

# Lane County – Lundy 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 2023. 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: Lundy Elementary

### Summary

Lundy Elementary School is a public elementary school serving students in the City of Lowell and rural Lane county. Lundy Elementary is a Title 1 school, with more than 70% of students eligible for the Federal Free and Reduced-Price Lunch Program. English is the primary language spoken by students.

City staff identified Lundy Elementary School as a high-priority site for SRTS improvements due to the main street's sidewalk being in a state of deterioration, and the lack of sidewalks on West Boundary Road.

The Oregon SRTS 2021 Competitive IN Grant included adding sidewalks on Main between West Boundary Road to Pioneer Street and on West Boundary Road between Pioneer St to Wetleau St. In addition to these improvements the grant will build a pedestrian refuge island at Jasper-Lowell Road.

For education programs, Lane County has recently hired a rural Safe Routes to School Coordinator and will be piloting the program in Lowell. Lundy Elementary is looking forward to working closely with the Rural SRTS Coordinator. Additionally, the school is committed to providing educational materials to students and their caregivers about the project and how it creates safer and more comfortable conditions for students to walk and bike to and from school.

Key information from Lundy Elementary caregiver surveys and staff interview:

- 44% of students live within a mile of the school.
- Approximately 35% of students ride in a family vehicle to school, and 35% use this mode to travel home; 50% of students take the school bus to school; and 45% take the bus home.
- Caregivers report that the convenience of driving is the most common barrier to walking/biking to school. Other barriers include:
  - Lack of crossing guards
  - Poor driver behavior
  - Bad weather
- Most caregivers recognize the value of walking/biking to school—76% described it as healthy, and 61% described it as fun for their student.

## Contact Information

JURISDICTION:	Lane County
CONTACT:	Peggy Keppler, Transportation Engineer
SCHOOL DISTRICT:	Lane County School District
CONTACT:	Lane County, (541) 682-6990
OTHER CONTACTS:	Becky Taylor, (541) 682-6932

## Enrollment and Demographics

Lundy Elementary School is a Title 1 public school enrolling 556 students in Kindergarten through 6<sup>th</sup> grade. The school serves low-income populations in the City of Lowell; with approximately 73% of students are eligible for the Free and Reduced-Price Lunch Program. English is the primary language spoken by students and less than 5% are registered to be Ever English Learners.<sup>1</sup>

ENROLLMENT: 166 <sup>2</sup>	GRADE LEVELS SERVED AND SCHOOL TYPE: K-6 <sup>th</sup> , Public
STUDENT ETHNIC/RACIAL DEMOGRAPHICS: American Indian/Alaska Native: 1% Asian: 0% Black/African American: 0% Hispanic/Latino: 8% Multiracial: 12% Native Hawaiian/Pacific Islander: 0% White: 79%	PREDOMINANT LANGUAGE SPOKEN IN LANE COUNTY SCHOOL DISTRICT: <sup>3</sup> English:1238
STUDENTS LIVING WITHIN 1 MILE OF SCHOOL:NA	TITLE 1 STATUS: Yes <sup>4</sup>
EVER ENGLISH LEARNERS: NA <sup>5</sup>	FREE AND REDUCED-PRICE LUNCH ELIGIBILITY: 73.9% <sup>6</sup>

<sup>1</sup> 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>

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

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

<sup>4</sup> 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>

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

<sup>6</sup> 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 the Oregon Department of Land Conservation and Development’s (DLCD) measures of place type for each community studied.<sup>7</sup> Each attribute is rated as “**Very Low, Low, Medium, or High**” by the block group. Place type characteristics provide important context for transportation opportunities and challenges in a community and influence the transportation decisions people make.

