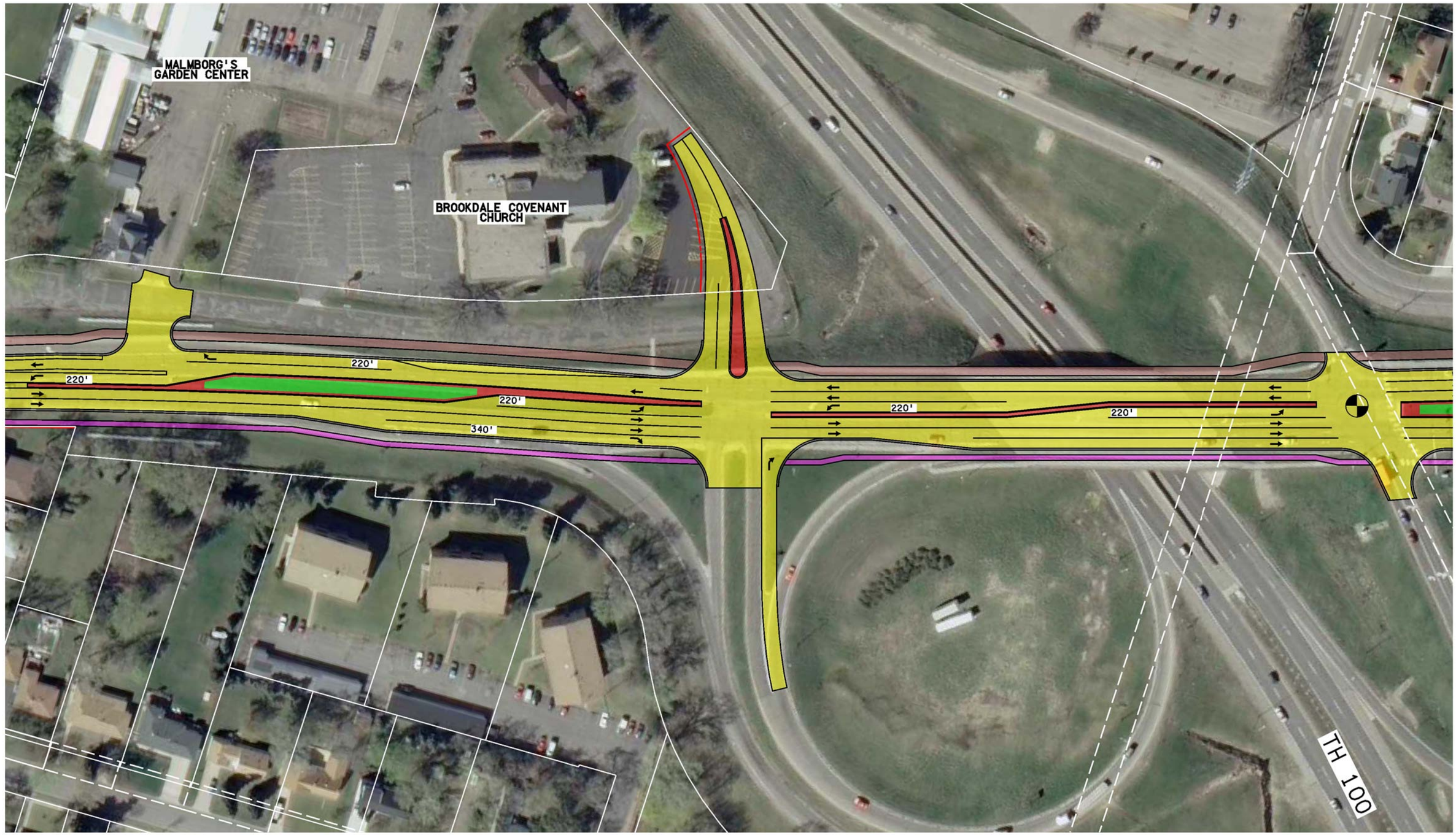
49th Avenue to 51st Avenue

Brooklyn Boulevard Concept Layout
City of Brooklyn Center

