

City of Gresham – Davis 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 spring 2024. 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: Davis Elementary

Summary

Davis Elementary School is a public elementary school serving students in the City of Gresham. Davis Elementary is a Title 1 school, with 90 to 100% of students eligible for the Federal Free and Reduced-Price Lunch Program. English and Spanish are the primary languages spoken by students, and 49% of students are registered as Ever English Learners.¹

City staff identified Davis Elementary School as a high priority site for SRTS improvements due to the high traffic speeds, missing sidewalks and unsafe crossings.

The Oregon SRTS 2021 Competitive Grant is building three established school zones that will flash during school arrival and dismissal times. The flashers make motorists more aware of the school zone and the school zone reduced speed during arrival and dismissal times.

In addition to these planned infrastructure improvements, the City has worked with the Gresham Barlow School District to complete a District SRTS Action Plan and Walking Maps for every school. A Multnomah County SRTS Coordinator supports SRTS efforts in Gresham. In 2019, City staff investigated issues of vehicle queuing at arrival and dismissal at Davis and provided options to the principal for new circulation options. At principal request a new ADA compliant crossing was installed across SE Fleming St to provide students a clear crossing from adjacent neighborhoods.

Key information from Davis Elementary caregiver surveys:

- 81% of students live within a mile of the school.
- Approximately 42% of students ride in a family vehicle to school, and 41% use this mode to travel home; 38% of students take the school bus to school, and 39% take the bus home; and 14% walk to school, with 18% walking home.
- Caregivers report that travel time is the most common barrier to walking/biking to school. Other barriers include:
 - Bad weather
 - Poor driver behavior
 - Concerns about safety, documentation, or criminal activity
 - Convenience of driving
 - The length of time it takes to walk or bike to school
- Most caregivers recognize the value of walking/biking to school—70% described it as healthy and 90% described it as fun for their student.

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, 2022.

Contact Information

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Enrollment and Demographics

Davis Elementary School is a Title 1 public school enrolling 423 students in Kindergarten through 5th grade. The school serves low-income populations in the City of Gresham, approximately 95% of students are eligible for the Free and Reduced-Price Lunch Program. English and Spanish are the primary languages spoken by students, and 49% are registered to be Ever English Learners.²

ENROLLMENT: 4233	GRADE LEVELS SERVED AND SCHOOL TYPE: K-5 th , Public
STUDENT ETHNIC/RACIAL DEMOGRAPHICS: American Indian/Alaska Native: 1% Asian: 7% Hispanic or Latino: 47% Native Hawaiian/Pacific Island: 3% Multiracial: 8% Black/African American: 15% White: 19%	PREDOMINANT LANGUAGES SPOKEN IN GRESHAM-BARLOW SCHOOL DISTRICT: ⁴ English: 8409 Spanish: 2306 Russian: 264 Arabic: 119 Romanian: 78 Ukrainian: 71 Hmong: 50 Tagalog: 24
STUDENTS LIVING WITHIN 1 MILE OF SCHOOL: NA	TITLE 1 STATUS: Yes ⁵
EVER ENGLISH LEARNERS: 49% ⁶	FREE AND REDUCED-PRICE LUNCH ELIGIBILITY: 94.5% ⁷

² 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>

³ Oregon Department of Education, SY 2020-2021 <https://www.ode.state.or.us/data/reportcard/Media.aspx>

⁴ Oregon Department of Education Language Use Survey, SY 2020-2021 <https://www.oregon.gov/ode/schools-and-districts/grants/ESEA/EL/Pages/LanguageUseSurvey.aspx>

⁵ 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>

⁶ Oregon Department of Education, SY 2020-2021 <https://www.ode.state.or.us/data/reportcard/Media.aspx>

⁷ 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 (OLCD) measures of place type for each community studied.⁸ 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.

Davis Elementary School is located in the City of Gresham. According to the Place Type Tool, the area surrounding Davis Elementary School is categorized as Close-in Community, meaning it contains medium density development. Its development type is Residential, meaning the surrounding census block group generally contains more residential development than employment, with 109,379 people residing and 1,830 people working within the census block group. The area has a medium level of access to regional employment centers and destinations, and a high mix of uses. However, the overall level of street connectivity in the area is characterized as medium.

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 to 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):

Residential

- 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 Gresham 109,379 people

CENSUS BLOCK GROUP POPULATION (2010):

1,830 people

NUMBER OF JOBS IN CENSUS BLOCK GROUP (2010):

109 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

DIVERSITY LEVEL- Mix of housing and employment:

Low

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

Medium

⁸ 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 Davis Elementary grant application is included in Appendix B.

