# TOMAHAWK ROAD SAFETY, BEAUTY, AND CONNECTIVITY AD HOC COMMITTEE

Report to the City Council of Mission Hills, Kansas

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## Executive Summary

### I. Introduction

In 2022, the City of Mission Hills plans to initiate the complete reconstruction of the asphalt, roadbed (as needed), curbing and all other elements of Tomahawk Road. As an arterial road, Tomahawk Road is eligible for County Assistance Road (CARS) funding. Further, a complete rehabilitation project of this type only occurs once in a generation, so careful planning and consideration for the future, as well as any remediation of known issues, must be a key part of the project.

### II. Ad hoc Committee Framework and Objectives

Mayor Dickey established the Tomahawk Safety, Beauty and Connectivity (Tomahawk SBC) ad hoc committee to work with residents and staff to assess what, if anything, could be done to enhance or improve the safety, beauty, and connectivity of Tomahawk Rd. Janelle Clayton, P.E., PTOE of Merge Midwest and Captain Eric McCullough of the Police Department provided traffic expertise and professional guidance throughout the Committee process. Upon establishment of the Committee, all residents on Tomahawk Rd were mailed a postcard invitation to participate in all Committee meetings. City publications, including the Mayor's Letter in the Columns Newsletter and website, invited all residents to attend Committee meetings. Additionally, a dedicated email address was created for residents to contact staff regarding Committee updates and all Committee materials were made available on the City's website. While residents were invited to provide input via attendance at meetings and email correspondence, only committee members voted on recommendations.

Through a brainstorming exercise, the Committee identified the following existing conditions of Tomahawk Road and guiding principles for the Committee's work:

<u>Safety</u>

- Review the varied speed limit of 25 and 30 mph
- Review existing signage and location of crosswalks
- Identify how pedestrians and bikers use the Tomahawk Rd corridor
- Review traffic incidences and crashes data – identify if there are any clusters or "hot spots" of issues
- Review sight distances at intersections – are there challenges due to road geometry or visibility blockers
- Traffic calming measures – does the current roadway encourage or discourage desired traffic behaviors
- Review current stop controls at the intersection of State Line Road and Tomahawk Road
- Review construction of sidewalk (See Connectivity)

<u>Beauty</u>

- Identify existing infrastructure (including electricity and irrigation) at parklets and islands
- Maintain existing aesthetics at Belinder Circle
- Review existing streetlight poles and signage
- Eisenhower Pond – incorporate and support efforts of the Park Board
- Review pervious materials for improvements

<u>Connectivity</u>

- Identify Activity Centers along the Tomahawk Rd corridor
- Connect residents within the City to Activity Centers

- Drivers, walkers, and bikers sharing the roadway
- Review Options for walking paths, sidewalks, bike paths
- School students
- Connect the community and with neighboring features, including the Village shops

The Committee identified guiding principles for the review criterion:

- Protect and maintain street trees
- Minimal signage and pavement markings
- Continued use of Tomahawk Rd for parking where possible, when needed for occasional deliveries, service providers, or individual residential events.
- The final recommendation to the Council could be to recommend no changes from the existing conditions of Tomahawk Rd

The Comprehensive Plan is the principle document that outlines the municipality's direction for the future. It was developed to conform to Kansas State Statues and guides the decision-making of City staff, elected officials, and the various boards and committees that make decisions on behalf of the community regarding the enhancement, maintenance, and redevelopment of the City. Goals are a long-range target at which decisions about the future should be aimed. The following goal supports the vision of the Comprehensive Plan:

STREETS

Goal 2: Accommodate safety and balance access improvements while maintain the street network, pattern, and design as a defining element of Mission Hills.

Principle 2.1:

A complete transportation network should connect the community.

Policies

- The street network design and connectivity shall be maintained.
- Improvements to the street network shall accommodate the automobile, pedestrian, and bicyclist in a manner that preserves the original design of the community.
- As infrastructure projects are planned, the City Council should consider providing new walkways that would connect current walkways and paths.

Principle 2.2:

Roadway design should provide safe travel routes for automobiles, pedestrians, and bicycles

Policy:

- The priority of specific improvements to balance automobile, pedestrian and bicycle networks shall be based on the context of each street within the network and the significance of the connection to destinations within and beyond Mission Hills

Principle 2.3:

The street network is a contributing element to the scenic character of Mission Hills.

Policies:

- Street design and improvements shall maintain the natural character of the community, including the rolling topography, vegetated landscapes, and subtle characteristics of construction elements.
- The design of future pedestrian and bicycle connection shall support neighborhood context and community character.

## III. Summary of the Committee's majority recommendations for consideration by the City Council

Safety

- Reduce the speed limit of all of Tomahawk Rd to 25 mph and encouraged enforcement of traffic regulations
- Construction of a 90-degree angle T-intersection at 69th St and Tomahawk Rd (Exhibit 1.1) conceptualized by Ochsner Hare & Hare in Option A (Exhibit 1.2).
- Modified intersection at 67th St/Wenonga Rd/Indian Ln and Tomahawk Rd (Exhibit 2.1) incorporating the meandering path conceptualize by Ochsner Hare & Hare in Option C (Exhibit 2.2) with additional consideration for sidewalk on the north side of Tomahawk Road from Wenonga Terrace to 67th St/Indian Ln/Wenonga Rd (Exhibit 2.3)
- Construction of a 70-degree angle T-intersection at Mission Drive with narrowed driving lanes to provide 29-foot distance between playground and roadway (Exhibit 3.3). Additional considerations are for a physical barrier between the road and playground, a crosswalk from Tomahawk Road to the playground, and elimination of parking on the east curve of Mission Drive.
- Reduce both driving lanes along Tomahawk to 12.5 feet (6-inch reduction to each lane), remove existing shoulder, and place 5-foot wide sidewalks against the curb (in what is now the existing roadway) on the south side of Tomahawk. This recommendation stipulates that all street trees should be maintained and the winding street network remains intact. Additionally, the Committee recommends as a sidewalk on an arterial road that snow/ice control be managed by the City.
- Manage sight challenges to drivers by trimming or replacing vegetation at Shepard Island (Mission Drive and Tomahawk Rd) and intersection of Aberdeen and Tomahawk Rd.
- Recommendation against Mission Dr being reconstructed as a cul-de-sac or a one-way
- Recommendation against Belinder Circle being reconstructed as a true roundabout or traffic circle
- Recommendation against modifying the existing stop controls at State Line Rd and Tomahawk Rd

Beauty

- Preserve the community's character and winding, tree-lined streets
- Demarcation of public and private property at intersections with land and hardscaping
- Install decorative streetlights in keeping with the aesthetics of other arterials in the City
- Limit the total amount of signage on Tomahawk Rd to a minimum

Connectivity

- Provide safe passage for all road users, including walkers and bikers, to points of interest in the City
- Pedestrian crossings should be signed on decorative poles and painted minimally on the roadway
- Consideration for a Rectangular Rapid Flashing Beacon pedestrian crossing sign on decorative mount at City Hall crossing at Tomahawk Road and Mission Drive (Exhibit 3.4)
- Maintain free flow of traffic for vehicles, bikers, and pedestrians.

## IV. Summary of the Committee's minority recommendations for consideration by the City Council

Safety

- Maintain the existing island configuration at 69th St and Tomahawk Rd
- Maintain the existing island configuration at 67th St/Wenonga Rd/Indian Ln and Tomahawk Rd
- Sidewalks could provide additional safety for walkers. Request for further exploration of 4-foot sidewalk with 5-foot wide turnarounds every 200 feet against the curb on the south side of Tomahawk.
- Maintain existing width of both driving lanes and road shoulder. With yard service trucks, delivery trucks, construction trucks, and the occasional residential car that parks along the street there is concern that narrowing the road could reduce all user's safety

Beauty

- Preserve the character of Belinder Circle. A sidewalk configuration around Belinder Circle could change the character of City.

**Evaluation of Current Conditions**

Over the course of a year, the Committee reviewed the existing condition data for Tomahawk Road.

**I. Speed**

Merge Midwest Engineering, LLC completed a review of the speed data recorded by the Mission Hills Police Department and existing conditions along Tomahawk Road from Mission Road to State Line Road in Mission Hills, Kansas, in order to determine if the existing speed limit is appropriate.

