

City of Milton-Freewater – Gib Olinger Elementary School Baseline Data Evaluation Report



DRAFT June 24, 2020

Introduction

This Case Study Evaluation measures the impacts of Oregon Safe Routes to School (SRTS) 2019-2020 Competitive Construction (Infrastructure) 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?

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

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 spring 2021. 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 parent surveys and student travel hand tallies, post-construction data collection methods for the evaluation report may also include: parent 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 parents 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 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, planning future infrastructure projects, as well as providing supporting documentation for future grant applications.

Baseline SRTS Snapshot: Lincoln Middle School

Summary

Gib Olinger Elementary School is a public school enrolling 504 students ranging from Kindergarten to 3rd grade. The school serves populations in the City of Milton-Freewater and in Umatilla County. More than 95% of students are eligible for the Free and Reduced-Price Lunch Program. English and Spanish are the primary languages spoken by students, and 7% are registered as Ever English Learners.

The new Gib Olinger Elementary School was recently built on the East side of OR11, which has created pedestrian patterns that drivers are unfamiliar with. Students who live on the west side of OR11 have to cross the highway to get to school, and drivers on this highly-traveled section of highway have to adapt to these changed patterns. Additionally, a number of City streets did not have sidewalks (or continuous sidewalks). The planned improvements were intended to address the potential for dangerous vehicle/pedestrian interaction, especially on the steep hill streets on the West side of OR11.

The Milton-Freewater School District provides four Walking School Bus routes for students attending Gib Olinger. Two of those routes, about 34 students, cross OR11. All students participating in the Walking School Bus program receive ongoing safety instruction concerning the importance of staying on the sidewalk, looking all ways before crossing a street, and staying in the crosswalks as they cross. Also, the Milton-Freewater Unified School District provides trained and equipped Adult School Crossing Guards at all the nearby crosswalks, including at the project location. The school nurse, as part of all students' health instruction, includes a unit on bike safety.

The Oregon SRTS 2019-2020 Competitive Construction Grant funded a rapid flashing beacon at the crosswalk at the intersection of OR11 and SW/SE 10th Ave. The project will also install new sidewalks/signage along collector streets, especially on steep hill streets to improve student/pedestrian safety.

Key information from Gib Olinger parent surveys:

- 51% of students live within a mile of the school.
- Approximately 70% of students ride in a family vehicle or take the bus to and from school.
- Many students walk to school: 27% in the morning and 33% after school.

- Parents report that poor driving behavior is the most common barrier to walking/biking to school. Other barriers include:
 - travel time,
 - bad weather, and
 - convenience of driving.
- Most parents recognize the value of walking/biking to school—82% described it as healthy and 56% described it as fun for their student.

Contact Information

JURISDICTION:	City of Milton-Freewater
CONTACT:	Steven Patten, steven.patten@milton-freewater-or.gov
SCHOOL DISTRICT:	Milton-Freewater Unified School District
CONTACT:	District Office: (541)938-5591
OTHER CONTACTS:	None

Enrollment and Demographics

Gib Olinger Elementary School is a public school enrolling 504 students ranging from Kindergarten to 3rd grade. The school serves low income populations in rural Umatilla County, with more than 95% of students enrolled in Free and Reduced-Price Lunch programing. English and Spanish are the primary languages spoken by students, and 49% are registered to be Ever English Learners.¹

ENROLLMENT: 504	GRADE LEVELS SERVED AND SCHOOL TYPE: K-3, Public
STUDENT ETHNIC/RACIAL DEMOGRAPHICS: American Indian/Alaska Native: 0.4% Asian: 0.0% Hispanic or Latino: 60.9% Native Hawaiian/Pacific Island: 0.2% Multiracial: 1.8% Black/African American: 0.6% White: 36.1%	PREDOMINANT LANGUAGES SPOKEN IN MILTON-FREEWATER SCHOOL DISTRICT: English 924 Spanish: 912 Chinese: 9
STUDENTS LIVING WITHIN 1-MILE OF SCHOOL: 51% ²	TITLE 1 STATUS: Yes ³
EVER ENGLISH LEARNERS: 49% ⁴	FREE AND REDUCED-PRICE LUNCH ELIGIBILITY: >95%

¹ Unless otherwise noted below, demographic data are from the Oregon Department of Education 19-20 SY, collected October 1, 2019

² SRTS Program parent surveys 2018

³ Title 1 schools are schools where 40% or more of students are enrolled in USDA's Free and Reduced-Price Meals Program.

⁴ Number of students who have been served or were eligible for an English language development program during 2018-19 or at any time in the past. Oregon Department of Education 18-19 SY collected May 1, 2019.

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.⁵ 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.

Gib Olinger Elementary School is located in the City of Milton-Freewater, and the block group encompasses a large portion of the city limits. According to the Place Type Tool, the area surrounding Gib Olinger Elementary School is categorized as Suburban/Town, meaning it contains low density development and the surrounding census block group generally contains more residential than commercial development, with 1,499 people residing and 466 people working within the census block group. The area has a low level of access to regional employment centers and destinations. Although it has a high 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)	Suburban/Town <ul style="list-style-type: none">• Lower densities of jobs and/or housing• Lower accessibility to regional jobs• Lower densities decrease multi-modal access to jobs
DEVELOPMENT TYPE describes more detailed physical characteristics of each neighborhood (transit supportive development, mixed use, employment, residential, rural/ low density):	Residential <ul style="list-style-type: none">• Land use is dominated by housing• Low diversity of land uses• Jobs/Housing balance: mostly housing• Missing either the density or street design required of mixed use
JURISDICTION POPULATION (ACS 5-YEAR ESTIMATES):	City of Milton-Freewater 7,035 people
CENSUS BLOCK GROUP POPULATION (2010):	1,499 people
NUMBER OF JOBS IN CENSUS BLOCK GROUP (2010):	466 jobs
ACCESS TO DESTINATIONS describes the number of regional jobs within 5 miles:	Low
DENSITY LEVEL- jobs and households per acre within ¼ mile:	Low
DESIGN LEVEL- level of street connectivity, pedestrian-oriented street density:	Very Low
DIVERSITY LEVEL- Mix of housing and employment:	High
TRANSIT LEVEL- Afternoon peak hourly transit service within ¼ mile:	Low