Lundy Elementary School is located in the City of Lowell. According to the Place Type Tool, the area surrounding Lundy Elementary School is categorized as Low Density/ Rural, meaning it contains very low-density development. The school’s development type is Low Density/ Rural meaning it has a very low density of housing and jobs. With 1,077 people residing and 117 people working within the census block group, the area has a very low level of access to regional employment centers and destinations and a very low mix of uses; however, 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)

Low Density / Rural

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

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

LOW DENSITY/RURAL

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

JURISDICTION POPULATION (ACS 5-YEAR ESTIMATES): City of Lowell 5,201

CENSUS BLOCK GROUP POPULATION (2010): 1,077 people

NUMBER OF JOBS IN CENSUS BLOCK GROUP (2010): 117 jobs

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

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

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

DIVERSITY LEVEL- Mix of housing and employment: Very Low

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

<sup>7</sup> More information about OLCD’s Place Type Tool is available at: [www.oregon.gov/lcd/CL/Pages/Place-Types.aspx](http://www.oregon.gov/lcd/CL/Pages/Place-Types.aspx)

## Project Description

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

**PROBLEM STATEMENT:** The two streets – Main Street and West Boundary Road – and the intersection this project addresses are vital routes for the 349 students that attend Lundy Elementary School. Main Street’s sidewalk is in a state of deterioration, and West Boundary Road lacks sidewalks completely. Additionally, the intersection of West Boundary Road/North Shore Drive/Pioneer Street is wide and heavily trafficked by vehicles connecting to the downtown area from Highway 58. These conditions create a dangerous and uncomfortable environment, deterring students from walking and biking to school.

**DESCRIPTION OF BARRIERS TO WALKING AND BIKING:** The City of Lowell 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:** Construct sidewalks approximately on Main between West Boundary Road to Pioneer Street and on West Boundary Road between Pioneer St to Wetleau St and a pedestrian refuge island at Jasper-Lowell Road.

**ESTIMATED PROJECT TIMELINE:** July 2022 Completion

**PRIORITY SAFETY CORRIDOR?<sup>8</sup>** Yes

**OUTREACH AND EDUCATION** In 2018/19, 6th grade Health piloted our Transportation Safety unit. In 2019/20, PE 6th grade teacher was trained. Historically, neither Lundy Elementary School nor the Lowell School District has led Safe Routes to School education or engagement programs. Lane County, however, has recently hired a rural Safe Routes to School Coordinator and will be piloting the program in Lowell. Lundy Elementary is excited to work closely with the Rural SRTS Coordinator. Additionally, the school is committed to providing educational materials to students and their caregivers about the project and how it creates safer and more comfortable conditions for students to walk and bike to and from school.

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<sup>8</sup> A road where the posted speed or 85<sup>th</sup> 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 Lundy 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 41 students, or 19% of the school-aged population living within a mile of the school, would gain safer walking or biking access to the school.

**Table 1. Access Analysis Results**

METRIC	VALUE
Total Population of New Access Areas	226
School Age Population of New Access Areas <sup>9</sup>	41
Percentage of Students within the School Areas Gaining Access <sup>10</sup>	19%

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<sup>9</sup> Calculated using the proportion of school-age children (5-17 years old) within the census block group.


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

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



**Lundy Elementary School**  
**Students with New Access to**  
**Walking and Biking**

Estimated Number of Students: 41  
 Proportion of Students within 1 Mile: 19%  
 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.

### Staff Interview

DATE COLLECTED: February 8, 2022

DATA COLLECTION PROCESS: Staff interview with Jason Pickett, Director of Facilities