Figure 1



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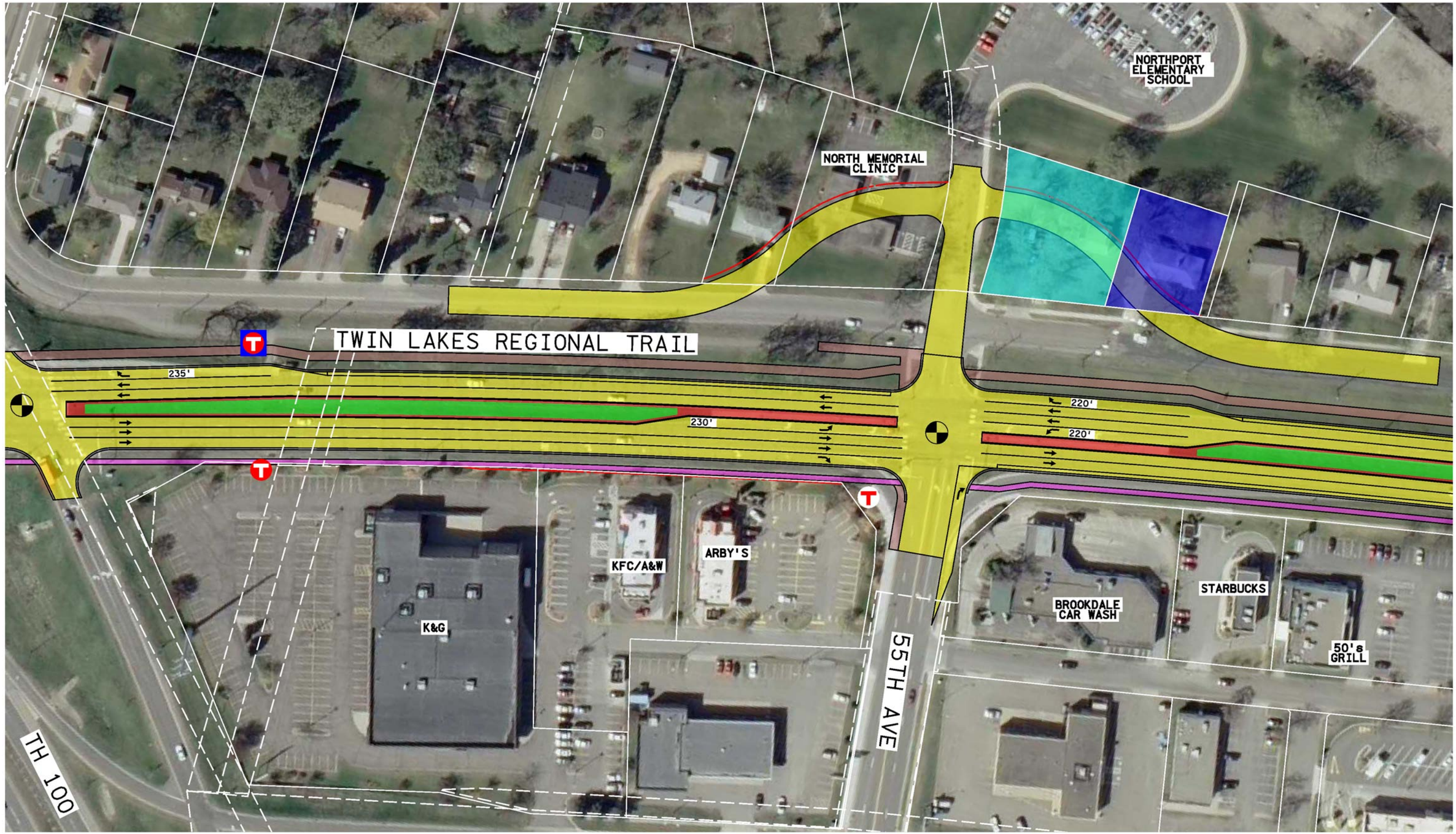
51st Avenue to T.H. 100

