

Multnomah County – Reynolds Middle 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 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: Reynolds Middle School

Summary

Reynolds Middle School is a public school enrolling 407 students from 5th through 8th grade. The school serves populations in the Cities of Fairview, Gresham, Portland, and Troutdale. Most of Reynolds students are eligible for the Federal Free and Reduced-Price Lunch Program (95%). English and Spanish are the primary languages spoken by students, and 58% are Ever English Learners.¹

Reynolds Middle School shares a campus with the Reynolds Aquatic Center, Salish Elementary School, Reynolds Learning Academy, and the Reynolds District offices. There is also a program called SUN (Students Uniting Neighborhoods), located on the Reynolds High School campus, that has provided a two-day Bike Training and Ride program for 30 students in the 6th grade. It was popular, and the SUN program is planning on hosting additional bike programs. The school and district remain engaged in planning around SRTS.

Because of the large number of activities and uses on this campus, the Halsey corridor is heavily-trafficked. This area of the street has no marked or protected crossing, meaning that pedestrians attempt to cross a 76-foot intersection without protection from traffic. For students attempting to access adjacent neighborhoods or bus stops, this is a significant barrier. Adding a safer crossing would encourage walking and increase safety for students and all pedestrians crossing NE Halsey connecting neighborhoods with schools.

The Oregon SRTS 2019-2020 Competitive Construction Grant funded the installation of a pedestrian crossing east and west of the Halsey and 208th Place intersection. The improved crossing will feature ADA ramps, center island refuges and crosswalks.

Key information from Reynolds Middle School parent/caregiver surveys:

- 29% of students live within a mile of the school.
- Approximately 74% of students take the school bus to school, and 80% take the bus home.
- Some Reynolds students walk to school: 19% in the morning and 18% after school.
- Parents report that the most common barriers to walking/biking to school include:
 - travel time between school and home,
 - bad weather,
 - lack of facilities or bike parking, and
 - concerns about personal safety.

¹ 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.

- Most parents recognize the value of walking/biking to school—86% described it as healthy and 86% described it as fun for their student.

Contact Information

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OTHER CONTACTS:	None

Enrollment and Demographics

Reynolds Middle School is a Title 1 public school enrolling 407 students from 5th through 8th grade. The school serves low income populations in the City of Fairview and East Multnomah County, with 95% of students eligible for the Free and Reduced-Price Lunch Program. English and Spanish are the primary languages spoken by students, and less than 58% are registered as Ever English Learners.

ENROLLMENT: 982	GRADE LEVELS SERVED AND SCHOOL TYPE: 5-8, Public
STUDENT ETHNIC/RACIAL DEMOGRAPHICS: American Indian/Alaska Native: 0.8% Asian: 4.0% Hispanic or Latino: 54.5% Native Hawaiian/Pacific Island: 4.1% Multiracial: 6.7% Black/African American: 6.3% White: 23.6%	PREDOMINANT LANGUAGES SPOKEN IN REYNOLDS SCHOOL DISTRICT: English: 6,001 Spanish: 3,892 Russian: 321 Vietnamese: 225
STUDENTS LIVING WITHIN 1 MILE OF SCHOOL: 29% ²	TITLE 1 STATUS: Yes ³
EVER ENGLISH LEARNERS: 58% ⁴	FREE AND REDUCED-PRICE LUNCH ELIGIBILITY: >95%

² SRTS Program parent surveys 2019

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.

Reynolds Middle School is located in the City of Fairview, and the block group encompasses a large portion of the city limits. According to the Place Type Tool, the area surrounding Reynolds Middle School is categorized as Close-in Community, meaning it contains medium density development, and Employment, meaning the surrounding census block group generally contains more commercial than residential development, with 4,435 people residing and 1,774 people working within the census block group. The area has a medium level of access to regional employment centers and destinations, partially facilitated by a high degree of access to transit. The overall level of street connectivity in the area is characterized as “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)

Close-In Community

- Medium densities of housing and employment
- Located adjacent and with good access to the region's employment center
- 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):

Employment

- Land use is dominated by commercial or industrial activities
- Low diversity of land uses
- Jobs/Housing balance: mostly jobs
- Missing either the density or street design required of mixed use

JURISDICTION POPULATION (ACS 5-YEAR ESTIMATES):	City of Fairview 9,303 people
CENSUS BLOCK GROUP POPULATION (2010):	4,435 people
NUMBER OF JOBS IN CENSUS BLOCK GROUP (2010):	1,774 jobs
ACCESS TO DESTINATIONS describes the number of regional jobs within 5 miles:	Medium
DENSITY LEVEL- jobs and households per acre within ¼ mile:	Medium
DESIGN LEVEL- level of street connectivity, pedestrian-oriented street density:	Low

⁵ More information about OLCD's Place Type Tool is available at: www.oregon.gov/lcd/CL/Pages/Place-Types.aspx

DIVERSITY LEVEL- Mix of housing and employment: High

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

Project Description

A map of the project improvements from the Reynolds Middle School grant application is included in Appendix B.

