

Spokane Traffic Calming Master Plan

District: 1
Neighborhood: Nevada Heights
Project Extent: Liberty Avenue and Lidgerwood Street Intersection
Estimate: \$371,000

Problem Statement: Residents of the Nevada Heights neighborhood raised concerns over pedestrian crossing safety at the school bus stop located at the Liberty Avenue and Lidgerwood Street intersection. In the project area, Liberty Avenue and Lidgerwood Street are classified as local streets with 25 mph speed limits. The intersection has no stop or yield control signs on any approaches.

Traffic Analysis:

The table below shows estimated 2022 daily traffic volumes and 85th percentile speeds on Lidgerwood Street (north of Euclid Avenue). As shown in the table, there are around 400 vehicles per day on Lidgerwood Street, with an 85th percentile speed of 23 mph (2 mph below the posted speed limit).

2022 Daily Traffic and 85th Percentile Speeds on Lidgerwood Street (north of Euclid Avenue)

Direction	# Lanes	2022 Estimated Daily Traffic (Vehicles per day) ^a	85 th Percentile Speed (mph)	Posted Speed (mph)
Both Dir.	2	405	23	25

^a Traffic data collected on June 5, 2019. Traffic volumes were grown at a 1.0% annual growth rate, to estimate 2022 traffic conditions. A seasonal adjustment factor of 0.96 was applied to the traffic count, based on historical traffic data from the city to estimate average daily traffic.

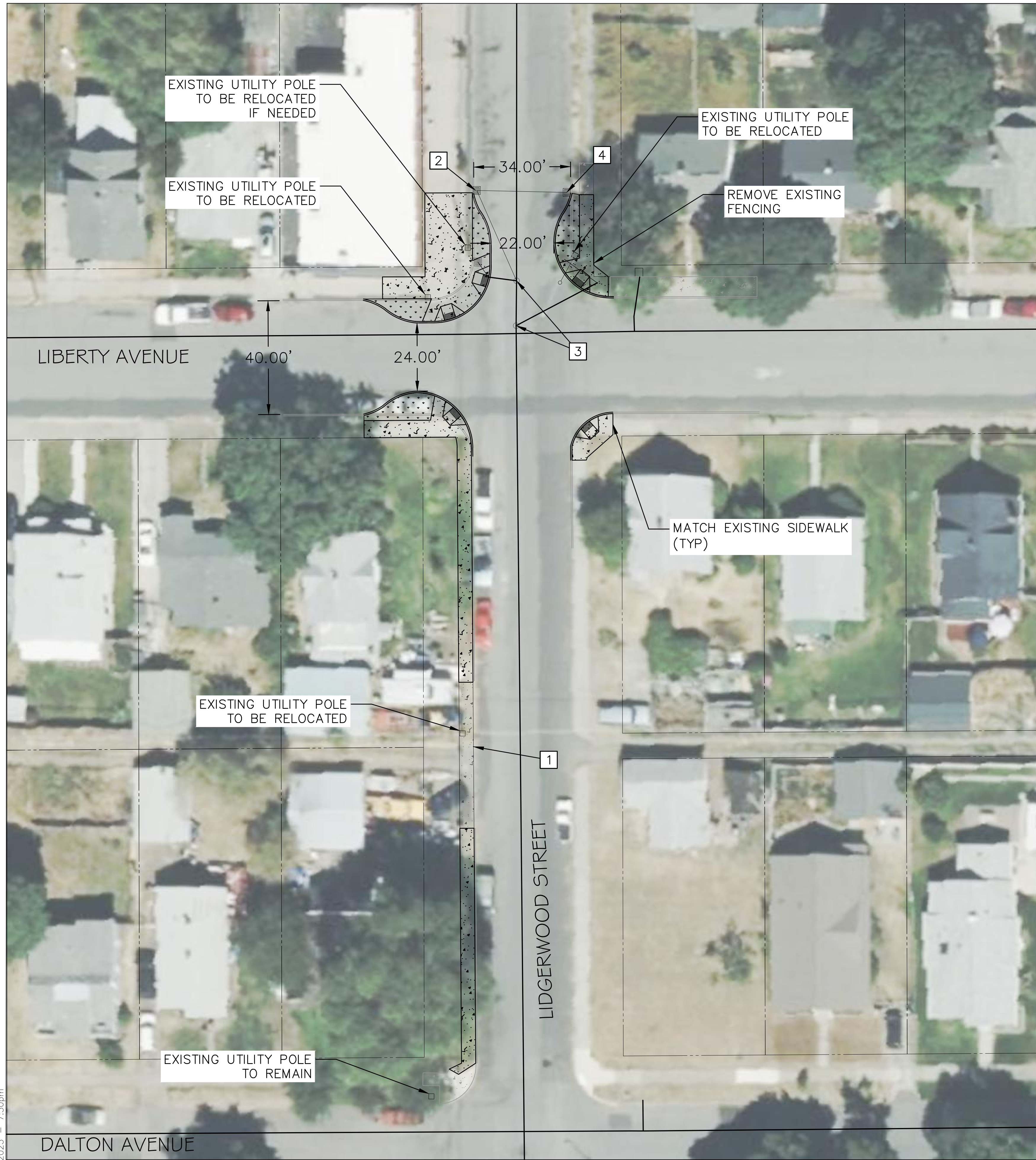
Crashes at the Lidgerwood Street and Liberty Avenue intersection were analyzed over the last five years (2017 through 2021), showing that no crashes were reported at this intersection within that timeframe. A review of school bus routes shows that there are no buses currently stopping at this intersection during the 2022 to 2023 school year. However, bus routes may be adjusted in the future, making this a potential future bus stop.

While no issues were identified through the speed and crash data, residents of the neighborhood were concerned about the intersection; so potential upgrades were evaluated to identify solutions to enhance pedestrian crossing safety. A review of the site shows that existing intersection curb ramps do not meet ADA standards. Additionally, no sidewalk is provided on the west side of Lidgerwood Street, south of the intersection. Curb extensions could be considered on the west and north legs of the intersection to reduce vehicle speeds and reduce the pedestrian crossing distance. Curb extensions are expected to decrease the 85th percentile speed by 3 mph.¹



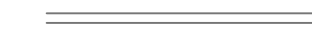


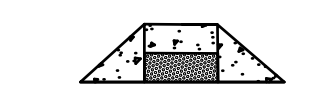
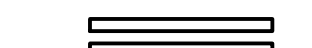
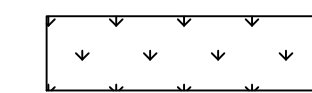
Recommended Solution:

It is recommended that all four ramps at the Lidgerwood Street and Liberty intersection be upgraded to meet ADA standards and that sidewalk be added on the west side of Lidgerwood Street on the block south of Liberty Avenue. Curb extensions could be considered on the west leg of the intersection to reduce vehicle speeds on Liberty Avenue and reduce the pedestrian crossing distance.

¹ *Engineering Speed Management Countermeasures: A Desktop Reference of Potential Effectiveness in Reducing Speed.* Federal Highway Administration. July 2014.



LEGEND

-  PROPERTY LINE
-  EXISTING CONCRETE SIDEWALK
-  EXISTING CURB
-  INSTALL NEW CONCRETE SIDEWALK PER COS STD PLAN F-1 02B
-  INSTALL NEW CURB PER COS STD PLAN F-1 06B
-  INSTALL CURB RAMP PER COS STD PLAN F-1 05
-  INSTALL CROSSWALK PER COS STD PLAN G-6 1
-  INSTALL LANDSCAPING, NATIVE PLANTINGS

CONSTRUCTION NOTES

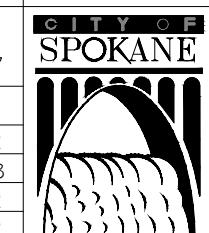
- 1 INSTALL CONCRETE DRIVEWAY TYPE 2 PER COS STD PLAN F-1 03A
- 2 INSTALL NEW CATCH BASIN TYPE 1 AND 8" DIAM. PIPE AS NECESSARY. CONNECT TO EXISTING MANHOLE WHERE SHOWN.
- 3 EXISTING MANHOLE TO REMAIN IN PLACE.
- 4 INSTALL NEW CATCH BASIN TYPE 1 AND 8" DIAM. PIPE AS NECESSARY. CONNECT TO NEW CATCH BASIN WHERE SHOWN.