Brooklyn Boulevard Concept Layout
City of Brooklyn Center

Figure 2



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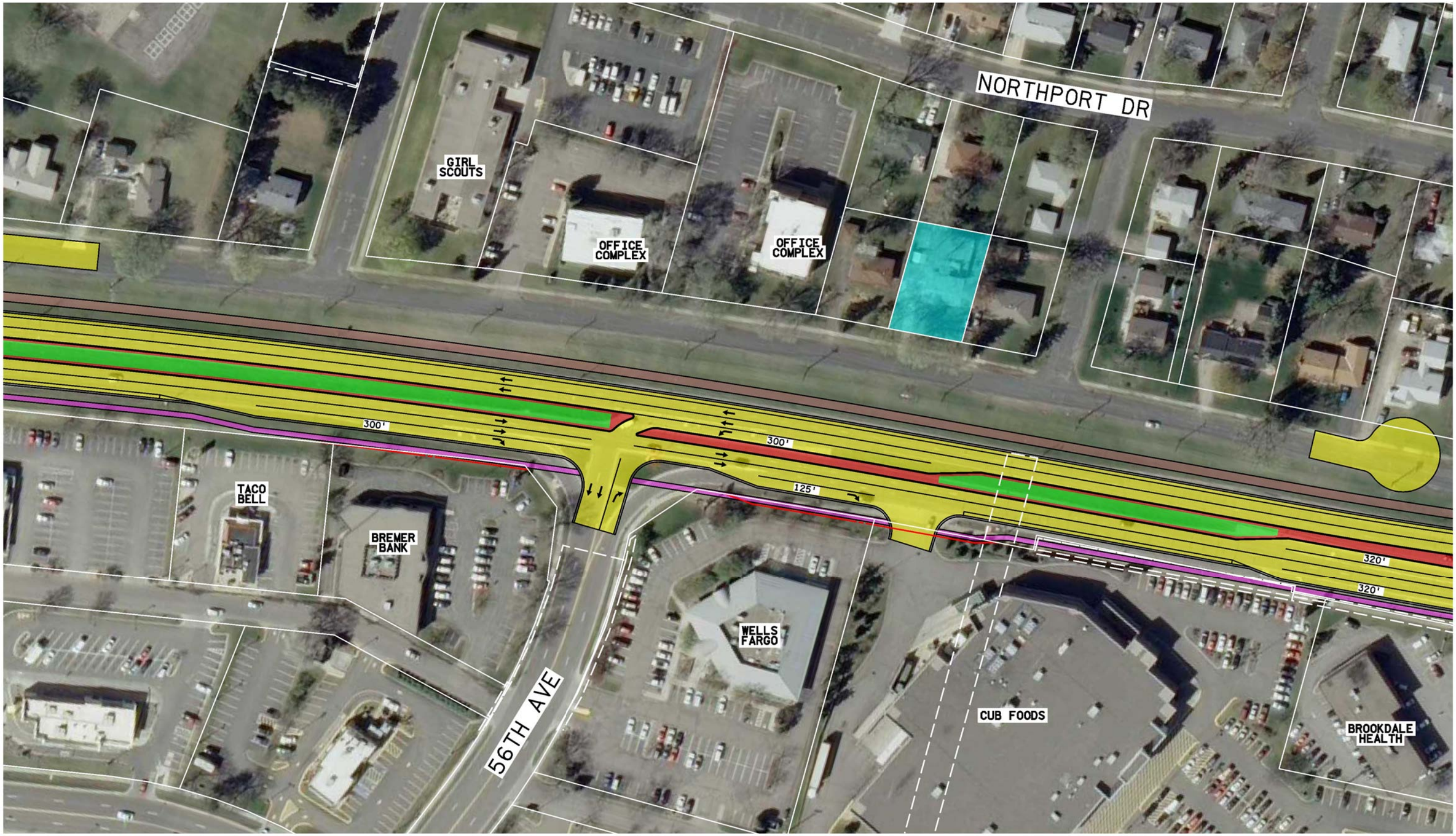
T.H. 100 to 55th Avenue