⁵ 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 Gib Olinger grant application is included in Appendix B.

PROBLEM STATEMENT:	An insufficient and non-compliant sidewalk network in the City of Madras is a giant barrier for children of all ages to walk safely to school. Especially when those routes are on high traffic volume streets in town.
DESCRIPTION OF BARRIERS TO WALKING AND BIKING:	The walks and ramps are missing pieces through this two-block section making it dangerous for children to walk to school.
PROJECT DESCRIPTION:	This project will replace a two-block section of sidewalk that is non-compliant and unsafe for children to use on one of our busiest streets in town. It includes adding ADA ramps, new curbing and sidewalk, and drainage, and paving.
PROJECT TIMELINE:	September 2019 Completion
PRIORITY SAFETY CORRIDOR? ⁶	Yes
OUTREACH AND EDUCATION:	The Milton-Freewater School District provides four Walking School Bus routes for students attending Gib Olinger. Two of those routes, about 34 students, cross OR11. All students on the WSBs are given ongoing safety instruction concerning the importance of staying on the sidewalk, looking all ways before crossing a street, and staying in the crosswalks as they cross. Also, the Milton-Freewater Unified School District provides trained and equipped Adult School Crossing Guards at all the nearby crosswalks, including at the project location. The school nurse, as part of all students' health instruction, includes a unit on bike safety.

⁶ A road where the posted speed or 85th percentile speed of traffic is 40 mph or greater OR if and 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, has a demonstrated history of crashes related to school traffic.

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 Gib Olinger 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 school-age children that live within the new access areas.

This analysis estimates that approximately 241 students, or 48% of the Gib Olinger Elementary School student body living within a mile of the school, would gain safer walking or biking access to the school.

Table 1. Access Analysis Results⁷

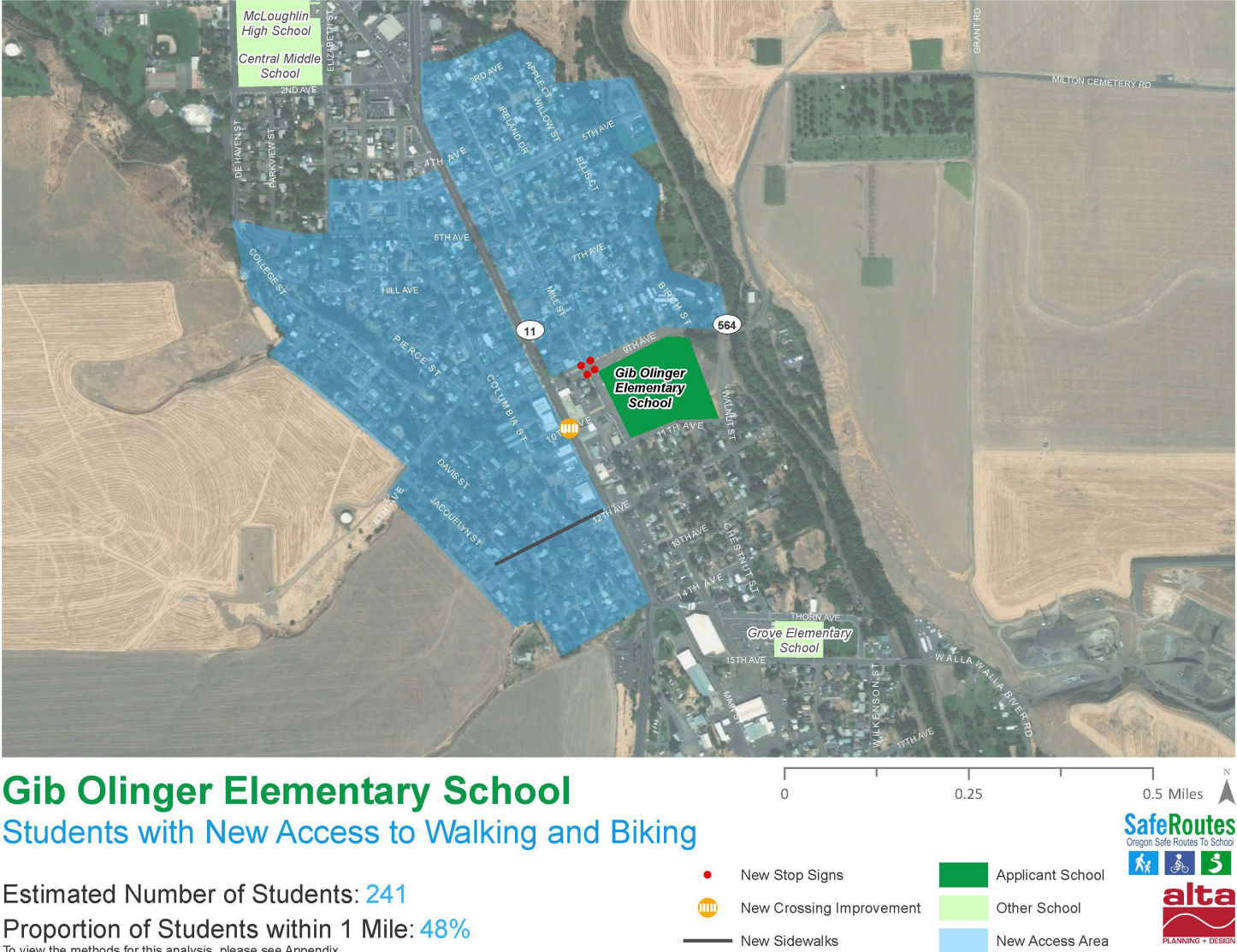
METRIC	VALUE
Total Population of New Access Areas	923
School Age Population of New Access Areas ⁸	241
Percentage of Students within the School Areas Gaining Access ⁹	48%