PROBLEM STATEMENT:	NE Halsey at 208th Place is a 5-lane Minor Arterial with a high volume of fast-moving traffic merging down to three-lanes. The speed limit is 35 mph, and the intersection is 76 feet across. Pedestrians attempt to cross without any marked or protected crossings.
DESCRIPTION OF BARRIERS TO WALKING AND BIKING:	Reynolds Middle School and SUN (Schools Uniting Neighborhoods) school serve over 1,000 students. In addition to the middle school, the campus also has the Reynolds Aquatic Center, Salish Elementary School, Reynolds Learning Academy, and the Reynolds District offices. These combined with surrounding uses, results in a heavily-traveled Halsey corridor. There are Tri-Met bus stops and Reynolds School District bus stops close to this intersection, so the crosswalk would improve safety for pedestrians crossing Halsey to get to the stops. Adding a safer crossing will encourage walking and increase safety for students and all pedestrians crossing NE Halsey connecting neighborhoods with schools.
PROJECT DESCRIPTION:	Install improved crossing with two intersection ADA ramps, two mid-block ADA ramps, two center refuge islands that each have a section of truncated domes, and staggered continental crosswalk, per Standard Drawing TM530.
ESTIMATED PROJECT TIMELINE:	September, 2019 Completion
PRIORITY SAFETY CORRIDOR? ⁶	Yes
OUTREACH AND EDUCATION:	The SUN Community Schools Program provided a Bike Training and Ride program for 30 students in the 6th grade. The East Multnomah SRTS Program is working with the Reynolds School District to support and encourage additional programming in the future, including additional pedestrian and bike safety training.

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 Reynolds Middle 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. Average population is used for this analysis, so higher density neighborhoods may be undercounted.

This analysis estimates that approximately 1% of the Reynolds Middle School student body living within a mile of the school, would gain safer walking or biking access to the school. Currently, the students living in the new access area (the neighborhood north of the proposed intersection improvement) are picked up by the school bus despite living less than a mile from the school. This improved crossing would allow Reynolds Middle School students from this 40-household area the option to safely walk or bike to school.

In addition to improving school access for students, this project also addresses other neighborhood connectivity issues. The 159-unit Fieldstone Apartments are adjacent to this project site, and this crosswalk is at one of two driveways for entering and exiting the complex. With these improvements, tenants who wish to cross to bus stops on the westbound side of the street will be able to do so safely and conveniently, rather than walking almost 500ft to the nearest existing crosswalk.

Table 1. Access Analysis Results⁷

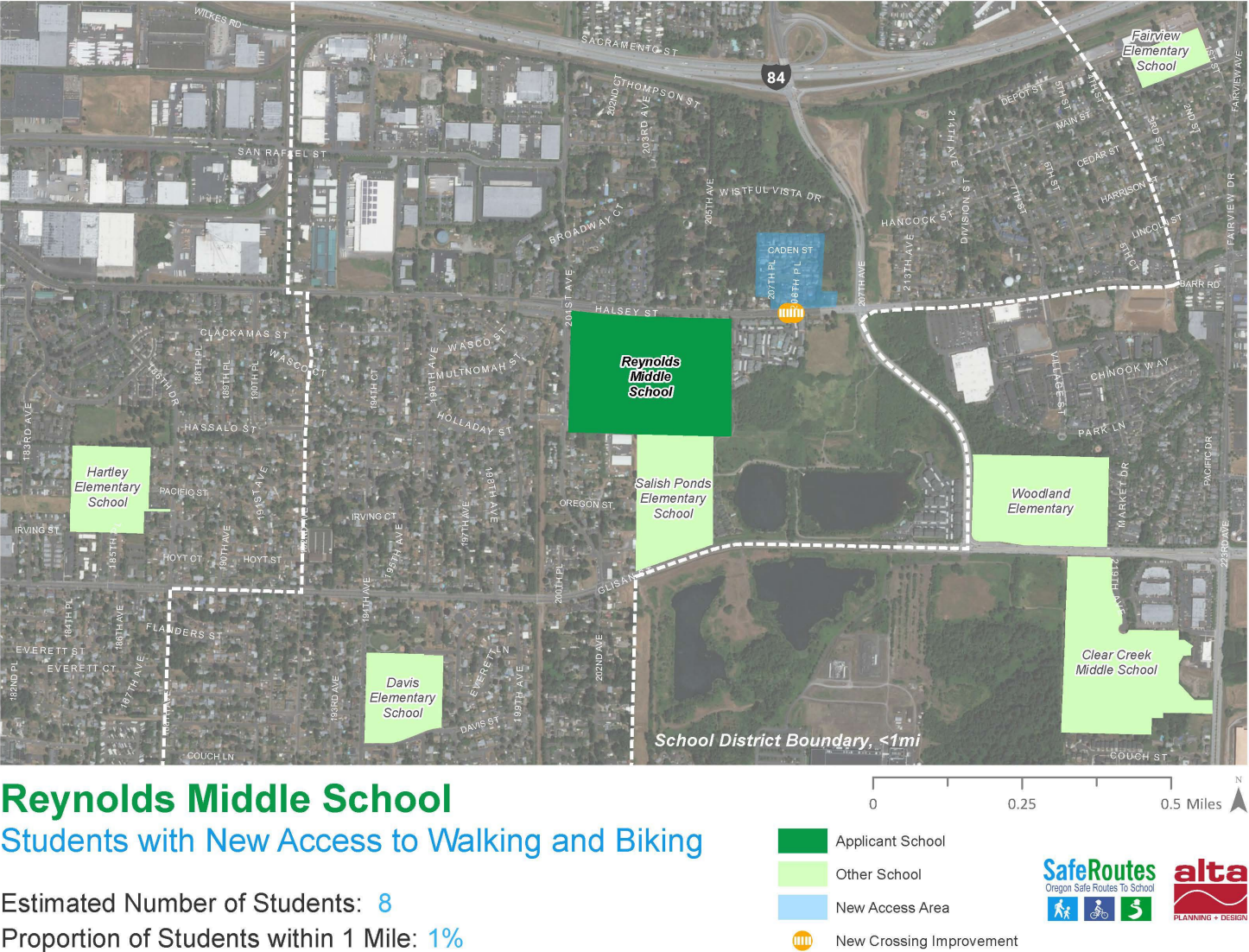
METRIC	VALUE
Total Population of New Access Areas	58
School Age Population of New Access Areas ⁸	8
Percentage of Students within the School Areas Gaining Access ⁹	1%