According to the Federal Highway Administrations (FHWA) "*Methods and Practices for Setting Speed Limits,*" an engineering approach for the practice of setting speed limits includes the following:

- Review of the road's environment, features, condition, and traffic characteristics.
- Observe and measure vehicle speeds at one or more representative locations along the road in ideal weather and under free-flowing traffic conditions.
- Analysis of vehicle speeds to determine 85th percentile speed and other characteristics.
- Review of the road's crash history
- Review of any unusual conditions not readily apparent.

Most engineering approaches to speed limit setting are based on the 85$^{th}$ percentile speed—the speed at which 85 percent of free-flowing traffic is traveling at or below. Adjustments to either increase or decrease the speed limits may be made depending on infrastructure and traffic conditions. There are two basic engineering approaches to setting speed limits: Operating Speed Method and Road Risk Method.
*Operating Speed Method:* Under this method of setting speed limits, the first approximation of the speed limit is to at the 85th percentile speed. The MUTCD recommends that the speed limit be within 5 mph (8 km/h) of the 85th percentile speed of free-flowing traffic.
*Road Risk Method:* is Under this method of setting speed limits he risks associated with the physical design of the road and the expected traffic conditions. The road risk method uses a base speed limit that is predicated on the functional classification of the road and its setting.

The Committee utilized both methodologies to review the existing speed conditions of Tomahawk Rd.

**Existing Tomahawk Road Characteristics**

- Speed Limit = 30 mph
- 85th Percentile Speed = 35 mph (just West of Belinder)
- Pedestrians walking on roadway or near roadway in the adjacent grassy area
- Bicyclists
- Horizontal Curvature
- National trend for speeding traffic stop is 10 mph over posted speed
- Intersection Sight Distance constraints at a couple of locations

Based on the current geometrics and 85th percentile speed alone, the speed limit of 30 mph on Tomahawk Rd is appropriate. However, if lane widths were reduced on Tomahawk Rd, the reduced lane width is another consideration for lowering the speed limit. "FHWA Course on Bicycle and Pedestrian Transportation" states that the need for full-width travel lanes decreases with speed with 11' lanes being set between 30 – 40 mph and 10' lanes being set up to 25 mph. The proposed 12.5' lanes are within the access of the minimum suggested road width for a posted speed limit of 25 mph.

**National Pedestrian Trends in relation to Traffic Speeds**
Pedestrian fatalities are on the rise nationwide. FHWA's "Pedestrian Safety Strategic Plan: Background Report" states that the speed of the vehicle is a major determinant in the severity of a crash. One study in the report states that a

pedestrian hit at 40 mph has an 80 percent chance of fatality, while a pedestrian hit at 20 mph has only a 5 percent chance of fatality. In January 2017, Boston reduced the default speed limit on City streets from 30 mph to 25 mph. The estimated odds of a vehicle exceeding 35 mph fell 29.3%, exceeding 30 mph fell 8.5%, and exceeding 25 mph fell 2.9%. The study concluded that communities should consider lowering speed limits to reduce speeds and improve safety for all road users.

In conclusion, pedestrians are using the roadway due to a lack of continuous sidewalks along Tomahawk Road. Considering this condition, and the research presented above, engineering judgement can support the reduction of the speed limit from 30 mph to 25 mph. If the narrowing of traffic lanes is implemented then drivers will be more inclined to obey a lower speed limit, since drivers typically drive slower on narrower roads. If sidewalks were constructed along Tomahawk Road reduction of the speed limit would still be recommended due to the narrower driving lanes and the sidewalks being adjacent to the roadway.

**Traffic Calming Measures**

Different traffic calming measures were discussed by the Committee including traffic circles, roundabouts, chicanes, bulb-outs, speed bumps/humps, and lane-width reductions. The Committee ruled out most of these options in order to preserve the aesthetic nature of the community and maintenance concerns.

Roundabouts and traffic circles were also considered at the intersections of Tomahawk Road with Belinder Avenue and Tomahawk Road with Wenonga Road, as both locations were identified in the crash data (Section II). These options at the intersection of Tomahawk Road and Wenonga Road were not ideal due to the constraints of the existing geometry and grades and would require the utilization of the right-of-way of adjacent properties. Converting Belinder Circle to a proper roundabout was not desirable to the Committee, as it would require the addition of splitter islands with directional signage on all approaches.

Based on the evidence above, the Committee is recommending the overall speed limit of Tomahawk Road be reduced to 25 mph with encouraged enforcement of all traffic regulations. The police department expressed concern that if citations were issued for moving violations of speeds less than 10 miles per hour over the posted limit then public perception could be that these citations are not safety related, but rather revenue generating. This could decrease public trust in community policing and lead to an adverse view of the City and the Department.

## II. Crash Data

Merge Midwest Engineering, LLC completed a crash analysis for Tomahawk Road from Mission Road to State Line in Mission Hills, Kansas. Captain McCullough provided crash data for the study corridor for the years 2010-2018 (9 years of complete data). During the study period, 46 crashes occurred along the study corridor. The crash severity was not listed on the crash data provided, but the location, accident class, cause, and circumstance were included in the information. The crash data is summarized below:

15 Intersection Crashes: Crashes where the actual point of impact is within the intersection of two streets

- 6 Tomahawk Rd. & Belinder Ave.
  - 4 - drove over curb and into circle or fountain
  - 2 – failed to yield right-of-way
- 5 Tomahawk Rd. & State Line Rd.
  - 4 – confused as to whom had right-of-way
  - 1 – slid off road
- 3 Tomahawk Rd. & Wenonga Rd.
  - All failed to yield right-of-way
- 1 Tomahawk Rd. & 67th St.
  - Slid off road due to snow

15 Intersection Related Crashes: Crashes where the point of impact was outside the confines of the intersection, but the officer taking the report determined that the intersection somehow contributed to the crash

- 3 Tomahawk Rd. & Mission Rd.
  - All were rear-ends while waiting at red light
- 7 Tomahawk Rd. & State Line Rd.
  - 5 – turning vehicles cutting turn or turning too sharply
  - 2 – rear-end
- 1 Tomahawk Rd. & Willow Lane
  - Rear-end from following too closely
- 2 Tomahawk Rd. & Wenonga Rd.
  - Both rear-ends
- 1 Tomahawk Rd. & Wenonga Terr.
  - Improper backing
- 1 Tomahawk Rd. & 66th St.
  - Rear-end due to inattention

3 Access to Parking Lot / Driveway Crashes

- 1 Tomahawk Rd. & 69th Street
  - Struck car on Tomahawk backing out of driveway
- 1 Tomahawk Rd. & Mission Rd.
  - Vehicle exiting Indian Hills Country Club struck car on Tomahawk
- 1 Tomahawk Rd. & Belinder Ave.
  - Vehicle exiting driveway struck car on Tomahawk

10 Non-Intersection Crashes

- 3 Fixed-Objects
  - 1-tree, 1-pole, 1-curb
- 4 Collision with Legally Parked Car
- 2 Rear-End
  - 1-hit gas instead of brake, 1-stopped for pedestrians and got rear-ended
- 1 Pedestrian
  - DUI related incident

3 Off-Roadway Crashes

- 3 1-hit traffic signal pole, 1-hit fountain, 1-hit tree

A crash heat-map was created to help identify the intersections with the most crashes during the study period. Overall, the most crashes attributed to intersections, or intersection related, occurred at the intersections of Tomahawk Road with State Line Road (12 crashes), Tomahawk Road with Belinder Avenue (6 crashes), and Tomahawk Road with Wenonga Road (5 crashes).

The crashes at the intersection of Tomahawk Road with State Line Road were analyzed to determine if there was a crash pattern that could be attributed to the lack of traffic signal control at the intersection. Three of the 12 crashes were due to lack of yielding right-of-way which could be caused by confusion of drivers on who has the right-of-way. However, there was not a strong pattern of these crashes at the intersection of Tomahawk Road & State Line Road.

Contact was made with Wei Sun with the City of Kansas City, Missouri to discuss the option of re-installing a traffic signal at the intersection of Tomahawk Road and State Line Road. He indicated the City of Mission Hills would be responsible for the cost of installation and maintenance if a signal were installed. The Committee expressed concerns about the cost of the signal (approximately $200,000-$250,000), and also the speed of cars coming down the hill from Meyer Circle and from State Line Road turning east onto Tomahawk Road if they had a green light, instead of having to stop. The Committee decided to not pursue the analysis of traffic signal warrants for these reasons.

