BANNOCK
Transportation Planning
ORGANIZATION

214 East Center Street
Suite 70
P.O. Box 6129
Pocatello, Idaho 83205

POLICY BOARD REPRESENTATIVES

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Jeff Hough

CITY OF CHUBBUCK
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Kevin England

Council Member
Roger Hernandez,
Vice-Chair

CITY OF POCATELLO
Mayor
Brian Blad

Council Members
Linda Leeuwrik, Chair
Rick Cheatum

POCATELLO REGIONAL TRANSIT
Director
Skyler Beebe

IDAHO TRANSPORTATION DEPARTMENT
District Engineer
Todd Hubbard

Ex-Officio
Non-Voting Members:
Shoshone-Bannock Tribes
School District #25
Idaho State University

PLANNING DIRECTOR
Mori R. Byington

p 208-233-9322

www.bannockplanning.org

MEETING NOTICE AND AGENDA

Policy Board
BTPO Conference Room
Monday, February 3, 2025
11:30 am

1. **Consent Agenda (Action Item)**
   - A. **Approval of October 7, 2024, Minutes**
   - B. **Check Register and Receipts**

2. **Action Items**
   - A. **Left Turn Phase Mode Guidelines (Action Item)**
   - B. **Coordinated Public Transportation Human Service Plan (Action Item)**
   - C. **FY 2024 Unified Planning Work Progam Annual Report (Action Item)**
   - D. **FY 2025 Unified Planning Work Progam Amendment (Action Item)**
   - E. **FY 2025 – 2031 Transportation Improvement Program change and Amendment 1 (Action Item)**
   - F. **On-Call Engineering Agreement with DKS (Action Item**
   - G. **2025 Safety Performance Measures (Action Item)**
   - H. **Establishment of Membership Dues for FY 2026 (Action Item)**
   - I. **Election of Officers (Action Item)**

3. **Information Discussion Items**
   - A. **Executive Director Search Update**
   - B. **Transportation Improvement Program Administrative Amendments**

The next meeting is
March 3, 2025

Agenda Item #1A Policy Board Meeting Minutes from October 7, 2024

Meeting Date: February 3, 2025

MEETING AGENDA
Policy Board
Monday, October 7, 2024
11:30 a.m.

Members Attending:
Linda Leeuwrik – City of Pocatello
Skyler Beebe – Pocatello Regional Transit
Rick Cheatum – City of Pocatello
Brian Blad – City of Pocatello
Roger Hernandez – City of Chubbuck
Todd Hubbard – Idaho Transportation Department

Others Attending:
Mori Byington – BTPO

Members Not in Attendance:
Kevin England – City of Chubbuck
Jeff Hough – Bannock County Commissioner

Chair Leeuwrik called the meeting to order at 11:42 a.m.

Agenda Item 1 Consent Agenda
Roger Hernandez motioned to approve the consent agenda items A and B; Todd Hubbard seconded the motion. The motion passed unanimously.

Agenda Item #2A – Notice of Funding Opportunity STBG
Mori reviewed the STBG process in Idaho and explained that there is an opportunity to identify a new project for the Transportation Improvement Program. The 2050 Metropolitan Transportation Plan identifies two projects for medium and long-range funding. The TAC recommends a NOFO with a restriction of one project per agency. Each agency would determine its priority and submit it to BTPO. The ranking system was reviewed.
Todd Hubbard motioned to approve NOFO as published in the agenda*; Brian Blad seconded the motion. The motion passed unanimously.*

Agenda Item #2B – Notice of Funding Opportunity FTA 5310
Mori reviewed the FTA 5310 process in Idaho. The NOFO would be for FY 2026 and 2027, much sooner than the STBG timeline. No applications were submitted during last year's application cycle. *Roger Hernandez motioned to approve the NFO for 5310; Todd Hubbard seconded the motion. The motion passed unanimously.*

Agenda Item #3A – FY 2024 Transportation Improvement Program Amendments
Amendment 8 - Monte Vista to Pocatello Creek Road Pathway (KN23697) – Increase construction cost by $1,150,269 to $1,936,140. The increase includes $391,800 in Federal and $758,470 in local participation.

Linda Leeuwrik adjourned the meeting at 12:02 p.m.

Approved

Date:

By:_____
Linda Leeuwrik, Chair

Attested:
By:_____
Mori Byington, Planning Director

Agenda Item #1B: Check Register and Receipts

Meeting Date: February 3, 2025

Summary of Item:
Attached are the receipts and check register since the last Policy Board Meeting.

Table 1 Receipts

Date	Receipt	Received	From	Project	Explanation
10/2/2024	87365	$4,179.46	ITD	Consolidated Planning Grant	August 2024 Billing
10/12/2024	87366	$235.32	Mori Byington	Admin	Credit card Error
10/16/2024	87367	$10,435.20	U.S. DOT	Smart Grant	August 2024 Billing
10/23/2024	87368	$75,000.00	ITD	Signal Coordination	Annual Rate Maintenance FY 2025
10/30/2024	87369	$128,424.66	U.S. DOT	Smart Grant	September 2024 Billing
11/1/2024	87370	$15.75	PNG Media	TIP	Refund of late fee
11/5/2024	87371	$3,650.00	ITD	Consolidated Planning Grant	FY 2025 Annual Dues
11/8/2024	87372	$5,856.00	Bannock County	Consolidated Planning Grant	FY 2025 Annual Dues
11/15/2024	87373	$92,545.00	City of Pocatello	Consolidated Planning Grant Signal Coordination	FY 2025 Annual Dues for Pocatello and PRT Traffic Signal Coordination FY 2025
11/19/2024	87374	$256,056.60	U.S. DOT	Smart Grant	October 2024 Billing
12/4/2024	87375	$29,545.00	City of Chubbuck	Consolidated Planning Grant	FY 2025 Annual Dues Traffic Signal Coordination FY 2025

Date	Receipt	Received	From	Project	Explanation
				Signal Coordination	
12/20/2024	87376	$26,308.75	ITD	Consolidated Planning Grant	September Billing
12/27/2024	87377	$7,893,92	U.S. DOT	Smart Grant	November 2024 Billing
1/22/2025	87378	$113,774.49	U.S. DOT	Smart Grant	December 2024 Billing

Table 2 Check Detail September 23, 2024 to November 15, 2024

BANNOCK TRANSPORTATION PLANNING ORGANIZATION
Check Detail Report
September 23 - November 15, 2024

Date	Transaction type	Num	Name	Memo/Description	Project	Amount	Reoccuring
1100 Cash							
09/24/2024	Bill Payment (Check)	7373	Verizon	Data package	Modeling	$40.01	Y
09/24/2024	Bill Payment (Check)	7374	MioVision Technologies, Inc.	Scout Plus Device and One-year subscription	Modeling	$7,738.93	N
09/24/2024	Bill Payment (Check)	7375	Liberty Mutual Insurance	Business Inland Marine and Business Owner's Policies renewal	Admin	$2,347.00	N
09/30/2024	Payroll Check	7376	Mori .. Byington	Pay Period: 09/01/2024-09/30/2024 (Gross Pay $7,350.93)	Various	$4,733.80	Y
09/30/2024	Payroll Check	7377	Shiela D. Eriksen	Pay Period: 09/01/2024-09/30/2024 (Gross Pay $575.05)	Admin	$471.06	Y
10/01/2024	Expense		CenturyLink	ACH Payment LumenCenturyLink SPE ACH Payment LumenCenturyLink SPEEDPAY	Traffic Counts	$89.96	Y
10/02/2024	Bill Payment (Check)	7378	Western Systems, Inc.	12 SDLC Intercon Assy 6 POS W/SHT MT and 40 5 ft. SDLC Cables	Traffic Signal	$3,558.57	N
10/02/2024	Bill Payment (Check)	7379	J-U-B Engineers, Inc.	Aug 4-31, 2024 Professional services	SMART Grant	$2,141.30	Y
10/02/2024	Bill Payment (Check)	7380	Mission Square Retirement	September 2024 Retirement Contribution	Admin	$507.51	Y
10/02/2024	Bill Payment (Check)	7381	PERSI	September 2024 Retirement Contribution	Admin	$1,406.97	Y
10/02/2024	Bill Payment (Check)	7382	Idaho State Journal	Transportation Improvement Program and Metropolitan Transportation Plan Public Comment notices	TIP	$1,940.75	N

