

City of Falls City – Falls City Elementary School

Baseline Data Evaluation Report



FINAL July 27, 2022

Introduction

This case study evaluation measures the impacts of Oregon Safe Routes to School (SRTS) 2021 Competitive Construction Grants in communities across the state. The evaluation will assess the effectiveness of individual SRTS projects, techniques, and programs designed to reduce barriers to biking and walking to and from school. Evaluation research questions include:

- What are the impacts for standalone construction grants, and combined outreach and education and construction grants?
- How do different combinations of interventions effectively address the barriers identified by communities and affect mode shift; safety; and perceptions of safety, program lifespan, and equity?

This Baseline Data Evaluation Report represents the “pre-construction” data and provides an overview of existing travel conditions and school site attributes. This report summarizes the funded improvement project, demographics of affected schools, and data from Oregon Department of Transportation (ODOT) and local roadway authority crash records, caregiver surveys, and student travel hand tallies. It is intended to contain the majority of the information needed to plan for the post-construction data collection.

Plan for the Final Case Study Evaluation Report

The Final Case Study Evaluation Report will represent the “post-construction” data. A draft outline for this report is included in Appendix A. For data consistency, the post-construction data will be collected as soon as possible after construction is complete, likely starting in winter 2022. This will reduce weather-related impacts and also allow time during the school year for families to establish or change their travel habits. In addition to the standard caregiver surveys and student travel hand tallies, post-construction data collection methods for the evaluation report may also include: caregiver focus groups and surveys or interviews with school staff.

The Final Case Study Evaluation Report will measure shifts using the evaluation metrics laid out in this document to identify the successes of SRTS projects and provide insight on opportunities for further improvement. SRTS performance metrics measured during this evaluation process will include:

- **Mode split:** Are more students walking and biking to school after a project’s completion than at the time of baseline data collection?
- **Access to safe infrastructure:** Do students have better access to sidewalks, bike lanes, or safe crossing locations on their route to school after the completion of the project?
- **Safety/perception of safety:** Do caregivers and students feel safer or more comfortable walking and biking to school after the project’s completion?
- **Program lifespan/partnerships:** Is the SRTS program functioning efficiently and providing adequate support for partner jurisdictions, schools, and districts?
- **Equity:** Are students from a diversity of ethnic/racial and socioeconomic backgrounds benefiting from the investments being made?

In addition to reporting on grant effectiveness, data presented in the Baseline Data Evaluation Report and the Final Case Study Evaluation Report could be used for a variety of transportation and program planning purposes at the local level. Having a comprehensive set of quantitative data and qualitative feedback on transportation conditions and trends around these sites could help inform decisions on school/district policy, SRTS event and program planning by schools/districts/local jurisdictions, and planning for future infrastructure projects, as well as provide supporting documentation for future grant applications.

Baseline SRTS Snapshot: Falls City Elementary

Summary

Falls City Elementary School is a public elementary school serving students in the City of Falls and rural Polk County. Falls City Elementary School is a Title 1 school, with over 90% of students eligible for the Federal Free and Reduced-Price Lunch Program. English is the primary language spoken by students.

City staff identified Falls City Elementary School as a site for SRTS improvements due to two major barriers for students. First, students are primarily using an unsafe dirt path in the woods for commute that does not provide safe bicycle and pedestrian access. Secondly, there is a three-way intersection that is heavily used by speeding downhill logging trucks, this road lacks safe crossings for pedestrians and bicyclists.

The Oregon SRTS 2021 Competitive in Construction Grant funded a well-lit pathway that is visible from the streets at both ends between the district's Elementary and High Schools. In addition to these planned infrastructure improvements, the grant also funds a pedestrian island, flashing beacons, and crosswalks to help students walk or bike safely to school. Lastly, on North Main Street, between the intersection and the schools, crosswalks will be repainted so students can cross the street safely.

Key information from Falls City Elementary caregiver surveys and staff interview:

- 13 respondents of the caregiver survey live within a mile of the school.
- Approximately 45% of students ride in a family vehicle to school, and 40% use this mode to travel home; 45% of students take the school bus to school, and 40% take the bus home. Very few families reported walking to/from school.
- Caregivers report that lack of facilities or bike parking is the most common barrier to walking/biking to school. Other barriers include:
 - Poor driver behavior
 - Concerns about safety, documentation, or criminal activity
 - The length of time it takes to walk or bike to school
- Most caregivers recognize the value of walking/biking to school—18 out of 19 described it as healthy, and 12 out of 19 described it as fun for their student.

Contact Information

JURISDICTION:	City of Falls City
CONTACT:	Macahan “Mac” Corthell, manager@fallscityoregon.gov
SCHOOL DISTRICT:	Falls City School District
CONTACT:	City of Falls City: (503) 787-3631
OTHER CONTACTS:	Art Houghtaling, K-8 Principal/Superintendent, art.houghtaling@fallscityschools.org

Enrollment and Demographics

Falls City Elementary School is a Title 1 public school enrolling 117 students in Kindergarten through 8th grade. The school serves low - income populations in the City of Falls; approximately 94.5% of students are eligible for the Free and Reduced-Price Lunch Program. English is the primary languages spoken by students, and less than 5% are registered to be Ever English Learners.¹

ENROLLMENT: 117 ²	GRADE LEVELS SERVED AND SCHOOL TYPE: K-8 th , Public
STUDENT ETHNIC/RACIAL DEMOGRAPHICS: American Indian/Alaska Native: 1% Asian: 0% Hispanic or Latino: 5% Native Hawaiian/Pacific Island: 0% Multiracial: 6% Black/African American: 0% White: 88%	PREDOMINANT LANGUAGE SPOKEN IN FALLS CITY SCHOOL DISTRICT 57: ³ English: 180
STUDENTS LIVING WITHIN 1 MILE OF SCHOOL: NA	TITLE 1 STATUS: Yes ⁴
EVER ENGLISH LEARNERS: NA ⁵	FREE AND REDUCED-PRICE LUNCH ELIGIBILITY: 94.5% ⁶

¹ Unless otherwise noted below, demographic data are from the Oregon Department of Education Fall Membership Report SY2020-2021 Data, <https://www.oregon.gov/ode/reports-and-data/students/Pages/Student-Enrollment-Reports.aspx>

² Oregon Department of Education, SY 2020-2021 <https://www.ode.state.or.us/data/reportcard/Media.aspx>

³ Oregon Department of Education Language Use Survey, SY 2020-2021 <https://www.oregon.gov/ode/schools-and-districts/grants/ESEA/EL/Pages/LanguageUseSurvey.aspx>

⁴ Title 1 schools are schools where 40% or more of students are enrolled in USDA’s Free and Reduced-Price Meals Program. Oregon Department of Education, SY 2018-2019 <https://www.oregon.gov/ode/schools-and-districts/reportcards/reportcards/Pages/Accountability-Measures.aspx>

⁵ Oregon Department of Education, SY 2020-2021 <https://www.ode.state.or.us/data/reportcard/Media.aspx>

⁶ Oregon Department of Education, SY 2020-2021 <https://www.oregon.gov/ode/students-and-family/childnutrition/cacfp/Documents/Site%20Eligibility%20for%20CACFP%20and%20SFSP.pdf>

Community Context and Place Type

Place type describes attributes of a built environment, including: access to destinations, density, walkability, mixing of uses, and presence of transit. The evaluation team compiled Oregon Department of Land Conservation and Development's (DLCD) measures of place type for each community studied.⁷ Each attribute is rated as “**Very Low, Low, Medium, or High**” by block group. Place type characteristics provide important context for transportation opportunities and challenges in a community and influence the transportation decisions people make.