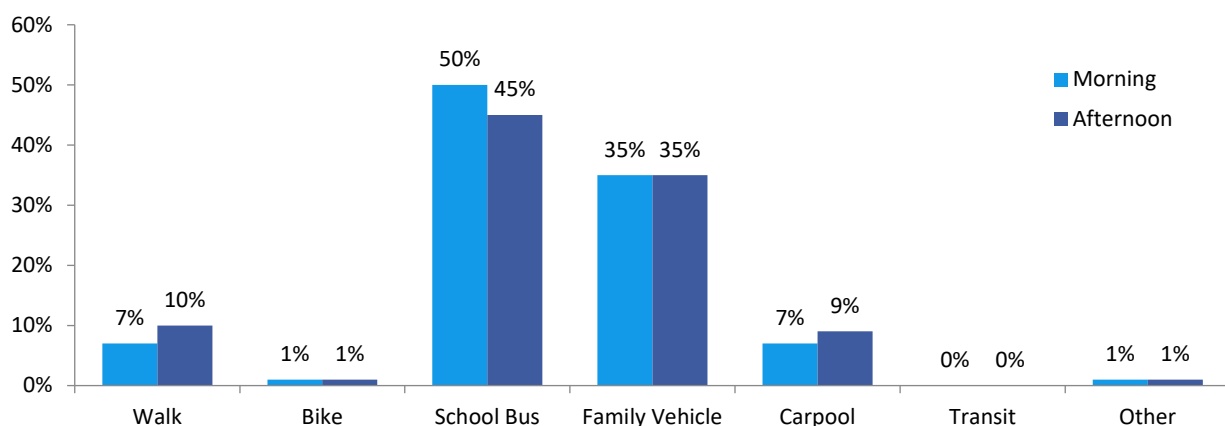
#### SUMMARY OF DATA COLLECTION AND METHODOLOGY

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

#### SUMMARY OF RESULTS

Lundy Elementary staff interview data from 2022 indicates that a majority of students travel by school bus in the mornings (50%), which decreases to 45% in the afternoon (see Figure 2 and Table 2). Walking was lower in the morning at 7%; however, it increased to 10% in the afternoon. Family vehicles were the second most common mode, with 35% of students using this mode to get to and from school. Bikes and other modes were used by 1% of students to get to both school and home, and carpool was used for 7% of students to get to school and 9% to get home.

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



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



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

TIME OF DAY	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Morning	7%	1%	50%	35%	7%	0	1%
Afternoon	10%	1%	45%	35%	9%	0	1%

### Caregiver Surveys

DATE COLLECTED: **April 2022**

DATA COLLECTION PROCESS: The Oregon Department of Transportation SRTS caregiver survey was distributed on paper copies to caregivers at Lundy Elementary to assess family perceptions about school travel options and behavior. The survey was available in English.

NUMBER OF SURVEYS: 47 responses

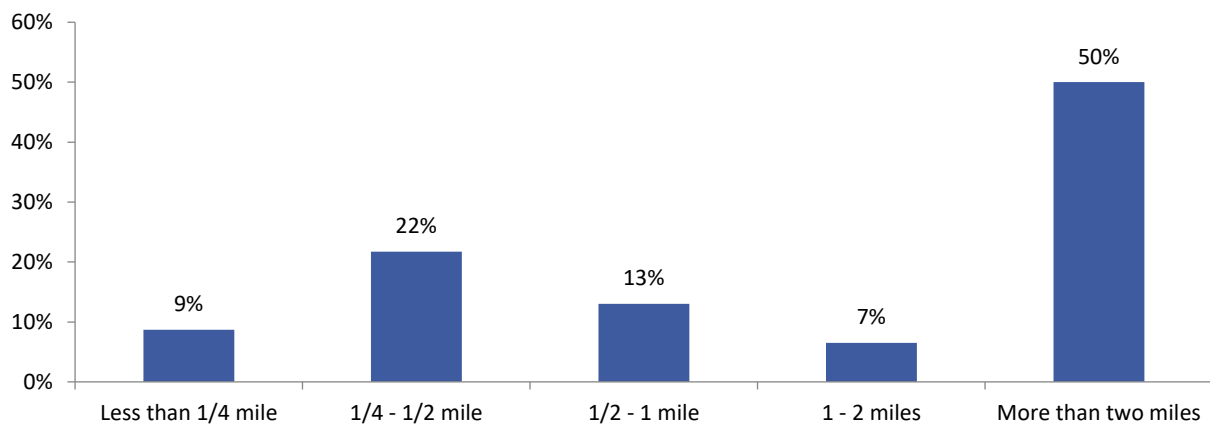
#### SUMMARY OF DATA COLLECTION AND METHODOLOGY

The caregiver survey data included in this report was collected in April of 2022 from 47 participants with students attending Lundy 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.

#### SUMMARY OF RESULTS

Caregiver survey analysis revealed that 44% of respondents live within one mile of Lundy Elementary, with an additional 7% living between one and two miles of the school site (see Figure 3). Half of surveyed caregiver and caregivers live more than two miles from the school.