**PRELIMINARY
NOT FOR CONSTRUCTION**



1
1 of 6

Plotted On: May 14, 2023 - 7:30pm

NAVD88 = (OLD CBM ELEV.) - (1.3 1.3) AS OF JANUARY, 2000 USE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)									
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NAVD88 ELEV.: None Given HORIZONTAL SCALE: 1" = 20' BY: DATE:									
CBM NO.: None Given VERTICAL SCALE: PROFILE ONLY N/A DRAWN: DRV 1/2/2022									
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY REVISION: DRV 05/2023									
APPROVED: AM 1/2/2022									
									
CITY OF SPOKANE, WASHINGTON DEPARTMENT OF ENGINEERING SERVICES 808 WEST SPOKANE FALLS BLVD. SPOKANE, WASHINGTON 99201-3343 (509) 625-6700									
PROJECT NAME: SPOKANE TRAFFIC CALMING MASTER PLAN					SEGMENT LIMITS: LIDGERWOOD STREET LIBERTY AVENUE TO DALTON AVENUE				
TYPE OF IMPROVEMENT: TRAFFIC					CITY PROJECT NUMBER: CITY PLAN NUMBER:				
PROJECT LIMITS: NEVADA HEIGHTS NEIGHBORHOOD					TRAFFIC DESIGN:				

REVISIONS		AS BUILT		GRADE ORDINANCE LIST	
DATE	BY	PROJ.	E.F.N. / U.S.N.	FROM	TO

CALL BEFORE YOU DIG 1-800-424-5555

Spokane Traffic Calming Master Plan

District: 1
Neighborhood: Nevada Heights
Project Extent: Lidgerwood Street from Empire Avenue to Wellesley Avenue
 Estimate: \$770,000

Problem Statement: Residents of the Nevada Heights neighborhood raised concerns over speeding and yield compliance on Lidgerwood Street from Empire Avenue to Wellesley Avenue (0.52 miles). In the project area, Lidgerwood Street has two travel lanes and is classified as a local street with a 25 mph speed limit. A traffic signal exists at Wellesley Avenue, while other intersections are stop controlled, yield controlled, or uncontrolled along the corridor.

Traffic Analysis:

The table below shows estimated 2022 daily traffic volumes and 85th percentile speeds on Lidgerwood Street. As shown in the table, there are 1,000 to 2,000 vehicles per day on Lidgerwood Street, with an 85th percentile speed of 23 to 25 mph (either at or just below the posted speed limit).

2022 Daily Traffic and 85th Percentile Speeds on Lidgerwood Street

Location	# Lanes	2022 Estimated Daily Traffic (Vehicles per day) ^a	85 th Percentile Speed (mph)	Posted Speed (mph)
North of Hoffman Ave (north end)	2	2,048	23	25
North of Heroy Ave (north end)	2	1,282	25	25
North of Rich Ave (mid-point)	2	966	24	25

^a Traffic volumes were grown at a 1.0% annual growth rate, to estimate 2022 traffic conditions. Seasonal adjustment factors (SAF) were applied based on historical traffic data from the city to estimate average daily traffic. Traffic data at Hoffman was collected on August 6, 2019 (SAF of 0.98). Traffic data at Heroy and Rich were collected on July 9 and 10, 2019 (SAF of 0.96).

The table below shows the severity and types of crashes occurring on Lidgerwood Street between Empire Avenue and Wellesley Avenue over the last five years (excluding intersection crashes at either end of the project extents). There were a total of 15 crashes, with seven injury crashes. Turning-related crashes were most common, representing 67% of all crashes.

Crashes on Lidgerwood Street, between Empire Avenue and Wellesley Avenue (2017 to 2021)

Crash Type	Crash Severity					Total
	Fatal	Major Injury	Minor Injury	Property Damage Only	Unknown	
Rear End	-	-	-	1	-	1
Turning	-	-	5	5	-	10
Fixed Object	-	-	2	2	-	4
Total	0	0	7	8	0	15

Spokane Traffic Calming Master Plan

The intersection traffic control varies throughout the half mile corridor, as shown in the table below. Four of the intersections have no traffic control (Princeton, Longfellow, Rockwell, and Walton Avenue). Given the sporadic nature of uncontrolled versus controlled intersections, there may be some confusion about when drivers on Lidgerwood Street are expected to yield to the side street.

Existing Intersection Traffic Control and Right Angle Crash History along Lidgerwood Street

Cross Street	Traffic Control	Classification	Number of Angle Crashes (2017-2021)
Wellesley Avenue	Signal	Major Arterial	-
Hoffman Avenue	All-way stop control	Local	1
Princeton Avenue	Uncontrolled	Local	3
Heroy Avenue	Side street yield control	Local	0
Longfellow Avenue	Uncontrolled	Local	2
Rich Avenue	All-way stop control	Local	0
Rockwell Avenue	Uncontrolled	Local	0
Lacrosse Avenue	Side street yield control	Local	4
Walton Avenue	Uncontrolled	Local	0
Garland Avenue	Side street yield control	Local	0
Empire Avenue	Two-way stop control (on Lidgerwood)	Minor Arterial	-

Section 2B.04 of the Manual on Uniform Traffic Control Devices (MUTCD)¹ states that the use of yield or stop signs should be considered at the intersection of two minor streets or local roads where the intersection has more than three approaches and where one or more of the following conditions exist:

- a) The combined vehicular, bicycle and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;
- b) The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right of way rule if such stopping or yielding is necessary; and/or
- c) Crash records indicate that five or more crashes that involve the failure to yield the right-of-way at the intersection under the normal right-of-way rule have been reported within a 3-year period, or that three or more such crashes have been reported within a 2-year period.

No intersections met the crash history requirement (c) regarding failure to yield crashes. However, additional data collection is needed to assess the vehicular volume requirement (a) and sight distance requirement (b). A desktop review shows that there is a sight distance concern on the southeast corner of the Lidgerwood Street and Lacrosse Avenue intersection. Therefore, it is recommended that stop signs be installed on the east and west approaches of that intersection. There were no obvious sight distance concerns noted at other intersections.

¹ Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009 Edition, Pg. 50.
<https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part2b.pdf>

Spokane Traffic Calming Master Plan

If stop control warrants are not met, typically no traffic control is provided when a local street intersects another local street in a residential neighborhood. For consistency, it is recommended that removal of the existing traffic control signing between Wellesley Avenue and Empire Avenue be considered, to provide uncontrolled intersections (except at Lacrosse Avenue).