⁷ New Access Area assumptions: For the north east access area it assumes that all residents would be able to walk or roll safely to the sidewalk on Mill street to take to school. The western access area assumes residents not included have access to school via the RRFB at 4th Ave.

⁸ Calculated using the proportion of school-age children (5-17 years old) within the City of Milton-Freewater

⁹ The School Area is defined as the area within the school enrollment area that is within one mile of the school.

Figure 1. Gib Olinger Elementary School 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 construction, in order to estimate the impact of the improvements.

Hand Tallies

DATE COLLECTED:	September, 2018
DATA COLLECTION PROCESS:	6 classrooms provided data about students trips to and from school
NUMBER OF STUDENTS:	140 students participated
TRIPS RECORDED	480 trips documented

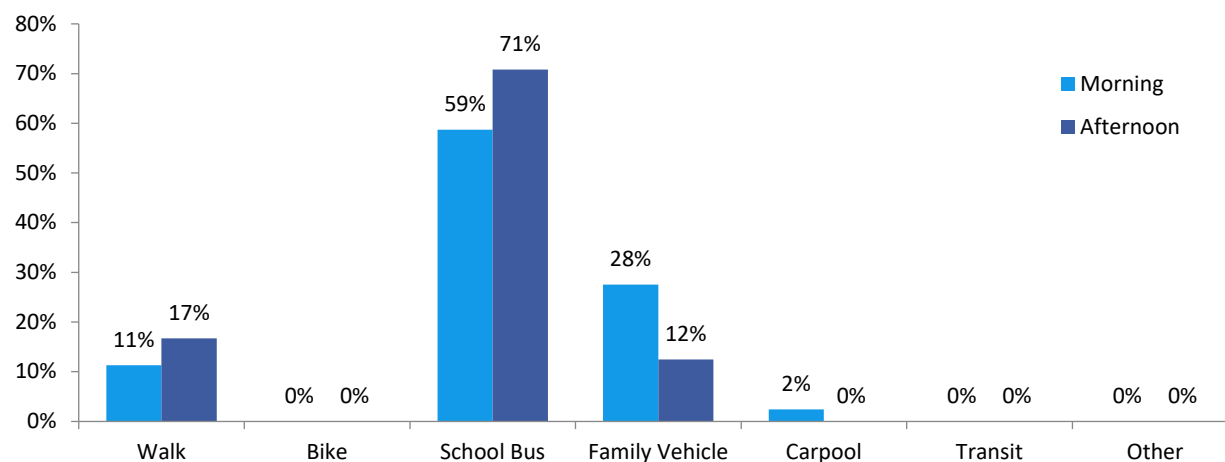
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The June 2019 baseline student travel data from Gib Olinger Elementary includes 480 recorded trips collected from 140 students in 6 classrooms. The school collects student transportation modes each day as a regular practice and shared two back to back days as baseline data. This data provides a snapshot of student travel behavior trends.

SUMMARY OF RESULTS:

Gib Olinger Elementary hand tally data from 2019 indicates that a majority of students surveyed ride the school bus in the morning and afternoon (see Figure 2 and Table 2). Riding in a family vehicle was the second most common student travel mode. Eleven percent of students walk in the morning and 17% of students walk home in the afternoon. No students reported biking to school.

Figure 2. Student Mode Split by Time of Day, 2019 Hand Tally Data



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

Table 2. Count of Student Mode Split to and From School, 2018 Hand tally Data

TIME OF DAY	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Morning	28	0	145	68	6	0	0
Afternoon	39	0	165	29	0	0	0

Parent/Caregiver Surveys

DATE COLLECTED:

September, 2019

DATA COLLECTION PROCESS:

The Oregon SRTS parent/caregiver survey was distributed electronically to parents at Gib Olinger Elementary School to assess family perceptions about school travel options and behavior.