⁷ New Access Area assumptions: This analysis assumes that residents living east of Fairview Pkwy would cross at the light at the intersection with Halsey. It is also assumed that 205th Ave crossing would serve residents to the west. This analysis uses average population and rates of youth, so it may undercount this higher-density neighborhood.

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

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

Figure 1. Reynolds Middle 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:	May, 2019
DATA COLLECTION PROCESS:	13 classrooms surveyed about their trip to and from school
NUMBER OF STUDENTS:	247 students participated in hand tallies
TRIPS RECORDED	728 trips recorded by the hand tallies

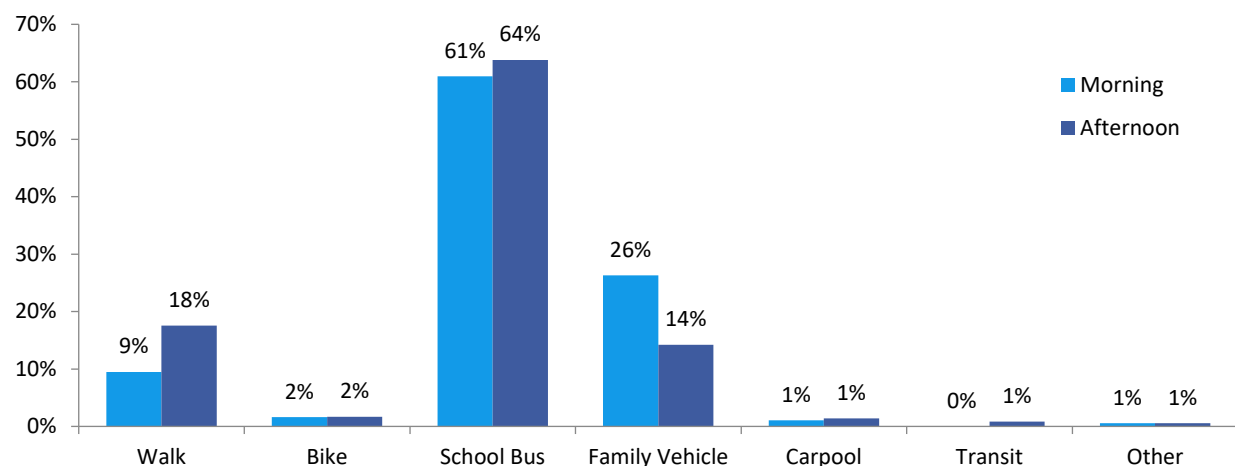
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The May 2019 baseline hand tally data from Reynolds Middle School includes 728 recorded trips collected from 247 students in 13 classrooms. The hand tally process surveyed all students in each classroom on which transportation mode(s) they had used to get to and from school the day of the survey and the day prior to the survey. The National Center for SRTS's standard hand tally data collection forms and process was used. This data provides a snapshot of student travel behavior trends.

SUMMARY OF RESULTS:

Reynolds Middle School 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 in the morning (26%), while walking was the most common mode in the afternoon (18%). However, only nine percent of students walk to school in the morning. Six 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, 2019 Hand tally Data

TIME OF DAY	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Morning	35	6	225	97	4	0	2
Afternoon	63	6	229	51	5	3	2

Parent/Caregiver Surveys

DATE COLLECTED: **May, 2019**

DATA COLLECTION PROCESS: The Oregon SRTS parent/caregiver survey was distributed to parents at Reynolds Middle School to assess family perceptions about school travel options and behavior. The survey was available in English and Spanish.