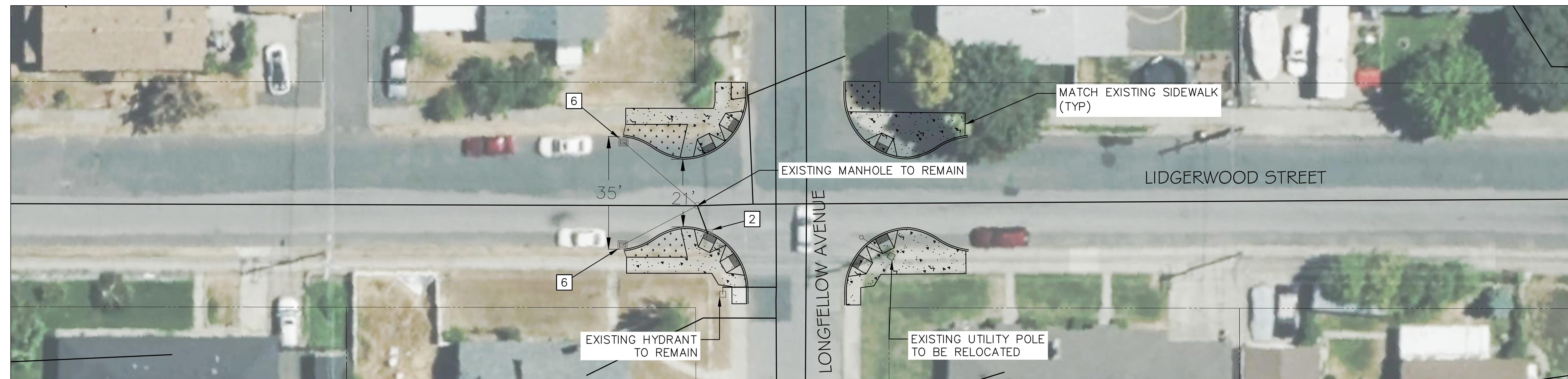
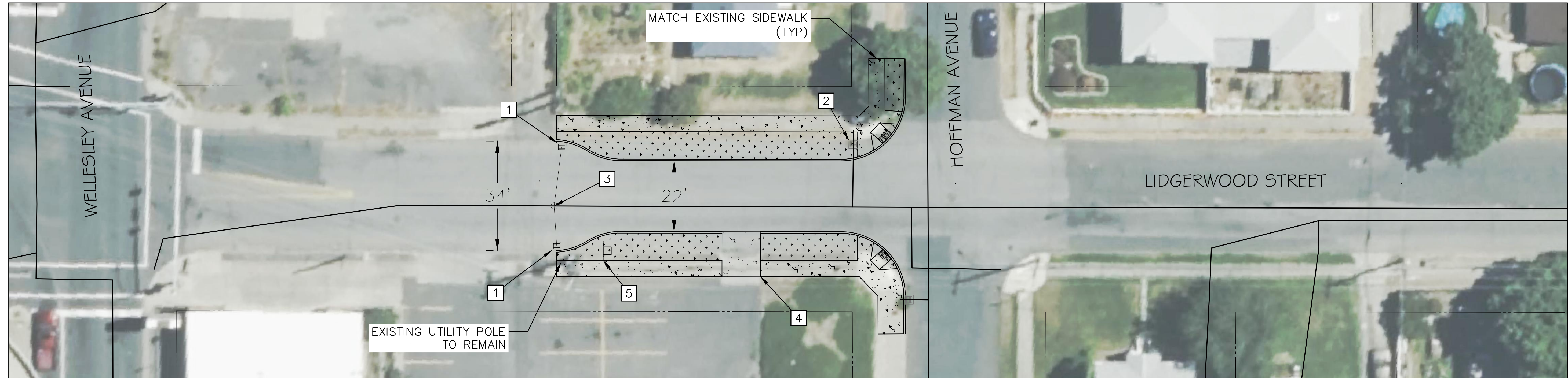
It is recommended that a choker and “end arterial” sign be provided on the north end of the study corridor (south of Wellesley Avenue) to indicate a transition from an arterial to a local street. Additionally, it is recommended that curb extensions be installed at the Longfellow Avenue and Lacrosse Avenue intersections, to reduce travel speeds and provide increased sight distance for pedestrians. Curb extensions and chokers are expected to result in a speed reduction of 3 mph.²

Recommended Solution:


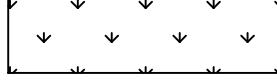
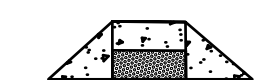
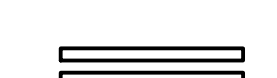

It is recommended that a choker be installed on the north end of the corridor and that curb extensions be installed at the Longfellow Avenue and Lacrosse Avenue intersections, to make it more clear to drivers that this section of Lidgerwood is a local road.

Typically, no traffic control is provided when a local street intersects another local street in a residential neighborhood. For consistency, it is recommended that removal of the existing traffic control signing between Wellesley Avenue and Empire Avenue be considered, to provide uncontrolled intersections (except at Lacrosse Avenue). A desktop review indicated there may be a sight distance concern at the Lacrosse Avenue intersection, which would warrant stop control on the side street approaches. Intersection traffic control needs should be evaluated based on intersection traffic counts and sight distance, before signing is removed or added. If stop control is still warranted at an intersection, a traffic circle could be considered in its place.

² *Engineering Speed Management Countermeasures: A Desktop Reference of Potential Effectiveness in Reducing Speed.* Federal Highway Administration. July 2014.



LEGEND

-  INSTALL NEW CONCRETE SIDEWALK PER COS STD PLAN F-102B
-  INSTALL LANDSCAPING, NATIVE PLANTINGS
-  INSTALL CURB RAMP PER COS STD PLAN F-105
-  INSTALL CROSSWALK PER COS STD PLAN G-61
-  PROPERTY LINE

CONSTRUCTION NOTES

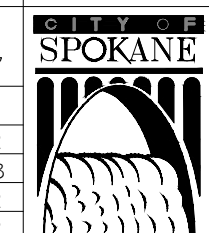
- 1 INSTALL NEW CATCH BASIN TYPE 1 AND 8" DIAM. PIPE AS NECESSARY. CONNECT TO NEW MANHOLE WHERE SHOWN.
- 2 REMOVE EXISTING INLET. PLUG AND ABANDON EXISTING PIPE.
- 3 INSTALL NEW MANHOLE
- 4 INSTALL CONCRETE DRIVEWAY TYPE PER COS STD PLAN F-103A
- 5 INSTALL "END ARTERIAL" WOG-G1P AND "SPEED LIMIT 25" SIGNS PER COS STD PLAN G-90.
- 6 INSTALL NEW CATCH BASIN TYPE 1 AND 8" DIAM. PIPE AS NECESSARY. CONNECT TO NEW MANHOLE WHERE SHOWN.

**PRELIMINARY
NOT FOR CONSTRUCTION**




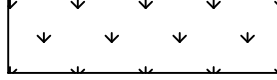
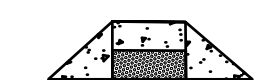
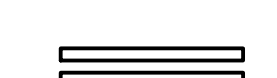

2
2 of 6

Plotted On: May 14, 2023 - 7:35pm

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BENCH MARK LOCATION: None Given									
CURRENT C.O.S. DESIGN STANDARDS ADOPTED FEB. 2007									
NAVD88 ELEV.: None Given CBM NO.: None Given					HORIZONTAL SCALE: 1" = 16' VERTICAL SCALE: PROFILE ONLY N/A				
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.									
SCALE:									
APPROVED: AM 1/2/2022									
									
CITY OF SPOKANE, WASHINGTON DEPARTMENT OF ENGINEERING SERVICES 808 WEST SPOKANE FALLS BLVD. SPOKANE, WASHINGTON 99201-3343 (509) 625-6700									
PROJECT NAME: SPOKANE TRAFFIC CALMING MASTER PLAN									
SEGMENT LIMITS: LIDGERWOOD STREET WELLESLEY AVENUE TO EMPIRE AVENUE									
PROJECT LIMITS: NEVADA HEIGHTS NEIGHBORHOOD									
TYPE OF IMPROVEMENT: TRAFFIC CITY PROJECT NUMBER: CITY PLAN NUMBER:									
CALL BEFORE YOU DIG 1-800-424-5555									



LEGEND

-  INSTALL NEW CONCRETE SIDEWALK PER COS STD PLAN F-102B
-  INSTALL LANDSCAPING, NATIVE PLANTINGS
-  INSTALL CURB RAMP PER COS STD PLAN F-105
-  INSTALL CROSSWALK PER COS STD PLAN G-61
-  PROPERTY LINE

CONSTRUCTION NOTES

- 1. INSTALL NEW CATCH BASIN TYPE 1 AND 8" DIAM. PIPE AS NECESSARY. CONNECT TO EXISTING MANHOLE WHERE SHOWN.