10/02/2024	Bill Payment (Check)	7383	Mori Byington	Per Diem and mileage to SLC, Utah 9/23-26/24 AMPO Annual Conference	Local Funds	$307.50	N
10/3/2024	Expense		Internal Revenue Service	941 Tax liability payment - September 2024 payroll	Admin	$2,040.13	Y
10/06/2024	Bill Payment (Check)	7384	Angle & Associates, LLC	6 Wavetronics Radar Based Vehicle Sensing Devices Complete Installation	SMART Grant	$71,279.36	N
10/06/2024	Bill Payment (Check)	7385	Altitude Signal, LLC	2 GRIDSMART processor units, Performance Plus Module, Bell Camera Kits, and project accessories	SMART Grant	$55,004.00	N
10/09/2024	Expense		Direct Communications	ACH Payment DIRECTCOM BILLPAY BI ACH Payment DIRECTCOM BILLPAY BILLPAY	Admin	$179.95	Y
10/13/2024	Bill Payment (Check)	7386	State Tax Commission	September 2024 payroll state tax withholding	Admin	$252.00	Y
10/13/2024	Bill Payment (Check)	7387	Business Phone Specialists	Oct - Dec 2024 phone maintenance agreement	Admin	$24.00	Y
10/13/2024	Bill Payment (Check)	7388	ELAN - Bank of Idaho	September 2024 credit card charges	Various	$1,999.79	Y
10/16/2024	Expense		Sparklight	ACH Payment sparklightbillpa WEB ACH Payment sparklightbillpa WEB PYMNT	Admin	$76.98	Y
10/17/2024	Expense		Idaho Power	ACH Payment IDAHO POWER CO. POWE ACH Payment IDAHO POWER CO. POWER BILL 800-488-6151	Traffic Counts	$4.20	Y
10/20/2024	Bill Payment (Check)	7389	SOUTHEAST IDAHO COUNCIL OF GOVERNMENTS	October 2024 rent/September 2024 utilities	Admin	$1,011.60	Y
10/20/2024	Bill Payment (Check)	7390	Idaho Department of Labor	3rd quarter (July - Sept 2024) state unemployment insurance	Admin	$31.41	Y
10/20/2024	Bill Payment (Check)	7391	System Tech	3 Vicon Fisheye Cameras	Traffic Signal	$3,572.28	N

10/20/2024	Bill Payment (Check)	7392	MioVision Technologies, Inc.	Terry and Memorial Drive traffic counts 9/3/2024	Traffic Counts	$1,058.18	N
10/27/2024	Bill Payment (Check)	7393	Verizon	Data package	Modeling	$40.01	Y
10/27/2024	Bill Payment (Check)	7394	Porters Office Products	Storage boxes and hanging file folders	Admin	$197.89	N
10/27/2024	Bill Payment (Check)	7395	J-U-B Engineers, Inc.	September 1-28, 2024, professional services	SMART Grant	$4,961.60	Y
10/27/2024	Bill Payment (Check)	7396	Deaton & Company, Chartered	FY 2023 professional audit and 990 tax report services	Admin	$5,728.13	N
10/29/2024	Expense		CenturyLink	ACH Payment LumenCenturyLink SPE ACH Payment LumenCenturyLink SPEEDPAY	Traffic Counts	$90.32	Y
10/31/2024	Payroll Check	7397	Mori .. Byington	Pay Period: 10/01/2024-10/31/2024 (Gross Pay $7,571.20)	Various	$4,906.58	Y
10/31/2024	Payroll Check	7398	Shiela D. Eriksen	Pay Period: 10/01/2024-10/31/2024 (Gross Pay $753.16)	Admin	$635.54	Y
10/31/2024	Bill Payment (Check)	7399	Angle & Associates, LLC	10 Wavetronics Radar Based Vehicle Sensing Devices Complete Installation	SMART Grant	$251,093.00	N
11/03/2024	Bill Payment (Check)	7400	Mission Square Retirement	October 2024 Retirement Contribution	Admin	$491.70	Y
11/03/2024	Bill Payment (Check)	7401	PERSI	October 2024 Retirement Contribution	Admin	$1,449.13	Y
11/03/2024	Bill Payment (Check)	7402	Idaho State Journal	Human Service Public Transportation Plan public notice comment period	Human Service	$525.00	N
11/04/2024	Expense		Internal Revenue Service	941 Tax liability payment - October 2024 payroll	Admin	$2,124.76	Y
11/10/2024	Bill Payment (Check)	7403	Western Systems, Inc.	4 AlphaCell batteries	Traffic Signal	$1,348.21	N
11/10/2024	Bill Payment (Check)	7404	State Tax Commission	October 2024 payroll state tax withholding	Admin	$259.00	Y
11/10/2024	Bill Payment (Check)	7405	ELAN - Bank of Idaho	October 2024 credit card charges	Various	$2,673.97	Y

11/10/2024	Bill Payment (Check)	7406	SOUTHEAST IDAHO COUNCIL OF GOVERNMENTS	November 2024 rent/October 2024 utilities	Admin	$975.46	Y
11/10/2024	Bill Payment (Check)	7407	Mori Byington	STBG Urban meeting in Meridian, ID 11-7-2024	Admin	$387.53	N
11/12/2024	Expense		Direct Communications	ACH Payment DIRECTCOM BILLPAY BI ACH Payment DIRECTCOM BILLPAY BILLPAY	Admin	$179.95	Y
11/17/2024	Bill Payment (Check)	7408	State Insurance Fund	Annual Workman's Compensation Insurance policy	Admin	$381.00	N
11/17/2024	Bill Payment (Check)	7409	Six Mile Engineering PA	Left Turn Phase Study June 29 - Sept 27, 2024 Professional services	Traffic Signal	$1,686.22	N

Bannock Transportation Planning Organization
Check Detail
November 16, 2024 - January 19, 2025

Date	Transaction Type	Num	Name	Memo/Description	Project	Amount	Recurring
1100 Cash	Bill Payment (Check)	7408	State Insurance Fund	FY 2024 Workman's Compensation Insurance	Admin	381.00	N
11/17/2024	Bill Payment (Check)	7409	Six Mile Engineering PA	June 29 - October 31, 2024 professional services Left Turn Study	Traffic Signal	1,686.22	N
11/17/2024	Expenditure	7410	Sparklight	ACH Payment sparklightbillpa WEB ACH Payment sparklightbillpa WEB PYMNT	Admin	76.98	Y
11/18/2024	Expenditure	7411	Idaho Power	ACH Payment IDAHO POWER CO. POWE ACH Payment IDAHO POWER CO. POWER BILL 800-488-6151	Traffic Counts	4.20	Y
11/18/2024	Bill Payment (Check)	7412	Verizon	Data package	Modeling	40.01	Y
11/23/2024	Bill Payment (Check)	7413	The Cincinnati Insurance Co.	Traffic Counter Van vehicle insurance	Traffic Counts	2,547.00	N
11/23/2024	Bill Payment (Check)	7415	United States Liability Insurance Co.	Liability Insurance coverage 12/11/24 - 12/11/25	Admin	861.00	N
11/23/2024	Bill Payment (Check)	7414	Institute of Transportation Engineers	2025 Annual Membership	Local	340.00	N
11/23/2024	Expenditure	7416	CenturyLink	ACH Payment LumenCenturyLink SPE ACH Payment LumenCenturyLink SPEEDPAY	Traffic Counts	91.30	Y
11/29/2024	Payroll Check	7417	Shiela D. Eriksen	Pay Period: 11/01/2024-11/30/2024 (Gross Pay - $897.03)	Admin	768.42	Y
11/30/2024	Payroll Check	7418	Mori .. Byington	Pay Period: 11/01/2024-11/30/2024 (Gross Pay - $7571.05)	Various	4,906.46	Y
11/30/2024	Bill Payment (Check)	7419	J-U-B Engineers, Inc.	September 29 - November 2, 2024 professional Services	SMART Grant	7,893.92	Y

11/30/2024	Bill Payment (Check)	7420	PERSI	November 2024 retirement contribution	Admin	1,449.10	Y
11/30/2024	Bill Payment (Check)	7421	Mission Square Retirement	November 2024 retirement contribution	Admin	491.71	Y
11/30/2024	Expenditure	7422	Internal Revenue Service	November 2024 941 tax liability	Admin	2146.68	Y
12/4/2024	Bill Payment (Check)	7423	SOUTHEAST IDAHO COUNCIL OF GOVERNMENTS	December 2024 Rent - November 2024 Utilities	Admin	975.67	Y
12/08/2024	Bill Payment (Check)	7424	State Tax Commission	November 2024 PR state withholding tax	Admin	259.00	Y
12/08/2024	Bill Payment (Check)	7425	System Tech	Repair of fiber at Poleline and Alameda	Traffic Signal	1,082.00	N
12/08/2024	Expenditure	7426	Direct Communications	ACH Payment DIRECTCOM BILLPAY BI ACH Payment DIRECTCOM BILLPAY BILLPAY	Admin	179.95	Y
12/09/2024	Bill Payment (Check)	7427	Laser Xpress of Idaho	On site computer repair	Admin	95.00	N
12/15/2024	Bill Payment (Check)	7428	ELAN - Bank of Idaho	November 2024 credit card charges	Various	797.09	Y
12/15/2024	Expenditure	7429	Sparklight	ACH Payment sparklightbillpa WEB ACH Payment sparklightbillpa WEB PYMNT	Admin	76.98	Y
12/17/2024	Expenditure	7430	Idaho Power	ACH Payment IDAHO POWER CO. POWE ACH Payment IDAHO POWER CO. POWER BILL 800-488-6151	Traffic Counts	4.20	Y
12/19/2024	Bill Payment (Check)	7431	Cascade Signal Corporation	Tesco 2KVA Inverter	Traffic Signal	1,875.00	N
12/21/2024	Bill Payment (Check)	7432	Peak Alarm Co., Inc.	December 2024 - February 2025 alarm monitoring	Admin	146.70	Y
12/21/2024	Bill Payment (Check)	7433	Verizon	Data package	Modeling	40.01	Y
12/21/2024	Bill Payment (Check)	7434	KAR-GOR, Inc dba CT Northwest	4 DERQ Edge Unit Packages; Project Management, Engineering and Configuration	SMART Grant	110,684.00	N
12/21/2024	Bill Payment (Check)	7435	J-U-B Engineers, Inc.	November 3 - 30, 2024 professional services	SMART Grant	3,090.40	Y
12/29/2024	Payroll Check	7436	Mori .. Byington	Pay Period: 12/01/2024-12/31/2024 (Gross Pay $7571.05)	Various	4,906.45	Y
12/31/2024	Payroll Check	7437	Shiela D. Eriksen	Pay Period: 12/01/2024-12/31/2024 (Gross pay $744.70)	Admin	627.72	Y
12/31/2024	Bill Payment (Check)	7438	PERSI	December 2024 payroll retirement contribution	Admin	1,449.10	Y
12/31/2024	Bill Payment (Check)	7439	Mission Square Retirement	December 2024 payroll retirement contribution	Admin	491.71	Y
12/31/2024	Expenditure		Internal Revenue Service	December 2024 941 tax liability	Admin	2123.44	Y
1/6/2025	Expenditure		Direct Communications	ACH Payment DIRECTCOM BILLPAY BI ACH Payment DIRECTCOM BILLPAY BILLPAY	Admin	179.95	Y
01/09/2025	Bill Payment (Check)		State Tax Commission	December 2024 payroll state tax withholding	Admin	259.00	Y
01/12/2025	Bill Payment (Check)		Business Phone Specialists	January - March 2025 phone maintenance agreement	Admin	24.00	Y
01/12/2025	Bill Payment (Check)		ELAN - Bank of Idaho	December 2024 credit card charges	Various	6,991.80	Y
01/12/2025	Bill Payment (Check)		SOUTHEAST IDAHO COUNCIL OF GOVERNMENTS	January 2025 Rent - December 2024 Utilities	Admin	987.42	Y
01/12/2025	Expenditure		Sparklight	ACH Payment sparklightbillpa WEB ACH Payment sparklightbillpa WEB PYMNT	Admin	76.98	Y
01/16/2025	Bill Payment (Check)		J-U-B Engineers, Inc.	December 1 - December 28, 2024 professional services	SMART Grant	8,596.01	Y
01/19/2025	Bill Payment (Check)		Caliper Corporation	Annual TransCAD Support 2/28/2025 - 2/28/2026	Modeling	1,800.00	N