**Road Segment Crash Rate**
The road segment crash rate was calculated for Tomahawk Road along the study limits (1.50 miles). The FHWA formula for the road segment crash rate is:

$$R = \frac{100{,}000{,}000 * C}{365 * N * V * L}$$

Where:
R = Crash rate for the road segment expressed as crashes per 100 million vehicle-miles of travel (VMT)
C = Total number of crashes in the study period
N = Number of years of data
V = Number of vehicles per day (both directions)
L = Length of the roadway segment in miles

$$R = \frac{100{,}000{,}000 * 46}{365 * 9 * 3{,}521 * 1.50}$$

R = 265.13 crashes per 100 million VMT
or <u>2.65 crashes per million VMT</u>

It should be noted that the number of vehicles per day was estimated by averaging the 24-hour weekday count data for the sections of Tomahawk Road recorded by Captain McCullough. KDOT's 5-year (2013-2017) statewide average for segment crashes on a 2-lane, undivided, urban roadway with no access control is 1.973 crashes per million VMT. **Therefore, the segment crash rate for Tomahawk Road of 2.65 crashes per mill VMT along the study corridor is 34 percent higher than the statewide average**. The critical crash rate (i.e. the rate that factors in location and ADT to reduce the exaggerated effect of sites with low volumes) is 2.93 crashes per million VMT. The segment crash rate along Tomahawk Road is 0.28 crashes per million VMT lower than the critical crash rate.

**Intersection Geometry**
Three intersections were studied in more detail due to the higher speeds and concern for safety for pedestrians. These intersections included:

- Tomahawk Road & W. 69th Street
- Tomahawk Road & Wenonga Road
- Tomahawk Road & Mission Drive

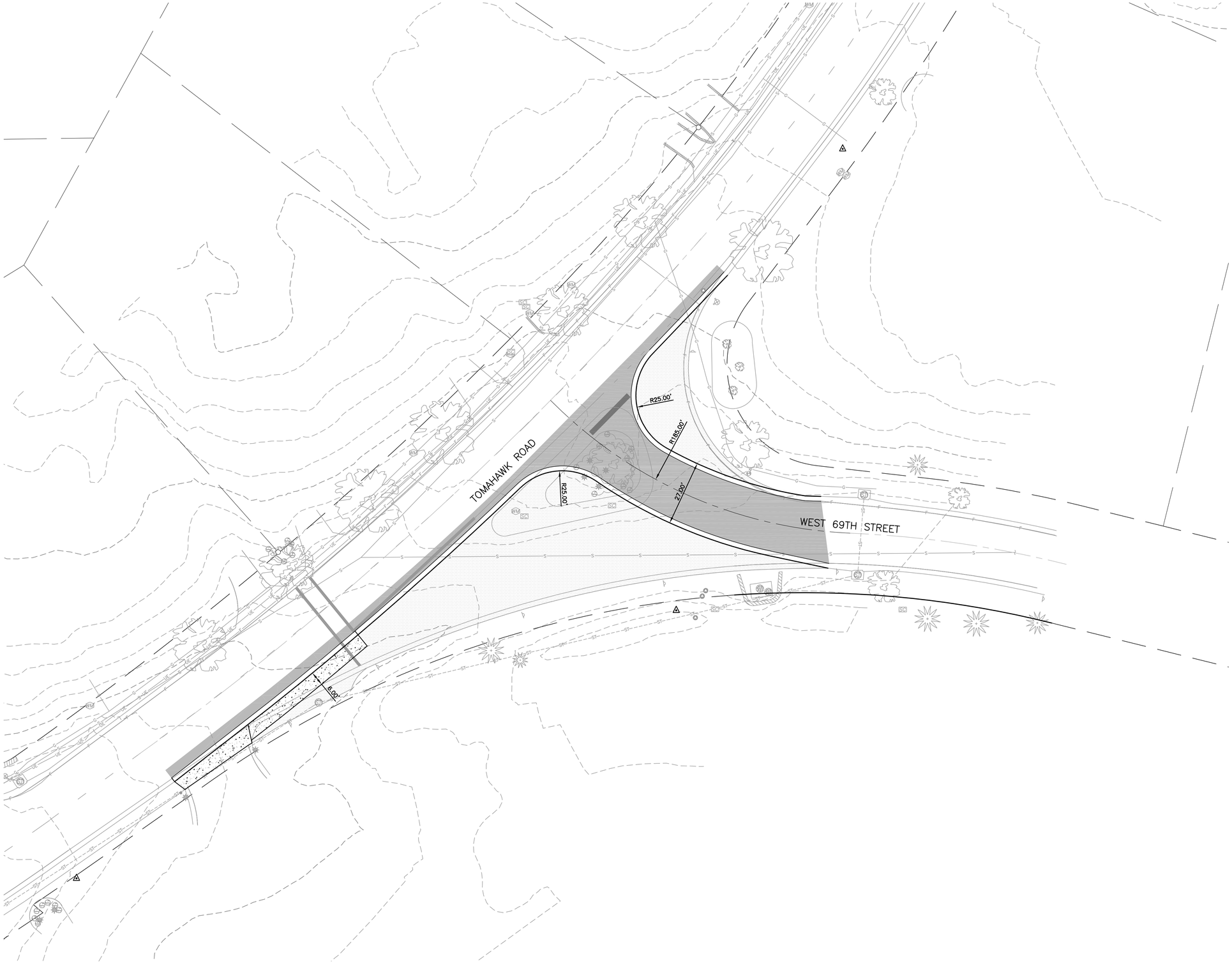
All of these intersections have been identified by the City as either a main trafficway or main trafficway connection because these roadways provide access to areas of concentrated activity within the City or between such areas within the City and traffic facilities outside of the City. Additionally, these streets typically carry higher traffic volumes than residential streets, have split approaches of the side street that result in pedestrians crossing twice, and have uncomfortable angles for the driver's head when trying to make a turn. The Committee submitted intersection reconfiguration concepts to the Park Board for consideration, who engaged Oschner Hare & Hare to produce the landscape renderings included. The Committee neither sought nor received the Park Board's approval for any recommended changes to intersections along Tomahawk Road. The only role of the Park Board was to design new public park spaces consistent with the aesthetic designs of Mission Hills.

**Tomahawk Road & W. 69th Street**

Currently it is undesirable to encourage pedestrians to travel east along Tomahawk Road due to the nature of the geometrics of the intersection allowing vehicles to turn without having to slow down while making the turn from northbound Tomahawk Road to eastbound W. 69th Street. The posted speed limit for Tomahawk Road on this segment is 25 miles per hour (mph). West 69th Street has a posted speed limit of 25 mph. There is a 20-mph advisory speed limit sign posted approximately 200' in advance of the intersection when traveling eastward from Tomahawk Rd to W. 69th Street. The collected speed data indicates the average speed for eastbound drivers is 27.0 mph. The 85th percentile speed, the speed at which 85% of vehicles are traveling at or below, is 29.9 mph. The current configuration of the intersection also forces pedestrians to cross the roadway twice. If reconstruction of W. 69th Street to a T-intersection is completed, a safer crossing can be provided for pedestrians by reducing the crossing width and the slowing of the vehicles to make the sharper turn. If 69th Street is not realigned and the speed on Tomahawk is reduced, the Committee identified concern that this could inadvertently encourage more traffic to travel along 69th Street to access Missouri. Given the potential hazard of golf balls that fall onto W. 69th Street from the adjacent driving range. Whereas if 69th Street was realigned it would become a more similar to the other existing intersections along Tomahawk Road that provide direct access to Missouri. Additionally, the Committee was charged to consider beauty improvements and the reconfiguring option would significantly reduce the amount of pavement and add significantly to green space at this intersection. <u>In conclusion, of this evaluation, the majority of the Committee is recommending the Construction of a 90-degree angle T-intersection at 69th St and Tomahawk Rd (Exhibit 1.1) conceptualized by Ochsner Hare & Hare in Option A (Exhibit 1.2). The minority of the Committee recommends maintaining the existing island configuration at 69th St and Tomahawk Rd.</u>

(Exhibits 1.1 and 1.2 directly follow. All renderings produced by Ochsner Hare & Hare for the Park Board are in the Appendix)