Falls City Elementary School is located in the City of Falls, within the center of the town's limits. According to the Place Type Tool, the area surrounding Falls City Elementary School's area type is categorized as a low density/ rural meaning it contains low density development. The school's development type is categorized as low density rural, with very low densities of housing and jobs with 1,873 people residing and 1,312 people working within the census block group. The area has a very low level of access to regional employment centers and destinations, and a medium mix of uses; the overall level of street connectivity in the area is characterized as “very low.”

AREA TYPE describes the role of each neighborhood district compared to the rest of the region (regional center, close-in community, suburban/town, low density/rural)

Rural

- Very low densities of jobs and housing
- Very low accessibility to jobs and services
- Generally, outside of UGB or undeveloped areas within UGB
- Auto dependent transportation, due to low densities of jobs and services

DEVELOPMENT TYPE describes more detailed physical characteristics of each neighborhood (transit supportive development, mixed use, employment, residential, rural/ low density):

Low Density / Rural

- Very low densities of housing and jobs
- Very low accessibility to jobs and services
- Generally, outside of UGB, or undeveloped areas within UGB
- Auto dependent transportation, due to low activity densities

JURISDICTION POPULATION (ACS 5-YEAR ESTIMATES):	City of Falls 1,873 people
---	----------------------------

CENSUS BLOCK GROUP POPULATION (2010):	1,312 people
---------------------------------------	--------------

NUMBER OF JOBS IN CENSUS BLOCK GROUP (2010):	91 jobs
--	---------

ACCESS TO DESTINATIONS describes the number of regional jobs within 5 miles:	Very low
--	----------

DENSITY LEVEL- jobs and households per acre within ¼ mile:	Very Low
--	----------

DESIGN LEVEL- level of street connectivity, pedestrian-oriented street density:	Very low
---	----------

DIVERSITY LEVEL- Mix of housing and employment:	Very low
---	----------

TRANSIT LEVEL- Afternoon peak hourly transit service within ¼ mile:	Very low
---	----------

⁷ More information about OLCD's Place Type Tool is available at: www.oregon.gov/lcd/CL/Pages/Place-Types.aspx

Project Description

A map of the project improvements from the Falls City Elementary grant application is included in Appendix B.

PROBLEM STATEMENT:	Falls City students face two major barriers traveling to school. First, a dirt path heavily used by students, through the woods between the Elementary and High schools is littered with junk vehicles, garbage, is not visible from the street. The path does not provide bicycle access, and is a known criminal loitering area. Second, there is a three-way intersection that is wide, heavily used by speeding downhill logging trucks, and lacks any controlled crossing for safe use by pedestrians and bicyclists.
DESCRIPTION OF BARRIERS TO WALKING AND BIKING:	This project will install a sidewalk along the south side of Prospect Avenue between the Elementary School and the proposed pathway. The pathway, adequately wide for both pedestrian and bicycle access and with street lighting, will extend from Prospect Avenue to N. Main Street. At that point, in front of the High School, the crosswalk will be repainted and a flashing beacon installed on the south side of the street. Additionally, crosswalks will be repainted along N. Main Street at Dayton Street and at Third Street. At the intersection of N. Main, Bridge, and Mitchell Streets, a flashing beacon and a pedestrian island will be installed and crosswalks painted. The northeast curb will be extended to shorten pedestrian travel distance.
PROJECT DESCRIPTION:	This project will create a well-lit pathway that is visible from the streets at both ends between the district's Elementary and High Schools and will install a pedestrian island, flashing beacons, and crosswalks at a dangerous intersection so that students can walk or bicycle safely to school. On North Main Street, between the intersection and the schools, crosswalks will be repainted so students can cross the street safely.
ESTIMATED PROJECT TIMELINE:	December 2022
PRIORITY SAFETY CORRIDOR? ⁸	No
OUTREACH AND EDUCATION:	The Transportation System Plan on which our proposal is based involved a thorough public outreach process including public meetings and a technical advisory committee that included many city residents. This specific project has been discussed at multiple City Council meetings over the past year and has been presented to the city's Public Works committee, and the school board. Many residents in the community have expressed support for the project, including one Falls City resident and grandmother who has grandchildren that attend Falls City Elementary School and spoke in vehement support of the project at the Mayor's State of the City address.

⁸ A road where the posted speed or 85th percentile speed of traffic is 40 mph or greater OR where two of the following apply: posted speed limit of 30 mph or greater, more than two lanes or a crossing distance greater than 30 feet, 12,000 AADT or greater, or a demonstrated history of crashes related to school traffic.

The Falls City School District has not engaged the community in Safe Routes to Schools education or engagement programs to date. This proposal is an important first step in the district making it easier for students to travel to and from school safely.

Access Analysis for Students Walking and Biking to School

The project team conducted an analysis to estimate the number of people who would gain walking and biking access to Falls City Elementary School when the project improvements are constructed, shown in Table 1 and Figure 1. First, the project improvements were evaluated to understand the geographic areas that would gain safe access to the school once the funded project was constructed. Next, American Community Survey (ACS) data was combined with zoning data to estimate the number of people and the number of school-age children that live within the new access areas.

This analysis estimates that approximately 58 students, or 19% of the school-aged population living within a mile of the school, would gain safer walking or biking access to the school.