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



Family vehicles modes were the most commonly used transportation option for students living less than a half mile from the school and those who live two miles or farther from school (see Figure 4 and Table 3). For students who live between a half mile and two miles from school, the school bus was the most popular transportation. Additionally, 49% of students who lived between one and two miles from school used shared modes.

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

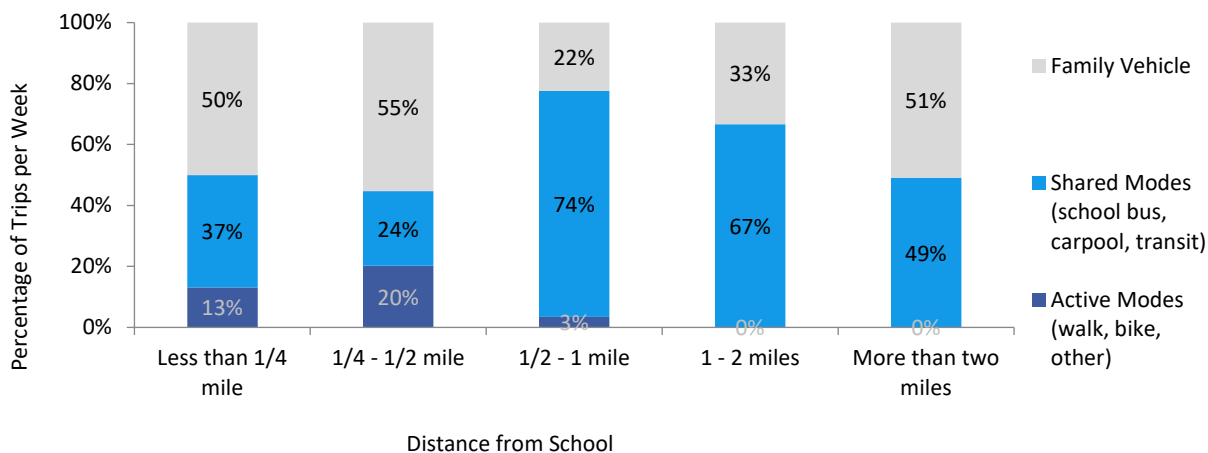
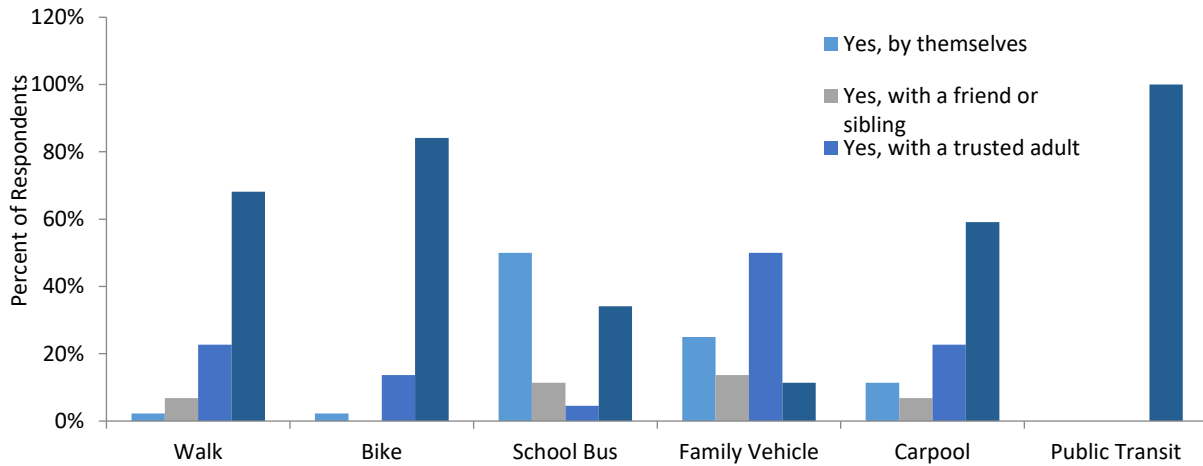


Table 3. Count of Trips by Distance the Family Lives from School, 2022 Caregiver Survey