Brooklyn Boulevard Concept Layout
City of Brooklyn Center

Figure 3



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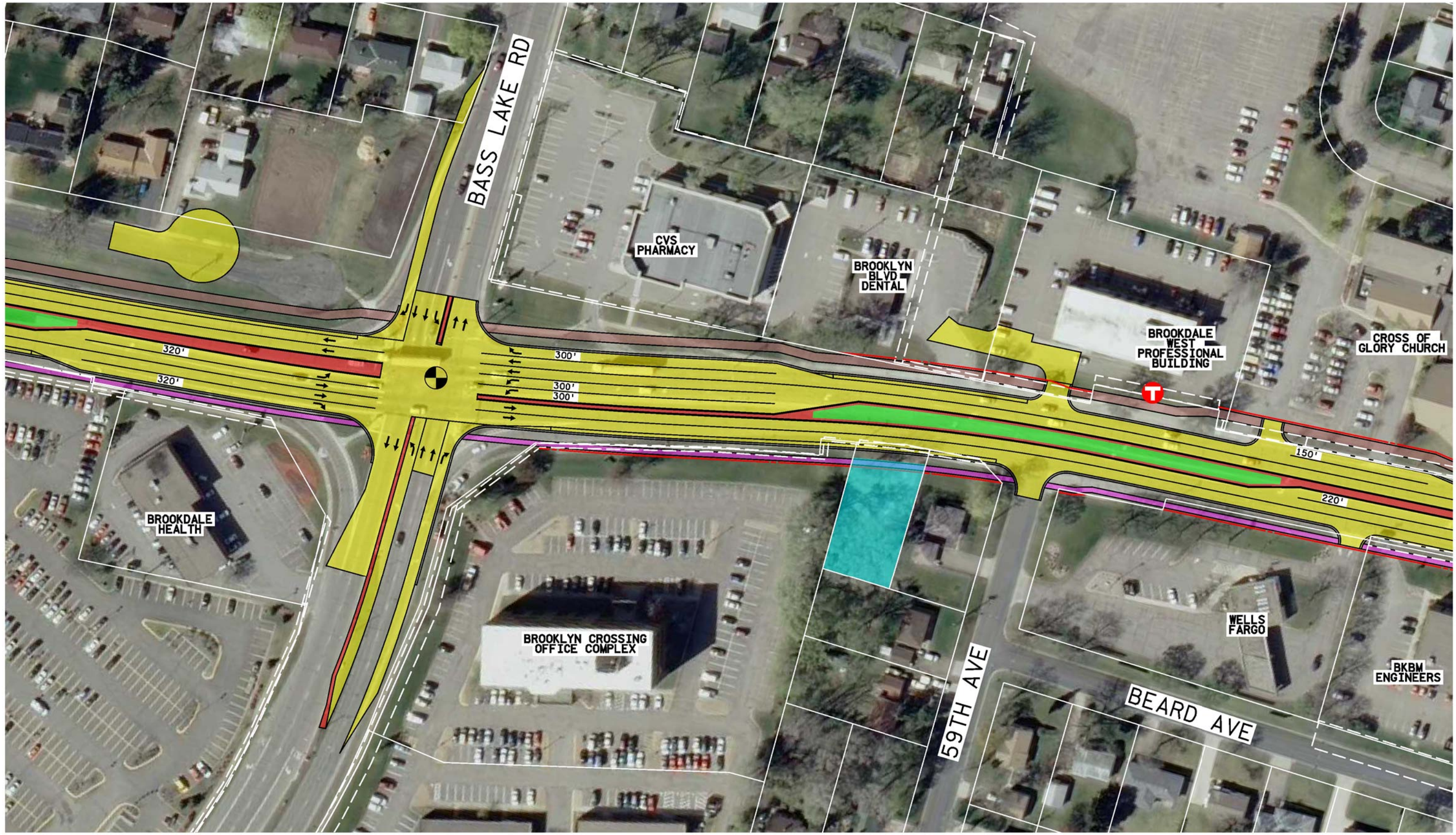
56th Avenue