NUMBER OF SURVEYS: 7; 0.7% response rate

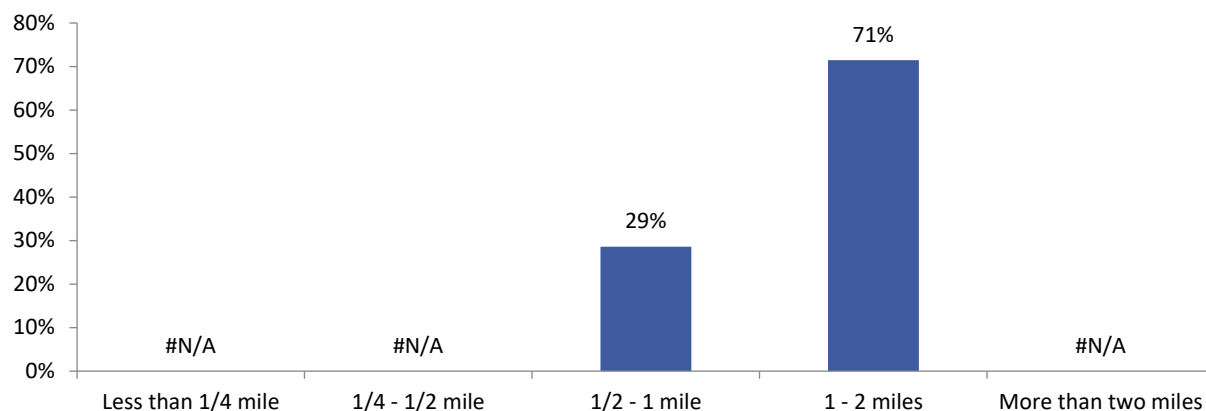
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The parent/caregiver survey data included in this report was collected in May of 2019 from 7 participants with students attending Reynolds Middle School. The SRTS Coordinator collected these surveys mostly in Spanish at a parent group meeting. The SRTS Coordinator also tried to promote the survey online and left paper copies with the front office staff to distribute, but these efforts were not generally successful. Due to the small number of survey responses, these results should not be used to extrapolate data to the entire school community.

SUMMARY OF RESULTS:

Parent/caregiver survey analysis revealed that only 29% of respondents live within one mile of Reynolds Middle School, with 71% living between one and two miles of the school site (see Figure 3).

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



Shared travel modes were the most commonly used transportation option for students living between a half-mile and a mile away from school (45%), followed by active modes (30%) and finally family vehicles (25%) (see Figure 4 and Table 3). For students who live between one and two miles from Reynolds Middle School, 92% of trips were by shared modes. Only 8% of trips used a family vehicle. Many students use the school bus to travel to and from Reynolds Middle School.

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

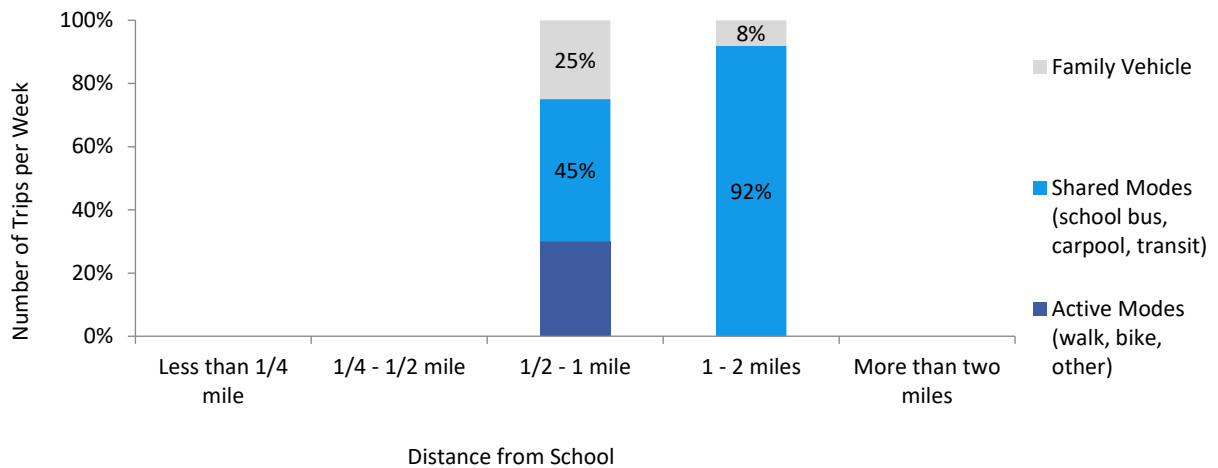
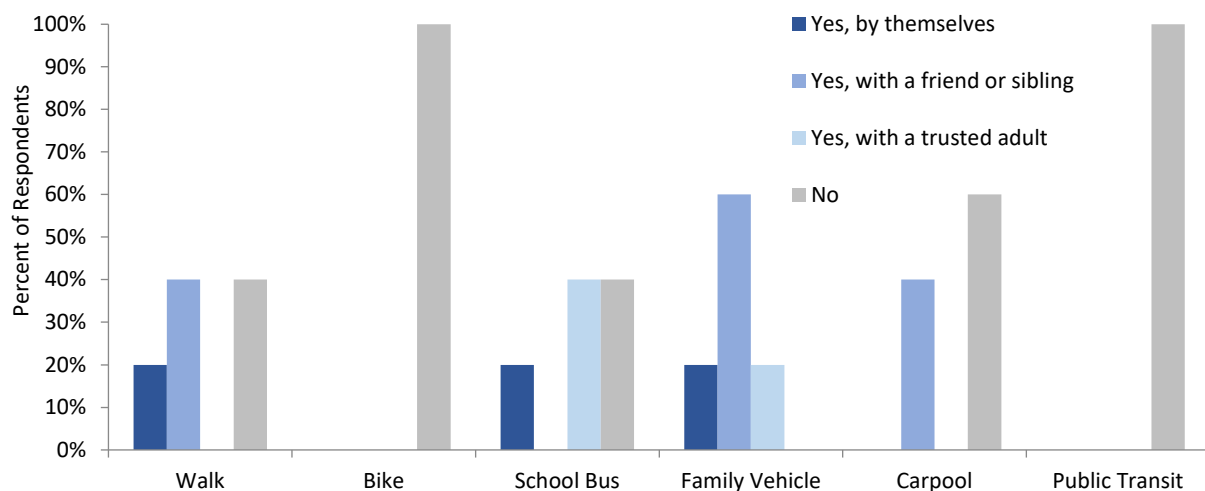