PROBLEM STATEMENT: Along this route to school there is a missing sidewalk gap and two unsafe crossings. The crossings at 194th and 192nd are not ADA accessible and due to street connectivity between two arterials they experience higher speed cut-through traffic. Couch Street, between 192nd Avenue and 190th Place has no sidewalk. The narrow 20-foot roadway does not provide a safe place for students to walk separated from vehicles.

DESCRIPTION OF BARRIERS TO WALKING AND BIKING: The City of Gresham has several School Zones located on high-speed arterial and collector streets with speeds of 35 mph. During school times the school zone reduces the speed to 20 mph for safety. Motorists often don't see the school zone signs and drive too fast in the school zone making it unsafe for students walking and biking to school.

PROJECT DESCRIPTION: This project adds flashers to three established school zones that will flash during school arrival and dismissal times. The flashers make motorists more aware of the school zone and the school zone reduced speed during arrival and dismissal times. By reducing speeds along these arterial and collector streets a safer and more pleasant environment for walking and biking to school is created. Gresham currently has nine school zones with flashers to attract motorist attention.

ESTIMATED PROJECT TIMELINE: December 2022 Completion

PRIORITY SAFETY CORRIDOR?⁹ Yes

OUTREACH AND EDUCATION: The city has worked with the Gresham Barlow School District to complete a District SRTS Action Plan and completed Walking Maps for every school in the district in 2019. City staff investigated issues of vehicle queuing at arrival and dismissal at Davis in 2019, providing options to the principal for new circulation options. At principal request a new ADA compliant crossing was installed across SE Fleming St to provide students a clear crossing from adjacent neighborhoods.

⁹ 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.

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 Edwards 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 220 students, or 23% of the school-aged population living within a mile of the school, would gain safer walking or biking access to the school.