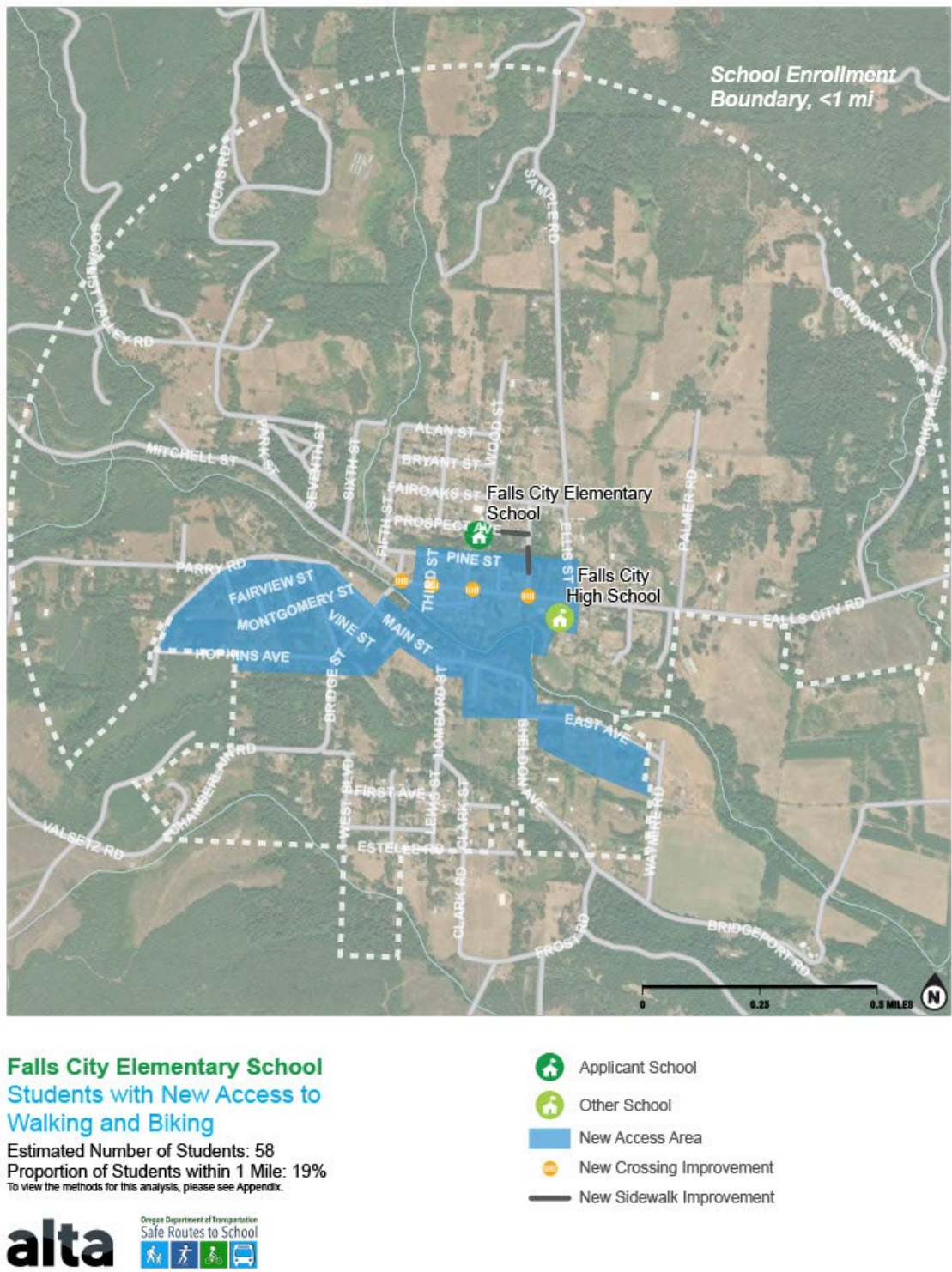
Table 1. Access Analysis Results

METRIC		VALUE
Total Population of New Access Areas		332
School Age Population of New Access Areas ⁹		58
Percentage of Students within the School Areas Gaining Access ¹⁰		19%

⁹ Calculated using the proportion of school-age children (5-17 years old) within the City of Falls City.

¹⁰ The School Area is defined as the area within the school enrollment area that is within one mile of the school.

Figure 1. Falls City Elementary New Access Area for Students Walking and Biking



Baseline Data

The following section presents pre-construction data, which will be compared against similar data collected after the project has been constructed, in order to estimate the impact of the improvements.

Staff Interview

DATE COLLECTED: February 8, 2022

DATA COLLECTION PROCESS: Staff Interview with Art Houghtaling

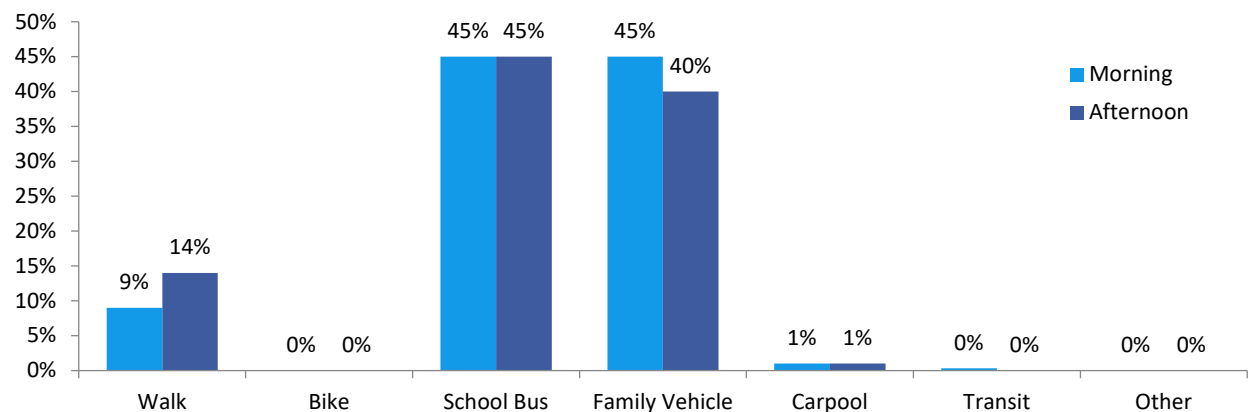
SUMMARY OF DATA COLLECTION AND METHODOLOGY

Due to the COVID-19 pandemic and the risk in conducting in-person travel tallies at Falls City Elementary, Art Houghtaling, the principal at the school, provided the Alta Planning + Design Safe Routes to School team an account of current travel conditions at Falls City Elementary. Art Houghtaling answered questions about typical travel mode-share to and from Falls City Elementary at the time of the interview.

SUMMARY OF RESULTS

Falls City Elementary hand tally data from 2022 indicates that a majority of students surveyed ride in a family vehicle in the morning and ride the school bus in the afternoon (see Figure 2 and Table 2). Riding the school bus and riding in a family vehicle were tied for the most common way students got to school in the morning (45%). In the afternoon, family vehicles were the second most common mode, with 40% of students. Carpools are also used by 1% of students to get to school and 1% to get home. 9% of students walk in the morning and 14% walk home in the afternoon. Zero students reported biking to school.

Figure 2. Student Mode Split by Time of Day, 2022 Staff Interview



Note: Percentages may not total 100% due to rounding.