NUMBER OF SURVEYS:

51; 10% response rate

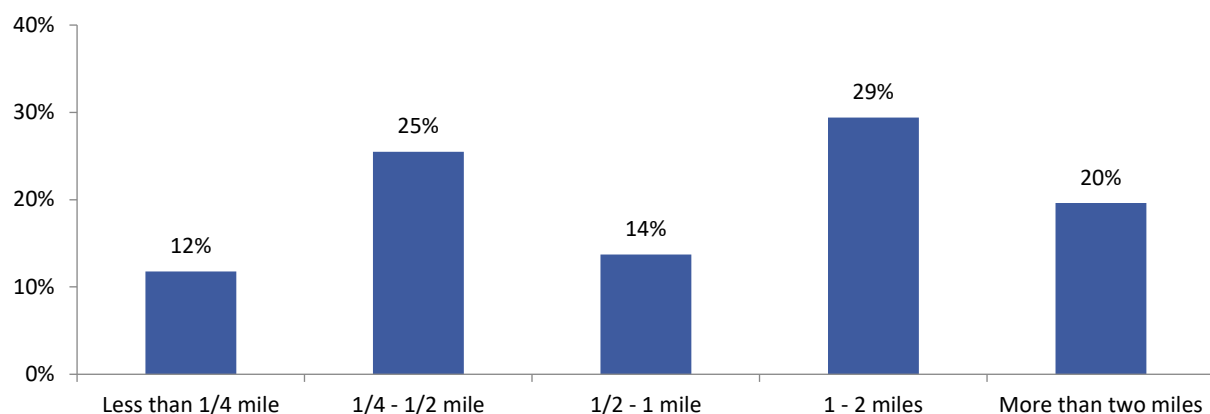
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The parent/caregiver survey data included in this report was collected in September of 2019 from 51 participants with students attending Gib Olinger Elementary.

SUMMARY OF RESULTS:

Parent/caregiver survey analysis revealed that over half of respondents (51%) live within 1 mile of Gib Olinger Elementary, with an additional 29% living between 1 and 2 miles of the school site (see Figure 3). Twenty percent of surveyed parents and caregivers live more than 2 miles from Gib Olinger.

Figure 3. How Far Does your Family Live from School?, 2019 Parent/Caregiver Survey



Active travel modes were the most commonly used transportation options for students living less than ½ mile from school (see Figure 4 and Table 3). 37% of the students who live between ½ mile and 1 mile from school also use active modes. At most distances, less than half of students rode in a family vehicle to get to school. Among those living between 1 and 2 miles from school, however, 51% used a family vehicle. Students living more than 2 miles from Gib Olinger mostly use shared modes (78%) to get to school, though 5% did report walking.

Figure 4. Mode Split by Distance from School, 2019 Parent/Caregiver Survey

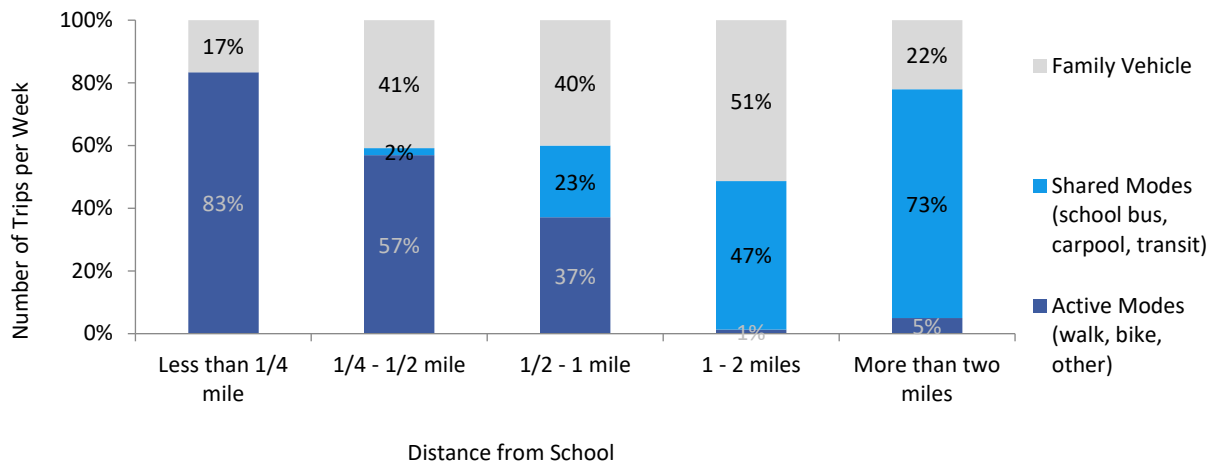
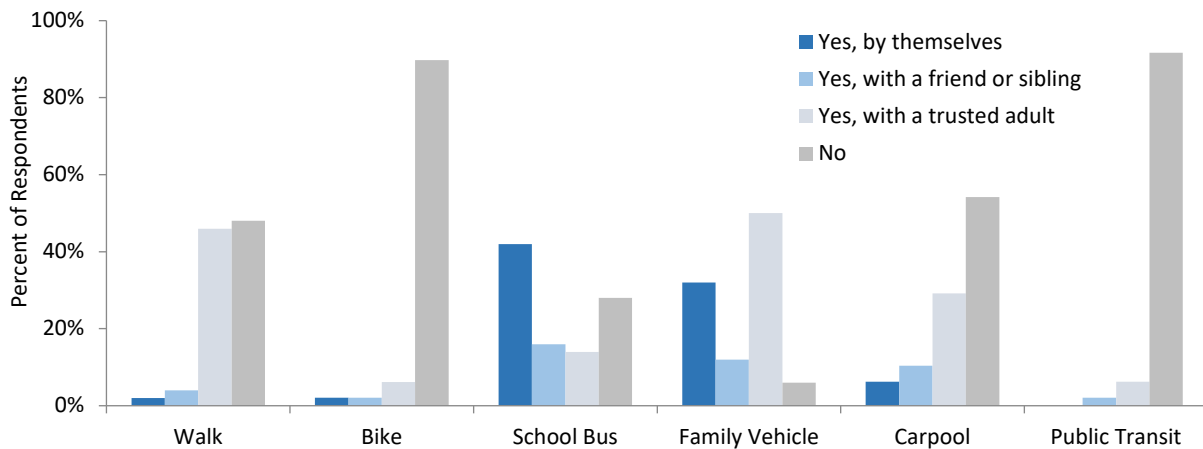