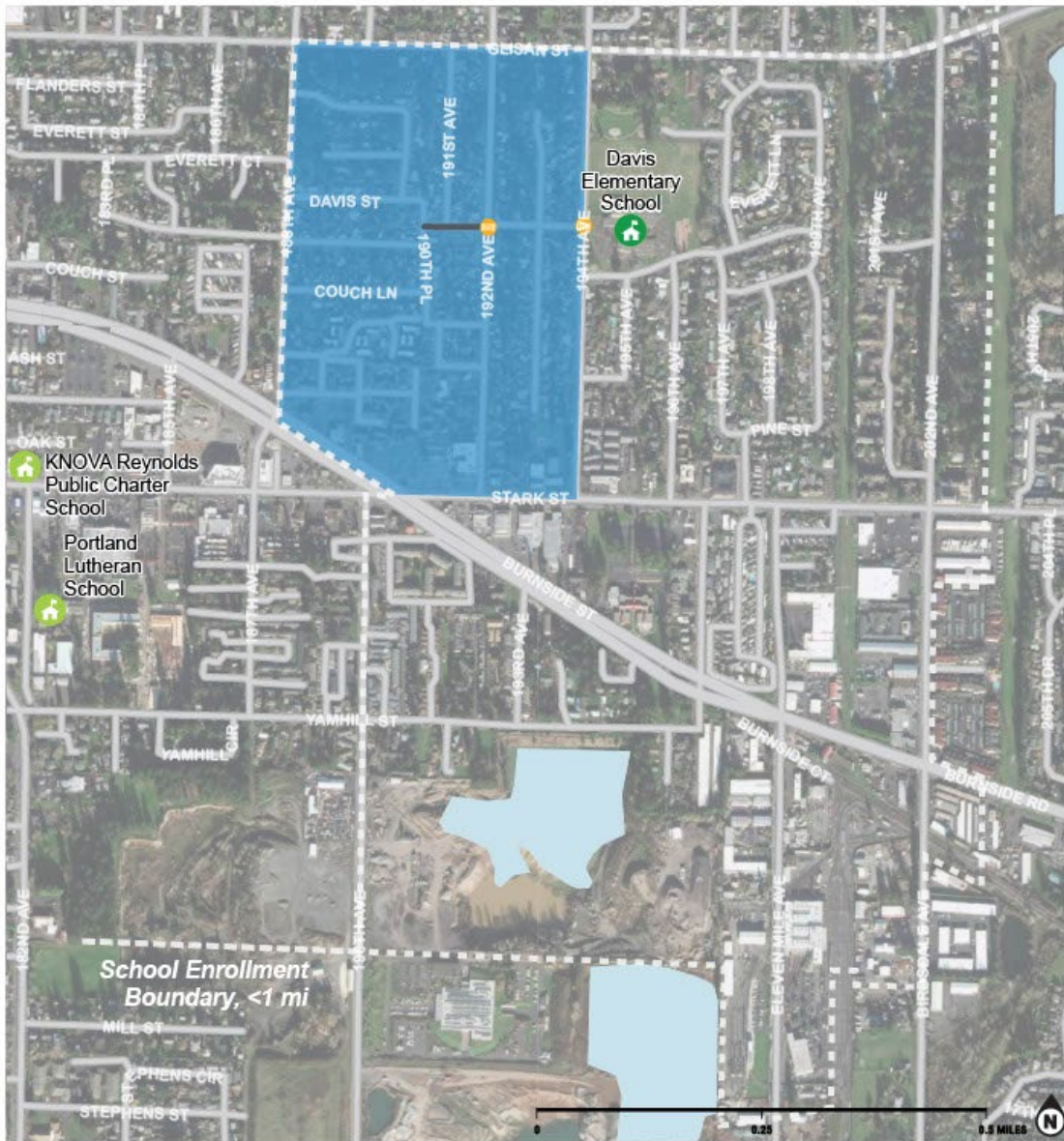
Table 1. Access Analysis Results

METRIC	VALUE
Total Population of New Access Areas	1,337
School Age Population of New Access Areas ¹⁰	220
Percentage of Students within the School Areas Gaining Access ¹¹	23%

¹⁰ Calculated using the proportion of school-age children (5-17 years old) within the City of Gresham.

¹¹ The School Area is defined as the area within the school enrollment area that is within one mile of the school.

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



Davis Elementary School
Students with New Access to
Walking and Biking

Estimated Number of Students: 220
 Proportion of Students within 1 Mile: 23%
 To view the methods for this analysis, please see Appendix.

-  Applicant School
-  Other School
-  New Access Area
-  New Crossing Improvement
-  New Sidewalk Improvement



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.

Hand Tallies

DATE COLLECTED:	February 2022
DATA COLLECTION PROCESS:	18 classrooms surveyed about their trip to and from school
NUMBER OF STUDENTS:	322 students participated in hand tallies
TRIPS RECORDED	616 trips recorded by the hand tallies

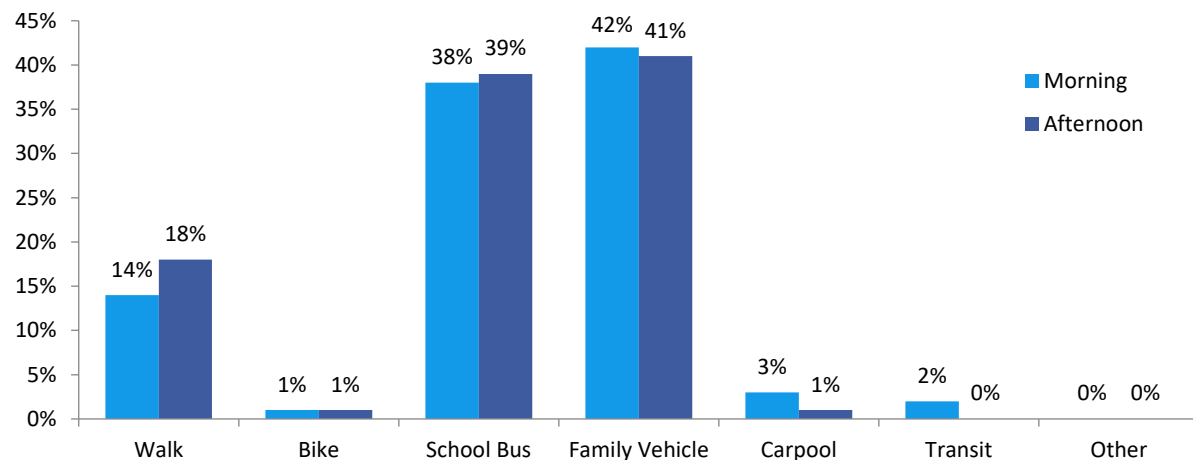
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The February 2022 baseline hand tally data from Davis Elementary includes 21 students. 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 Oregon SRTS's hand tally data collection forms and process were used. This data provides a snapshot of student travel behavior trends.

SUMMARY OF RESULTS:

Davis Elementary hand tally data from 2022 indicates that a majority of students surveyed ride in a family vehicle in the morning and in the afternoon (see Figure 2 and Table 2). Riding the school bus was the second most common way students got to school in the morning (38%) and home in the afternoon (39%). Carpools are also used by 3% of students to get to school and 1% to get home; 14% percent of students walk in the morning, and 18% walk home in the afternoon. Only 1% of students reported biking to school or home. 2% of students reported using transit to get to school, and 0% reported using transit to get home. 0% of students reported using other modes of transportation to get to school or home.