**EXHIBIT 1.1**





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CONCEPTUAL LAYOUT

TOMAHAWK / W 69TH
INTERSECTION IMPROVEMENTS

TOMAHAWK ROAD
MISSION HILLS, KANSAS

REVISIONS

DESIGNER / DRAFTER

DATE
SEPTEMBER 30, 2019

PROJECT NUMBER
0319052.01

BOOK AND PAGE

SHEET
1 OF 2

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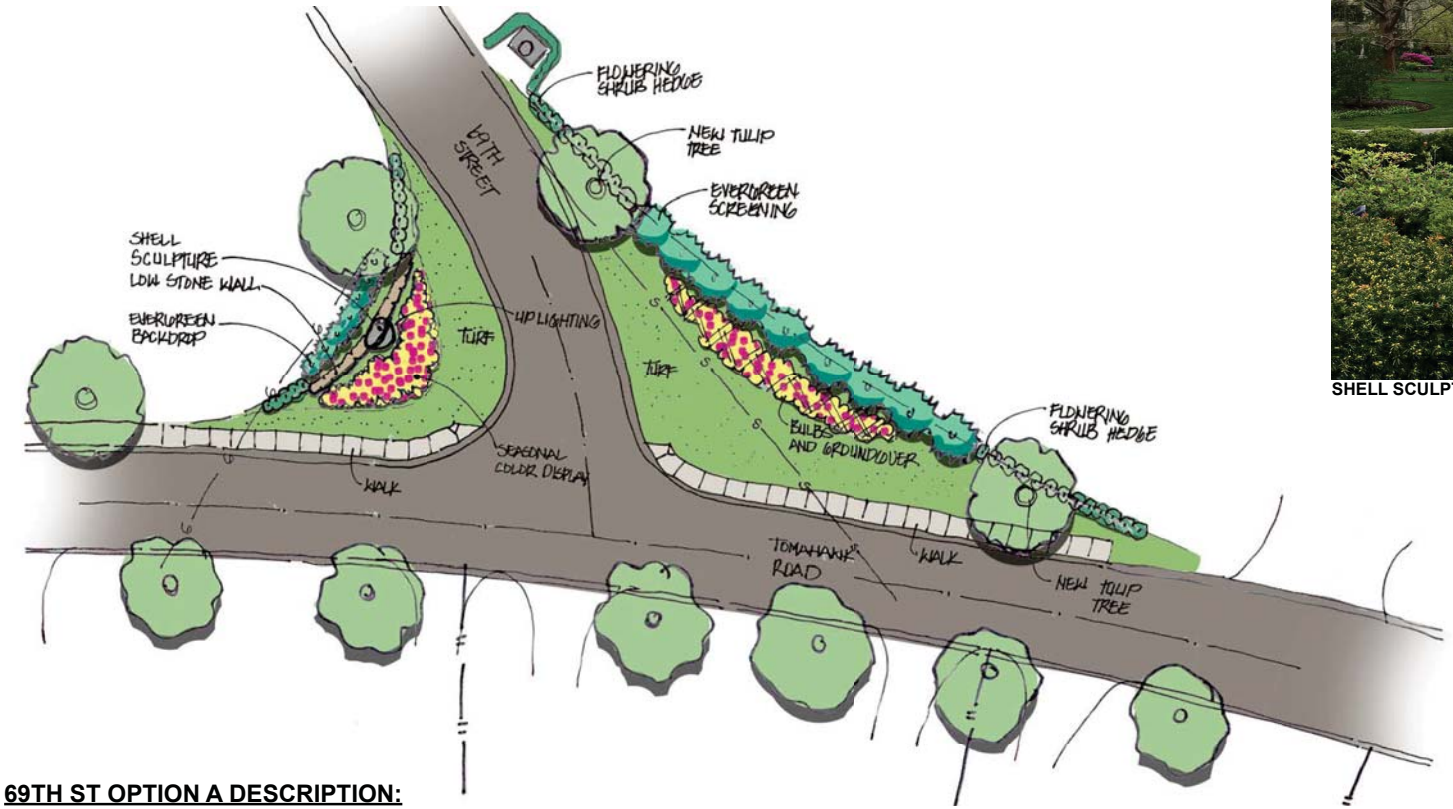
# EXHIBIT 1.2



SHELL SCULPTURE

**69TH ST OPTION A DESCRIPTION:**

SHELL SCULPTURE WITH CURVED STONE WALL
ADJACENT TO OTT PROPERTY

## TOMAHAWK ROAD INTERSECTION RECONFIGURATION - OPTION A

**69th Street at Tomahawk Road / Mission Hills, Kansas**

April 23, 2020 / 020-0501

1' = 30'

0' 15' 30' 60'

SCALE IN FEET

ochsner hare + hare
the olsson studio

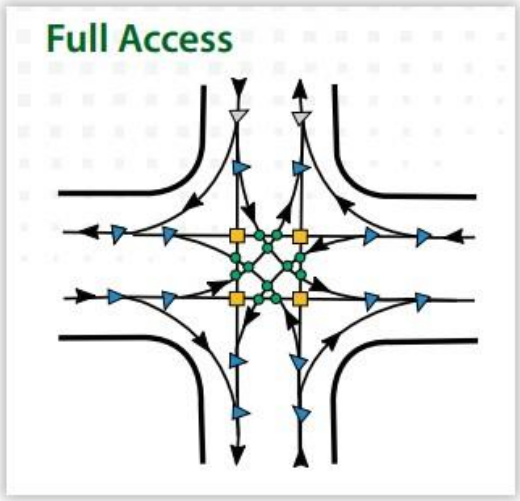
1814 Main Street / Kansas City, MO 64108
O 816.842.8844 / olsson.com

**Tomahawk Road & Wenonga Road**

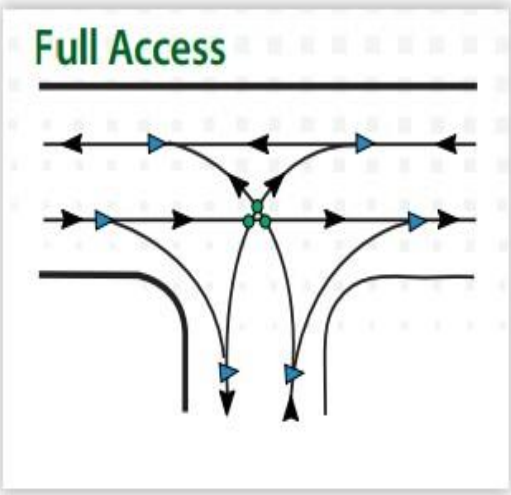
Of the 46 total crashes along the Tomahawk Road corridor, seven of those occurred near the intersection of Tomahawk and Wenonga Rd. Of those seven crashes, five were directly at the intersection or intersection related, behind Tomahawk Road & State Line Road, and Tomahawk Road and Belinder Avenue. Of those seven crashes, three were due to failing to yield right of way. This could be due to confusion of the many legs coming into and out of the intersection.

With the current configuration, the intersection has 38 conflict points (32 for the standard 4-leg intersection, plus six additional at the intersections with the curve of Tomahawk Road). The reconfiguration to a T-intersection reduces the conflict points to only nine.