Brooklyn Boulevard Concept Layout
City of Brooklyn Center

Figure 4



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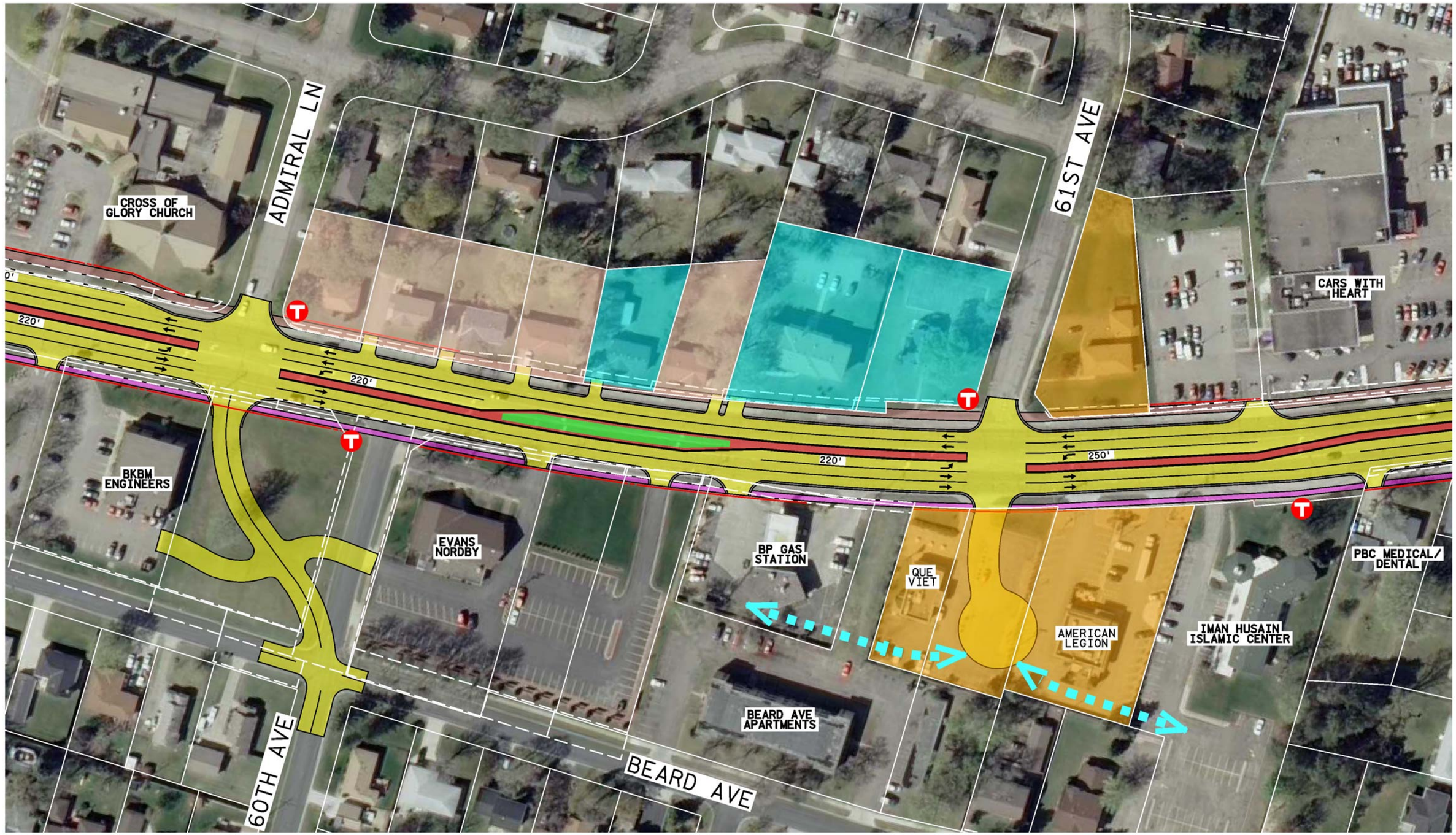
Bass Lake Road