DISTANCE	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Less than 1/4 mile	5	0	14	19	0	0	0
1/4 mile up to 1/2 mile	19	0	18	52	5	0	0
1/2 mile up to 1 mile	2	0	33	13	10	0	0
1 mile up to 2 miles	0	0	20	10	0	0	0
More than 2 miles	0	0	107	111	0	0	0

As Figure 5 illustrates, 68% of caregivers surveyed reported that they would not allow their student to walk to/from school. However, 23% responded that they would allow their student to walk if they were accompanied by a trusted adult, and another 7% would allow them to walk with a friend or sibling. 84% said they would not allow their student to bike, and only 14% would allow biking with a trusted adult present.

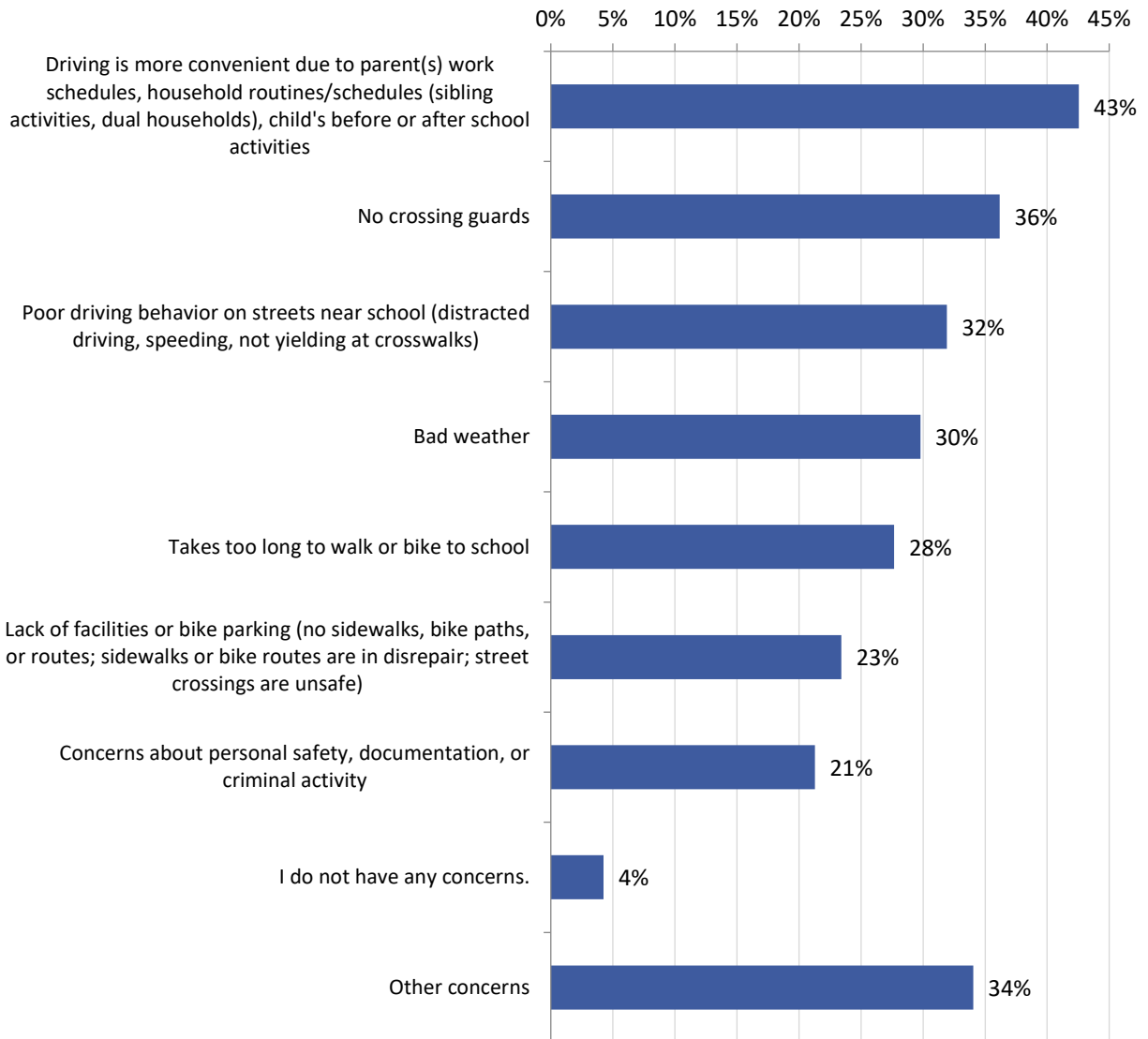
Figure 5. Do You Allow This Student to Travel to School in the Following Ways? 2022 Caregiver Survey