Table 2. Count of Student Mode Split to and From School, 2022 Staff Interview Data

TIME OF DAY	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Morning	9%	0%	45%	45%	1%	0%	0%
Afternoon	14%	0%	45%	40%	1%	0%	0%

Caregiver Surveys

DATE COLLECTED: May 2022

DATA COLLECTION PROCESS: The Oregon Department of Transportation SRTS caregiver survey was distributed electronically to caregivers at Falls City Elementary School to assess family perceptions about school travel options and behavior. The survey was available in English and Spanish.

NUMBER OF SURVEYS: 18 surveys in English, 1 survey in Spanish

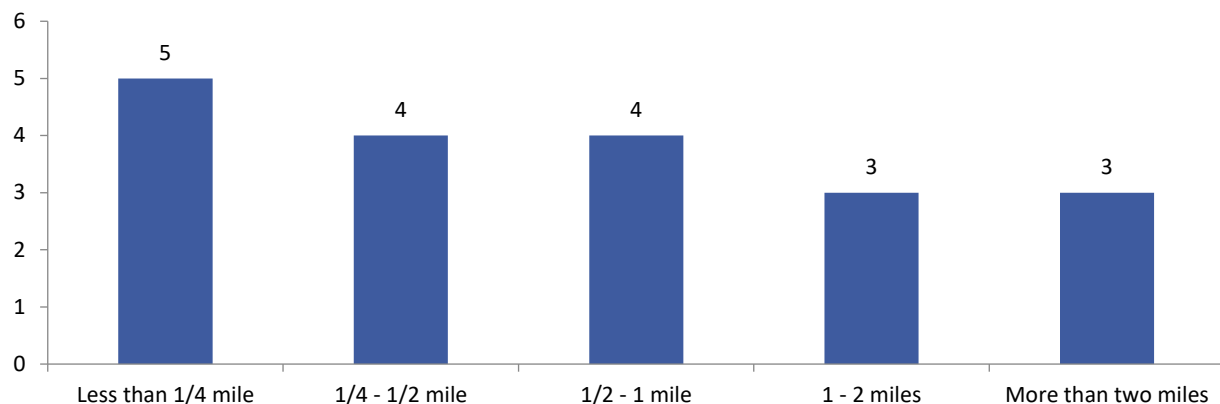
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The caregiver survey data included in this report was collected in April 2022 from 19 participants with students attending Falls City Elementary. Alta Planning + Design staff created a promotional flier which included details about the Safe Routes to School program, project contact information, and a link to the online survey. Caregivers who completed the survey were entered into a raffle for a walking/biking safety kit. *Note: due to the small sample size, the following charts are provided as raw numbers as they do not provide a representative sample of the total population.*

SUMMARY OF RESULTS

Caregiver survey analysis revealed that 13 respondents live within one mile of Falls City Elementary, with an additional three living between one and two miles of the school site (see Figure 3). Three surveyed caregivers live more than two miles from the school.

Figure 3. How Far Does your Family Live from School?, 2022 Caregiver Survey



Family vehicles modes were the most commonly used transportation option for students living less than a quarter mile from the school, as well as those living between a half mile and one mile away and those who live two miles or farther from school (see Figure 4 and Table 3). For students who live between a quarter-mile and a half-mile from school, the school bus was the most popular transportation, with 70% using this mode. Additionally, 58% of students who lived between one and two miles from school used shared modes. Only three students (all living between a half-mile and one mile from school) walked to/from school.

Figure 4. Mode Split by Distance from School, 2022 Caregiver Survey

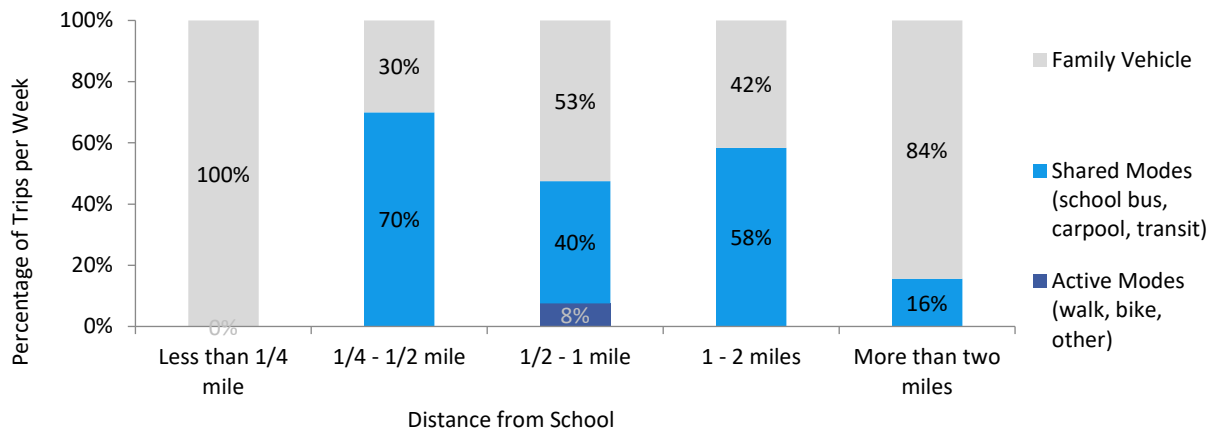
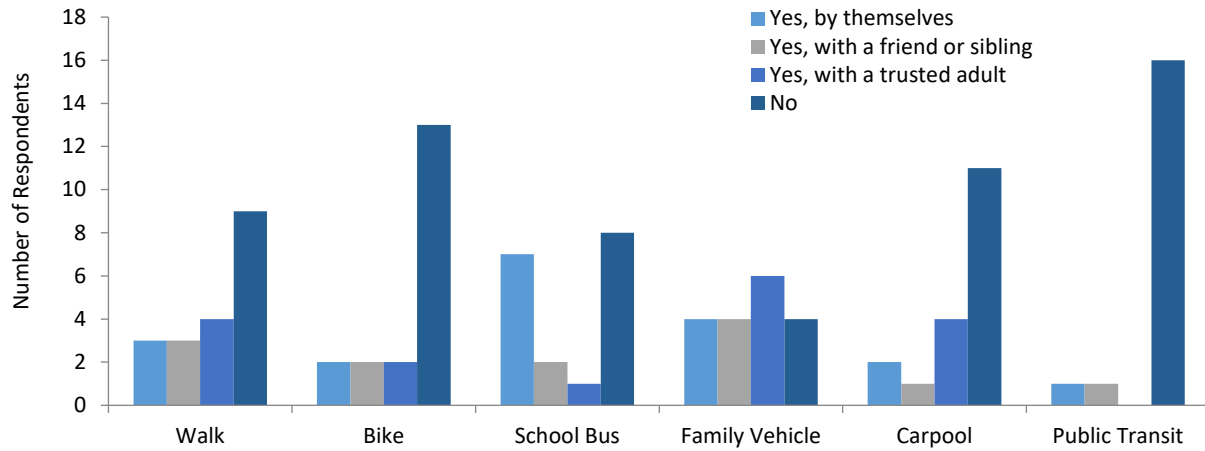


Table 3. Count of Trips by Distance the Family Lives from School, 2022 Caregiver Survey

DISTANCE	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Less than 1/4 mile	30	2	4	9	0	0	0
1/4 mile up to 1/2 mile	4	0	22	8	0	0	0
1/2 mile up to 1 mile	0	2	4	13	19	0	0
1 mile up to 2 miles	0	0	8	20	0	0	0
More than 2 miles	0	0	10	20	0	0	0

As Figure 5 illustrates, nine caregivers surveyed reported that they would not allow their student to walk to/from school. However, four responded that they would allow their student to walk if they were accompanied by a trusted adult, another three would allow them to walk with a friend or sibling, and another three would allow them to walk alone. Thirteen said they would not allow their student to bike, and only two would allow biking with a trusted adult present, with a sibling, or alone.