Figure 2. Student Mode Split by Time of Day, 2022 Hand Tally Data



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

Table 2. Count of Student Mode Split to and from School, 2022 Hand tally Data

TIME OF DAY	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Morning	42	3	115	127	8	5	1
Afternoon	57	2	119	126	4	0	1

Caregiver Surveys

DATE COLLECTED: **March 2022**

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

NUMBER OF SURVEYS: 21; 4 online, 17 hard copies

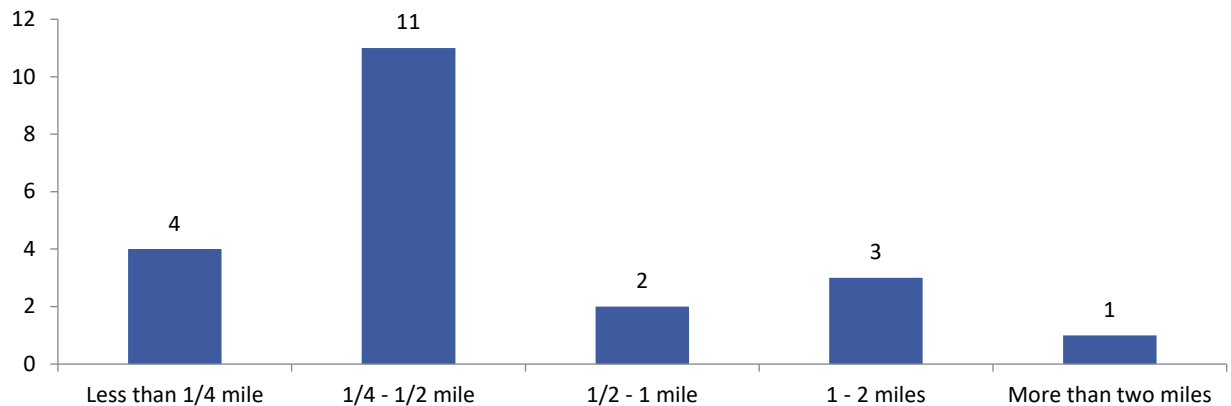
SUMMARY OF DATA COLLECTION AND METHODOLOGY

The caregiver survey data included in this report was collected in March of 2022 from 21 participants with students attending Davis Elementary. Alta Planning + Design staff created a promotional flier which included details about the Safe Routes to School program, project contact information, a link to the online survey and instructions on where to return hard copies of the paper surveys. 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 17 respondents live within one mile of Davis Elementary, with an additional three living between one and two miles of the school site (see Figure 3). One surveyed caregiver lives more than two miles from the school.

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



Active modes were the most commonly used transportation option for students living less than a quarter mile from the school (75% of trips). Those living between a half mile and one mile away were most likely to use shared modes, and those who live two miles or farther from school were most likely to use a family vehicle. (See Figure 4 and Table 3). For students who live between a quarter mile and a half mile from school, a family vehicle was the most popular transportation, with 60 trips made using this mode. Additionally, 90% of trips made by students who lived between one and two miles from school used shared modes.