01/19/2025	Bill Payment (Check)	Idaho Department of Labor	2024 4th quarter unemployment insurance (SUTA)	Admin	6.73	Y

Agenda Item 2A: Left-Turn Phase Mode Guidelines

Meeting Date: February 3, 2025

Summary of Item:

The Coordinated Traffic Control System Operation Committee has developed Left-Turn Phase Mode Guidelines. The Operation Committee has reviewed several intersections that have or are being proposed to implement a permissive left-turn phase. After reviewing the Idaho Transportation Department guidelines, the committee felt additional guidance was needed. Six Mile Engineering was hired to develop guidance the committee could use to review permissive left-turn phase operations.

The study identified three intersections to review using any proposed guidelines, they were:

- Yellowstone and Flandro
- Alameda and Warren
- Yellowstone and Maple

The operations committee recommends that the guidelines be approved. The guidelines will cover intersections within the BTPO planning area and are intended for use in engineering studies that evaluate left turns.

Left-turn Phase Mode Guideline

Prepared for:

Bannock Transportation Planning Organization Cooperative

Prepared by:

Six Mile Engineering

A DKS ASSOCIATES COMPANY

November 2024

Introduction

This document provides guidance for determining the appropriate left-turn phase mode for dedicated left-turn lanes at signalized intersections. It serves as a resource for engineering studies on new traffic signals, as well as for assessing existing signal phases.

This guideline was developed through the collaborative efforts of members from the Bannock Transportation Planning Organization (BTPO) Transportation Cooperative, which includes representatives from:

- Bannock Transportation Planning Organization (BTPO)
- Idaho Transportation Department (ITD), District 5
- City of Pocatello
- City of Chubbuck

This guideline augments Section 4D.17, "Signal Indications for Left-turn Movements", of the 2020 ITD Traffic Manual by providing additional clarifications and adding considerations not covered in the manual.

The study effort included a review of national publications, as well as guidance and policies from eight neighboring and other state DOTs, to inform the selection of left-turn phase modes. A summary of the research is included in the appendix.

Critical Evaluation Questions

There are two critical evaluation questions for the left-turn phase mode analysis:

1. From a safety perspective, can permissive left-turn movements be allowed on an approach?
2. Should some level of left-turn protection (e.g., protected-permissive mode) be provided for efficiency reasons?

If the answer to the first question is no, then there is no need to continue with the evaluation of the second question. Safety should be considered the number one priority, followed by mobility.

The first critical evaluation question should consider sight distance and, in the case of an existing intersection in operation, the crash history of permissive or protected-permissive left turns from local or regional data.

Definitions

Permissive Left Turn – An unprotected left turn that does not have a left-turn indication dedicated to left-turn vehicles. Opposing traffic has the right-of-way and permissive left turns must find gaps in oncoming traffic to complete their turn. Permissive left-turns typically have a steady circular green indication or a flashing yellow arrow indication.

Protected Left Turn – A left-turn with an exclusive left-turn phase that provides right-of-way. Protected left turns have a steady green arrow indication.

Protected-Permissive Left Turn – A left turn with a combination of protected and permissive phasing. A green arrow indicates a protected left turn, and a flashing yellow arrow indicates a permissive left turn. In the BTPO region, protected-permissive left turns are serviced by a four section signal head with a steady red arrow or ball, steady yellow arrow, flashing yellow arrow, and steady green arrow. These signal heads are commonly referred to as FYA (flashing yellow arrow) signal heads.

Red Before Ped – A signal controller option to hold the permissive portion of a protected-permissive left turn until the conflicting pedestrian signal has finished serving the pedestrian. This eliminates pedestrian-vehicle conflicts and improves pedestrian safety at signalized intersections with protected-permissive left turns. The protected portion of the left-turn phase is still served, and the permissive portion is only served if there is remaining time in the phase split after the conflicting walk + flashing don't walk intervals have terminated.

ATSPM – Automatic Traffic Signal Performance Measures. High-resolution data logging capability added to select signalized intersections. Relevant metrics for left-turn phase mode evaluations are 85th-percentile approach speed and Purdue split failures.

General Questions

What are the key factors that influence left-turn phase mode?

There are seven key factors, with two classified as safety factors and the remaining five encompassing geometrics, operations, and pedestrians:

1. Sight Distance (safety)
2. Correctable Left-turn Crashes (safety)
3. Turn Lanes and Intersection Geometry
4. Crossing Distance, Opposing Lanes and Speed
5. Critical Crossing Gaps
6. Pedestrian Considerations
7. Operations

How does this guide complement ITD's Traffic Manual guidance?

This guideline replaces Section 4D.17, "Signal Indications for Left-turn Movements" of the 2020 ITD Traffic Manual for all signalized intersections within the BTPO jurisdiction. It closely adheres to the ITD Traffic Manual while introducing additional criteria, including speed constraints and pedestrian guidelines, and offering more comprehensive detail on certain aspects. Figure 4D-1:

Left-turn Phasing Guide flow chart and supporting Table 1: Left-turn Related Crash Frequency in the ITD Traffic Manual are replaced by Figure 3 flow chart on page 9 and supporting Table 1 on page 10 in this guideline. Table 2: Minimum Sight Distance is not used and is replaced by AASHTO Green Book Intersection Sight Distance, Case F, Left Turn from the Major Road (see Key Factor #1 Sight Distance section on page 3).

What types of left turns require a left-turn phase mode evaluation?

This evaluation applies to proposed or existing intersections with single dedicated left-turn lanes. Dual left-turn lanes are always operated as protected-only, and a phase mode evaluation is not needed. However, for intersections that require dual left-turn movements for the design year, there may be an operational benefit to operating a single left turn as protected-permissive in the interim, requiring an evaluation.

How should the left-turn phase mode evaluation be documented?

If a permissive left-turn phase mode is desired, a comprehensive study should be conducted to ensure that the decision is well-founded according to the evaluation criteria in this guideline. If protected left-turn phase mode is selected, a study is not needed. However, if there is a desire to convert an existing protected left-turn phase to permissive, then a study is required.

If the assessment of the initial two factors – sight distance and crash data – concludes that protected-only left-turn operation is necessary for safety, this determination should be documented, and further evaluation of the remaining factors is unnecessary.

Can two opposing approaches have different left-turn phase modes?

Yes. For the purposes of maximizing mobility and efficiency, differing left-turn phase modes on opposing approaches should be considered.

Does the signalized corridor need to have left-turn phase consistency?

No. For the purposes of maximizing mobility and efficiency, the left-turn phase modes throughout a corridor do not need to be the same.

Key Factors

1. Sight Distance (safety)

What methodology is used to calculate sight distance for left turns?

All locations that allow permissive left-turn traffic should have sufficient sight distance to accommodate the left turn. The minimum sight distance is calculated using the methodology from AASHTO Green Book's *Intersection Sight Distance, Case F, Left Turn from the Major Road*. Sight distance is a function of the design speed of the opposing traffic, the number of lanes traversed, and gap times for design vehicle types.

The default design vehicle is a passenger vehicle; however, the land uses near the intersection should be considered. If a large amount of single-unit truck or heavy truck traffic is expected (or if traffic counts indicate these vehicles are frequent), the gap time should be increased according to AASHTO. Gap times listed in Table 9-16 increase 0.5 seconds for passenger cars and 0.7 seconds for single-unit and heavy trucks for each lane, including medians.