NOTE:

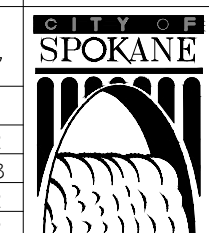
- 1. PROJECT SCOPE ALSO INCLUDES THE REMOVAL OF ALL YIELD AND STOP SIGNS AT INTERSECTIONS WITH LIDGERWOOD STREET FROM EMPIRE AVENUE TO WELLESLEY AVENUE.

**PRELIMINARY
NOT FOR CONSTRUCTION**



3
3 of 6

Plotted On: May 14, 2023 - 7:37pm

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NAVD88 ELEV.: None Given					DRAWN: DRV 1/2/2022 REVISION: DRV 05/2023 CHECKED: JS 1/2/2022 APPROVED: AM 1/2/2022				
HORIZONTAL PLAN PROFILE: 1" = 10' VERTICAL PROFILE ONLY: N/A					SCALE:				
									
CITY OF SPOKANE, WASHINGTON DEPARTMENT OF ENGINEERING SERVICES 808 WEST SPOKANE FALLS BLVD. SPOKANE, WASHINGTON 99201-3343 (509) 625-6700									
PROJECT NAME: SPOKANE TRAFFIC CALMING MASTER PLAN									
SEGMENT LIMITS: LIDGERWOOD STREET WELLESLEY AVENUE TO EMPIRE AVENUE									
PROJECT LIMITS: NEVADA HEIGHTS NEIGHBORHOOD									
TYPE OF IMPROVEMENT: TRAFFIC									
CITY PROJECT NUMBER: CITY PLAN NUMBER:									
DATE: BY: PROJ: E.F.N.: U.S.N.: FROM: TO: COUNCIL ACCEPT DATE: FROM: TO: ORD. NO.: DATE: FILE NO.: NAVD88 DATUM:									
REVISIONS: AS BUILT: GRADE ORDINANCE LIST: NAVD88 DATUM:									

Spokane Traffic Calming Master Plan

District:	1
Neighborhood:	Nevada Heights
Project Extent:	Perry Street near Rogers High School
	\$102,000

Problem Statement: Residents of the Nevada Heights neighborhood raised concerns over pedestrian crossing safety for school students near Rogers High School. In the project area, Perry Street is classified as a collector with a 30 mph speed limit.

Traffic Analysis:

The table below shows estimated 2022 daily traffic volumes and 85th percentile speeds on Perry Street (north of Rockwell Avenue). As shown in the table, there are around 2,700 vehicles per day on Perry Street, with an 85th percentile speed of 33 mph (3 mph above the posted speed limit).

2022 Daily Traffic and 85th Percentile Speeds on Perry Street (North of Rockwell Avenue)

Direction	# Lanes	2022 Estimated Daily Traffic (Vehicles per day) ^a	85 th Percentile Speed (mph)	Posted Speed (mph)
Both Dir.	2	2,712	33	30

^a Traffic data collected on May 1, 2019. Traffic volumes were grown at a 1.0% annual growth rate, to estimate 2022 traffic conditions. A seasonal adjustment factor of 0.96 was applied to the traffic count, based on historical traffic data from the city to estimate average daily traffic.

The table below shows the severity and types of crashes occurring on Perry Street between Rich Avenue and Wellesley Avenue over the last five years. There was only one crash on this section of Perry Street involving a turning-related collision with minor injury.

Crashes on Perry Street, between Rich Avenue and Wellesley Avenue (2017 to 2021)

Crash Type	Crash Severity					Total
	Fatal	Major Injury	Minor Injury	Property Damage Only	Unknown	
Turning	-	-	1	-	-	1
Total	0	0	1	0	0	1

The need for enhanced pedestrian crossing treatments (across Perry Street) was analyzed based on the National Cooperative Highway Research Program (NCHRP) Report 562.¹ This report uses four main criteria to identify appropriate crossing treatment: peak hour pedestrian volumes, conflicting vehicle volumes, conflicting vehicle speed, and crossing distance/number of travel lanes to be crossed. Based on NCHRP 562, if there are 20 or more pedestrian crossings in the peak hour, a crosswalk is recommended as the crossing treatment on Perry Street.

If installed, these crossings would qualify as school crossings and would therefore need to have school zone signage installed on Perry Street, to clarify the extents of the school speed zone. Per the Revised Code of Washington (Section 46.61.440) school zones can be installed up to 300 feet away from active

¹ NCHRP Report 562: *Improving Pedestrian Safety and Unsignalized Crossings*. National Cooperative Highway Research Program, 2006. <https://nacto.org/wp-content/uploads/2010/08/NCHRP-562-Improving-Pedestrian-Safety-at-Unsignalized-Crossings.pdf>

Spokane Traffic Calming Master Plan

schools or playgrounds.² In order to install these school zone signs; a motion will need to go through city council to update the school zone extents.

Recommended Solution:

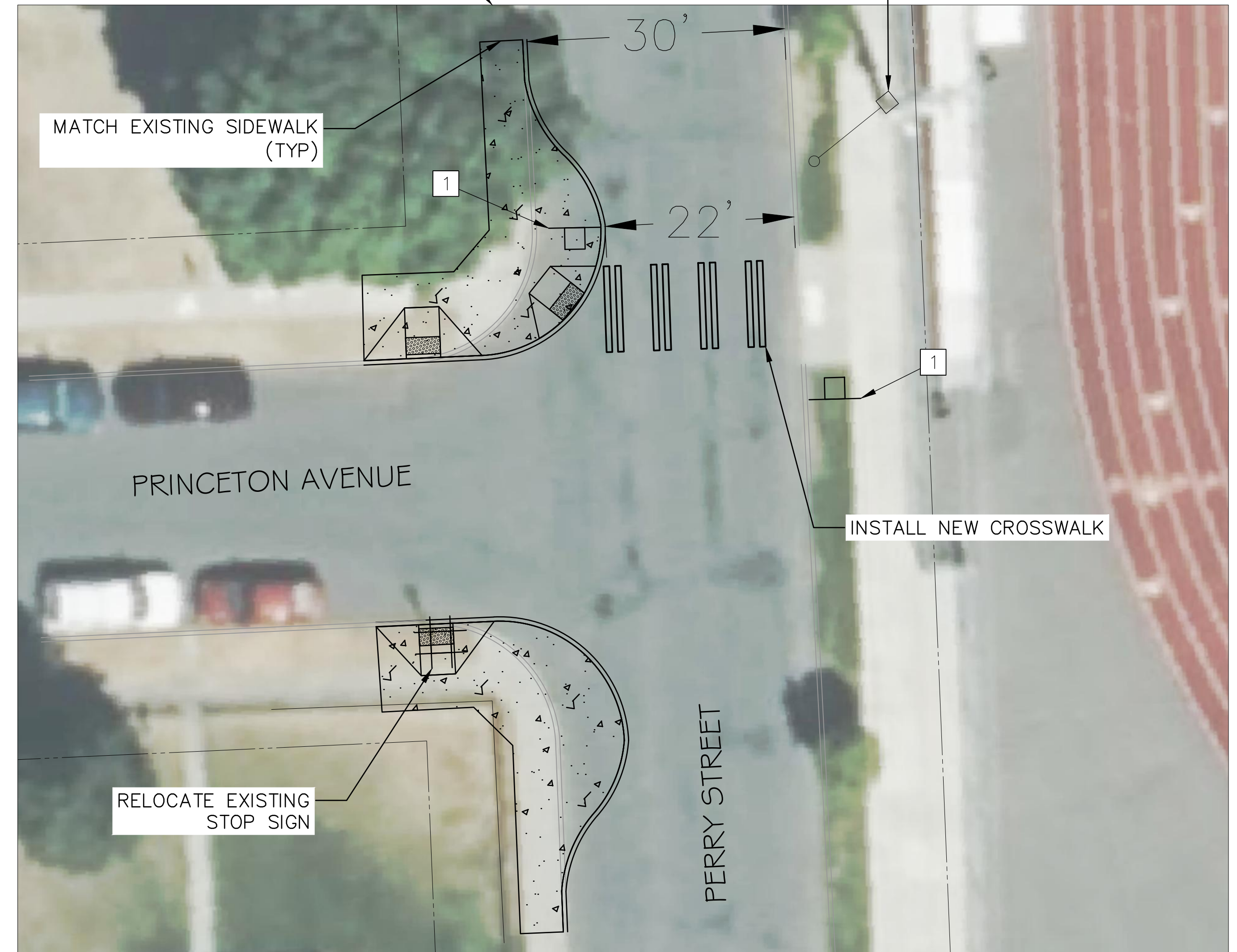
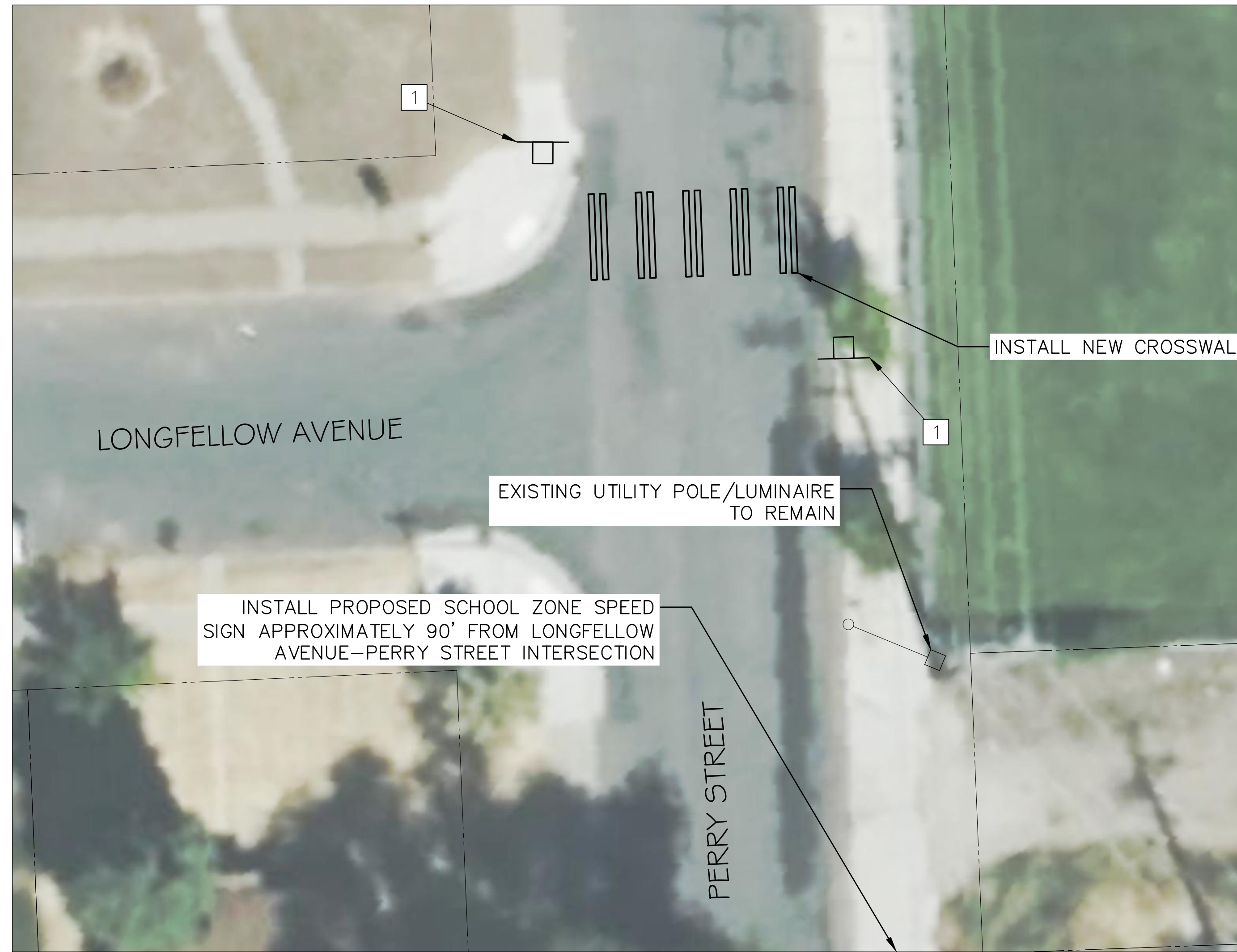
The installation of a school zone on Perry Street is recommended along with marked school zone crosswalks at two locations on Perry Street (adjacent to Rogers High School):

- North leg of the Longfellow Avenue and Perry Street intersection
- North leg of the Princeton Avenue and Perry Street intersection

The curb ramps at the Longfellow Avenue intersection were recently upgraded; therefore, only a marked crosswalk is recommended at this location. At the Princeton Avenue crossing, curb ramp upgrades would be needed, along with a marked crosswalk. Curb extensions are also recommended on the west side of the Princeton Avenue intersection to decrease the pedestrian crossing distance and lower travel speeds on Perry Street. Curb extensions are expected to decrease the 85th percentile speeds by 3 mph.³

² Revised Code of Washington Section 46.61.440. <https://app.leg.wa.gov/rcw/default.aspx?cite=46.61.440>

³ Engineering Speed Management Countermeasures: A Desktop Reference of Potential Effectiveness in Reducing Speed. Federal Highway Administration. July 2014.



LEGEND

- PROPERTY LINE
- EXISTING CONCRETE SIDEWALK
- EXISTING CURB
- INSTALL NEW CONCRETE SIDEWALK PER COS STD PLAN F-102B
- INSTALL NEW CURB PER COS STD PLAN F-106B
- INSTALL CURB RAMP PER COS STD PLAN F-105
- INSTALL CROSSWALK PER COS STD PLAN G-61
- PROPOSED SCHOOL CROSSING SIGN

CONSTRUCTION NOTES

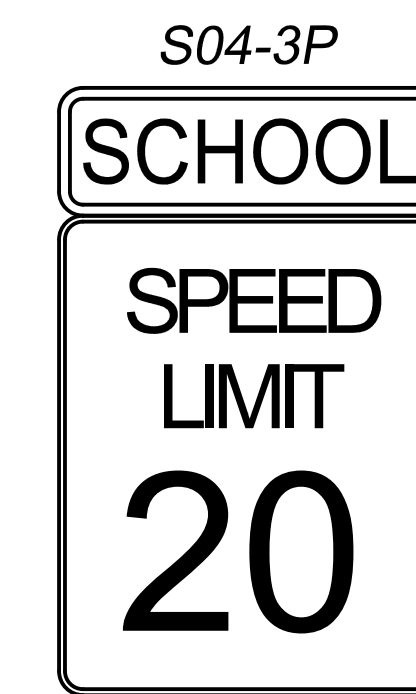
- 1. INSTALL PROPOSED SCHOOL CROSSWALK SIGN

NOTE:

- 1. CITY COUNCIL RESOLUTION ADOPTING 20 MPH SPEED LIMIT IS REQUIRED FOR THIS PROJECT.