Brooklyn Boulevard Concept Layout

City of Brooklyn Center

Figure 5



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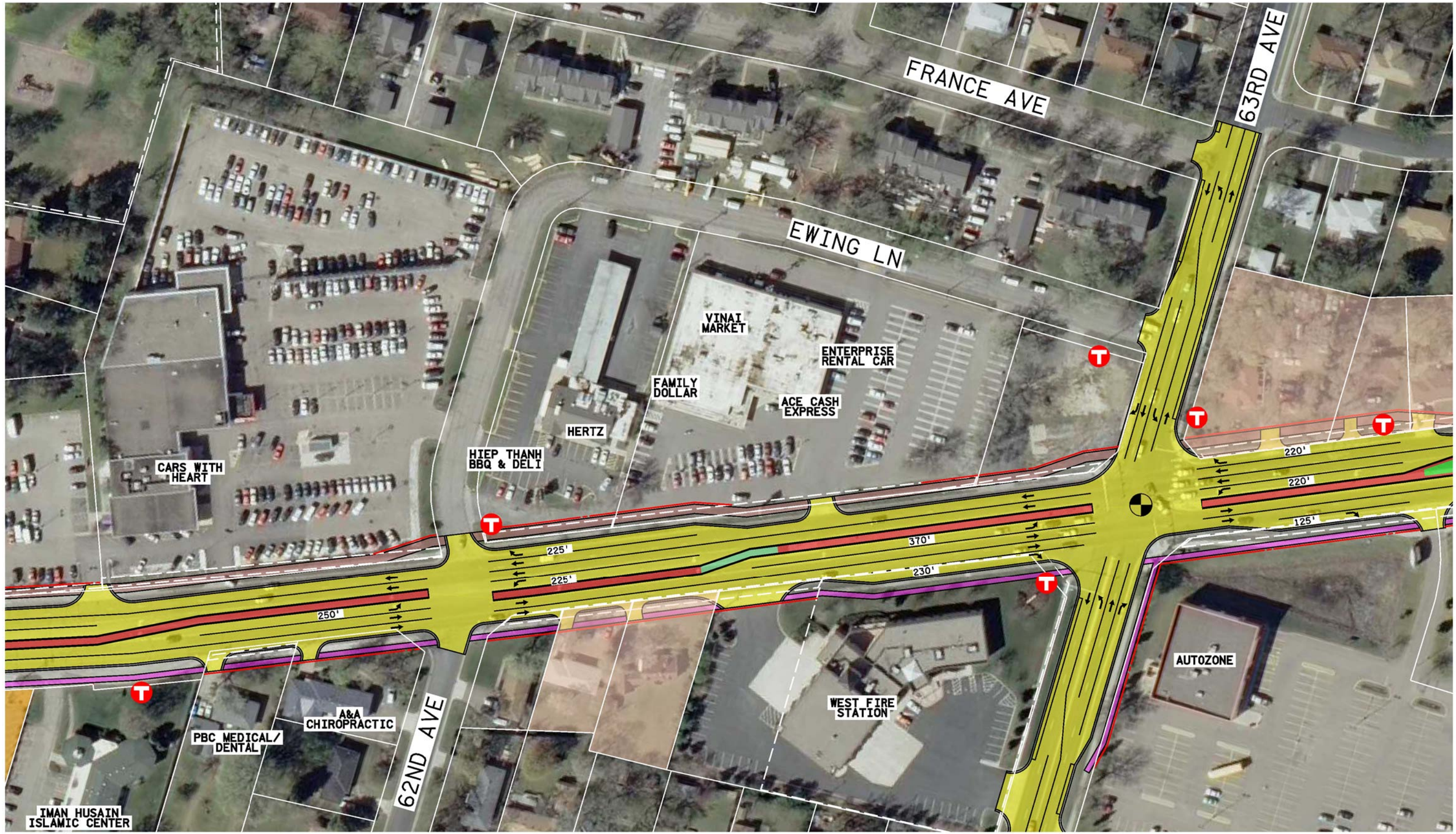
Admiral Lane to 61st Avenue