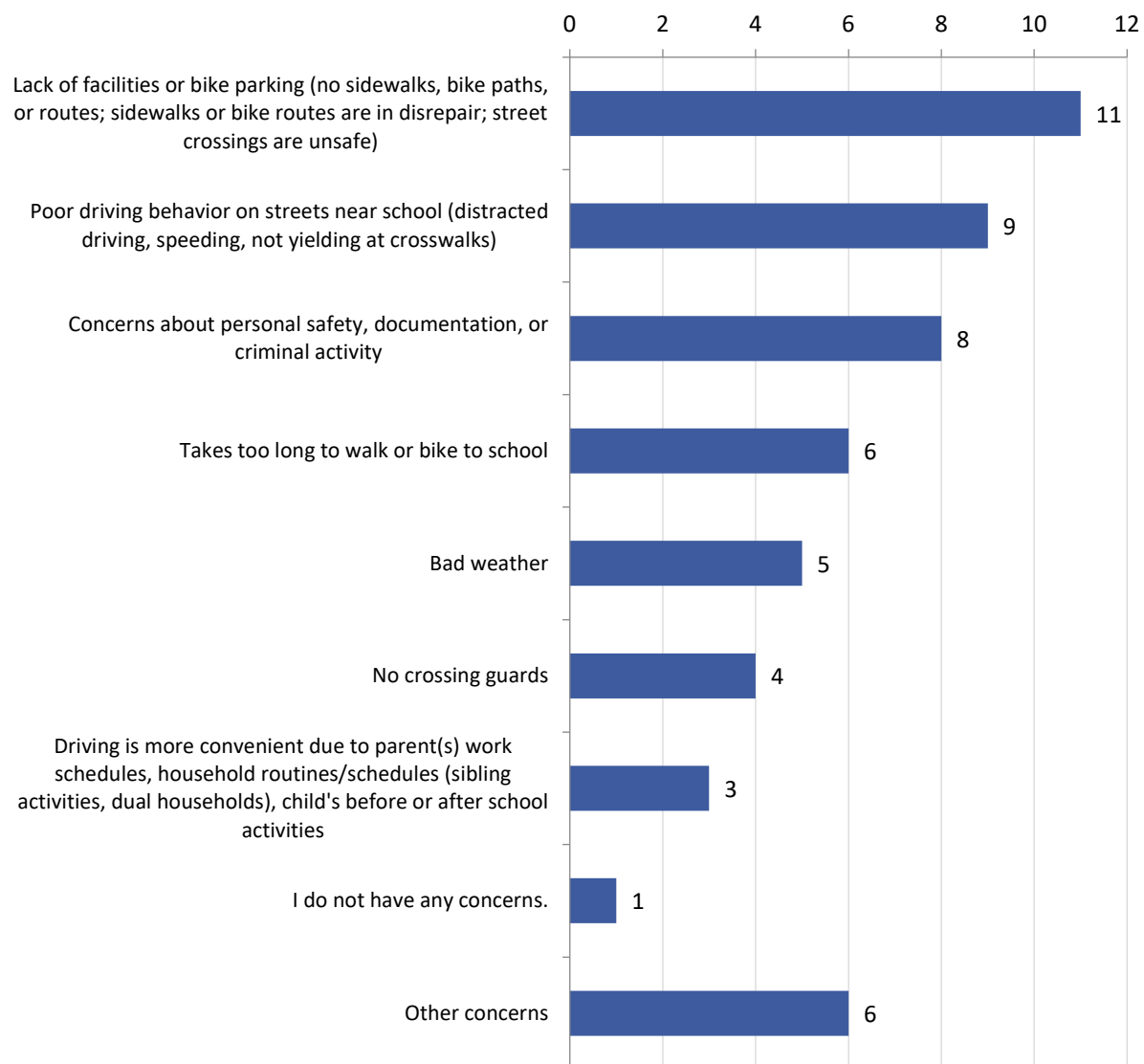
Figure 5. Do You Allow This Student to Travel to School in the Following Ways?, 2022 Caregiver Survey



While caregivers reported varying concerns that limit their student's ability to walk or bike to school, some were more commonly expressed than others (see Figure 6). Many surveyed caregivers faced the following barriers:

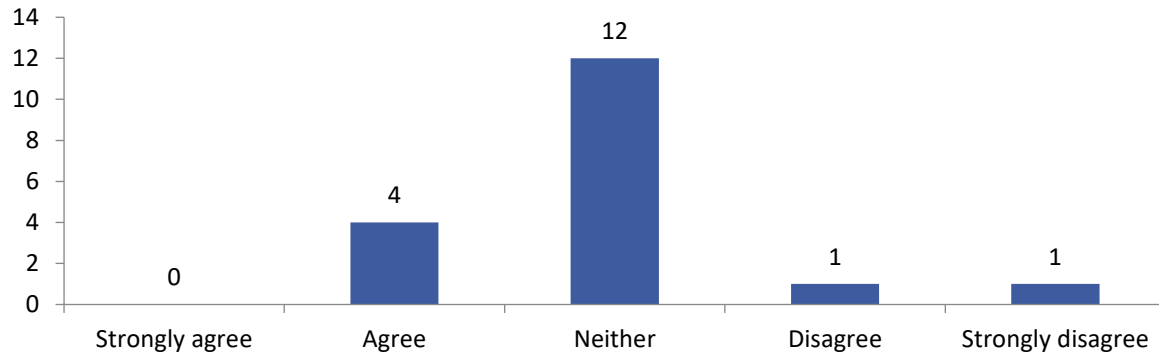
- Lack of facilities or bike parking
- Poor driver behavior
- Concerns about safety, documentation, or criminal activity
- The length of time it takes to walk or bike to school

Figure 6. What Concerns Limit Your Student's Ability to Walk or Bike to/from School? 2022 Caregiver Survey