Existing Configuration with 38 conflict points



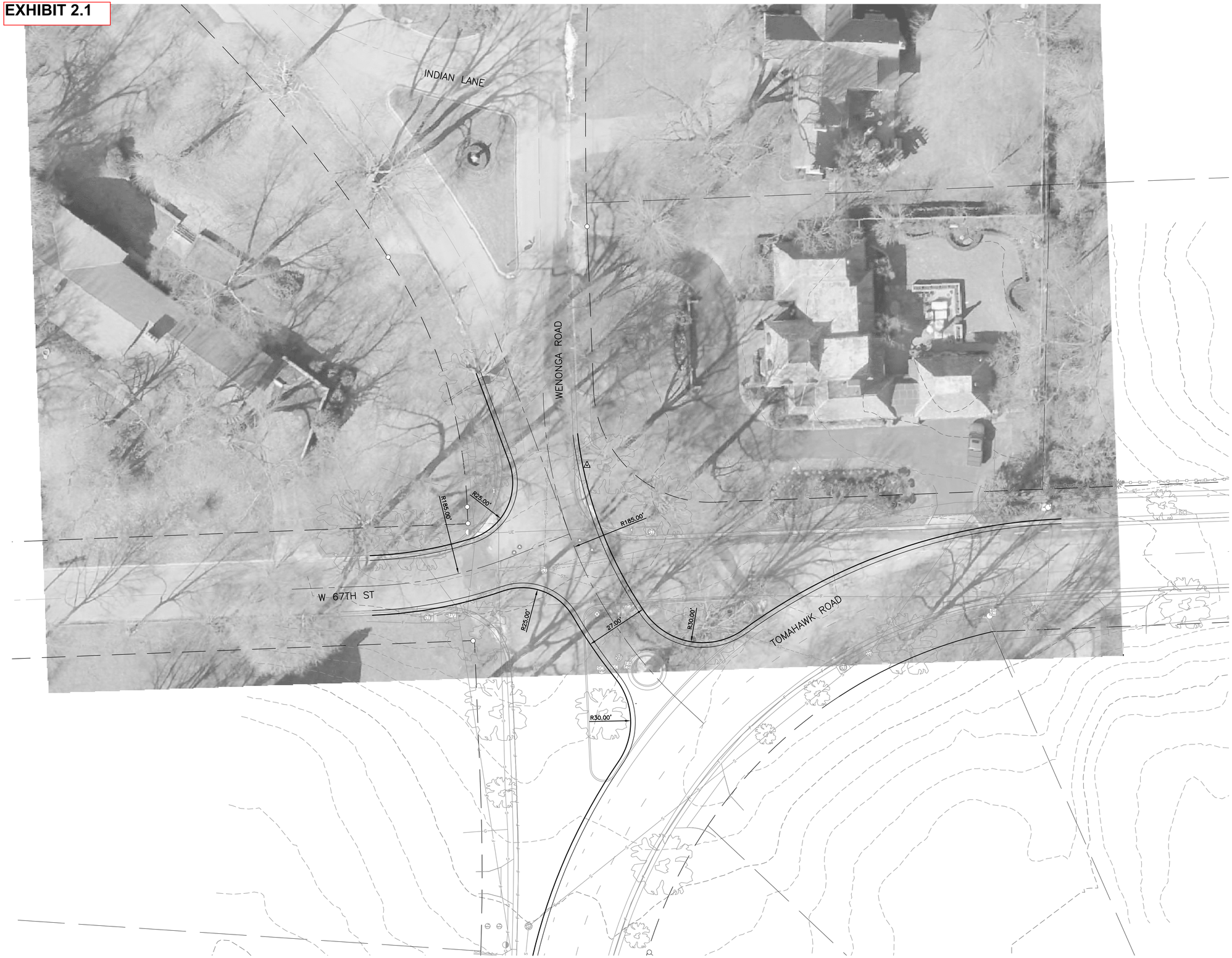

Recongfiguration with 9 conflict points




Reducing the number of conflict points also reduces the confusion by eliminating excess legs of the intersection. In addition, less vehicle conflict points at an intersection, and fewer legs of an intersection to cross, also improves safety for pedestrians. Many pedestrians currently cross at or near this intersection, particularly schoolchildren. Additionally, the Committee was charged to consider beauty improvements and the reconfiguring option would significantly reduce the amount of pavement and add significantly to green space at this intersection. To reduce the number of conflicts and improve vehicular and pedestrian safety, the majority of the Committee is recommending a modified intersection at 67th St/Wenonga Rd/Indian Ln and Tomahawk Rd (Exhibit 2.1) incorporating the meandering path on the west side conceptualize by Ochsner Hare & Hare in Option C (Exhibit 2.2) with additional consideration for sidewalk on the north side of Tomahawk Road from Wenonga Terrace to 67th St/Indian Ln/Wenonga Rd (Exhibit 2.3). The minority of the Committee recommends maintaining the existing island configuration at 67th St/Wenonga Rd/Indian Ln and Tomahawk Rd.

(Exhibits 2.1, 2.2, and 2.3 directly follow)

EXHIBIT 2.1

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0 20 40

CONCEPTUAL LAYOUT

WENONGA RD / 67TH ST / TOMAHAWK RD
INTERSECTION IMPROVEMENTS – NO ISLAND

TOMAHAWK ROAD
MISSION HILLS, KANSAS

REVISIONS
NOVEMBER 5, 2019
NOVEMBER 27, 2019

DESIGNER / DRAFTER

DATE
OCTOBER 28, 2019
PROJECT NUMBER
0319052.01
BOOK AND PAGE

SHEET
1 OF 2

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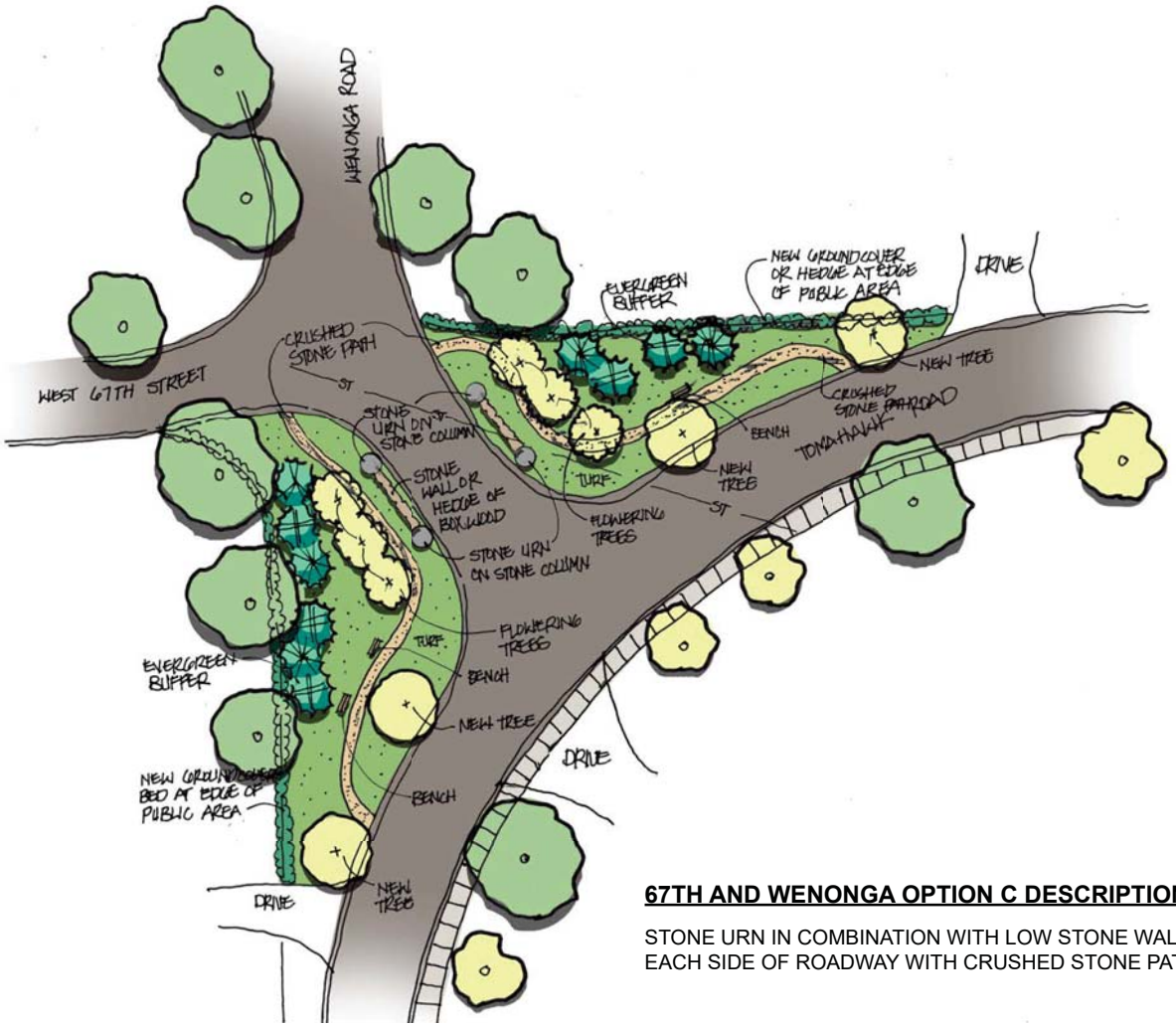
# EXHIBIT 2.2



URN WITH BOXWOOD HEDGE

**67TH AND WENONGA OPTION C DESCRIPTION:**

STONE URN IN COMBINATION WITH LOW STONE WALL
EACH SIDE OF ROADWAY WITH CRUSHED STONE PATH

## TOMAHAWK ROAD INTERSECTION RECONFIGURATION - OPTION C

**67th Street & Wenonga at Tomahawk Road / Mission Hills, Kansas**

April 23, 2020 / 020-0501

1' = 30'

0' 15' 30' 60'