PROPOSED SCHOOL CROSSWALK SIGN



PROPOSED SCHOOL ZONE SPEED SIGN

**PRELIMINARY
NOT FOR CONSTRUCTION**



Plotted On: May 14, 2023 - 7:31 pm

NAVD88 = (OLD CBM ELEV.) - (1.313) AS OF JANUARY, 2000 USE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)									
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NAVD88 ELEV.: None Given					BY: DATES:				
CBM NO.: None Given					DRAWN: DRV 1/2/2022				
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY					REVISED: DRV 05/2023				
HORIZONTAL PLAN/PROFILE: 1" = 20'					CHECKED: JS 1/2/2022				
VERTICAL PROFILE ONLY: N/A					APPROVED: AM 1/2/2022				
CITY OF SPOKANE, WASHINGTON DEPARTMENT OF ENGINEERING SERVICES 808 WEST SPOKANE FALLS BLVD. SPOKANE, WASHINGTON 99201-3343 (509) 625-6700									
PROJECT NAME: SPOKANE TRAFFIC CALMING MASTER PLAN									
SEGMENT LIMITS: PERRY STREET ROGERS HIGH SCHOOL									
PROJECT LIMITS: NEVADA HEIGHTS NEIGHBORHOOD									
TYPE OF IMPROVEMENT: TRAFFIC									
CITY PROJECT NUMBER: CITY PLAN NUMBER:									
TRAFFIC DESIGN: CALL BEFORE YOU DIG 1-800-424-5555									

DATE	BY	PROJ.	E.F.N. / U.S.N.	FROM	TO	COUNCIL ACCEPT DATE
AS BUILT						

FROM	TO	ORD. NO.	DATE	FILE NO.
GRADE ORDINANCE LIST				

NAVD88 DATUM	SCALE
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DESCRIPTION

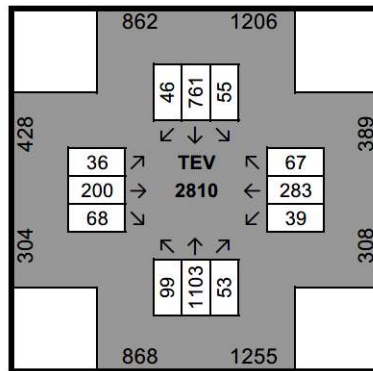
Spokane Traffic Calming Master Plan

District: 1
Neighborhood: Nevada Heights
Project Extent: Longfellow Elementary Safe Routes to School
 Estimate: \$94,000

Problem Statement: Residents of the Nevada Heights neighborhood raised concerns over safe routes to school for school children near Longfellow Elementary School. The city also expressed concerns specific to the Empire Avenue and Nevada Street signalized intersection, just north of the school. In the project area, Nevada Street is classified as a major arterial with a 30 mph speed limit, while Empire Avenue is a minor arterial with a 30 mph speed limit. During school hours, Nevada Street has a school speed zone of 20 mph through the intersection.

Traffic Analysis:

The figure below shows the existing PM peak hour traffic volumes at the Empire Avenue and Nevada Street intersection, based on a traffic count from May 7, 2019. Traffic volumes were grown at a 1.0% annual growth rate, to estimate 2022 traffic conditions. Traffic volumes were adjusted with a seasonal adjustment factor of 1.00, based on historical traffic data from the city to estimate the 30th highest hour. As shown in the figure, Nevada Street (north-south major arterial) has significantly higher volumes than Empire Avenue (east-west minor arterial).



PM Peak Hour Traffic at Empire Avenue and Nevada Street

The table below shows the severity and types of crashes occurring at the Empire Avenue and Nevada Street intersection from 2017 through 2021. There were a total of 27 crashes, with turning-related crashes representing 56% of all crashes.

Crashes at Empire Avenue and Nevada Street Intersection (2017 to 2021)

Crash Type	Crash Severity					Total
	Fatal	Major Injury	Minor Injury	Property Damage Only	Unknown	
Sideswipe	-	-	-	4	-	4
Pedestrian	-	1	2	-	-	3
Turning	-	2	9	3	1	15
Fixed Object	-	-	-	-	1	1
Rear-end	-	-	3	1	-	4
Total	0	3	14	8	2	27

Spokane Traffic Calming Master Plan

An analysis of protected phasing was completed for the eastbound and westbound left turn lanes using the Federal Highway Administration Signal Timing Manual.¹ This indicates that signals should be evaluated on the following conditions:

- Protected-permissive phasing was considered if sight distance did not meet the following criteria: 200 feet for 25 mph oncoming traffic speed, 280 feet for 35 mph oncoming traffic speed.
- Protected-permissive phasing was considered if the cross product of left turning and opposing thru volumes exceeds 50,000 for a left-turn movement with one opposing thru lane or exceeds 100,000 for a left-turn movement with two opposing thru lanes.
- Protected-permissive phasing was considered if left-turning crashes met the following criteria; four crashes in one year, six crashes in two years, or seven crashes in three years.
- Protected-only phasing was recommended for intersections with two or more left-turn lanes.

The eastbound and westbound left turn lanes did not meet any of the above criteria, and therefore it is recommended that the left turning movements remain permissive only.

Recommended Solution:



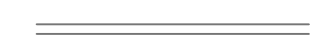

The existing pavement markings on Empire Avenue show that the roadway transitions from a two-lane cross section to a four-lane cross section, just east and west of Nevada Street (four-lane cross section extends about 400 feet). It is recommended that the pavement markings on Empire Avenue be updated to provide a three-lane cross section at the Nevada Street intersection with left-turn lanes on the east and west legs. This improvement will lower the number of lanes that are crossed for pedestrians crossing the intersection going north and south.

A school parent also expressed interest in adding a north-south marked crosswalk at Empire Avenue and Cincinnati Street (600 feet west of the signal at Empire Avenue and Nevada Street). It is recommended that a traffic count be conducted during the school year to better understand the existing pedestrian crossing demand at this intersection.

¹ *Traffic Signal Timing Manual, Federal Highway Administration, June 2008.*
<https://ops.fhwa.dot.gov/publications/fhwahop08024/index.htm>



LEGEND

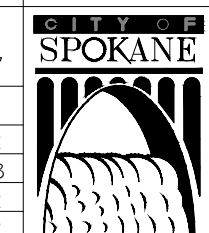
-  PROPERTY LINE
-  EXISTING CONCRETE SIDEWALK
-  EXISTING CURB
-  EXISTING ASPHALT PAVEMENT