Brooklyn Boulevard Concept Layout

City of Brooklyn Center

Figure 6



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62nd Avenue to 63rd Avenue

Brooklyn Boulevard Concept Layout
City of Brooklyn Center

Figure 7

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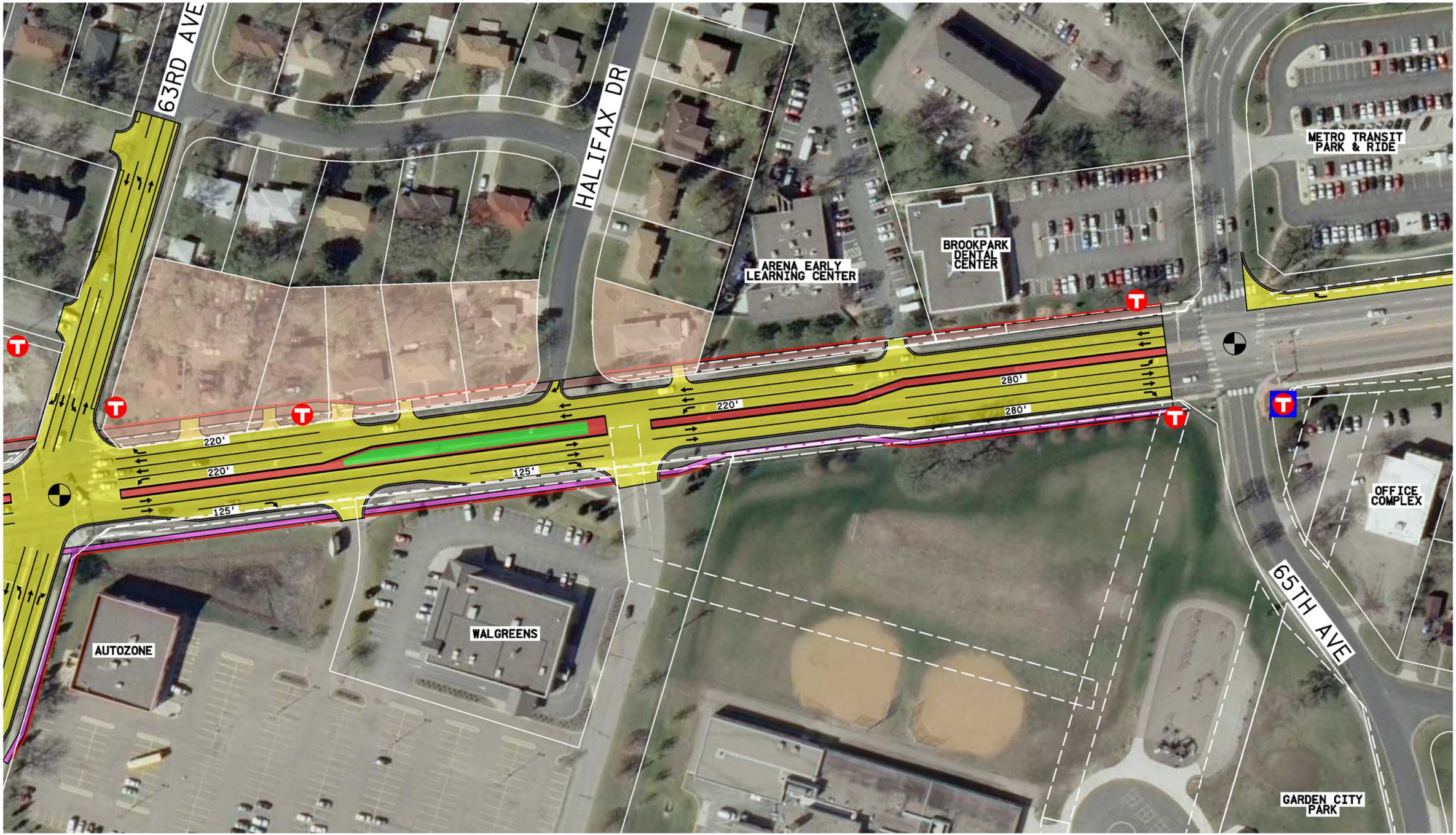
63rd Avenue