Table 3. Count of Trips by Distance the Family Lives from School, 2019 Parent/Caregiver Survey

DISTANCE	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Less than 1/4 mile	-	-	-	-	-	-	-
1/4 mile up to 1/2 mile	-	-	-	-	-	-	-
1/2 mile up to 1 mile	6	0	9	5	0	0	0
1 mile up to 2 miles	0	0	45	4	0	0	0
More than 2 miles	-	-	-	-	-	-	-

As Figure 5 illustrates, 20% of parents and caregivers surveyed reported that they would allow their students to walk to school by themselves. Another 40% indicated that they would allow walking with a friend or sibling, and another % said they wouldn't allow it at all. However, all parents and caregivers who responded to the survey reported that they would not allow their student to bike to/from school regardless of who was accompanying them.

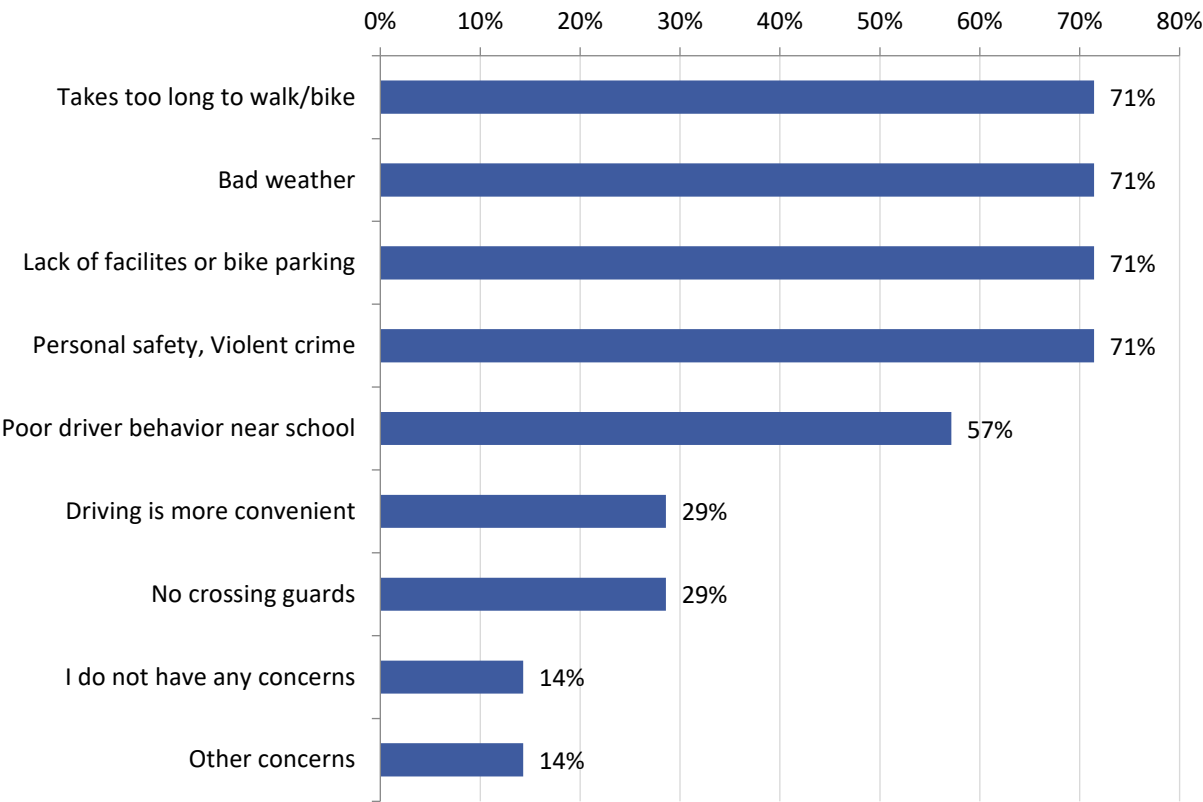
Figure 5. Do You Allow this Student to Travel to School in the Following Ways?, 2019 Parent/Caregiver Survey



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). Over half of surveyed parents faced the following barriers:

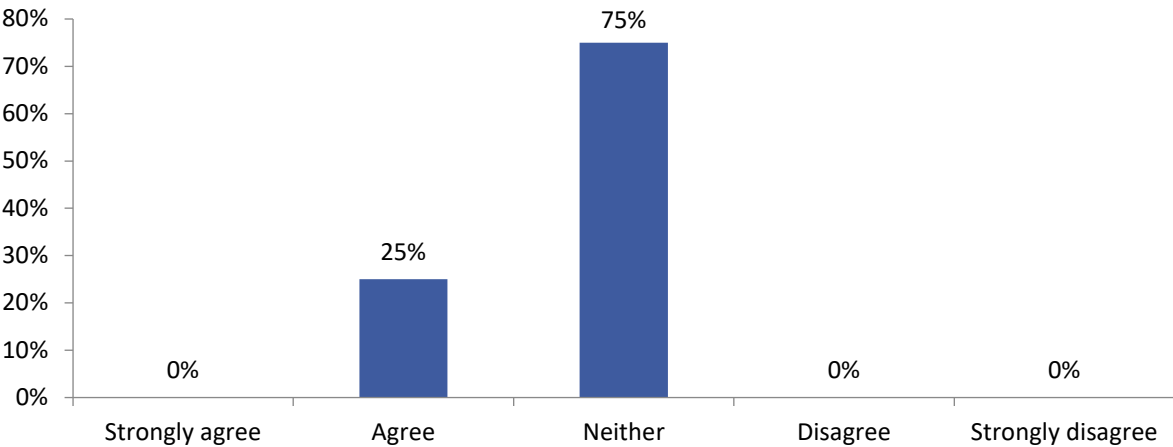
- Travel time between home and school
- Bad weather
- Lack of facilities or bike parking
- Concerns about personal safety, documentation, or criminal activity

Figure 6. What Concerns Limit Your Student’s Ability to Walk or Bike to/from School?, 2019
Parent/Caregiver Survey



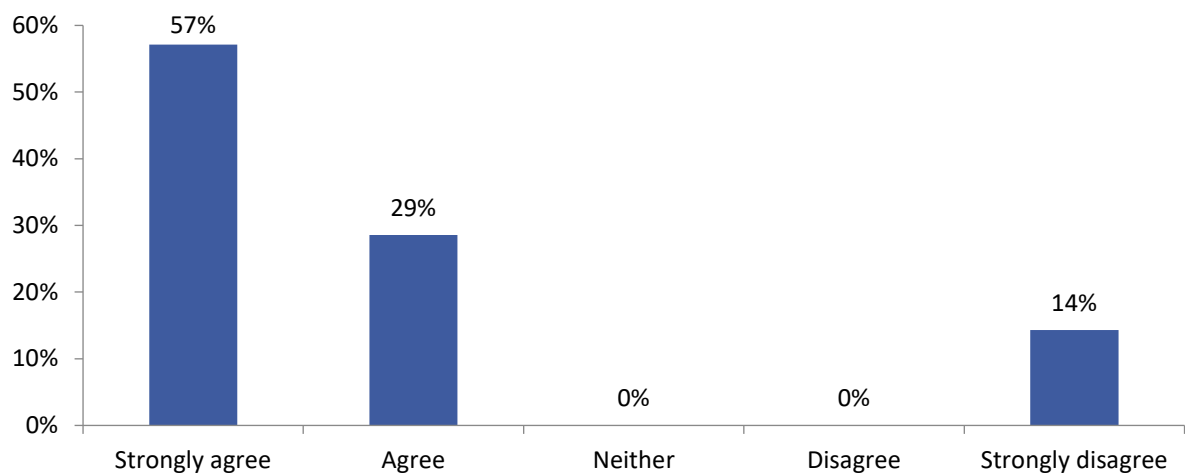
A majority of parent and caregiver respondents (75%) felt Reynolds Middle School neither encouraged or discouraged students from walking and biking to school at the time of the survey. However, 25% felt the school encouraged active transportation (see Figure 7).

Figure 7. Agree/Disagree: Walking/Biking to/from School is Encouraged by my Student’s School, 2019
Parent/Caregiver Survey



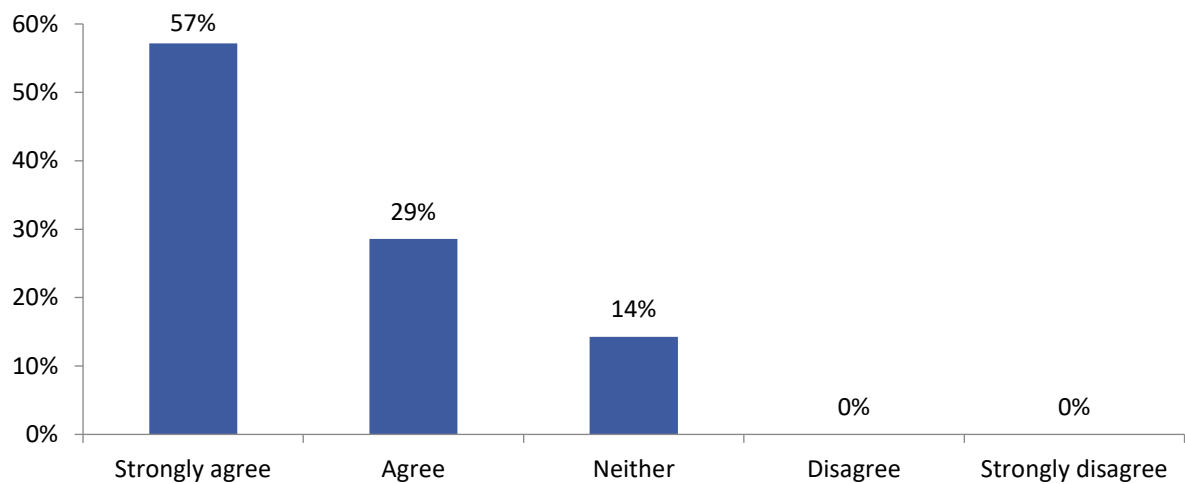
At the time of the survey, an large majority (86%) of parents and caregivers reported that they agreed or strongly agreed that walking or biking to school would be a fun activity for their students, while only 14% disagreed with this statement (Figure 8).