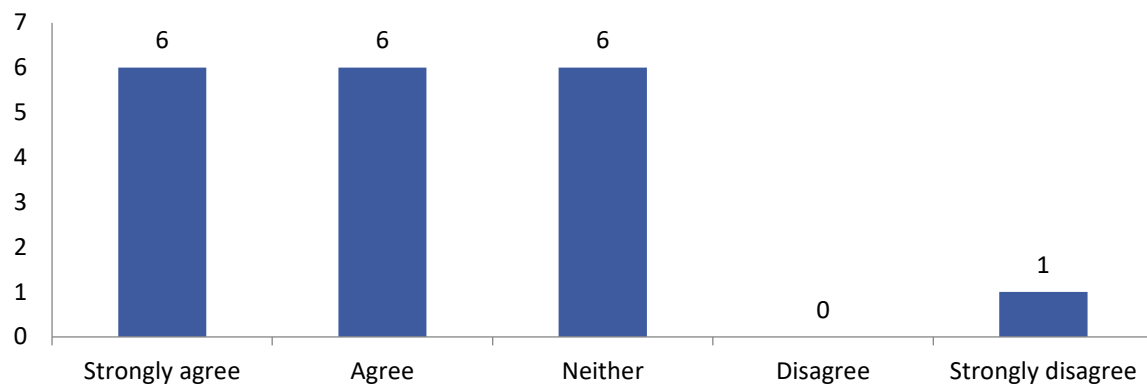
A majority of caregiver respondents (12) felt Falls City Elementary neither encouraged or discouraged students from walking and biking to school at the time of the survey. An additional four felt the school encouraged active transportation, while two characterized the school as discouraging walking and biking (see Figure 7).

Figure 7. Agree/Disagree: Walking/Biking to/from School Is Encouraged by My Student's School, 2022 Caregiver Survey



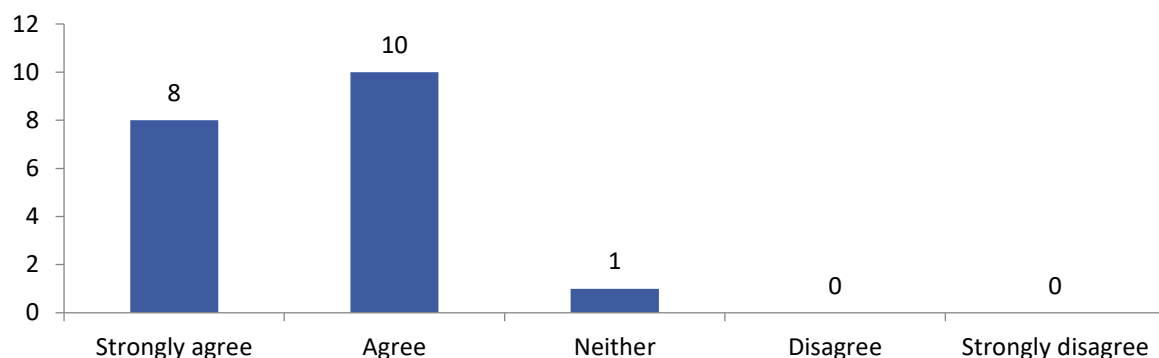
At the time of the survey, 12 caregivers agreed that walking or biking to school would be a fun activity for their students, while only one believed the activity would be boring. An additional six were neutral or unsure on whether their student would enjoy walking and biking to school (Figure 8).

Figure 8. Agree/Disagree: Walking/Biking to/from School Is Fun for My Student, 2022 Caregiver Survey



A majority of caregivers recognized the health benefits of active transportation, with 18 agreeing that walking or biking to school would be healthy for their student. One caregiver was neutral regarding the health benefits of walking and biking, and none felt that the activities would be unhealthy for their student (see Figure 9).

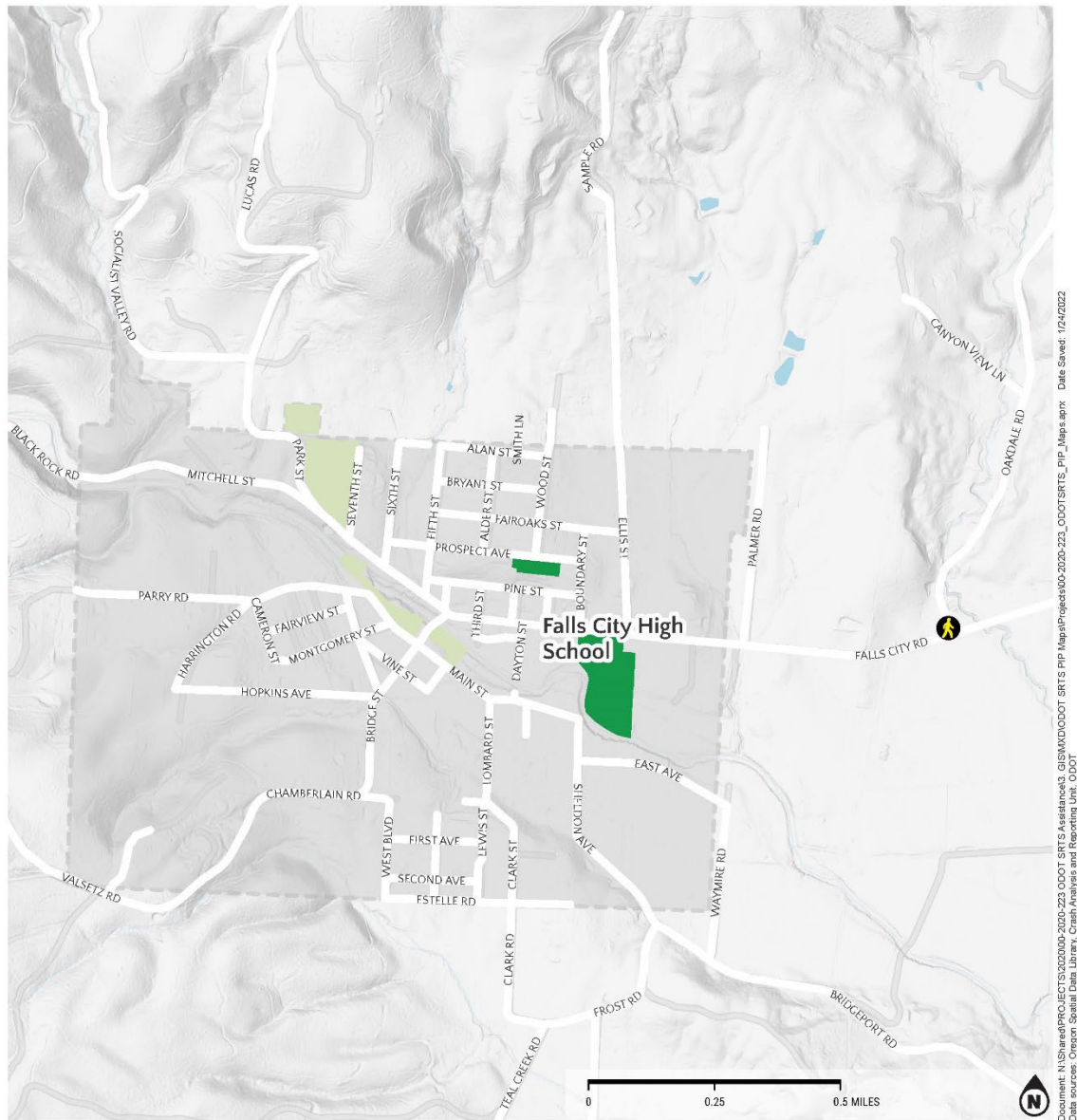
Figure 9. Agree/Disagree: Walking/Biking to/from School Is Healthy for My Student, 2022 Caregiver Survey