SCALE IN FEET

N

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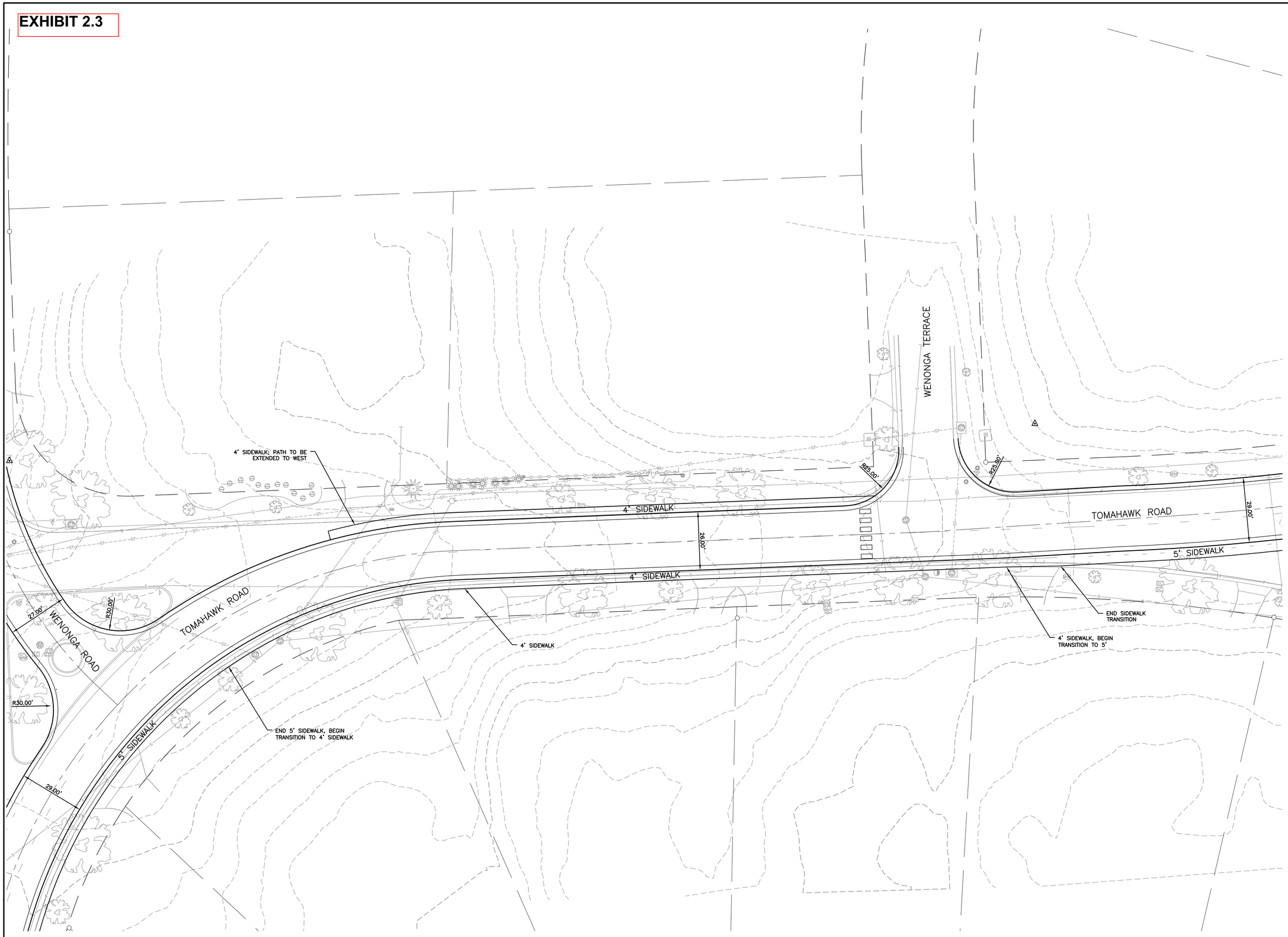
**EXHIBIT 2.3**





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LampRynearson.com


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0 20 40

CONCEPTUAL LAYOUT

WENONGA RD / WENONGA TER
SIDEWALK CONNECTIONS ON BOTH SIDES

TOMAHAWK ROAD
MISSION HILLS, KANSAS

REVISIONS

DESIGNER / DRAFTER

DATE
MAY 1, 2020

PROJECT NUMBER
0319052.01

BOOK AND PAGE

SHEET
1 OF 1

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**Tomahawk Road & Mission Drive**

The geometry of the intersection allows for vehicles traveling westbound on Tomahawk Road turning north on Mission Drive to not have to reduce their speed as they make the turn. This section of Mission Drive is adjacent to a playground where children play and is a popular route for pedestrians, especially for City events in the park. There is an existing 30 mile per hour (mph) speed limit sign posted for westbound drivers on Tomahawk Road approximately 130' in advance of the intersection with Mission Drive. The posted speed limit on Mission Drive is 25 mph. There is a 25-mph speed limit sign posted approximately 120' after a driver enters onto Mission Drive from Tomahawk Road. Speed studies conducted by the Mission Hills police department indicate the average speed on Mission Drive, near the intersection with Tomahawk Road, is 28.4 mph. The 85$^{th}$ percentile speed, the speed at which 85% of vehicles are traveling at or below, is 34 mph. The maximum speed recorded was 55 mph. The realignment of the intersection to a T-intersection would reduce conflict points and give pedestrians a safer place to cross Tomahawk Road.

In recent years, the City has received considerable citizen interest in using the City Hall playground and open space, and it has responded with more planned activities. From the Safety component of the Committee's charge, it is expected that these uses will increase foot and pedestrian traffic at this already dangerous intersection. The Committee reviewed the reconstruction of Mission Drive as a cul-de-sac or a one-way and determined to recommend against these options due to concerns about how the public would access City Hall, changes to residential driving patterns, and the potential of diverting traffic to other roads, including Ensley Lane and State Line Road. The Committee identified 3 options for consideration at Mission Drive and Tomahawk Rd: 1) Construction of a 75-degree T-intersection with standard driving lanes, 15-foot distance between playground and roadway with reorienting or moving existing playground (Exhibit 3.1) 2) Construction of a 75-degree angle T-intersection with narrowed driving lanes, 20-foot distance between playground and roadway with physical barrier between the road and playground, no parking on the east side of the curve of Mission Drive, and a sidewalk to the playground (Exhibit 3.2). 3) Construction of a 70-degree angle T-intersection with narrowed driving lanes, 29-foot distance between playground and roadway with physical barrier between the road and playground, no parking on the east side of the curve of Mission Drive, and a sidewalk to the playground (Exhibit 3.3). <u>The Committee is recommending the 70-degree T-intersection (Option 3) because it provides the greatest greenspace buffer between the roadway and playground and allow for a pedestrian crossing, while also addressing the existing conflict points and encouraging drivers to reduce their speed when entering Mission Drive.</u> <u>Since this intersection is also popular crossing spot for pedestrians, the Committee reviewed possible crossing locations and options. Due to the higher number of crossing, the Committee recommends a Rectangular Rapid Flashing Beacon pedestrian crossing sign on decorative pole (Exhibit 3.4).</u>

(Exhibits 3.1, 3.2., 3.3, and 3.4 directly follow)

**EXHIBIT 3.1**

LAMP RYNEARSON

9001 STATE LINE RD., STE. 200
KANSAS CITY, MO 64114
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LampRynearson.com


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CONCEPTUAL LAYOUT

TOMAHAWK / MISSION INTERSECTION IMPROVEMENTS

TOMAHAWK ROAD
MISSION HILLS, KANSAS

REVISIONS

DESIGNER / DRAFTER

DATE
SEPTEMBER 30, 2019

PROJECT NUMBER
0319052.01

BOOK AND PAGE

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**EXHIBIT 3.2**

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0 20 40

CONCEPTUAL LAYOUT

TOMAHAWK / MISSION
INTERSECTION IMPROVEMENTS

TOMAHAWK ROAD
MISSION HILLS, KANSAS

REVISIONS
NOVEMBER 27, 2019

DESIGNER / DRAFTER

DATE
SEPTEMBER 30, 2019
PROJECT NUMBER
0319052.01
BOOK AND PAGE

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**EXHIBIT 3.3**

LAMP RYNEARSON

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0 20 40

CONCEPTUAL LAYOUT

TOMAHAWK / MISSION
INTERSECTION IMPROVEMENTS – DESIGN EXCEPTION

TOMAHAWK ROAD
MISSION HILLS, KANSAS

REVISIONS
NOVEMBER 27, 2019
MAY 1, 2020

DESIGNER / DRAFTER

DATE
SEPTEMBER 30, 2019
PROJECT NUMBER
0319052.01
BOOK AND PAGE

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# EXHIBIT 3.4

## III. Sight Distance Evaluation

Merge Midwest Engineering, LLC conducted intersection sight distance measurements along Tomahawk Road where sight distance appeared to be an issue. The intersection sight distance for a southbound vehicle turning right onto Tomahawk Road from Mission Drive is currently inadequate due to the existing landscaping bushes in the island. Likewise, the landscape bushes on the islands at the intersection of Tomahawk Road with Aberdeen Street block the line of sight for southbound vehicles turning right or left onto Tomahawk Road. The recommendation to trim or replace the existing vegetation as to improve the sight lines at these intersections was been submitted to the Park Board for review.