Figure 8. Agree/Disagree: Walking/Biking to/from School is Fun for my Student, 2019 Parent/Caregiver Survey



A large majority of parents and caregivers also recognized the health benefits of active transportation, with 86% reporting that they agreed that walking or biking to school would be healthy for their student. An additional 14% were neutral regarding the health benefits of walking and biking (see Figure 9).

Figure 9. Agree/Disagree: Walking/Biking to/from School is Healthy for my Student, 2019 Parent/Caregiver Survey



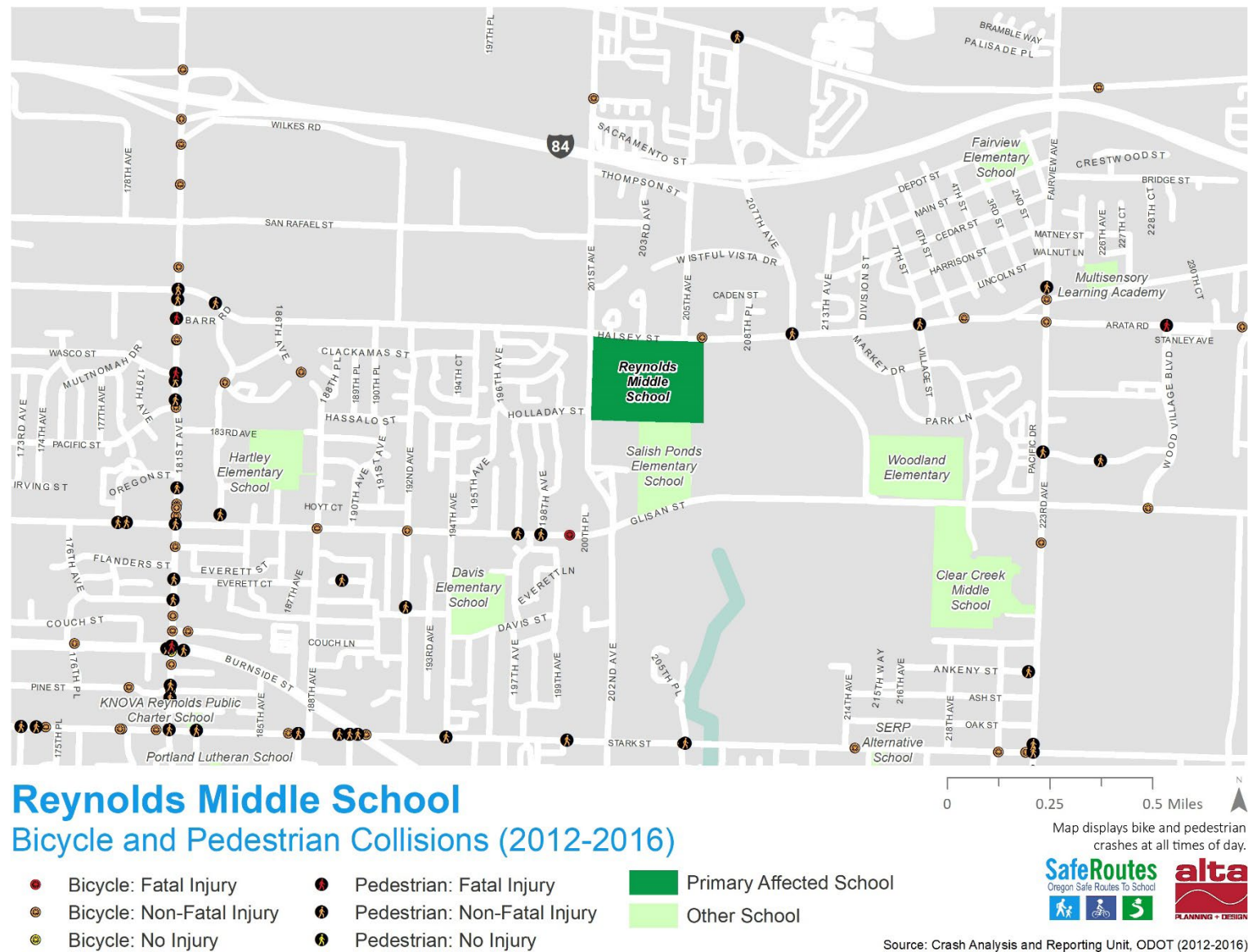
Crash Data

DATE COLLECTED:	2012-2016
DATA COLLECTION PROCESS:	Crash Data included in this report originates from the ODOT SRTS Web Map Application. 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 2012 and 2016, 46 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*:	38 of these reported crashes occurred during school commuting hours; the majority occurred during PM commuting hours. <i>* For these purposes school commuting hours were defined as 6 AM to 9 PM.</i>
NUMBER OF REPORTED INJURIES BY SEVERITY WITHIN 1 MILE OF THE SCHOOL:	All 46 of these reported crashes involved an injury to a bicyclist or pedestrian. Of the 20 bike crashes, 19 were non-fatal and one was fatal. All 26 of the injuries