Sight distance should be checked for an oncoming vehicle in each opposing through lane and right-turn lane (if right-turn vehicles conflict with left-turn vehicles), and the gap times for each lane should be adjusted accordingly.

The ITD Traffic Manual sight distance table should not be used because it applies only to two-lane highways and does not account for the larger gap times needed for many urban traffic signals on multilane roadways. It also does not increase distances for single-unit and heavy truck design vehicles.

What design speed is used?

The 85th-percentile speed should be used to calculate sight distance. Use speed counts or ATSPM data if available. In the absence of field data, the 85th-percentile speed can be estimated by adding 7 mph to the posted speed, which is consistent with BTPO methods for estimating speed for the yellow clearance interval.

How is sight distance measured?

Sight distance measurement follows methods published by the Florida Department of Transportation Research Department (Radwan and Yan, 2006). As shown in Figure 1 on page 5, the driver's eye is 8 feet behind the near side stop bar and 3.5 feet from the centerline or median. The opposing left-turn lane is assumed to have a passenger vehicle present. The sight line extends from the driver's eye to an opposing left-turn vehicle positioned 2 feet from the opposing through lane line to the middle of the opposing through lane or right-turn lane. The available sight distance (SD_a) is the adjacent leg of the sight triangle. If there is more than one opposing through lane, measurements must be taken for each lane and the gap time increased to account for the additional crossing lanes.

Sight distance is typically taken from the driver's eye when the vehicle is positioned at the stop bar; however, at certain approaches where the most common turn location differs from the stop bar, it should be evaluated accordingly. The calculation should utilize the most restrictive vehicle position.

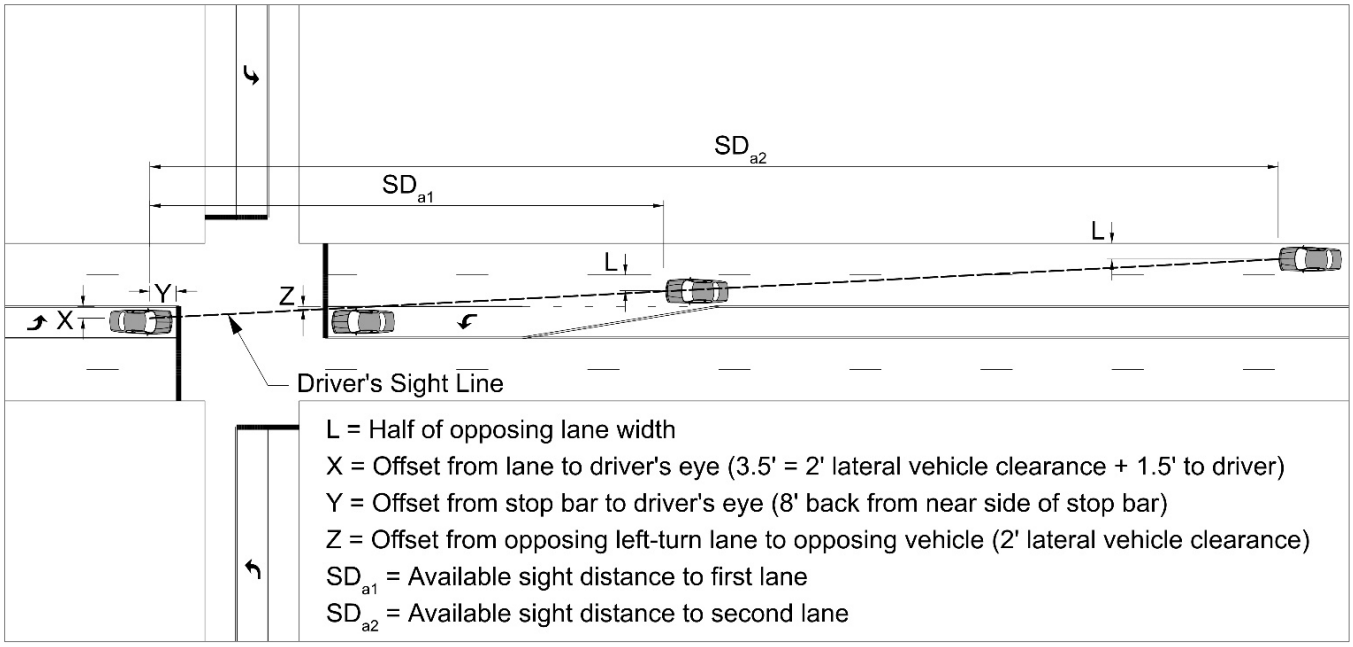


Figure 1. Available sight distance (SD_a) measurement (adapted from Figure 3-2 in Intersection Sight Distance for Unprotected Left-Turn Traffic by Radwan and Yan, 2006)

What can be used to measure sight distance?

For proposed intersections, design plans and models are typically used to calculate available sight distance. At existing intersections, the evaluation can use design plans or high-resolution aerials but should also include a site visit to determine if there are any additional visual obstructions.

2. Correctable Left-turn Crashes (safety)

What are the crash thresholds to trigger protected-only mode?

Where permissive or protected-permissive left turns exist at an existing traffic signal, use crash thresholds in Table 1 on page 10, which are unchanged from ITD's Traffic Manual. If the number of crashes exceeds these thresholds, increased phase mode protection is required, changing permissive to protected-permissive or protected-permissive to protected-only.

Evaluate at least one full year of the most recent crash data, though multiple years should be evaluated if available. Typically, a safety analysis involves evaluating five years of crash data.

What crashes are considered correctable left-turning crashes?

It is important to correctly isolate left-turn crashes that are potentially correctable with left-turn phase mode restrictions. These crashes include any left-turn crash with an opposing through or right-turn vehicle, pedestrian, or bicyclist. The key crash types are angle-turning and head-on turning. Single-vehicle crashes and crashes with animals or fixed objects do not apply.

To isolate applicable left-turn crashes provided in a spreadsheet, pivot tables are an efficient data processing tool. If used, the pivot tables should have the following fields (see Figure 2):

- First Harmful Event (row)
- Count of First Harmful Event (values)
- Filter crash data fields to isolate the following:
  - *Intersection Related* = "True"
  - *Direction of Travel* = filter to subject movement
  - *Street* = this filter may also be needed in addition to *Direction of Travel* to isolate the correct approach, especially when intersections are skewed and approaches are classified across multiple directions (e.g., Yellowstone and Flandro intersection).
  - *Driver Action* = evaluate both "Turning Left" and "Going Straight"

Count angle turning and head-on turning crashes, and summarize crashes by time of day to identify any periods with a concentration of crashes. Protection may only be needed during certain times to reduce the crash risk, such as peak periods when opposing traffic volumes are heavy and result in crashes.

intersection_related	TRUE
direction_of_travel	E
street1	Quinn Rd
driver_action	Turning Left

Row Labels	Count of first_harmful_event
Angle Turning	1
Head-On Turning	1
Grand Total	**2**

Figure 2. Crash data pivot table analysis example

3. Turn Lanes and Intersection Geometry

How should the number of left-turn lanes be considered?

Dual left-turn lanes will always operate protected, while single left-turn lanes are potential candidates for permissive or protected-permissive phasing. If single or dual left-turns cannot run concurrently due to path overlap, they must operate protected with lead-lag sequencing or be split phased.

4. Crossing Distance, Opposing Lanes and Speed

How should the crossing width be considered?

Crossing wide or skewed intersections poses a safety risk due to the heightened exposure of vehicles making permissive left turns. If the crossing distance is 150 feet or greater, protected-only phasing is required. This distance is measured from the midpoint of the lane, starting at the near side stop bar along the left-turn path, and ending at the far side of the intersection, which may extend to the farthest travel lane or curb/gutter.

How does speed factor into the evaluation?

ITD's Traffic Manual for left-turn phase mode guidance does not include an upper limit for opposing vehicle speeds to trigger protected-only phasing. However, due to safety concerns and the increased severity of angle crashes at higher speeds, the upper limit for permissive and protected-permissive phasing is set at 55 mph posted speed.

How should the opposing lanes be considered?

If there are four or more opposing lanes, the left turn should be protected-only. For intersections with three opposing lanes where the 85th-percentile speed or posted speed is 45 mph or greater, the left turn should be protected-only.

Are right-turn lanes considered in the number of opposing lanes?

Right-turn lanes may be considered in the total number of opposing lanes on a case-by-case basis. If there are expected or observed conflicts with turning traffic from right-turn lanes, such as incorrect lane assignment, they may be included. However, if right turns are minimal or typically enter the correct receiving lane (near-side), they may be excluded. For existing intersections, a site visit during peak congested periods is recommended to observe right-turn and left-turn conflicts and determine whether the right-turn lane should be included.

5. Critical Crossing Gaps

What threshold should trigger protected-permissive phasing?

The cross-product threshold to trigger protected-permissive phasing is 50,000 for any hour when there is one opposing lane and 100,000 when there are two or three opposing lanes. The cross-product is the product of the left-turn volume and opposing through plus right-turn volume.

What threshold should trigger protected-only phasing?

There is no upper cross-product threshold to trigger protected-only phasing in ITD's Traffic Manual left-turn phase mode guidance.

6. Pedestrian Considerations

What pedestrian activity should trigger protected-permissive or protected-only mode?