## IV. Assessment of Demand and Need for Bicycle & Pedestrian Facilities

**Bicycle Lanes**

Currently a 2-3' shoulder is delineated with a solid white pavement marking line along both sides of Tomahawk Road but is not officially marked as a bike lane. This area is frequently utilized by walkers and bikers but is too narrow to be fully utilized and can be challenging to utilize during the fall as leaves drop and collect along the curb line. Discussions were held early on in Committee meetings regarding adding an official bike lane along Tomahawk Road. Different options were presented including a dedicated on-road bike lane, buffered bike lane, and raised cycle track options. The Committee noted the importance of maintaining as much on-street parking as possible along Tomahawk Road. There are many homes along Tomahawk Road with circle driveways where the restriction of on-street parking is not as critical, but for many homes with only one driveway connection it would be important to maintain the option for on-street parking. On-road bicycle lanes should be a minimum of 5' and located on both sides of the roadway. This would prohibit the addition of sidewalks along Tomahawk Road given the restriction of available width without the removal of trees or the taking of right-of-way. A dedicated bike lane would require that all on-street parking be prohibited; therefore, the Committee decided that a bike lane would not be a priority for improvements.

**Pedestrian Facilities**

After completing an inventory of Tomahawk Road's existing conditions related to speed and crashes, the Committee completed a sidewalk infrastructure evaluation by modeling the sidewalk evaluation tool from Mission Hills' comparable city, Ladue, MO. In order to determine areas where sidewalks could be considered, items such as housing density, connectivity, recreational use, and proximity to activity centers have been considered.

**Housing Density:**

The City of Mission Hills' zoning ordinance assigns lot size categories. The density of housing in a zoning district is directly related to the minimum lot size within a district. Below is a listing of the zoning districts in Mission Hills and their corresponding minimum lot size requirements.

**City of Mission Hills Zoning Districts by Minimum Lot Size**

LS – 1: Less than 16,000 sq ft
LS – 2: 16,000 to 19,999 sq ft
LS – 3: 20,000 to 24,999 sq ft
LS – 4: 25,000 to 29,999 sq ft
LS – 5: 30,000 to 43,559 sq ft
LS – 6: 43,560 to 87,119 sq ft
LS – 7: 87,120 sq ft or more

Areas with higher housing densities are likely to generate more pedestrian traffic than areas with lower housing densities. Following is the City of Mission Hills Zoning District Map (Exhibit 4.1 directly follow) showing home lot density is higher south of Tomahawk Road.

EXHIBIT 4.1

# Mission Hills Neighborhood Density

## Legend

### Properties by Size

**AreaCSqFt**

- 19 - 16000
- 16001 - 27500
- 27501 - 50000
- 50001 - 100000
- 100001 - 250000

**Connectivity:**
The Committee reviewed the existing network of sidewalks in Mission Hills. When targeting areas for sidewalks, segments that could enhance the existing network of sidewalks by linking or tying into streets that already have sidewalks were given consideration.

a. South side of Tomahawk – Can connect to 9 existing sidewalk routes
b. North side of Tomahawk – Can connect to 3 existing sidewalk routes
c. Existing sidewalk sections – The Committee reviewed maps of existing sidewalks in Mission Hills, and although not a part of their charge, the Committee recommends consideration of connecting existing sidewalk fragments.

**Recreational use:**
Sidewalks are often used for enjoyment and exercise. When assessing the recreational use of sidewalks, the Committee considered characteristics such as terrain, type of traffic in the roadway, the curvature, and housing density surrounding Tomahawk Road.

**Activity Centers:**
An activity center is a term used to describe locations such as schools, shops, and parks that draw people to them. The amount of pedestrian and vehicular traffic associated with an activity center depends on factors such as the type of activity center, distance to residential areas, and the housing density in surrounding residential areas. The amount of pedestrian and vehicular traffic generated by activity centers depends on the type of activity center, distances to activity centers, and housing density surrounding an activity center. Since different types of activity centers generate different amounts of demand, the activity centers have been grouped in categories.

**Potential for Pedestrian Activity Centers Rankings (Modeled after the City of Ladue, MO)**

- Parks and City Buildings: High potential – public facilities open to the general public
- Retail: High potential – private facilities open to the general public
- Junior and Senior High Schools: High potential– both public and private facilities, open to the public and used by those with limited access to motorized transportation
- Elementary Schools: High potential – both public and private facilities, open to the public and used by those with limited access to motorized transportation
- County Clubs: Moderate potential - although these are private facilities, many residents are members of private clubs within the community
- Churches: Moderate potential – private facilities, general public welcomed, and community services such as daycare and voting.

**Activity Centers that residents could be walking to when utilizing Tomahawk Road:**

a. Shops at Prairie Village
b. Indian Hills Country Club
c. Prairie Elementary
d. Indian Hills Middle School
e. Belinder Elementary
f. City Hall (including the playground and front lawn that is utilized as a sports field)

**Design Considerations – utility conflicts, geometric conflicts, pedestrian patterns etc.**
Certain "non-negotiables" were expressed by the Committee when considering design modifications for Tomahawk Road, including street trees should be preserved to the maximum extent possible, the occasional on-street parking should be maintained along Tomahawk Road to the extent possible, and improvements should stay within the existing right-of way. In addition, pavement markings and signing should be kept to a minimum. The Park Board retained a landscape architect from Ochsner Hare & Hare to determine if reconfiguration options could be consistent with City's aesthetics. It should be noted that the SBC Committee's focus was primarily safety on balance with beauty and connectivity. (Exhibit 4.2 Existing Sidewalk Pattern and Exhibit 4.3 Activity Centers directly follow)

EXHIBIT 4.2

# Mission Hills Sidewalks

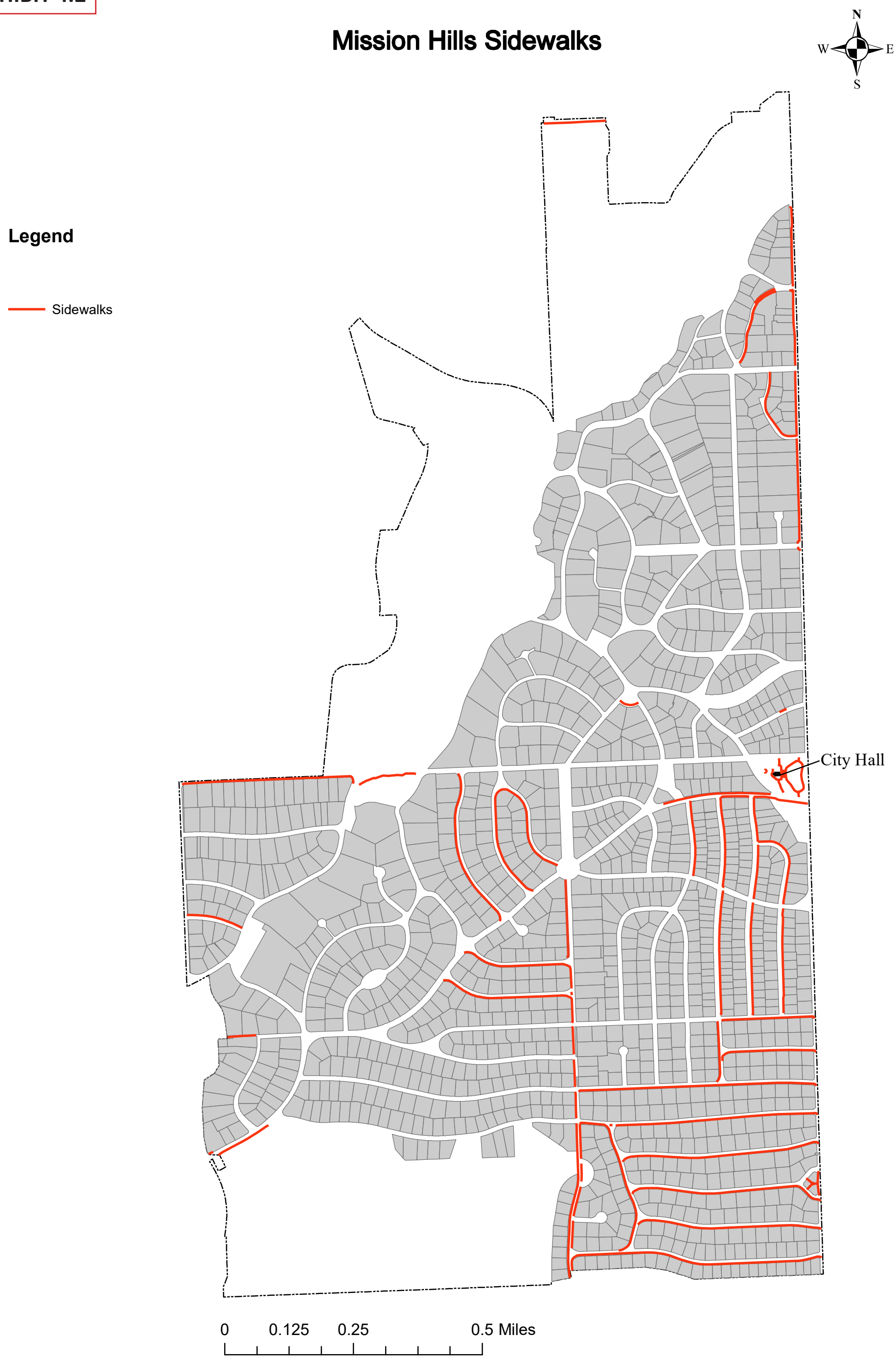
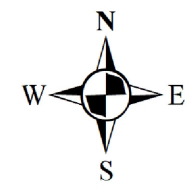