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

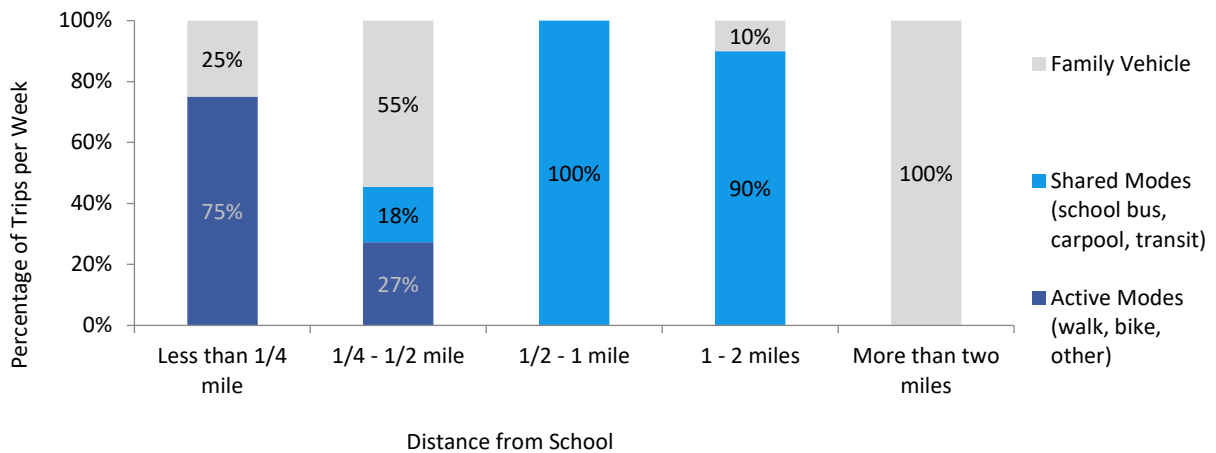
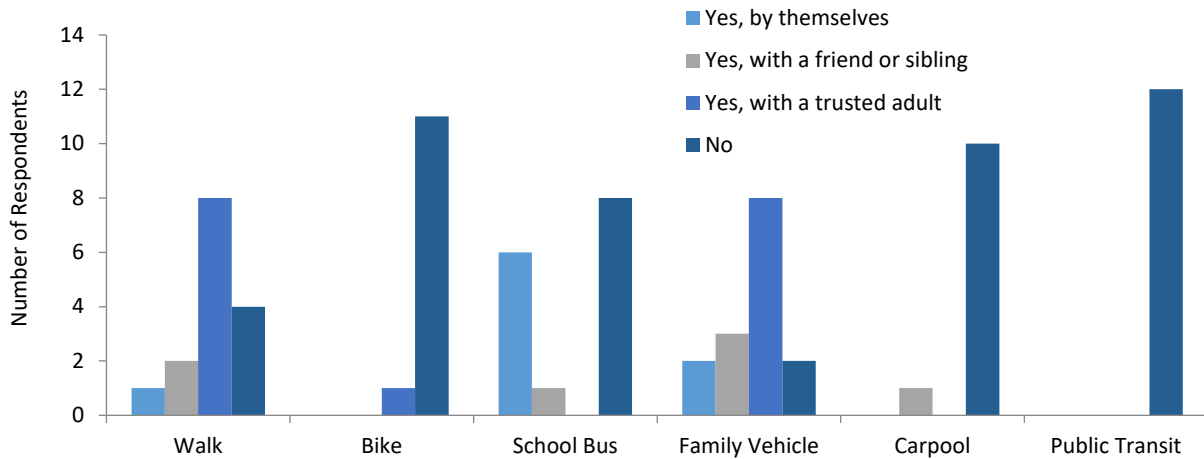


Table 3. Count of Trips by Distance the Family Lives from School, 2022 Caregiver Survey

DISTANCE	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Less than 1/4 mile	30	0	0	10	0	0	0
1/4 mile up to 1/2 mile	30	0	20	60	0	0	0
1/2 mile up to 1 mile	0	0	20	0	0	0	0
1 mile up to 2 miles	0	0	27	3	0	0	0
More than 2 miles	0	0	0	10	0	0	0

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

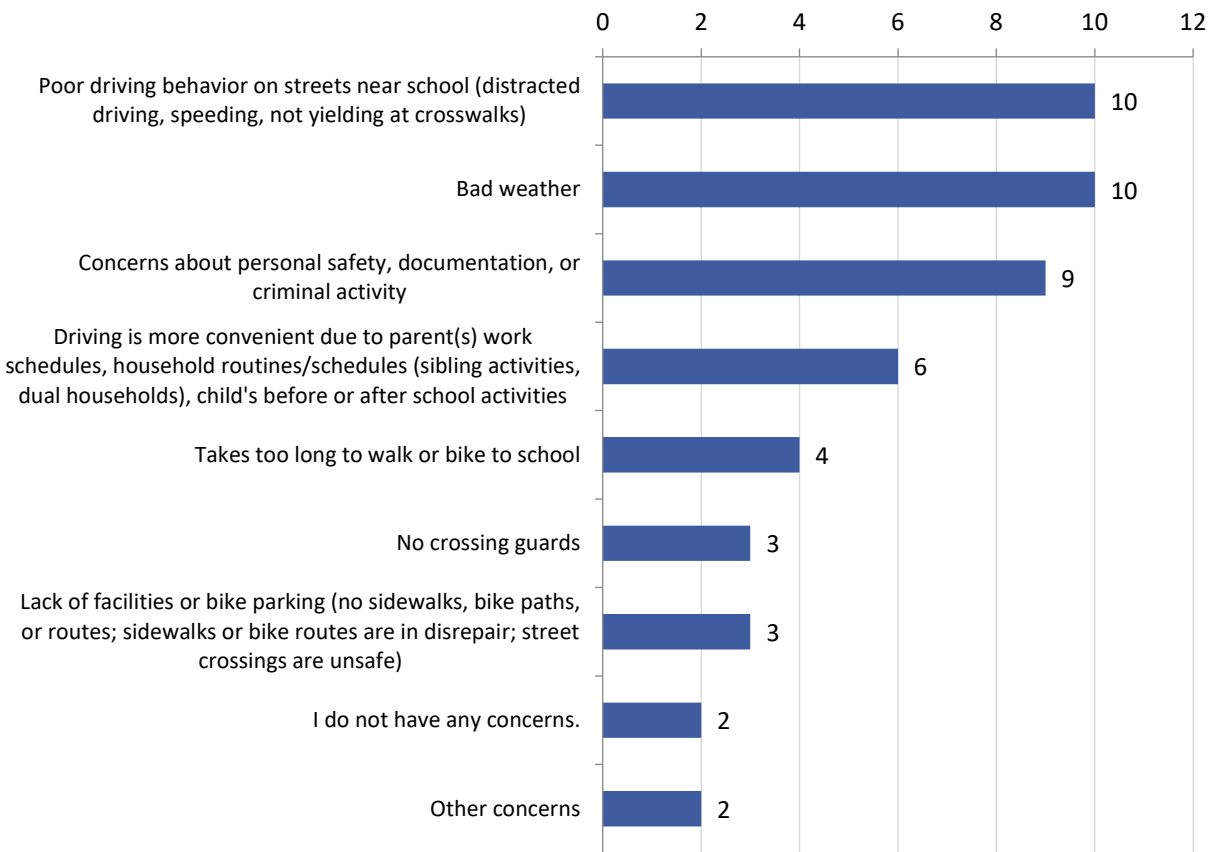
Figure 5. Do You Allow this Student to Travel to School in the Following Ways? 2022 Caregiver Survey