Brooklyn Boulevard Concept Layout

City of Brooklyn Center

Figure 8



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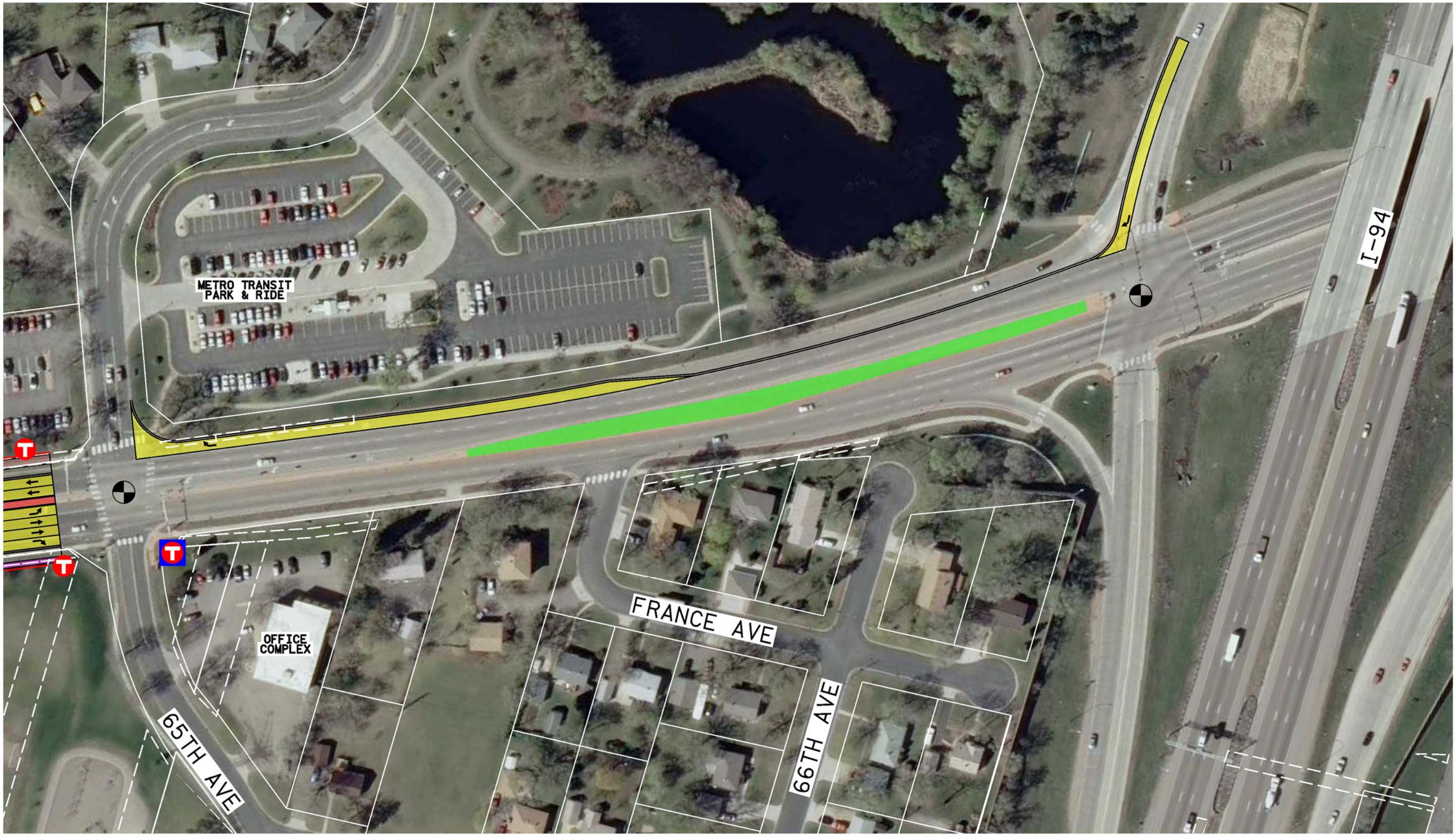
63rd Avenue to 65th Avenue

Brooklyn Boulevard Concept Layout

City of Brooklyn Center

Figure 9



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65th Avenue to I-94

Brooklyn Boulevard Concept Layout
City of Brooklyn Center

Figure 10