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:

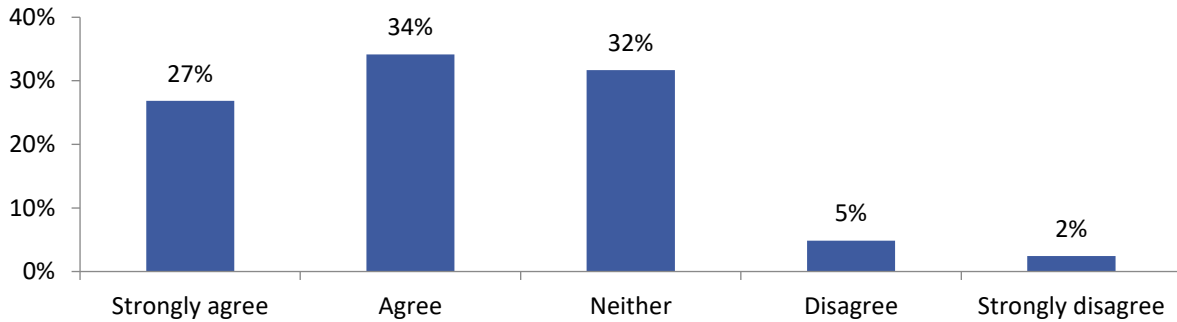
- Convenience of driving
- Lack of crossing guards
- Poor driver behavior
- Bad weather

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



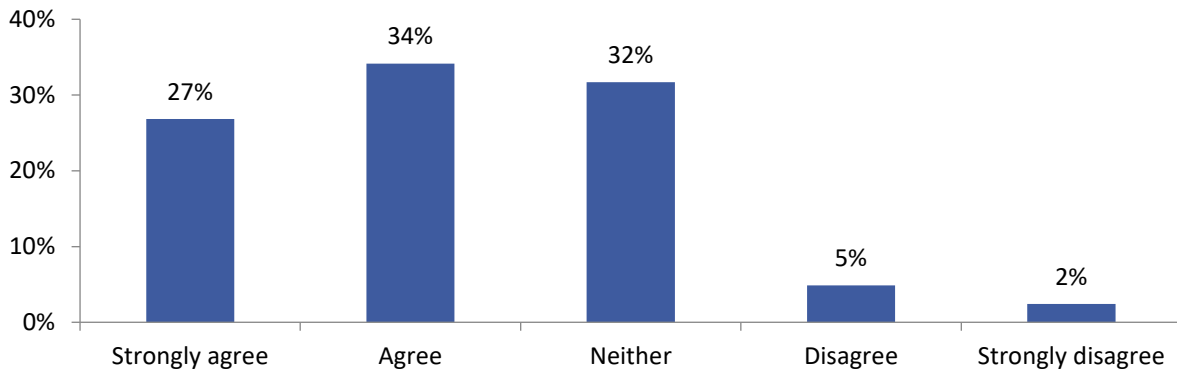
A majority of caregiver respondents (57%) agreed or strongly agreed that Lundy Elementary encouraged students to walk and bike to school at the time of the survey. An additional 9% felt the school encouraged or strongly encouraged active transportation, while 32% characterized the school as discouraging 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**