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:

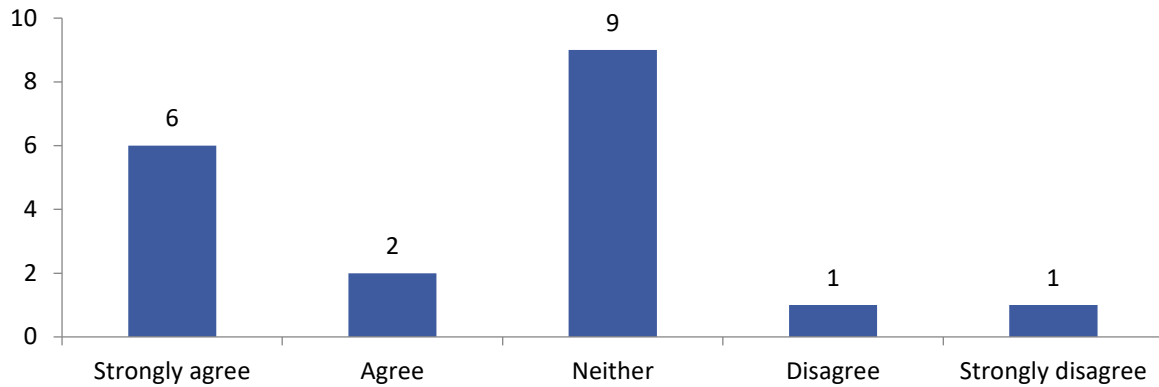
- Poor driver behavior
- Bad weather
- Concerns about safety, documentation, or criminal activity
- Convenience of driving
- The length of time it takes to walk or bike to school

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



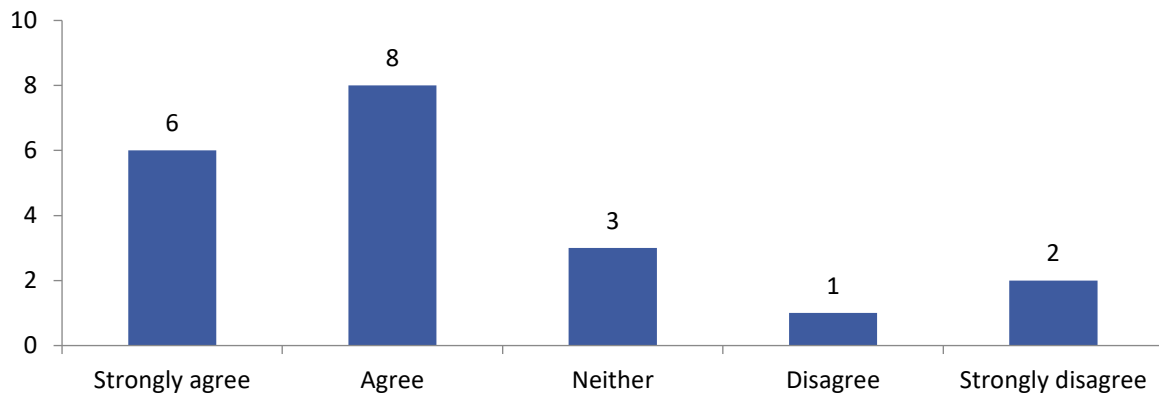
A majority of caregiver respondents (nine) felt Davis Elementary neither encouraged or discouraged students from walking and biking to school at the time of the survey. An additional eight felt the school encouraged or strongly encouraged active transportation, while two characterized the school as discouraging 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