Table 3. Count of Trips by Distance the Family Lives from School, 2019 Parent/Caregiver Survey

DISTANCE	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPPOOL	TRANSIT	OTHER
Less than 1/4 mile	50	0	0	10	0	0	0
1/4 mile up to 1/2 mile	74	0	3	53	0	0	0
1/2 mile up to 1 mile	24	2	15	28	1	0	0
1 mile up to 2 miles	2	0	62	77	0	9	0
More than 2 miles	5	0	73	22	0	0	0

As Figure 5 illustrates, 48% of parents and caregivers surveyed reported that they do not allow their student to walk to/from school, while 90% don't allow their student to commute by bike. Interestingly, 46% of respondents reported that they would allow their student to walk with a trusted adult, indicating potential for Walking School Bus programs to be effective. Six percent would allow their student to bike with a trusted adult.

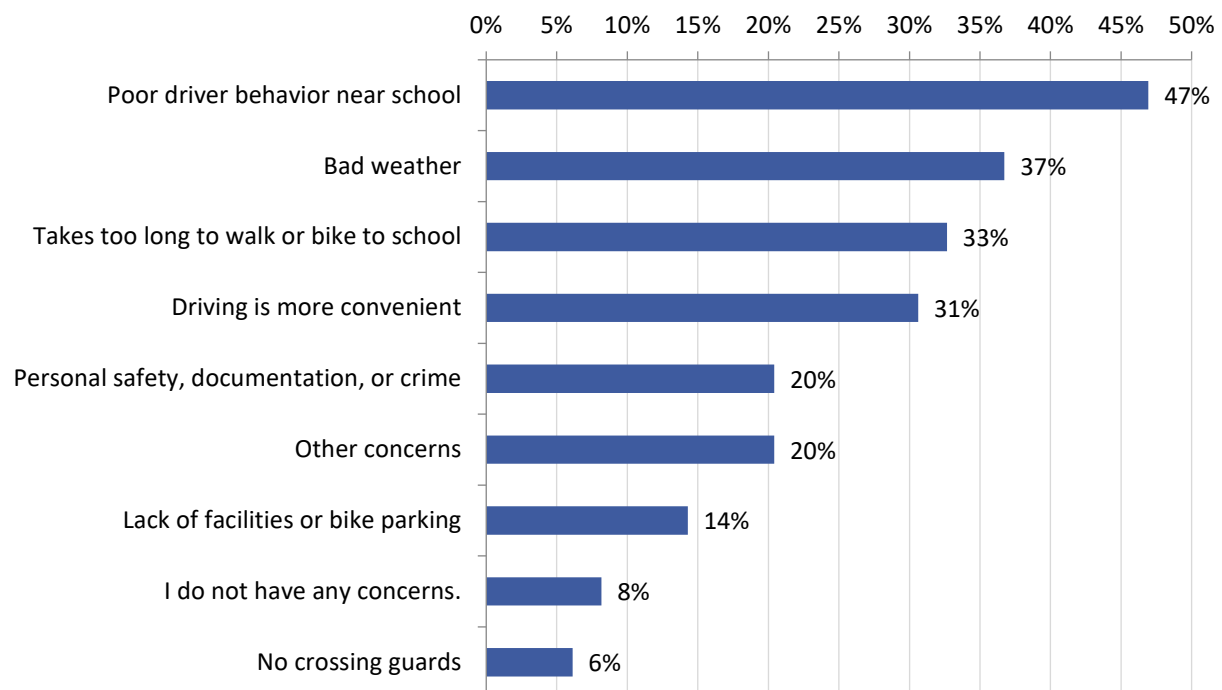
Figure 5. Do you allow this student to travel to school in the following ways?, 2019 Parent/Caregiver Survey



While parents and 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 parents faced the following barriers:

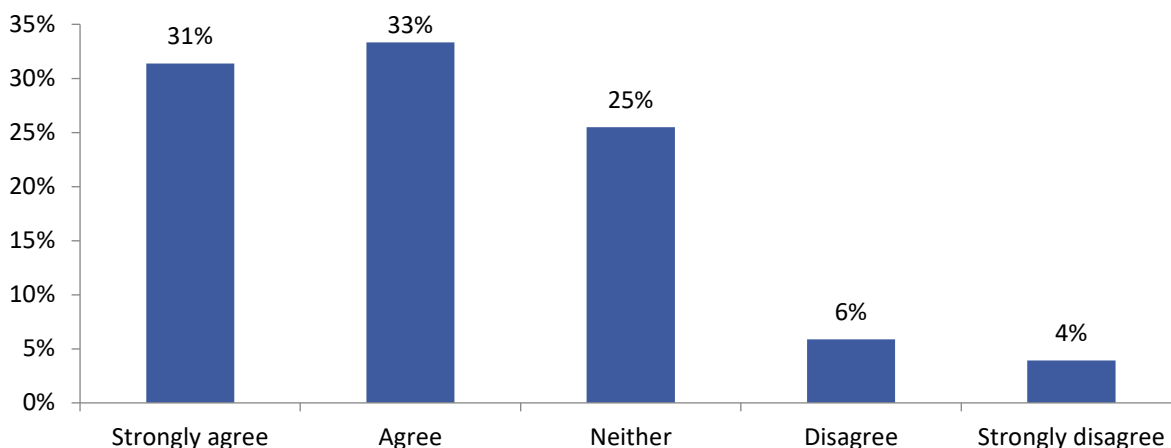
- Poor driver behavior on streets near the school
- Bad weather
- Travel time between school and home
- Convenience of driving