involving a pedestrian within one mile were non-fatal, although several pedestrian fatalities have occurred nearby on 181 st Ave. Figure 10 illustrates the location of the crashes by type and injury severity.
ADDITIONAL CRASH DATA CONSIDERATIONS:	Three crashes were recorded in the direct vicinity of the planned improved crossing at Halsey St and 208th Pl between 2012-2016. One bike crash occurred along Halsey just west of 208th Pl, and one bike crash and one pedestrian crash occurred at the Halsey/207th Ave intersection. All involved non-fatal injuries.

Notes on Community Context or other Relevant Information:

None.

Figure 10: Reynolds Middle School Bicycle & Pedestrian Collisions (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. Multnomah County completed this project 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
PARENT SURVEYS:	Yes	At least 30 parents per school	Late spring 2021
PARENT FOCUS GROUPS:	Yes	4-10 parents	Late spring 2021
STAFF SURVEYS:	Yes	1-3 school staff and administration	Late spring 2021
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*)

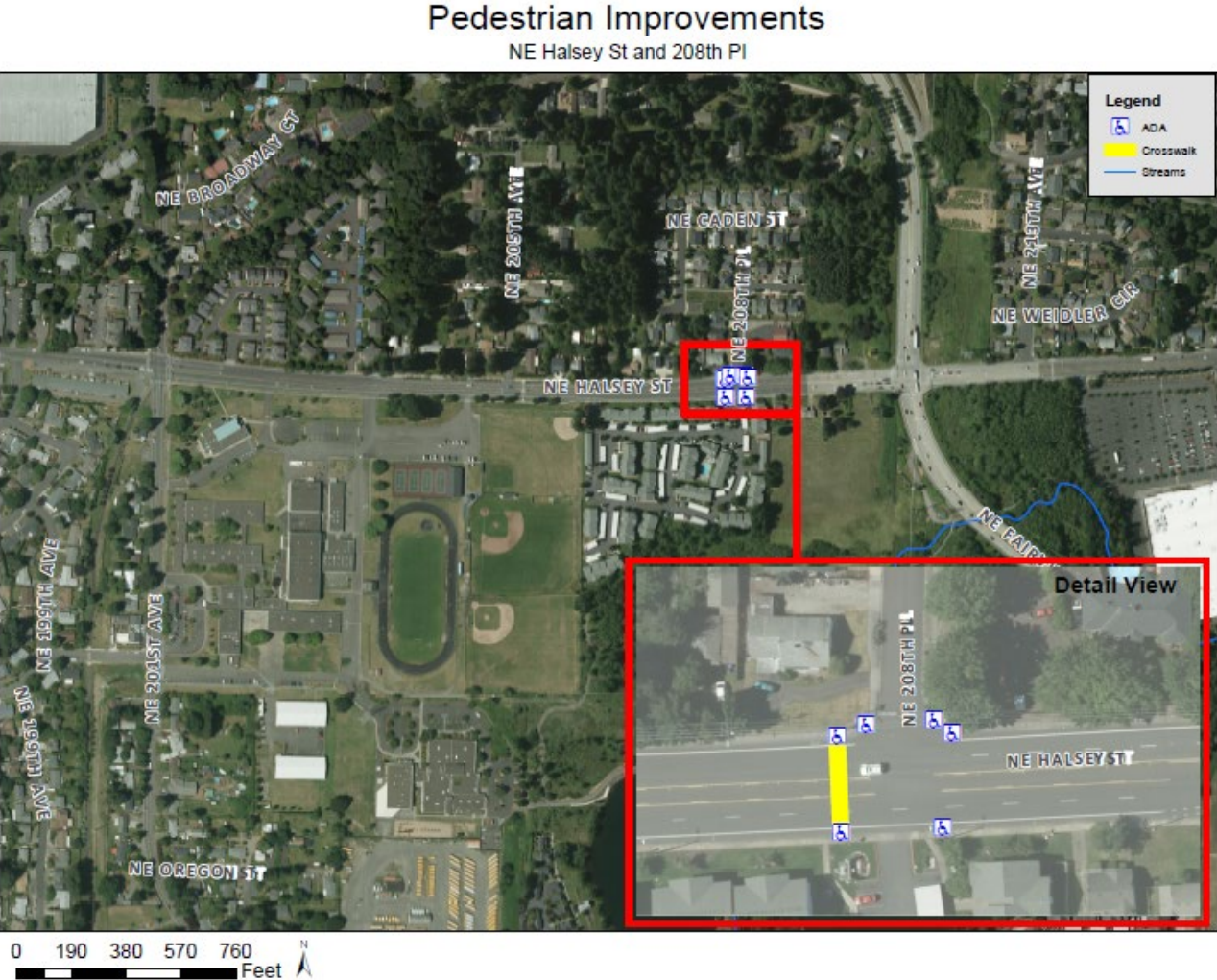
Chapter 3. Findings

- 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. Reynolds Middle 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.