There is no minimum pedestrian volume that triggers more protection for the left turns to reduce conflicts. However, if pedestrian and left-turn crashes have occurred, protected-only mode should be enabled. In areas with heightened pedestrian traffic, adopting a protected-only mode during specific high-activity periods, such as morning and afternoon school start/end times or lunch breaks, should be considered as a safety measure.

What other measures can be implemented to avoid prohibiting permissive left turns?

To reduce or eliminate pedestrian and left-turn conflicts, Red Before Ped timing should be implemented. Red Before Ped timing holds the permissive portion of the left-turn phase on red until the walk and flashing don't walk (pedestrian clearance) have terminated. After the pedestrian clearance has terminated, the permissive left-turn can commence. If there are low pedestrian volumes, the disruption to vehicle efficiency is minimal, and the potential safety benefit is high.

Red Before Ped can only be applied where pedestrian movements are actuated (no rest in walk or fixed time operation) and locations with four-section FYA left-turn signal heads, or three section bimodal FYA left-turn heads. For this reason, new traffic signals should be installed with FYA heads for all left-turn movements that operate permissive and have a dedicated turn lane.

7. Operations

How should operations/delay be considered?

The ITD Traffic Manual vehicle delay values should be used. If there are fewer than three left-turn vehicles per cycle during peak hours the left turn should be permissive. If the left-turn delay is equal to or greater than 2 vehicle-hours and greater than 35 seconds per vehicle in the peak hours the left turn should be protected-permissive.

Significant left-turn delays and queues observed in the field may justify changing the phase mode. In some cases, a permissive or protected-only left turn may benefit from changing to protected-permissive, if all safety criteria are met. Field observations should be verified with ATSPM Purdue split failures (if available) during the peak and off-peak periods to confirm the split failures on other days that were not observed. Adjustments to signal timing should be considered as a first mitigation option to alleviate the split failures before changing to another phase mode.

Left-Turn Phase Mode Flow Chart

A flow chart of the key factors is shown in Figure 3 on page 9. The supporting crash threshold Table 1 is on page 10.

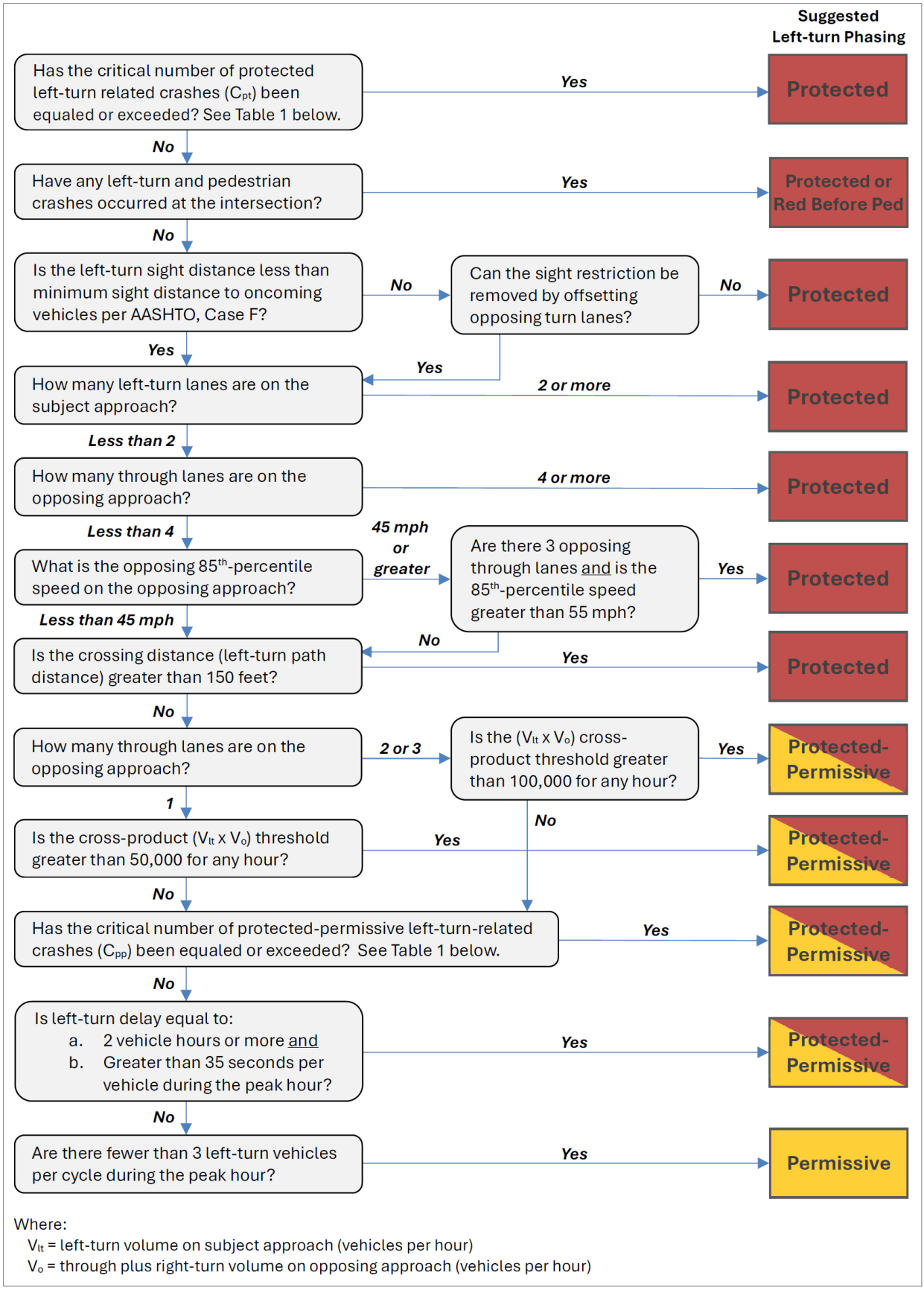


Figure 3. Left-turn phase mode flow chart

Table 1. Left-turn related crash frequency

Number of Left-turn Movements on Subject Road	Period During which Crashes are Considered (Years)	Critical Left-turn Related Crash Count (Crashes Per Period)	
		When Considering Protected-Only (C_{pt})	When Considering Protected-Permissive (C_{pp})
One	1	6	4
	2	11	6
	3	14	7

Source: ITD Traffic Manual April 2020, Section 4D-17

Example Intersection Evaluations

Three existing signalized intersections in the City of Pocatello were evaluated with the key factors in this guideline. The analysis summaries are attached in Appendix A.

Appendix A:
Example Intersection Evaluations

Left-Turn Phase Mode Analysis

Intersection: Alameda Road and Warren Drive

November 2024

Traffic Count Dates: 8/24/2023
Crash Data Range: 2018-2022

input value

Inputs	Direction / Approach Name	EB Alameda	WB Alameda	NB Warren	SB Warren	Comment
Left Turns	Current Left-Turn Phase Mode (none, permissive, protected-permissive, protected)	Pt+Pm	Pt+Pm	Perm	Perm	
	Left-Turn Head Type (FYA, Doghouse, Shared, Arrow)	FYA	FYA	Shared	Shared	
	Number of Left-Turn Lanes on Subject Approach	1	1	1	1	
	If there are dual lefts, can one lane potentially be striped-out in the interim to improve operations?	n/a	n/a	n/a	n/a	
	Crossing Distance, ft (left-turn path distance)	73	63	79	80	
Speed	Posted Speed of the Opposing Approach	35	30	15	20	No posted speeds on Warren, 15 & 20 mph assumed
	85th-percentile Speed of the Opposing Approach from ATSPM data (if available)	n/a	n/a	n/a	n/a	
	85th-percentile Speed of the Opposing Approach (ATSPM data or posted speed + 7mph)	42	37	22	27	
Opposing Approach	Number of Opposing Through Lanes	2	2	1	1	
	Number of Opposing Dedicated Right-Turn Lanes	0	0	0	0	
	Is the Right-Turn Channelized or Have a Dedicated Receiving Lane?	n/a	n/a	n/a	n/a	
Sight Distance	Maximum Number of Opposing Crossing Lanes for Gap Time (Through + Right + Median, not including channelized right-turn lanes)	2	2	1	1	
	Design Vehicle for Sight Distance (Car, SU, HV)	Car	Car	Car	Car	
	1st Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds	5.5	5.5	5.5	5.5	
	2nd Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds	6.0	6.0	n/a	n/a	
	3rd Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds	n/a	n/a	n/a	n/a	
	1st Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft	340	299	178	218	
	2nd Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft	370	326	n/a	n/a	
	3rd Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft	n/a	n/a	n/a	n/a	
	SD_{a1} = 1st Lane Available Horizontal Sight Distance at Stop Bar, ft	>1,000	689	227	311	
	SD_{a2} = 2nd Lane Available Horizontal Sight Distance at Stop Bar, ft	>1,000	>1,000	n/a	n/a	
	SD_{a3} = 3rd Lane Available Horizontal Sight Distance at Stop Bar, ft	n/a	n/a	n/a	n/a	
	SD_a = Available Horizontal Sight Distance at Common Turning Location, ft (if more restrictive than at stop bar)	n/a	n/a	n/a	n/a	
Crash History	Number of Left-Turn Crashes in 1 Year Period	1	1	0	0	
	Number of Left-Turn Crashes in 2 Year Period	1	2	0	0	
	Number of Left-Turn Crashes in 3 Year Period	4	2	0	0	
	Number of Left-Turn Crashes in 5 Year Period	9	3	0	0	
	Average Number of Left-Turn Crashes Per Year (if using five years of data)	1.8	0.6	0	0	
	Number of Pedestrian and Left-Turn Crashes in 5 Year Period (or any period)	0	0	0	0	
	Critical Left-Turn Crashes when Considering Protected-Permissive (C_{pp})					
	1 Year Period	4				
	2 Year Period	6				
	3 Year Period	7				
	Critical Left-Turn Crashes when Considering Protected-Only (C_{pt})					
	1 Year Period	6				
	2 Year Period	11				
	3 Year Period	14				