Crash Data

DATE COLLECTED:	2014-2018
DATA COLLECTION PROCESS:	Crash data included in this report originates from relevant roadway jurisdictions, as well as the ODOT SRTS Web Map Application for the years 2014-2018. This analysis does not determine whether the grant intervention <i>caused</i> any change in the occurrence of crashes, due to small sample size. Additionally, due to insufficient mode split data to calculate crash <i>rates</i> , this report offers a count and description of reported incidents.
NUMBER OF REPORTED CRASHES INVOLVING BIKES AND PEDESTRIANS WITHIN 1 MILE OF SCHOOL:	Between 2014 and 2018, one crash involving a pedestrian was reported within one mile of the school.
TIME OF REPORTED CRASHES INVOLVING BIKES AND PEDESTRIANS WITHIN 1 MILE OF SCHOOL*:	This crash occurred on September 21, 2014, between the hours of 10 AM and 11 PM. <i>* For these analyses school commuting hours are defined as 6 AM to 9 PM.</i>
NUMBER OF REPORTED INJURIES BY SEVERITY WITHIN 1 MILE OF THE SCHOOL:	The one reported crash resulted in a non-fatal pedestrian injury. Figure 10 illustrates the location of the crash.
ADDITIONAL CRASH DATA CONSIDERATIONS:	N/A

Figure 10: Falls City Elementary School Bicycle & Pedestrian Collisions (2014-2018)



**COLLISIONS WITH
PEOPLE WALKING
AND BIKING
2014-18**

alta Oregon Department of Transportation
Safe Routes to School

Pedestrian Collisions

- Pedestrian Injury
- 2 or more Pedestrian Injuries
- Pedestrian Fatality

Bicyclist Collisions

- Bicyclist Injury
- 2 or more Bicyclist Injuries
- Bicyclist Fatality

- Railroad
- School Property
- Parks
- Water
- City Boundary

Follow-Up Data Collection Plan

Timeline

Post-grant field visits to collect follow-up data will be scheduled to take place the spring following the completion of each grant intervention. Falls City estimates the project will be completed by December 2022.

Follow-Up Data Collection Process

METHOD	PLANNED AT THIS SITE?	TARGET SAMPLE SIZE	TARGET FIELD WORK DATE
STUDENT HAND TALLIES:	Yes	At least 2 classrooms per grade per school	Spring 2023 (assuming project completion)
CAREGIVER SURVEYS:	Yes	At least 30 caregivers per school	Spring 2023 (assuming project completion)
CAREGIVER FOCUS GROUPS:	Yes	4-10 caregivers	Spring 2023 (assuming project completion)
STAFF SURVEYS:	Yes	1-3 school staff and administration	Spring 2023 (assuming project completion)
COMMUNITY SURVEYS:	Yes	At least 20 community members	Spring 2023 (assuming project completion)
CRASH DATA:	Yes	N/A	N/A
OTHER:	None	N/A	N/A

Appendix A. Final Report DRAFT Outline

Note: The following Final Report outline is subject to change.

Chapter 1. Introduction

- Description of SRTS Construction Grant Program
- Description of Final Report purpose and contents

SUMMARY OF FUNDED INFRASTRUCTURE IMPROVEMENTS

- Project description
- Map of improvements
- Project timeline

BACKGROUND

- School demographics
- Summary of Non-Infrastructure SRTS Work
- Place Type

Chapter 2. Data Collection and Results

HAND TALLY DATA

- Data Collection Methods
- Change in walking and biking rates

CAREGIVER SURVEY DATA

- Data Collection Methods
- Change in mode split by distance from school
- Change in barriers to walking and biking
- Change in perceptions of walking and biking
- Other observations

FOCUS GROUPS

- Data Collection Methods
- Change in barriers to walking and biking
- Change in perceptions of walking and biking

CRASH DATA

- Data included in analysis
- Change in crash data (*If available, otherwise this will provide updated baseline crash data from ODOT*)