CONSTRUCTION NOTES

- 1** INSTALL PROPOSED MARKING

**PRELIMINARY
NOT FOR CONSTRUCTION**

Plotted On: May 14, 2023 - 7:33pm

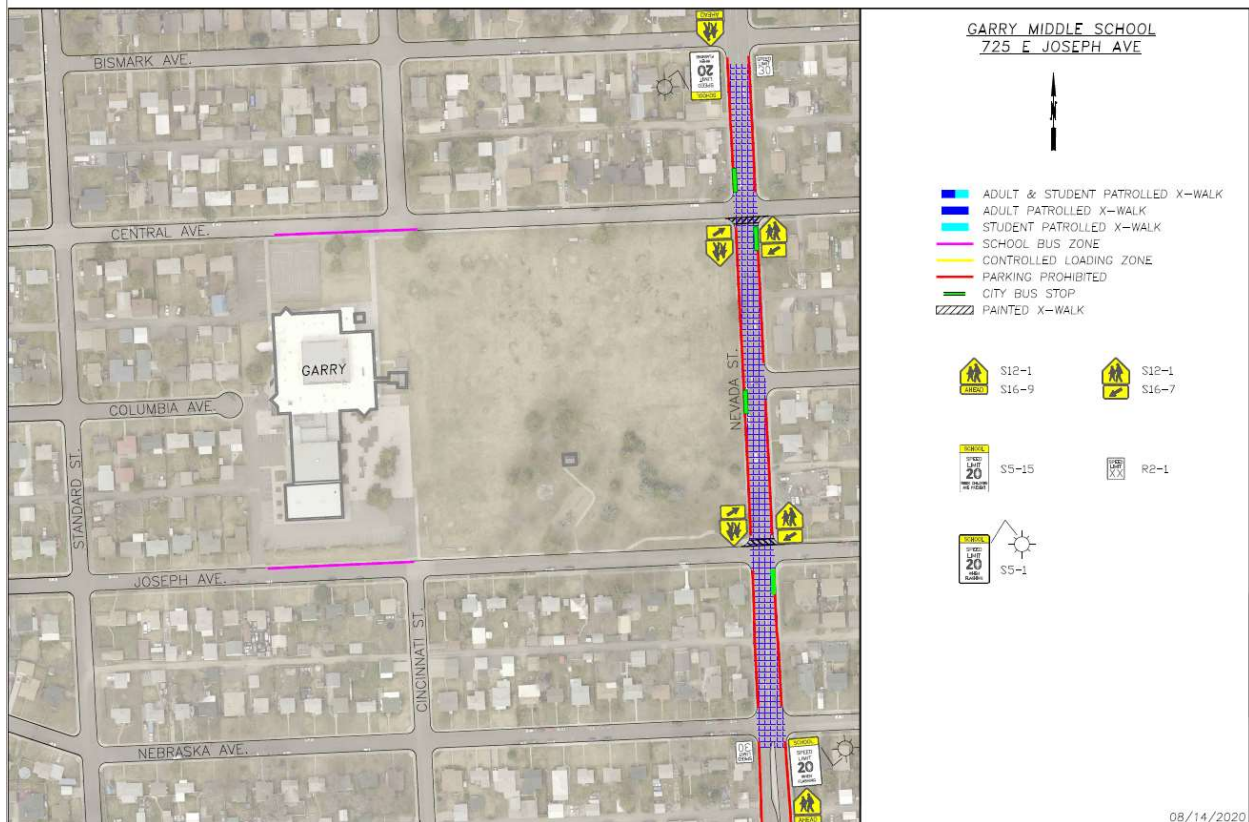
NAVD88 = (OLD CBM ELEV.) - (1.3.13) AS OF JANUARY, 2000 USE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)									
BENCH MARK LOCATION: None Given					CURRENT C.O.S. DESIGN STANDARDS ADOPTED FEB. 2007				
NAVD88 ELEV.: None Given					HORIZONTAL PLAN/PROFILE: 1" = 30' VERTICAL PROFILE ONLY: N/A				
CBM NO.: None Given					SCALE:				
NAVD88 DATUM					DRAWN: DRV 1/2/2022 REVISION: DRV 05/2023 CHECKED: JS 1/2/2022 APPROVED: AM 1/2/2022				
									
CITY OF SPOKANE, WASHINGTON DEPARTMENT OF ENGINEERING SERVICES 808 WEST SPOKANE FALLS BLVD. SPOKANE, WASHINGTON 99201-3343 (509) 625-6700									
PROJECT NAME: SPOKANE TRAFFIC CALMING MASTER PLAN									
SEGMENT LIMITS: EMPIRE AVENUE AND NEVADA STREET LONGFELLOW ELEMENTARY									
PROJECT LIMITS: NEVADA HEIGHTS NEIGHBORHOOD									
TYPE OF IMPROVEMENT: TRAFFIC CITY PROJECT NUMBER: CITY PLAN NUMBER:									
TRAFFIC DESIGN: CALL BEFORE YOU DIG 1-800-424-5555									

DATE	BY	PROJ.	DESCRIPTION	DATE	BY	PROJ.	E.F.N. - U.S.N.	FROM	TO	COUNCIL ACCEPT DATE	FROM	TO	ORD. NO.	DATE	FILE NO.
AS BUILT															
GRADE ORDINANCE LIST															

Spokane Traffic Calming Master Plan

District: 1
Neighborhood: Nevada Heights
Project Extent: Garry Middle School Safe Routes to School
 Estimate: \$134,000

Problem Statement: Residents of the Nevada Heights neighborhood raised concerns over safe routes to school for school children near Garry Middle School. The figure below shows the locations of the existing marked crosswalks on Nevada Street, east of the school (east-west crosswalks located at Central Avenue and Joseph Avenue). A new pedestrian hybrid beacon is also planned at the Nevada Street and Joseph Avenue intersection. This project analyses the need for marked crossings for pedestrians coming to/from the north and south (on Joseph Avenue and Central Avenue at Cincinnati Street). In front of the school, Joseph Avenue and Central Avenue are classified as local streets with a 25 mph speed limit.



Existing Marked Crosswalks on Nevada Street (east of Garry Middle School)

Traffic Analysis:

The need for pedestrian crossing treatments was analyzed at the Central Avenue and Cincinnati Street intersection (for pedestrians coming to/from the north) and at the Joseph Avenue and Cincinnati Street intersection (for pedestrians coming to/from the south).

The table below shows estimated 2022 daily traffic volumes and 85th percentile speeds on Central Avenue and Joseph Avenue. As shown in the table, there are around 2,600 vehicles per day on Central Avenue, with only 400 vehicles per day on Joseph Avenue.

Spokane Traffic Calming Master Plan

2022 Daily Traffic and 85th Percentile Speeds on Central Avenue and Joseph Avenue

Location	# Lanes	2022 Estimated Daily Traffic (Vehicles per day) ^a	85 th Percentile Speed (mph)	Posted Speed (mph)
Central Avenue east of Astor Street	2	2,578	29	30
Joseph Avenue east of Standard Street	2	405	28	25

^a Traffic volumes were grown at a 1.0% annual growth rate, to estimate 2022 traffic conditions. A seasonal adjustment factor (SAF) was applied, based on historical traffic data from the city to estimate average daily traffic. Traffic data at Central Avenue collected on April 16, 2019 (SAF of 0.98). Traffic data at Joseph Avenue collected on May 20, 2021 (SAF of 0.96).

The 85th percentile speed was measured as 28 and 29 mph on Joseph Avenue and Central Avenue, respectively. Although it's worth noting that both roadways have 25 mph speed limits in front of the school (the speed limit on Central Avenue increases to 30 mph two blocks west of the school where the traffic count was collected).

Crashes at the Cincinnati Street/Central Avenue and Cincinnati Street/Joseph Avenue intersections were analyzed over the last five years (2017 through 2021), showing that no crashes were reported at these intersections within that timeframe. The need for enhanced pedestrian crossing treatments at these locations was analyzed based on the National Cooperative Highway Research Program (NCHRP) Report 562.² This report uses four main criteria to identify appropriate crossing treatment: peak hour pedestrian volumes, conflicting vehicle volumes, conflicting vehicle speed, and crossing distance/number of travel lanes to be crossed.

Based on NCHRP 562, crosswalks would be warranted at these locations if there are more than 20 pedestrians in the peak hour. However, there is some discretion allowed regarding the application of crosswalks in school zones. It is recommended that pedestrian counts be collected during the school year to verify the level of pedestrian activity at these intersections. Pending the findings of the data collection, north-south crosswalks are recommended at the Cincinnati Street/Central Avenue and Cincinnati Street/Joseph Avenue intersections. Ramp upgrades are also recommended at these intersections to meet ADA standards.

If installed, these crossings would qualify as school crossings and would therefore need to have school zone signage installed on Central Avenue and Joseph Avenue, to clarify the extents of the school speed zone. Per the Revised Code of Washington (Section 46.61.440) school zones can be installed up to 300 feet away from active schools or playgrounds.³ In order to install these school zone signs; a motion will need to go through city council to update the school zone extents.