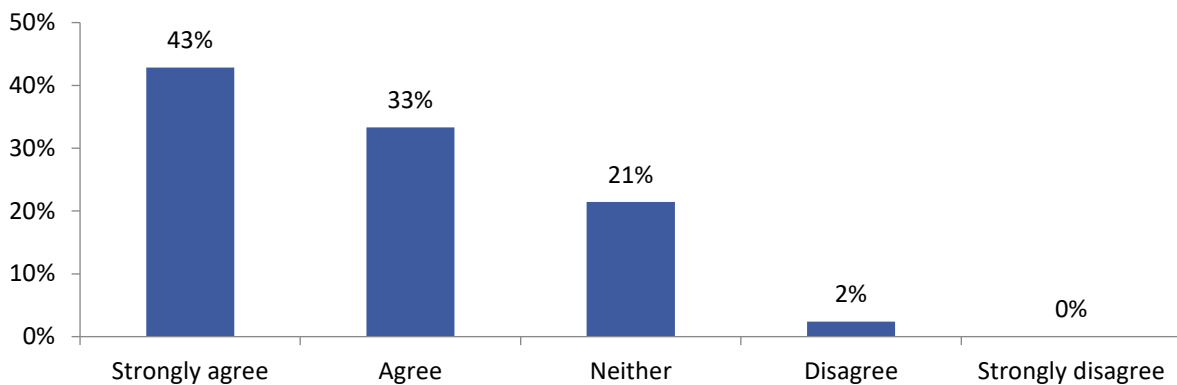
At the time of the survey, 61% of caregivers agreed that walking or biking to school would be a fun activity for their students, while only 7% believed the activity would be boring. An additional 32% were neutral or unsure on whether their student would enjoy walking and biking to school (Figure 8).

**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 76% agreeing that walking or biking to school would be healthy for their student. An additional 21% were neutral regarding the health benefits of walking and biking, and 2% did not feel that the activities would be healthy for their student (see Figure 9).

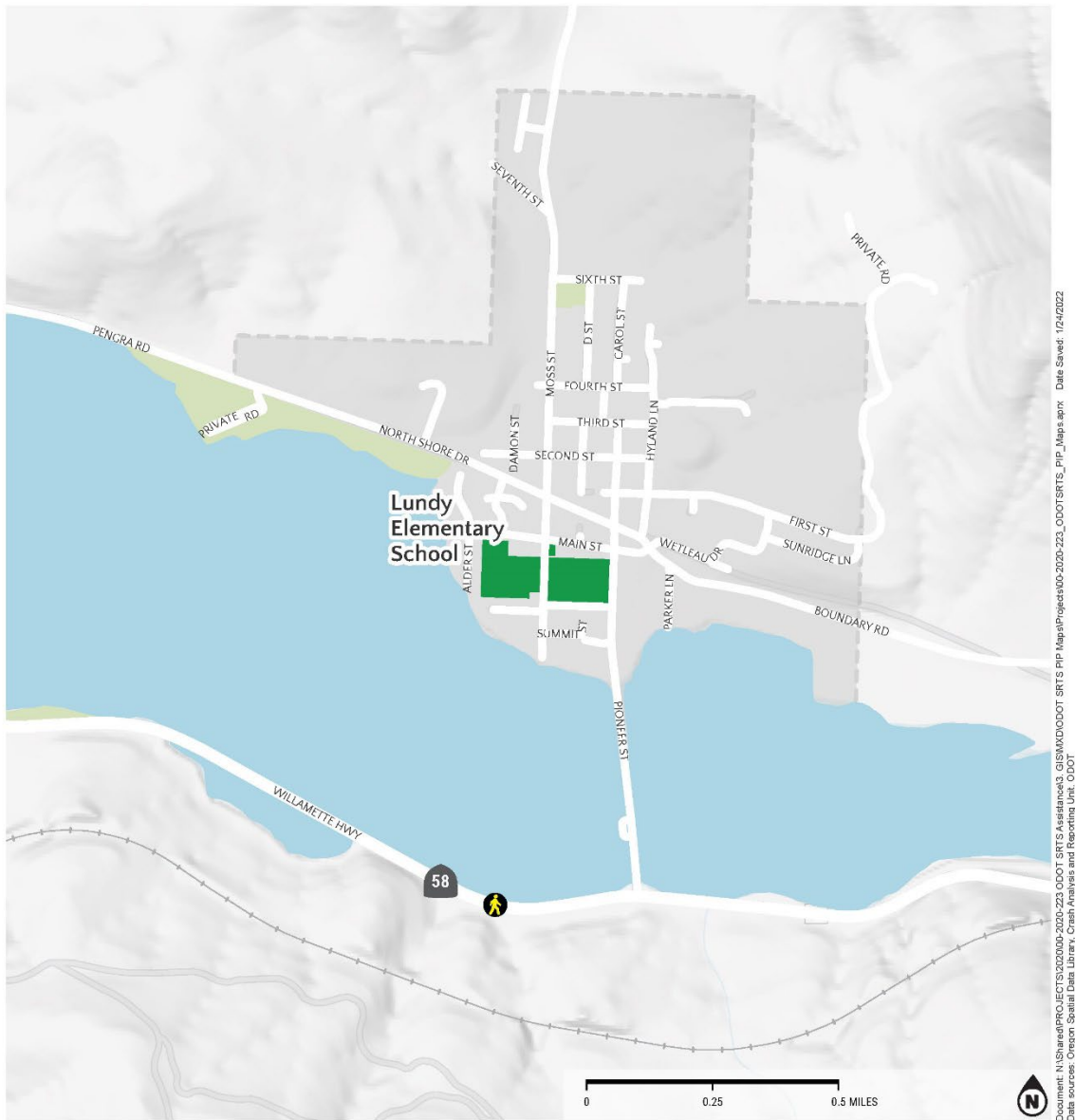
**Figure 9. Agree/Disagree: Walking/Biking to/from School Is Healthy for My Student, 2022 Caregiver Survey**