Figure 6. What Concerns Limit Your Child's Ability to Walk or Bike to/from School?, 2018 Parent/Caregiver Survey



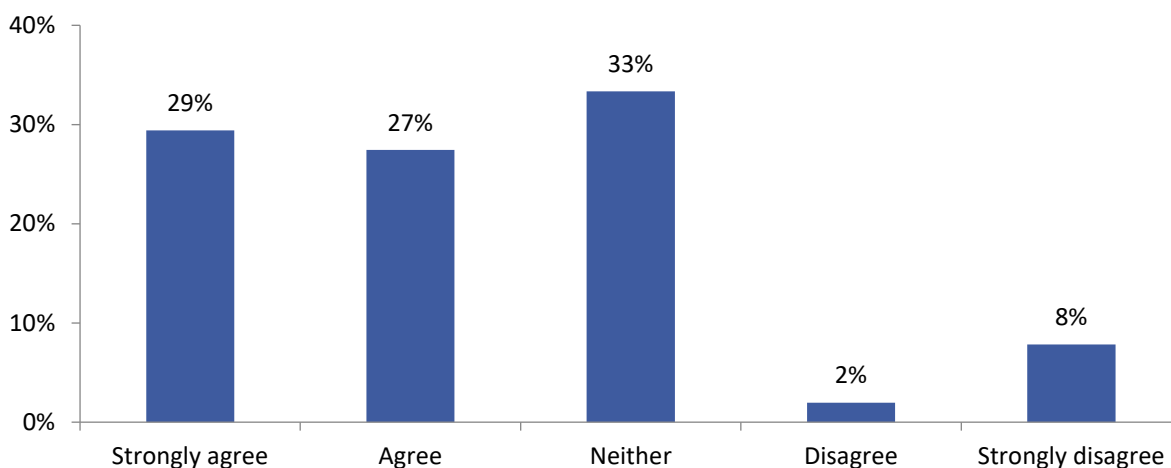
A majority of parent and caregiver respondents (64%) either agreed or strongly agreed that Gib Olinger Elementary encouraged students to walk and bike to school at the time of the survey. An additional 25% felt neutral, while 10% characterized the school as discouraging walking and biking (see Figure 7).

Figure 7. Agree/Disagree: Walking or biking to/from school is encouraged by my student's school, 2019 Parent/Caregiver Survey



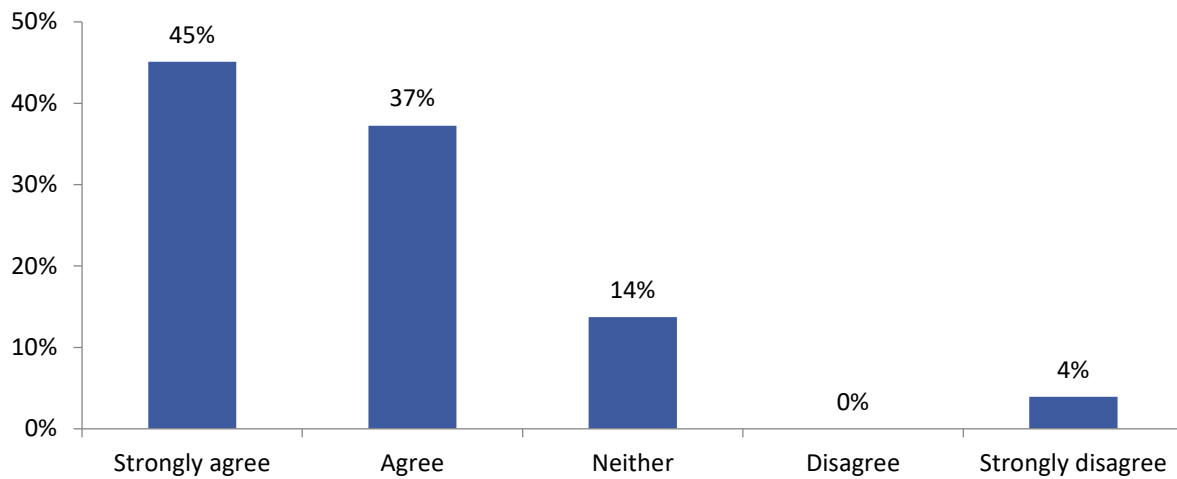
At the time of the survey, over half (56%) of parents and caregivers agreed or strongly agreed that walking or biking to school would be a fun activity for their students, while only 10% believed the activity would not be fun. An additional 33% were neutral or unsure on whether their student would enjoy walking and biking to school (Figure 8).

Figure 8. Agree/Disagree: Walking or Biking to/from school is fun for my student, 2019 Parent/Caregiver Survey



A majority of parents and caregivers recognized the health benefits of active transportation, with 82% reporting that walking or biking to school would be healthy or very healthy for their student. An additional 14% were neutral regarding the health benefits of walking and biking, and just 4% did not agree that these activities would be healthy for their student (see Figure 9).