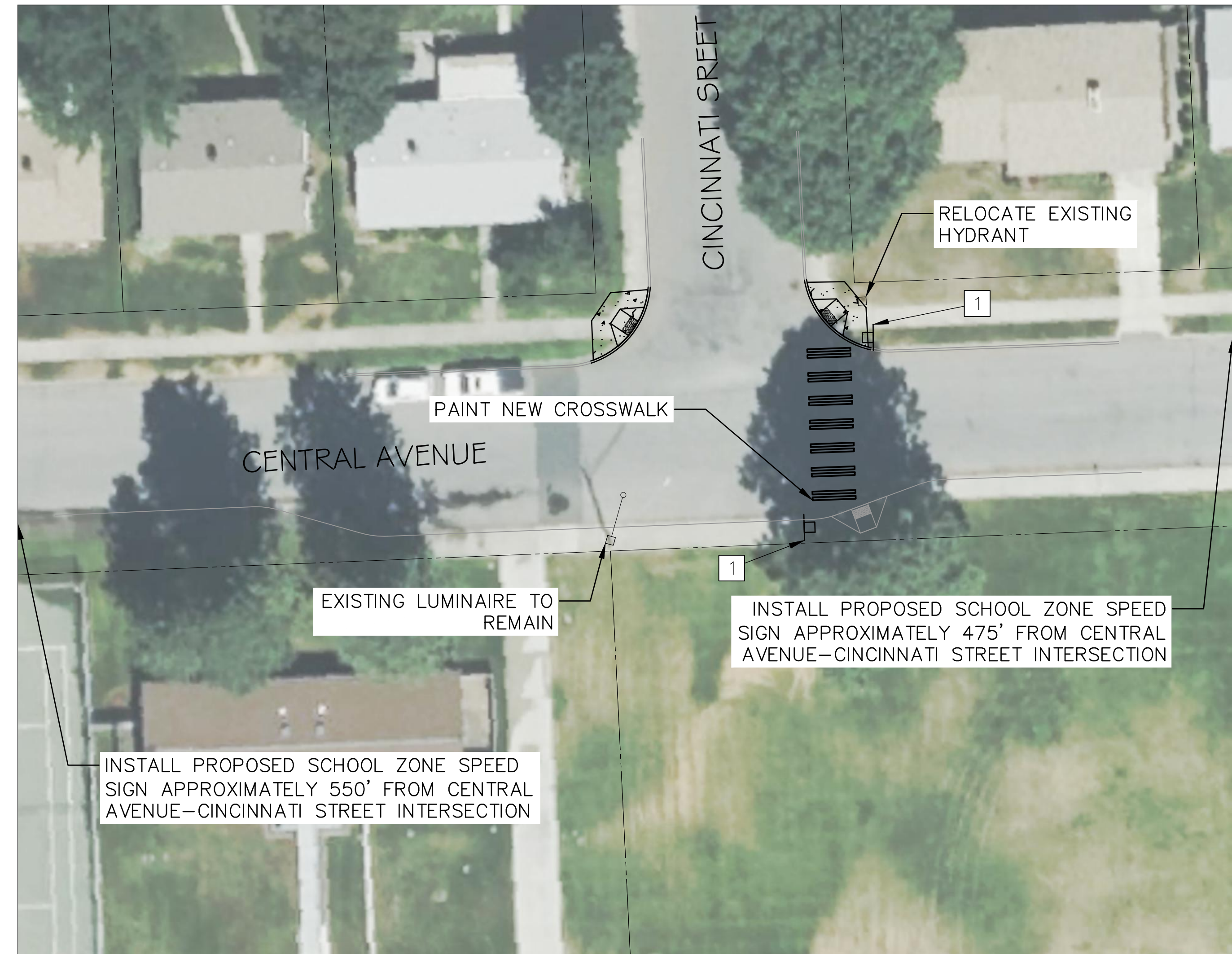
² NCHRP Report 562: *Improving Pedestrian Safety and Unsignalized Crossings*. National Cooperative Highway Research Program, 2006. <https://nacto.org/wp-content/uploads/2010/08/NCHRP-562-Improving-Pedestrian-Safety-at-Unsignalized-Crossings.pdf>

³ Revised Code of Washington Section 46.61.440. <https://app.leg.wa.gov/rcw/default.aspx?cite=46.61.440>




Spokane Traffic Calming Master Plan

Recommended Solution:

It is recommended that north-south crosswalks and ADA ramp upgrades be considered at the Cincinnati Street/Central Avenue and Cincinnati Street/Joseph Avenue intersections (pending additional data collection to verify existing pedestrian travel patterns at the school). These crossings would be accompanied by the installation of school zone signage on both of these streets. These upgrades will allow for safer access to the school for students traveling to/from the north and south of Garry Middle School.



LEGEND

-  PROPERTY LINE
-  EXISTING CONCRETE SIDEWALK
-  EXISTING CURB
-  INSTALL NEW CONCRETE SIDEWALK PER COS STD PLAN F-102B
-  INSTALL NEW CURB PER COS STD PLAN F-106B
-  INSTALL CURB RAMP PER COS STD PLAN F-105
-  INSTALL CROSSWALK PER COS STD PLAN G-61
-  PROPOSED SCHOOL CROSSING SIGN

CONSTRUCTION NOTES

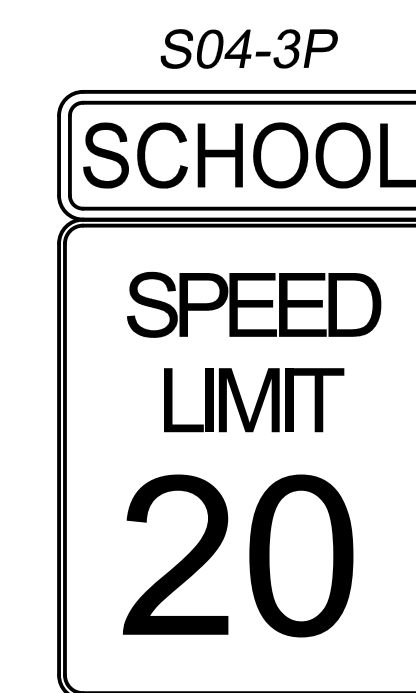
- 1. INSTALL PROPOSED SCHOOL CROSSWALK SIGN

NOTE:

- 1. CITY COUNCIL RESOLUTION ADOPTING 20 MPH SPEED LIMIT IS REQUIRED FOR THIS PROJECT.



PROPOSED SCHOOL CROSSWALK SIGN

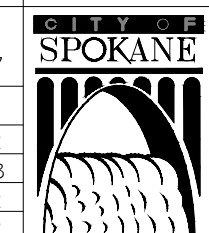


PROPOSED SCHOOL ZONE SPEED SIGN

**PRELIMINARY
NOT FOR CONSTRUCTION**

Plotted On: May 14, 2023 - 7:34pm

NAVD88 = (OLD CBM ELEV.) - (1.313) AS OF JANUARY, 2000 USE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)									
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DATE		BY		PROJ.		E.F.N. / U.S.N.		DATE	
REVISIONS		AS BUILT		GRADE ORDINANCE LIST		NAVD88 DATUM		SCALE	
DESCRIPTION		DATE		FROM		TO		FILE NO.	
COUNCIL ACCEPT DATE		FROM		TO		ORD. NO.		DATE	
DRAWN: DRV		DATE: 1/2/2022		CHECKED: JS		DATE: 1/2/2022		APPROVED: AM	
REVISED: DRV		DATE: 05/2023		DRAWN: DRV		DATE: 1/2/2022		APPROVED: AM	
HORIZONTAL PLAN/PROFILE: 1" = 20'		VERTICAL PROFILE ONLY: N/A		SCALE		SCALE		SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.		IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.		SCALE		SCALE		SCALE	



CITY OF SPOKANE, WASHINGTON
DEPARTMENT OF ENGINEERING SERVICES
808 WEST SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3343
(509) 625-6700

PROJECT NAME: SPOKANE TRAFFIC CALMING MASTER PLAN		TYPE OF IMPROVEMENT: TRAFFIC	
SEGMENT LIMITS: GARRY MIDDLE SCHOOL		CITY PROJECT NUMBER: CITY PLAN NUMBER:	
PROJECT LIMITS: NEVADA HEIGHTS NEIGHBORHOOD		TRAFFIC DESIGN: CALL BEFORE YOU DIG 1-800-424-5555	