Left-Turn Phase Mode Analysis

Intersection: Alameda Road and Warren Drive

November 2024

Traffic Count Dates: 8/24/2023
Crash Data Range: 2018-2022

input value

Inputs	Direction / Approach Name	EB Alameda	WB Alameda	NB Warren	SB Warren	Comment
Volumes	V_{lt} = Left-Turn Volume, vph					
	AM Peak	13	52	11	20	
	Midday Peak	35	96	32	72	
	PM Peak	29	117	39	93	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
	V_o = Opposing Through + Right-Turn Volume, vph					
	AM Peak	670	459	10	9	
	Midday Peak	619	578	46	70	
	PM Peak	694	743	55	64	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
	V_o x V_{lt} = Cross Product of Opposing Through + Right-Turn Volume, vph					
	AM Peak	8,710	23,868	110	180	
	Midday Peak	21,665	55,488	1,472	5,040	
	PM Peak	20,126	86,931	2,145	5,952	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
Operations	Cycle Length, Seconds					
	AM Peak	60				
	Midday Peak	130				
	PM Peak	130				
	Weekend Peak	n/a				
	Number of Left-Turn Vehicles Per Cycle					
	AM Peak	0.2	0.9	0.2	0.3	
	Midday Peak	1.3	3.5	1.2	2.6	
	PM Peak	1.0	4.2	1.4	3.4	
	Weekend Peak	n/a	n/a	n/a	n/a	
	Left-Turn Delay, seconds per vehicle (from Synchro 12)					
	AM Peak	2.5	2	24.9	24.5	
	Midday Peak	3.6	3.6	51.8	55.5	
	PM Peak	4.0	3.7	51.4	54.6	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
	Left-Turn Delay, vehicle-hours					
	AM Peak	0.01	0.03	0.08	0.14	
	Midday Peak	0.04	0.10	0.46	1.11	
	PM Peak	0.03	0.12	0.56	1.41	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	

Left-Turn Phase Mode Analysis

Intersection: Alameda Road and Warren Drive

November 2024

Traffic Count Dates: 8/24/2023
Crash Data Range: 2018-2022

input value

Inputs	Direction / Approach Name	EB Alameda	WB Alameda	NB Warren	SB Warren	Comment
Key Factors Results						
1. Sight Distance (safety)						
Is there adequate available sight distance?		Yes	Yes	Yes	Yes	
If No, can the left-turns be offset to provide adequate sight distance?		n/a	n/a	n/a	n/a	
2. Correctable Left-Turn Crashes (safety)						
Equals or Exceeds protected-permissive (C_{pp}) crash threshold?		No	No	No	No	
Equals or Exceeds protected-only (C_{pt}) crash threshold?		No	No	No	No	
Have pedestrian and left-turn crashes occurred in the last 5 years?		No	No	No	No	
3. Turn Lanes and Intersection Geometry						
Are the subject left-turn lanes single left turn lanes?		Yes	Yes	Yes	Yes	
4. Crossing Distance, Opposing Lanes and Speed						
Does the crossing width (left-turn path) exceed 150 feet?		No	No	No	No	
Is the opposing approach posted speed greater than 55 mph?		No	No	No	No	
Are there more than four opposing lanes?		No	No	No	No	
If there are three opposing lanes, is the 85th-percentile speed 45 mph or greater?		No	No	No	No	
5. Critical Crossing Gaps						
Does the cross-product threshold exceed 50,000 for one opposing lane or 100,000 for two or three opposing lanes?		No	No	No	No	
6. Pedestrian Considerations						
Is Red Before Ped timing currently implemented for permissive or protected-permissive left-turns?		No	No	No	No	Requires changing NBL and SBL shared signal heads to FYA signal heads.
7. Operations						
Is the left-turn delay greater than 2 vehicle-hours and 35 seconds per vehicle?		No	No	Yes	Yes	
Are there fewer than 3 left-turn vehicles per cycle?		Yes	No	Yes	No	

Conclusions

EB Current protected-permissive left-turn phase mode can remain. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-only. No other key factors suggest considering protected-only phasing. The critical crossing gaps and operations key factors suggest that the volumes and delay are low enough to consider permissive-only phasing.

WB Current protected-permissive left-turn phase mode can remain. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-only. No other key factors suggest considering protected-only phasing.

NB Based on operations key factor, protected-permissive operation should be considered. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-only.

SB Current permissive left-turn phase mode can remain. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-permissive. No other key factors suggest considering protected-permissive or protected-only phasing.

All Red Before Ped operation is recommended for pedestrian safety. The shared signal heads for the NBL and SBL require changing to FYA signal heads and protected-permissive operation to enable this function at the entire intersection.

Sight Distance Measurements

Alameda Road and Warren Drive

November 2024

1st Lane

2nd Lane (sight line intersects >1,000')

Alameda Rd

1st Lane

Southbound Driver's Eye (typical)

227'

>1,000'

689'

Warren Dr

311'

Southbound Opposing Vehicle (2' Lateral Vehicle Clearance, typical)

2nd Lane (sight line does not intersect)

1st Lane (sight line intersects >1,000')

1st Lane

Google Earth

Image © 2024 Airbus

N

200 ft

Left-Turn Phase Mode Analysis

Intersection: Yellowstone Avenue and Flandro Drive

November 2024

Traffic Count Dates: 8/22/23

Crash Data Range: 2018-2022

input value

Inputs		Direction	EB	WB	NB	SB	Comment
		Approach Name	Costco	Flandro	Yellowstone	Yellowstone	
Left Turns	Current Left-Turn Phase Mode (none, permissive, protected-permissive, protected)		Prot	Prot	Pt+Pm	Pt+Pm	Only analysis of NB and SB left turns is needed because EB and WB are dual left-turns.
	Left-Turn Head Type (FYA, Doghouse, Shared, Arrow)		Arrow	Arrow	FYA	FYA	
	Number of Left-Turn Lanes on Subject Approach		2	2	1	1	
	If there are dual lefts, can one lane potentially be striped-out in the interim to improve operations?		No	No	n/a	n/a	
	Crossing Distance, ft (left-turn path distance)				109	99	
Speed	Posted Speed of the Opposing Approach				35	35	
	85th-percentile Speed of the Opposing Approach from ATSPM data (if available)				n/a	n/a	
	85th-percentile Speed of the Opposing Approach (ATSPM data or posted speed + 7mph)				42	42	
Opposing Approach	Number of Opposing Through Lanes				2	2	
	Number of Opposing Dedicated Right-Turn Lanes				1	1	
	Is the Right-Turn Channelized or Have a Dedicated Receiving Lane?				No	No	North approach has width for two receiving lanes and the NBR could have a dedicated receiving lane if the north approach were repainted.
Sight Distance	Maximum Number of Opposing Crossing Lanes for Gap Time (Through + Right + Median, not including channelized right-turn lanes)				3	3	
	Design Vehicle for Sight Distance (Car, SU, HV)				Car	Car	
	1st Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds				5.5	5.5	
	2nd Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds				6.0	6.0	
	3rd Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds				6.5	6.5	
	1st Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft				340	340	
	2nd Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft				370	370	
	3rd Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft				401	401	
	SD_{a1} = 1st Lane Available Horizontal Sight Distance at Stop Bar, ft				356	190	Available sight distance generally increases for the 2nd and 3rd lanes but decreases for the NBL due to roadway curvature and occlusions caused by roadside elements such as trees and light poles.
	SD_{a2} = 2nd Lane Available Horizontal Sight Distance at Stop Bar, ft				322	229	
	SD_{a3} = 3rd Lane Available Horizontal Sight Distance at Stop Bar, ft				278	264	
	SD_a = Available Horizontal Sight Distance at Common Turning Location, ft (if more restrictive than at stop bar)				n/a	n/a	
Crash History	Number of Left-Turn Crashes in 1 Year Period				1	0	
	Number of Left-Turn Crashes in 2 Year Period				4	1	
	Number of Left-Turn Crashes in 3 Year Period				9	2	
	Number of Left-Turn Crashes in 5 Year Period				21	4	
	Average Number of Left-Turn Crashes Per Year (if using five years of data)				4.2	0.8	
	Number of Pedestrian and Left-Turn Crashes in 5 Year Period (or any period)				0	0	
	Critical Left-Turn Crashes when Considering Protected-Permissive (C_{pp})						
	1 Year Period		4				
	2 Year Period		6				
	3 Year Period		7				
	Critical Left-Turn Crashes when Considering Protected-Only (C_{pt})						
	1 Year Period		6				
	2 Year Period		11				
	3 Year Period		14				