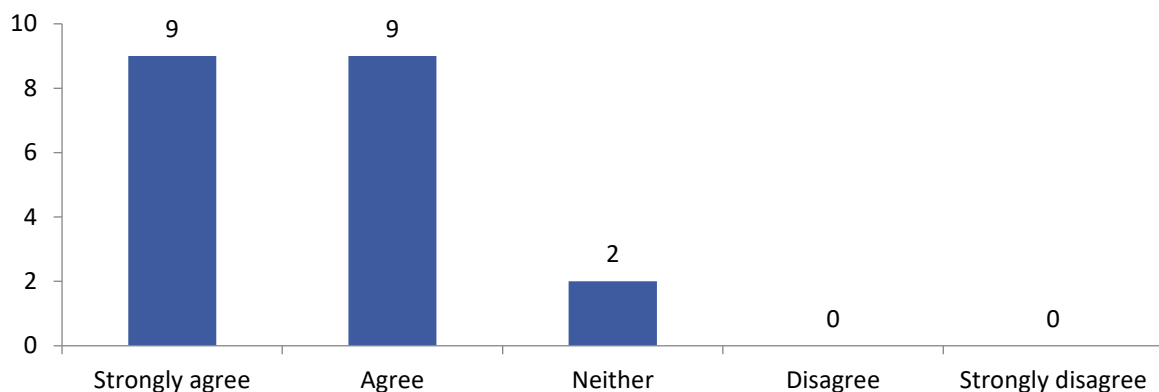
At the time of the survey, 14 caregivers agreed that walking or biking to school would be a fun activity for their students, while only three believed the activity would be boring. An additional three were neutral or unsure on whether their student would enjoy walking and biking to school (Figure 8).

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. An additional two were neutral regarding the health benefits of walking and biking, and none felt that the activities would not be healthy for their student (see Figure 9).