EXHIBIT 4.3

# Mission Hills Activity Centers




**Legend**

**Properties by Size**

**AreaCSqFt**

- 19 - 16000
- 16001 - 27500
- 27501 - 50000
- 50001 - 100000
- 100001 - 250000
- Public Activity Center with Facility
- Park Without Recreational Facility
- Private Club

MHCC

KCCC

IHCC

Indian Hills Middle School

City Hall & Park

First Lutheran Church

Prairie Elementary School

Village Shops

0 0.125 0.25 0.5 Miles

The Committee reviewed the following design considerations in relation to a potential sidewalk option:

a. ADA Consultation: Michele Ohmes, an ADA expert and wheelchair user, provided personal context and professional application of ADA to residential sidewalks. Following consultation a 5-foot sidewalk could be pursed or 4-foot sidewalk that widens to 5-foot every 200 feet to allow for resting and passing. Since the City will not be receiving state or federal funding for the rehabilitation project, there is more flexibility in the design recommendations. An additional consideration for wheelchair and stroller users are curbs that provide safe transitions into the roadway. The Committee evaluated sidewalks with the consideration that frequently residents walk side-by-side social and with strollers, so adequate room for passing without stepping off the sidewalk was discussed.

b. Storm sewer infrastructure: The existing stormwater drainage structures are located on both sides of Tomahawk, but the south side generally contains end of run storm structures. Relocating end of run structures would be less complicated than relocating junction structures on the north side, which may require additional storm sewer infrastructure. Both sides of the street contain fiber near the existing curb throughout much of the project, so storm sewer modifications will likely require fiber relocations. In conjunction with the City's capital improvement projects, Google Fiber has been relocating their lines from the roadway into the back of curb right of way. The condition of the existing storm sewer pipes within the road section may also factor into the sidewalk location, as storm sewer pipes could be replaced within the road section prior to street reconstruction. Most of the storm sewer infrastructure is located on the north side of the street.

c. If there is a reduction of lane-width along Tomahawk Road due to the construction of a potential sidewalk, there could be an impact to on-street parking. Parking would still be allowed, but the "pass-by" width would be reduced by 6-inches for each side. The homes with a circle drive or 2-access driveways would be better able to accommodate parking on their property.

d. Location of Sidewalk: The Committee discussed the pros and cons of locating a sidewalk on the north or south side of Tomahawk Road. In addition to the factors mentioned above, the number of times the pedestrian is required to cross the roadway was considered. The geometry of the split-entrances at the intersections with side streets causes pedestrians to cross at two crossing points, rather than a single crossing. Below is a summary of intersections that have split-entrance geometry:

| North Side = 5 | South Side = 4 (Possible 3*) |
|---|---|
| Seneca Road | 69th Street (If not reconfigured) |
| Aberdeen Street | Flag Island (67th Terrace) |
| Verona Road | 66th Terrace |
| Ensley Lane | 66th Street |
| Mission Drive | |

*If 69th Street is reconfigured and the sidewalk is placed on the south side of Tomahawk the whole length of the project, the crossings at split entrances can be reduced to three locations.

e. Pedestrian Crossings – Consideration was given to where pedestrians are crossing Tomahawk Road today, where they desire to cross Tomahawk Road, as well as the available infrastructure at the connecting side streets. Existing marked pedestrian crossings are provided across Tomahawk Road as follows:

1. Near the Indian Hills Country Club – pavement marking and signing are provided, but there are not any curb ramps in place. Sidewalk connection is only available on the east side of Tomahawk Road.
2. At the intersection with 67th Street – Pavement marking and signing are provided, but no curb ramps are in place. It is assumed this crosswalk was intended to serve the school-related walkers. The Committee noted that it is common to see school- children walking along the north side of Tomahawk Road near the curve where Tomahawk Road changes from north/south to east/west. The children

utilize the north side of the curve to continue west toward the pedestrian bridge that provides access to Prairie Elementary School and Indian Hills Middle School.

The Committee identified locations where marked pedestrian crossings would be beneficial including:

1. Near City Hall to accommodate pedestrians wanting to get to City Hall and the playground and sports fields
2. Between Wenonga Road and W. 67th Terrace to accommodate Prairie Elementary / Indian Hills Middle School walkers. Exact locations will be determined once intersection reconfigurations, if any, are selected.

The existing crossing near Indian Hills Country Club was discussed. The Committee noted this crossing is not frequently utilized, as there is no connecting sidewalk along the west side of Tomahawk Road. If a sidewalk is constructed along the south side of Tomahawk Road, a safer crossing for pedestrians could be located near Wenonga Road. Lamp Rynearson provided an exhibit that depicted if lane widths were reduced to 11-foot on Tomahawk around the curve, and the sidewalk near this section was reduced to 4-foot in width, a section of sidewalk could be provided on the north side of Tomahawk Road from Wenonga Terrace to Wenonga Road within the existing roadbed footprint. Gradual tapers could be provided to transition back to a 5-foot sidewalk width and 12-foot lanes on Tomahawk Road after this section.

The Park Board is considering an overlook area along the north side of Tomahawk Road at Eisenhower Pond. The Committee discussed if it would make sense to switch sidewalk from the south side of Tomahawk to the north side at the pond overlook. When considering moving the sidewalk to the north side of Tomahawk east of Blinder, the restrictions to homes without circle drives should be considered:

On Tomahawk (east of Belinder):
North Side: 7 homes with circle/2 access drives & 6 homes without circle/2 access drives
South Side: 7 homes with circle/2 access drives & 3 without circle/2 access drives

On each end of the Tomahawk Road corridor there are public and highly desirable activity centers for the City's residents. In combination with servicing the highest density area of the City, gained value of connecting nine existing sidewalk nodes, and not disturbing the existing utility structures on the north side, the majority of the Committee's consensus is that the installation of a sidewalk on the entire length of the south side of Tomahawk Road (Mission Road to State Line Road) could provide the safest connectivity option for the greatest number of residents. This recommendation utilizes the existing roadbed to minimally affect the existing lane widths (6-inches to each lane) and preserve all street trees. A consideration when reviewing the 5 feet-wide versus 4-feet wide sidewalk width recommendations is the need to accommodate residents with strollers, wheelchairs, and two way traffic on sidewalks since would only be a south side sidewalk present. A minority of the Committee is recommending that sidewalks could provide additional safety for walkers and requesting further exploration of 4-foot sidewalk with 5-foot wide turnarounds every 200 feet against the curb on the south side of Tomahawk. This recommendation includes maintaining existing width of both driving lanes and road shoulder. With yard service trucks, delivery trucks, construction trucks, and the occasional residential car that parks along the street there is concern that narrowing the road could reduce all user's safety