Left-Turn Phase Mode Analysis

Intersection: Yellowstone Avenue and Flandro Drive

November 2024

Traffic Count Dates: 8/22/23

Crash Data Range: 2018-2022

input value

Inputs		Direction	EB	WB	NB	SB	Comment
		Approach Name	Costco	Flandro	Yellowstone	Yellowstone	
Volumes	V_{lt} = Left-Turn Volume, vph						
	AM Peak				148	104	
	Midday Peak				187	176	
	PM Peak				163	227	
	Weekend Peak (if larger than weekday peaks)				n/a	n/a	
	V_o = Opposing Through + Right-Turn Volume, vph						
	AM Peak				403	829	
	Midday Peak				693	1,057	
	PM Peak				736	1,182	
	Weekend Peak (if larger than weekday peaks)				n/a	n/a	
	V_o x V_{lt} = Cross Product of Opposing Through + Right-Turn Volume, vph						
	AM Peak				59,644	86,216	
	Midday Peak				129,591	186,032	
	PM Peak				119,968	268,314	
	Weekend Peak (if larger than weekday peaks)				n/a	n/a	
Operations	Cycle Length, Seconds						
	AM Peak		100				Operates free, assumed cycle length
	Midday Peak		120				Operates free, assumed cycle length
	PM Peak		130				Operates free, assumed cycle length
	Weekend Peak		n/a				
	Number of Left-Turn Vehicles Per Cycle						
	AM Peak				4.1	2.9	
	Midday Peak				6.2	5.9	
	PM Peak				5.9	8.2	
	Weekend Peak				n/a	n/a	
	Left-Turn Delay, seconds per vehicle (from Synchro 12)						
	AM Peak				11.1	10.6	
	Midday Peak				15.0	14.5	
	PM Peak				15.2	16.0	
	Weekend Peak (if larger than weekday peaks)				n/a	n/a	
	Left-Turn Delay, vehicle-hours						
	AM Peak				0.46	0.31	
	Midday Peak				0.78	0.71	
	PM Peak				0.69	1.01	
	Weekend Peak (if larger than weekday peaks)				n/a	n/a	

Left-Turn Phase Mode Analysis

Intersection: Yellowstone Avenue and Flandro Drive

November 2024

Traffic Count Dates: 8/22/23
Crash Data Range: 2018-2022

input value

Inputs	Direction / Approach Name	EB Costco	WB Flandro	NB Yellowstone	SB Yellowstone	Comment
Key Factors Results						
1. Sight Distance (safety)						
Is there adequate available sight distance?				No	No	There is not enough width to offset the turn lanes and maintain 11' opposing lanes
If No, can the left-turns be offset to provide adequate sight distance?				No	No	
2. Correctable Left-Turn Crashes (safety)						
Equals or Exceeds protected-permissive (C_{pp}) crash threshold?				Yes	No	
Equals or Exceeds protected-only (C_{pt}) crash threshold?				No	No	
Have pedestrian and left-turn crashes occurred in the last 5 years?				No	No	
3. Turn Lanes and Intersection Geometry						
Are the subject left-turn lanes single left turn lanes?				Yes	Yes	
4. Crossing Distance, Opposing Lanes and Speed						
Does the crossing width (left-turn path) exceed 150 feet?				No	No	
Is the opposing approach posted speed greater than 55 mph?				No	No	
Are there more than four opposing lanes?				No	No	
If there are three opposing lanes, is the 85th-percentile speed 45 mph or greater?				No	No	
5. Critical Crossing Gaps						
Does the cross-product threshold exceed 50,000 for one opposing lane or 100,000 for two or three opposing lanes?				Yes	Yes	
6. Pedestrian Considerations						
Is Red Before Ped timing currently implemented for permissive or protected-permissive left-turns?				No	No	
7. Operations						
Is the left-turn delay greater than 2 vehicle-hours and 35 seconds per vehicle?				No	No	
Are there fewer than 3 left-turn vehicles per cycle?				No	No	

Conclusions

EB EB left-turn is currently protected dual lefts and no analysis was conducted.

WB WB left-turn is currently protected dual lefts and no analysis was conducted.

NB The NBL is not meeting the sight distance requirement and exceeds the protected-permissive crash threshold. This left-turn should be changed to protected-only phasing.

SB The SBL is not meeting the sight distance requirement, and should be changed to protected-only phasing. There is not enough width to offset the turn lane to increase sight distance while maintaining 11' opposing lanes. The north approach has width for two receiving lanes and the NBR could have a dedicated receiving lane if the north approach were repainted, which would reduce the required sight distance; however, the available sight distance would still be lower than the required sight distance.

NB/SB If the NB and SB left-turns are not changed to protected-only operation, Red Before Ped operation should be implemented for pedestrian safety.

Sight Distance Measurements

Yellowstone Avenue and Flandro Drive

November 2024

1st Lane

2nd Lane

3rd Lane

Yellowstone Ave

Driver's Eye

Assumed 3.5' offset from face of curb to sight line

356'

322'

278'

190'

229'

264'

Flandro Dr

Driver's Eye

Opposing Vehichle

1st Lane

2nd Lane

3rd Lane

Left-Turn Phase Mode Analysis

Intersection: Yellowstone Avenue and Maple Street

November 2024

Traffic Count Dates: 9/17/2019
Crash Data Range: 2018-2022

input value

Inputs		Direction	EB	WB	NB	SB	Comment
		Approach Name	Maple	Maple	Yellowstone	Yellowstone	
Left Turns	Current Left-Turn Phase Mode (none, permissive, protected-permissive, protected)		Perm	Perm	Pt+Pm	Pt+Pm	
	Left-Turn Head Type (FYA, Doghouse, Shared, Arrow)		Shared	Shared	FYA	FYA	
	Number of Left-Turn Lanes on Subject Approach		1	1	1	1	
	If there are dual lefts, can one lane potentially be striped-out in the interim to improve operations?		n/a	n/a	n/a	n/a	
	Crossing Distance, ft (left-turn path distance)		81	73	72	72	
Speed	Posted Speed of the Opposing Approach		30	30	35	35	
	85th-percentile Speed of the Opposing Approach from ATSPM data (if available)		n/a	n/a	n/a	n/a	
	85th-percentile Speed of the Opposing Approach (ATSPM data or posted speed + 7mph)		37	37	42	42	
Opposing Approach	Number of Opposing Through Lanes		1	1	2	2	
	Number of Opposing Dedicated Right-Turn Lanes		0	0	0	0	
	Is the Right-Turn Channelized or Have a Dedicated Receiving Lane?		n/a	n/a	n/a	n/a	
Sight Distance	Maximum Number of Opposing Crossing Lanes for Gap Time (Through + Right + Median, not including channelized right-turn lanes)		1	1	2	2	
	Design Vehicle for Sight Distance (Car, SU, HV)		Car	Car	Car	Car	
	1st Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds		5.5	5.5	5.5	5.5	
	2nd Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds		n/a	n/a	6.0	6.0	
	3rd Lane - Gap Time per AASHTO, Case F - Passenger Car, seconds		n/a	n/a	n/a	n/a	
	1st Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft		299	299	340	340	
	2nd Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft		n/a	n/a	370	370	
	3rd Lane - Minimum Sight Distance per AASHTO, Case F - Passenger Car, ft		n/a	n/a	n/a	n/a	
	SD_{a1} = 1st Lane Available Horizontal Sight Distance at Stop Bar, ft		891	848	>1,000	>1,000	
	SD_{a2} = 2nd Lane Available Horizontal Sight Distance at Stop Bar, ft		n/a	n/a	>1,000	>1,000	
	SD_{a3} = 3rd Lane Available Horizontal Sight Distance at Stop Bar, ft		n/a	n/a	n/a	n/a	
	SD_a = Available Horizontal Sight Distance at Common Turning Location, ft (if more restrictive than at stop bar)		n/a	n/a	n/a	n/a	
Crash History	Number of Left-Turn Crashes in 1 Year Period		0	0	1	2	
	Number of Left-Turn Crashes in 2 Year Period		0	0	1	2	
	Number of Left-Turn Crashes in 3 Year Period		1	0	1	3	
	Number of Left-Turn Crashes in 5 Year Period		1	0	1	4	
	Average Number of Left-Turn Crashes Per Year (if using five years of data)		0.2	0	0.2	0.8	
	Number of Pedestrian and Left-Turn Crashes in 5 Year Period (or any period)		1	0	0	0	
	Critical Left-Turn Crashes when Considering Protected-Permissive (C_{pp})						
	1 Year Period		4				
	2 Year Period		6				
	3 Year Period		7				
	Critical Left-Turn Crashes when Considering Protected-Only (C_{pt})						
	1 Year Period		6				
	2 Year Period		11				
	3 Year Period		14				