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



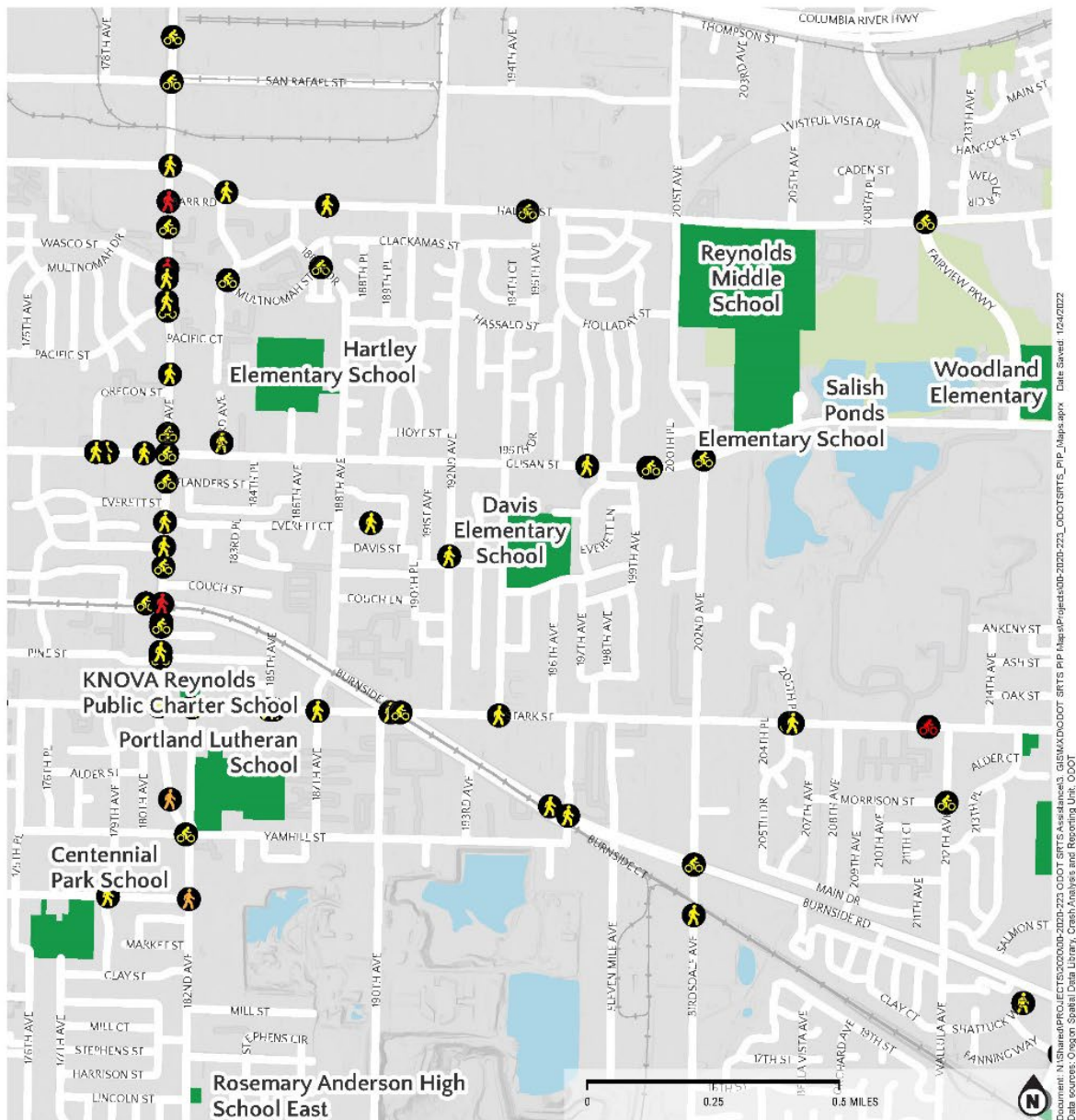
Crash Data

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, 74 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*:	Fifty of these reported crashes occurred during school commuting hours; the majority occurred outside these 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 74 of these reported crashes involved an injury to a bicyclist or pedestrian. Of the 31 reported crashes involving a bicyclist, 30 were non-fatal injuries and one was fatal. Of the 43 reported crashes involving a pedestrian, 40 were non-fatal and three were fatal. Figure 10 illustrates the location of the crashes by type and injury severity. <i>(Note that some crashes may be shown on the map that are not included in this total; they occurred outside a one-mile radius from the school. Additionally, some crash icons may be beneath others if they occurred at the same location).</i>
ADDITIONAL CRASH DATA CONSIDERATIONS:	N/A

Notes on Community Context or Other Relevant Information:

None.

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



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



- | | | |
|-------------------------------|------------------------------|-----------------|
| Pedestrian Collisions | Bicyclist Collisions | Railroad |
| Pedestrian Injury | Bicyclist Injury | School Property |
| 2 or more Pedestrian Injuries | 2 or more Bicyclist Injuries | Parks |
| Pedestrian Fatality | Bicyclist Fatality | Water |
| | | City Boundary |

Follow-Up Data Collection Plan

Timeline

Post-grant field visits to collect follow-up data will be scheduled to take place following the completion of each grant intervention. The City of Gresham estimates the project will be completed by December 2023

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 2024 (assuming project completion)
CAREGIVER SURVEYS:	Yes	At least 30 caregivers per school	Late spring 2024 (assuming project completion)
CAREGIVER FOCUS GROUPS:	Yes	4-10 caregivers	Late spring 2024 (assuming project completion)
STAFF SURVEYS:	Yes	1-3 school staff and administration	Late spring 2024 (assuming project completion)
COMMUNITY SURVEYS	Yes	At least 20 community members	Late spring 2024 (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*)

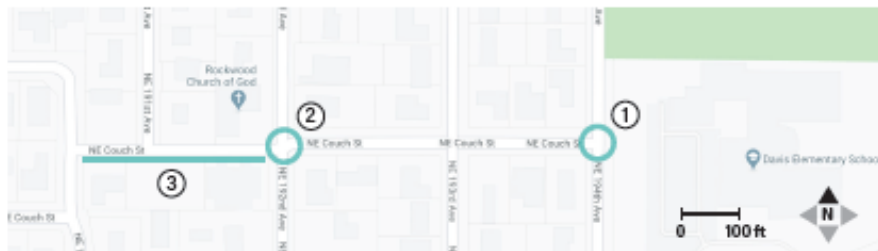
Chapter 3. Findings

- 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. Davis Elementary Competitive SRTS Infrastructure Grant-Funded Project Map

Davis Elementary Project Scope



① 194th Avenue + Couch Street

Problem:

- Cars speed through crosswalk area

Design:

- Curb extensions with stormwater planters on east + west side of crosswalk



② 192nd Avenue + Couch Street

Problem:

- Cars speed through crosswalk area

Design:

- School Zone flashers at crosswalk



③ Couch Street between 192nd Street + 190th Place

Problem:

- South side of street has no sidewalk

Design:

- Alternative sidewalk design
- Approximately 350 feet

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.