## Crash Data

DATE COLLECTED:	<b>2014-2018</b>
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, 1 crash involving a pedestrian was reported within one mile of the school.
TIME OF REPORTED CRASHES INVOLVING BIKES AND PEDESTRIANS WITHIN 1 MILE OF SCHOOL*:	This crash occurred on January 6th, 2015 between the hours of 5 pm and 6 pm. <i>* For these analyses school commuting hours are defined as 6 AM to 9 PM.</i>
NUMBER OF REPORTED INJURIES BY SEVERITY WITHIN 1 MILE OF THE SCHOOL:	The one reported crash resulted in a non-fatal pedestrian injury. Figure 10 illustrates the location of the crash.
ADDITIONAL CRASH DATA CONSIDERATIONS:	N/A

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



Download: N:\Share\PROJECTS\202000-2020-223\_ODOT\_SRTS\_Asst\map3\_GIS\MXD\DOT\_SRTS\_PIP\_Maps.aprx Date Saved: 12/14/2022  
 Data sources: Oregon Spatial Data Library, Crash Analysis and Reporting Unit, ODOT

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



**Pedestrian Collisions**

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

**Bicyclist Collisions**

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

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

## Follow-Up Data Collection Plan

### Timeline

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

### Follow-Up Data Collection Process

METHOD	PLANNED AT THIS SITE?	TARGET SAMPLE SIZE	TARGET FIELD WORK DATE
STUDENT HAND TALLIES:	Yes	At least 2 classrooms per grade per school	Spring 2023 (assuming project completion)
CAREGIVER SURVEYS:	Yes	At least 30 caregivers per school	Spring 2023 (assuming project completion)
CAREGIVER FOCUS GROUPS:	Yes	4-10 caregivers	Spring 2023 (assuming project completion)
STAFF SURVEYS:	Yes	1-3 school staff and administration	Spring 2023 (assuming project completion)
COMMUNITY SURVEYS:	Yes	At least 20 community members	Spring 2023 (assuming project completion)
CRASH DATA:	TBD	N/A	(2023-2027 will likely be available in 2030)
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

Application did not include a Project Map.

## Appendix C. Access Analysis Detailed Methodology

### Purpose

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

### Data Sources

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

Name	Source
American Community Survey (ACS) Population Estimates	<a href="#">US Census Bureau</a>
Oregon School District Boundaries	<a href="#">Oregon Department of Education</a>
2017 Oregon Statewide Zoning Map	<a href="#">Oregon Department of Land Conservation and Development</a>

### 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 one-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:

<b>Residential Zone Group</b>	<b>Population Density Factor</b>
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.