Figure 9. Agree/Disagree: Walking or Biking to/from school is healthy for my student, 2019
Parent/Caregiver Survey



Crash Data

DATE COLLECTED:

2012-2016

DATA COLLECTION PROCESS:

Crash data included in this report originates from relevant roadway jurisdictions, as well as the ODOT SRTS Web Map Application. This analysis does not determine whether the grant intervention *caused* any change in the occurrence of crashes, due to small sample size. Additionally, due to insufficient mode split data to calculate crash *rates*, this report offers a count and description of reported incidents.

NUMBER OF REPORTED CRASHES INVOLVING BIKES AND PEDESTRIANS WITHIN 1 MILE OF SCHOOL:

Between 2012 and 2016, seven crashes involving a bicyclist or pedestrian were reported within one mile of the school.

TIME OF REPORTED CRASHES INVOLVING BIKES AND PEDESTRIANS WITHIN 1 MILE OF SCHOOL*:

All seven of these reported crashes occurred during school commuting hours; the majority occurred during PM commuting hours.

** For these purposes school commuting hours were defined as 6 AM to 9 PM.*

NUMBER OF REPORTED INJURIES BY SEVERITY WITHIN 1 MILE OF THE SCHOOL:

All four of the reported crashes involving a bicyclist as well as all three of the reported crashes involving a pedestrian were non-fatal. Figure 10 illustrates the location of the crashes by type and injury severity.

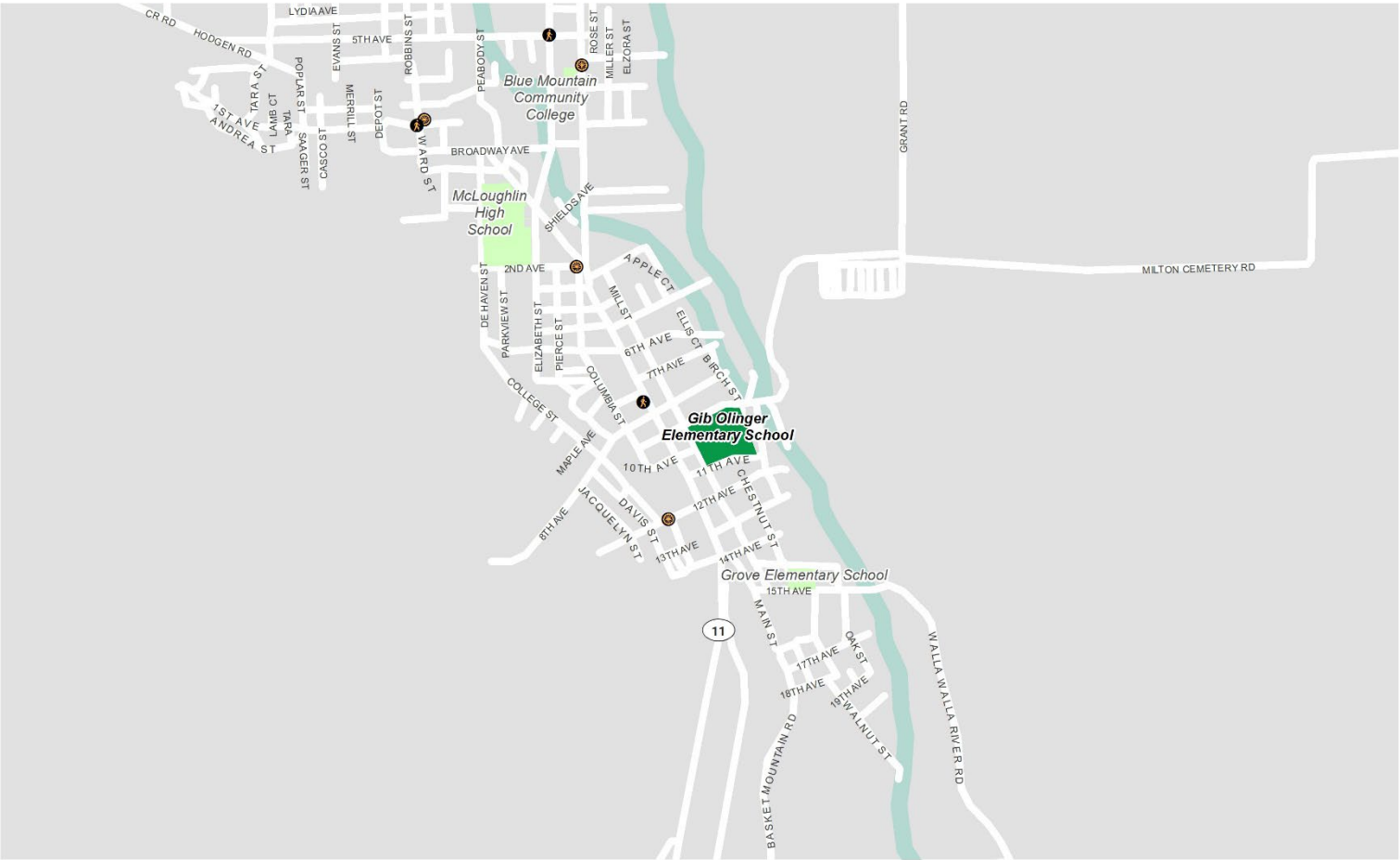
ADDITIONAL CRASH DATA CONSIDERATIONS:

In addition to the bicycle/pedestrian crashes between 2012-2016 illustrated on the map, in its application the City of Milton-Freewater reported that in the past five years there have been 14 collisions reported on OR 11 near the school that included seven minor injuries. Seven collisions occurred during times when children could potentially have been walking to or from school. A pedestrian was injured in an collision while attempting to cross OR 11. Crossing improvements and traffic calming measures are planned in the project area to address these incidents.