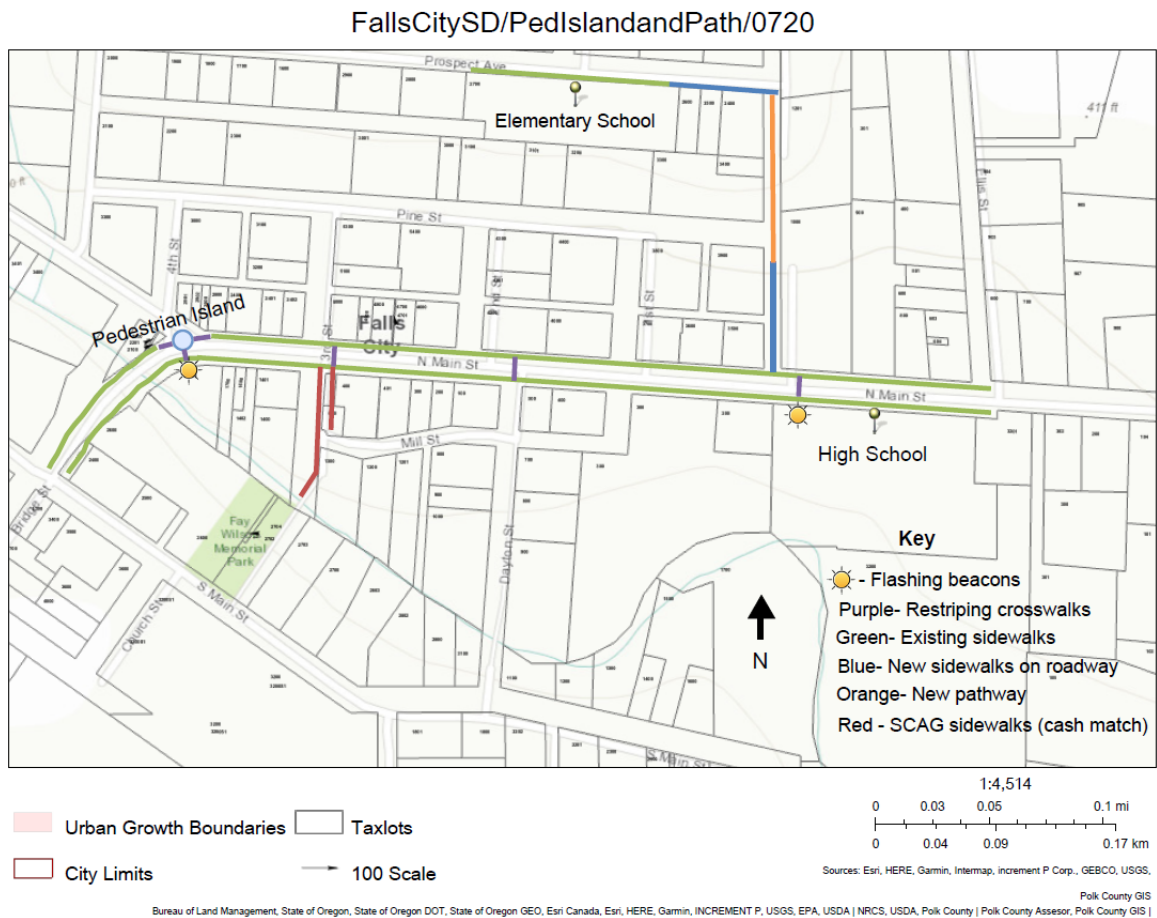
Chapter 3. Findings

- Impact of Infrastructure improvements on mode split
- Impact of Infrastructure Improvements on Access to Safe Infrastructure

- Impact of improvements on safety/perception of safety
- Impact of infrastructure improvements on Program lifespan/partnerships
- Impact of infrastructure improvements on equity
- Other Findings
- Next Steps and Recommendations

Appendix B. Competitive SRTS Infrastructure Grant Funded Project Map

Figure 11. Falls City Elementary Competitive SRTS Infrastructure Grant Funded Project Map



Appendix C. Access Analysis Detailed Methodology

Purpose

The access map analysis was designed to estimate the number of students with new or significantly improved access to school upon the implementation of a proposed walking or biking facility. While determining the number of students who benefit from a proposed project is not an exact science, this analysis provides a common approach that utilizes school district boundaries, census population data and local zoning codes to generate rough estimates. These estimates lend greater insight into the impact of a particular Safe Routes to School project, allowing facility improvements to be compared and thus aid in prioritizing investments. This memo outlines the data sources, methods, and assumptions that inform the access map analysis described in this report.

Data Sources

Three primary data sources were used in this analysis in conjunction with the information provided in each project application:

Name	Source
American Community Survey (ACS) Population Estimates	US Census Bureau
Oregon School District Boundaries	Oregon Department of Education
2017 Oregon Statewide Zoning Map	Oregon Department of Land Conservation and Development

Methods

The analysis establishes two geographical areas in which census block population data are apportioned to: 1) the school area and 2) the access area. The school area is defined as the area that is within a 1-mile radius of the applicant school or within the enrollment boundary, whichever is closer. This area covers residents within reasonable walking or biking distance of the school. The access area is the area that covers all residents who would experience new or significantly improved access to school upon the implementation of the proposed walking or biking facility.

Once both of these areas were established, the consultant team identified the census blocks that intersect each. We then apportioned the population data from the census blocks to the school area and the access area, based on the relative coverage of each census block. To account for varying residential densities in each census block, we used residential zoning data to determine the proportion of the population that should be attributed to the school area and access area.

After the estimated populations of both the school area and the access area are calculated, the local jurisdiction's youth rate is applied to each to get the number of people ages 5-17 in those areas, which we refer to as the 'school age population'. Finally, the school age populations of the access area and the school

area are compared. The percentage of school age students with new or improved access to school represents the proportion of students impacted by the project out of all the students in the school area who could reasonably walk or bike to school.

Defining the Access Area

The boundary of the school area is readily calculable using GIS and the rules described above. By contrast, the access area boundary was determined manually based on the project description and professional judgement of impact. While this method inherently includes subjective judgement, the high variability and nuance in the transportation context surrounding the proposed project makes this method more suitable for determining the residential areas apportioned that would benefit from its implementation than a purely GIS-based workflow. The following assumptions and rules of thumb were adopted in order to make the assessment of the access areas as uniform as possible:

1. The analysis assumes people are willing to “walk around the block” half the distance of their street in the opposite direction of school in order to utilize a safe path to school.
2. The analysis assumes that Google Earth Street view imagery is up to date, as this was used to determine sidewalk connectivity and condition, which informed the access areas.
3. Places without sidewalks, particularly in small towns, are considered walkable if the street is narrow, residential, and designed for a low volume of traffic (i.e., lacks a centerline)
4. The access areas consider ADA accessibility and account for those in wheelchairs or other mobility devices.
5. The access areas may include residents who have to walk more than one mile to school, based on the available street network.
6. Even if some residents may have already had access to school, they might be included in the access area if the proposed project would significantly improve their access to school.

Apportioning Census Population Data

As described above, census population data was apportioned to both the school area and the access area based on how much a census block covered them. However, to account for varying population densities across census blocks, residential zones in the census blocks were identified.

The statewide zoning data provided by the Oregon Department of Land Conservation and Development groups residential zones across all jurisdictions in the state into 13 categories of increasing density. Our team further consolidated these categories into just 4: Low Density, Medium-Low Density, Medium-High Density, and High Density. We then weighted these categories by their relative density compared to Low Density:

Residential Zone Group	Population Density Factor
Low Density	1
Medium-Low Density	2
Medium-High Density	5

Residential Zone Group	Population Density Factor
High Density	15

These factors serve to more accurately distribute the population data across the residential zones within the census block. In other words, if the census block contained only Low-Density residential zones, then the population of any given area within that census block is equal to the proportion of the census block that that area covers. By contrast, if a census block contains Low Density residential zones and High-Density zones, we attribute 15 times the population of the census block to the High-Density zones than the Low-Density zones. The density factors were determined using the typical number of dwellings per acre in each zone.

The analysis uses these four zoning categories to identify the spatial distribution of the population of the census block and apportion it to the overlaying school area and access areas based on how much those areas cover the residential zones of the census block.

General Assumptions

- This analysis assumes that the Oregon Statewide Zoning code reflects the actual residential densities of the current built environment.
- Areas that were zoned for housing that had no development on them according to the latest satellite imagery (and therefore significantly impacted the output) were removed from the analysis in order to improve the accuracy of the estimates. This was only utilized in a few low-population jurisdictions.
- For rural schools with no local residential zoning reported, the population of the appropriate block group is assumed to be evenly distributed across the school zone and the percentage of people served is equal to the percentage of the school zone covered by the new access area.
- This analysis assumes that families are evenly distributed between each of the four residential zone groups.
- The reported number of school-age students includes all students ages 5-17, not just elementary or middle school students. Thus, the number of students who actually attend the applicant school is likely much lower than the reported figure.