Notes on Community Context or other Relevant Information:

None.

Figure 10: Gib Olinger Elementary School Bicycle & Pedestrian Collisions (2012-2016)



Gib Olinger Elementary School

Bicycle and Pedestrian Collisions (2012-2016)

- | | | |
|-----------------------------|--------------------------------|---------------------------|
| ● Bicycle: Fatal Injury | ● Pedestrian: Fatal Injury | ■ Primary Affected School |
| ⦿ Bicycle: Non-Fatal Injury | ⦿ Pedestrian: Non-Fatal Injury | ■ Other School |
| ⦿ Bicycle: No Injury | ⦿ Pedestrian: No Injury | |

0 0.25 0.5 Miles

Map displays bike and pedestrian crashes at all times of day.



Source: Crash Analysis and Reporting Unit, ODOT (2012-2016)

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. The project was completed in September 2019.

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	Late spring 2021 (assuming project completion)
PARENT SURVEYS:	Yes	At least 30 parents per school	Late spring 2021 (assuming project completion)
PARENT FOCUS GROUPS:	Yes	4-10 parents	Late spring 2021 (assuming project completion)
STAFF SURVEYS:	Yes	1-3 school staff and administration	Late spring 2021 (assuming project completion)
CRASH DATA:	Yes	N/A	N/A
OTHER (LIST):	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 IN 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

PARENT 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*)

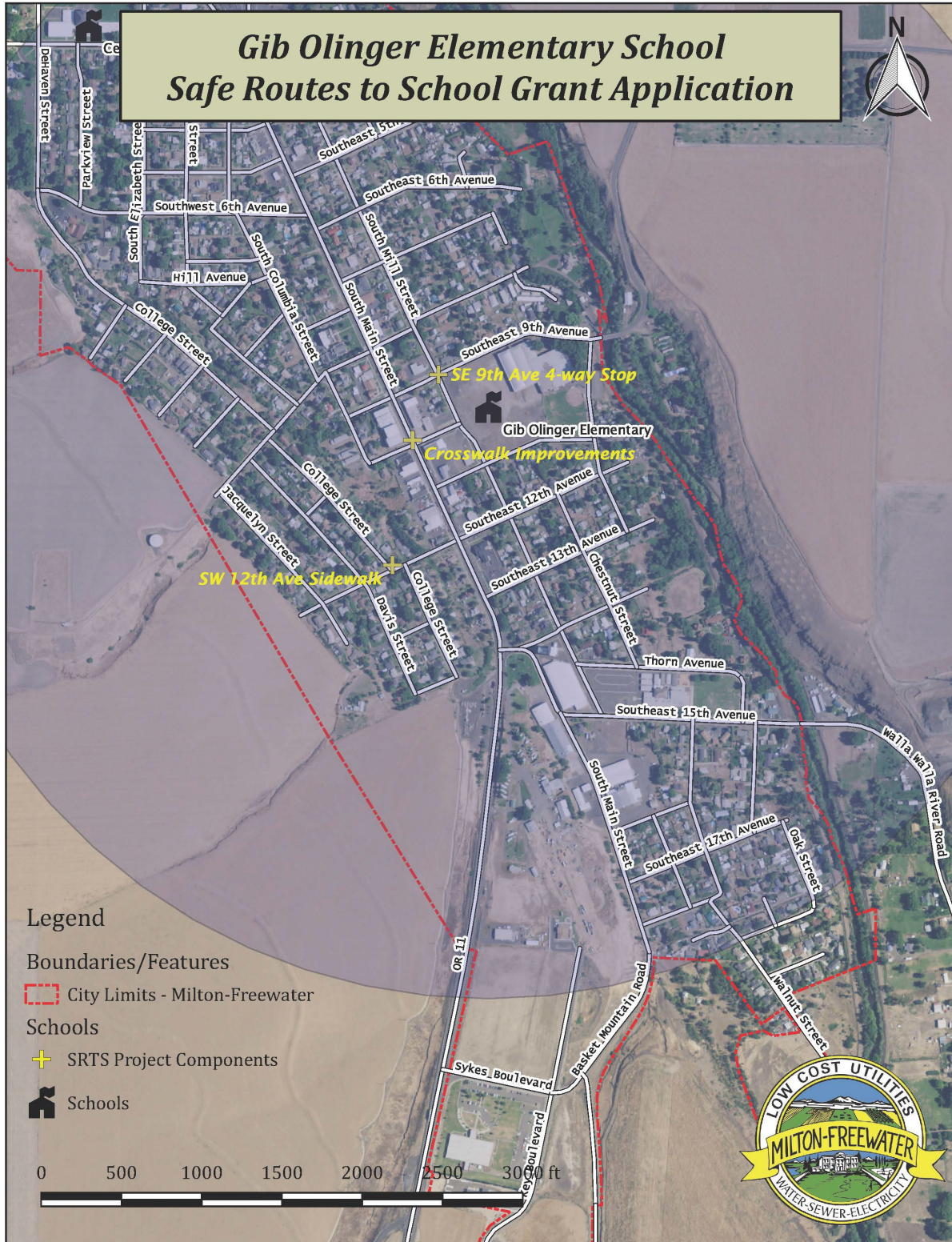
Chapter 3. Findings

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

- impact of infrastructure 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 IN Grant Funded Project Map

Figure 11. Gib Olinger Elementary School Competitive SRTS IN Grant Funded Project Map



Appendix C. Access to SRTS 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 to 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 have been 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 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
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 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 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.
- 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.