Left-Turn Phase Mode Analysis

Intersection: Yellowstone Avenue and Maple Street

November 2024

Traffic Count Dates: 9/17/2019
Crash Data Range: 2018-2022

input value

Inputs	Direction / Approach Name	EB Maple	WB Maple	NB Yellowstone	SB Yellowstone	Comment
Volumes	V_{lt} = Left-Turn Volume, vph					
	AM Peak	48	11	25	23	
	Midday Peak	60	30	31	36	
	PM Peak	79	30	32	49	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
	V_o = Opposing Through + Right-Turn Volume, vph					
	AM Peak	55	50	596	714	
	Midday Peak	72	69	846	901	
	PM Peak	101	83	903	1,066	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
	V_o x V_{lt} = Cross Product of Opposing Through + Right-Turn Volume, vph					
	AM Peak	2,640	550	14,900	16,422	
	Midday Peak	4,320	2,070	26,226	32,436	
	PM Peak	7,979	2,490	28,896	52,234	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
Operations	Cycle Length, Seconds					
	AM Peak	100				Operates free, assumed cycle length
	Midday Peak	120				Operates free, assumed cycle length
	PM Peak	120				
	Weekend Peak	n/a				
	Number of Left-Turn Vehicles Per Cycle					
	AM Peak	1.3	0.3	0.7	0.6	
	Midday Peak	2.0	1.0	1.0	1.2	
	PM Peak	2.6	1.0	1.1	1.6	
	Weekend Peak	n/a	n/a	n/a	n/a	
	Left-Turn Delay, seconds per vehicle (from Synchro 12)					
	AM Peak	45.6	40.8	12.3	8.7	
	Midday Peak	51.8	50.0	10.9	7.7	
	PM Peak	51.0	47.2	11.7	11.9	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	
	Left-Turn Delay, vehicle-hours					
	AM Peak	0.61	0.12	0.09	0.06	
	Midday Peak	0.86	0.42	0.09	0.08	
	PM Peak	1.12	0.39	0.10	0.16	
	Weekend Peak (if larger than weekday peaks)	n/a	n/a	n/a	n/a	

Left-Turn Phase Mode Analysis

Intersection: Yellowstone Avenue and Maple Street

November 2024

Traffic Count Dates: 9/17/2019
Crash Data Range: 2018-2022

input value

Inputs	Direction / Approach Name	EB Maple	WB Maple	NB Yellowstone	SB Yellowstone	Comment
Key Factors Results						
1. Sight Distance (safety)						
Is there adequate available sight distance?		Yes	Yes	Yes	Yes	
If No, can the left-turns be offset to provide adequate sight distance?		n/a	n/a	n/a	n/a	
2. Correctable Left-Turn Crashes (safety)						
Equals or Exceeds protected-permissive (C_{pp}) crash threshold?		No	No	No	No	
Equals or Exceeds protected-only (C_{pt}) crash threshold?		No	No	No	No	
Have pedestrian and left-turn crashes occurred in the last 5 years?		Yes	No	No	No	
3. Turn Lanes and Intersection Geometry						
Are the subject left-turn lanes single left turn lanes?		Yes	Yes	Yes	Yes	
4. Crossing Distance, Opposing Lanes and Speed						
Does the crossing width (left-turn path) exceed 150 feet?		No	No	No	No	
Is the opposing approach posted speed greater than 55 mph?		No	No	No	No	
Are there more than four opposing lanes?		No	No	No	No	
If there are three opposing lanes, is the 85th-percentile speed 45 mph or greater?		No	No	No	No	
5. Critical Crossing Gaps						
Does the cross-product threshold exceed 50,000 for one opposing lane or 100,000 for two or three opposing lanes?		No	No	No	No	
6. Pedestrian Considerations						
Is Red Before Ped timing currently implemented for permissive or protected-permissive left-turns?		No	No	No	No	Requires changing EBL and WBL shared signal heads to FYA signal heads.
7. Operations						
Is the left-turn delay greater than 2 vehicle-hours and 35 seconds per vehicle?		No	No	No	No	
Are there fewer than 3 left-turn vehicles per cycle?		Yes	Yes	Yes	Yes	

Conclusions

EB Left-turn phase mode should be updated to protected-only phasing due to pedestrian crash history until Red Before Ped operation in enabled. Once enabled, current permissive phase mode can be reimplemented. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-permissive or protected-only.

WB Current permissive left-turn phase mode can remain. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-permissive. No other key factors suggest considering protected-permissive or protected-only phasing.

NB Current protected-permissive left-turn phase mode can remain. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-only. No other key factors suggest considering protected-only phasing. The critical crossing gaps and operations key factors suggest that the volumes and delay are low enough to consider permissive-only phasing.

SB Current protected-permissive left-turn phase mode can remain. Available sight distance exceeds the requirement and crash history does not exceed threshold for protected-only. No other key factors suggest considering protected-only phasing. The critical crossing gaps and operations key factors suggest that the volumes and delay are low enough to consider permissive-only phasing.

All Red Before Ped operation is recommended for pedestrian safety. The shared signal heads for the EBL and WBL require changing to FYA signal heads and protected-permissive operation to enable this function at the entire intersection.

Sight Distance Measurements
Yellowstone Avenue and Maple Street
November 2024

1st Lane (sight line intersects >1,000')

2nd Lane (sight line intersects >1,000')

>1,000'

>1,000'

Yellowstone Ave

Southbound Driver's Eye (typical)

Maple St

848'

891'

1st Lane

1st Lane

Southbound Opposing Vehicle (2' Lateral Vehicle Clearance, typical)

>1,000'

>1,000'

1st Lane (sight line does not intersect)

2nd Lane (sight line does not intersect)

Google Earth

Image © 2024 Airbus

N

400 ft

Appendix B:
Literature Review

Appendix B:
Left Turn Phase Mode Study
Literature Review and State-of-Practice

Prepared for:

Bannock Transportation Planning Organization Cooperative

Prepared by:

Six Mile Engineering

February 2024

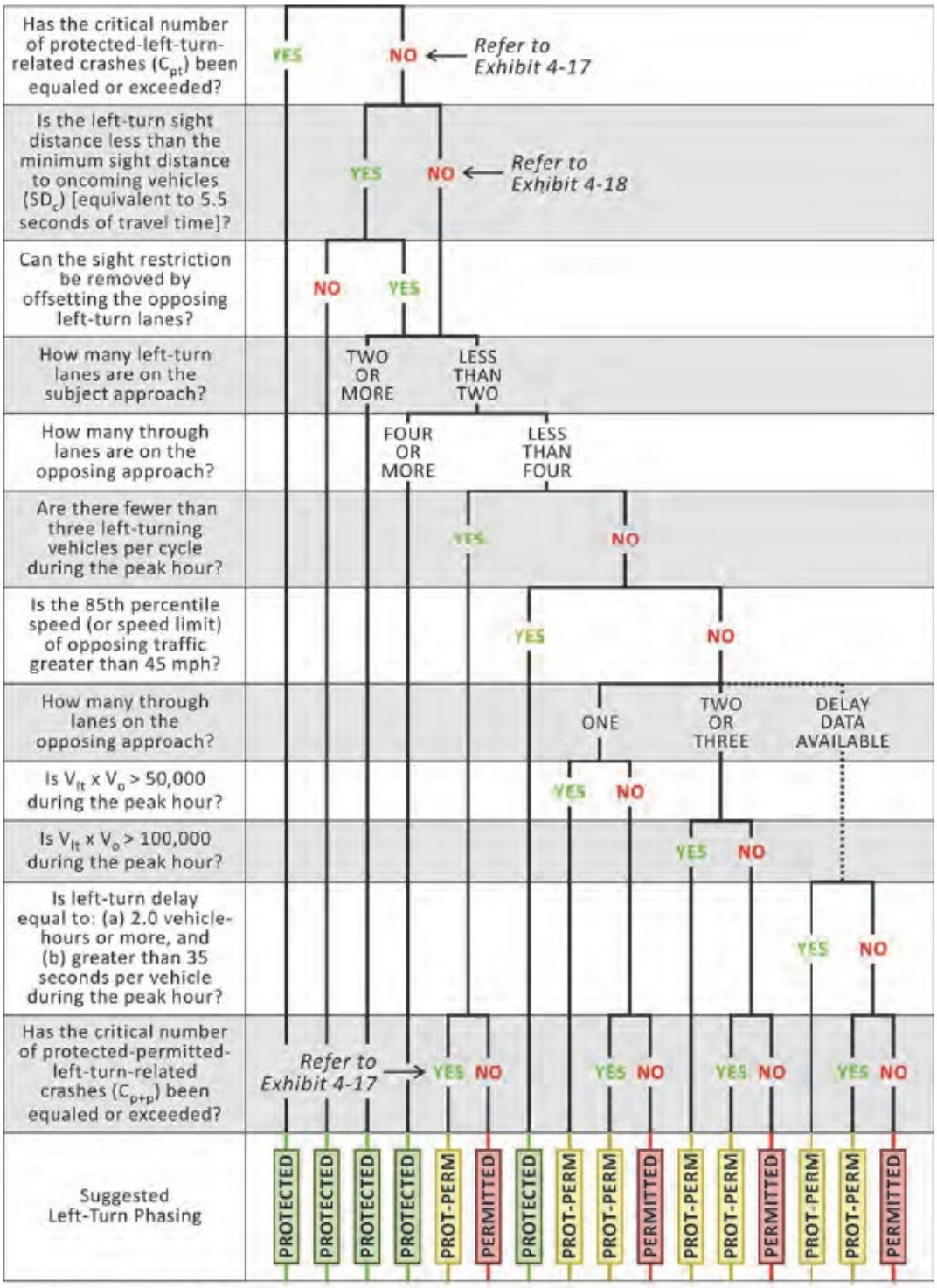
1. Introduction

This document summarizes the results of a limited literature review of left-turn phase mode national publications and state guidance. Many of the guidelines available have overlapping methodologies, citing the same general considerations when determining left turn phase type. The following sections describe the varying guidelines or publications and their recommendations or process when selecting left-turn phasing type.

2. Summary of Select National Publications

NCHRP Report 812: Signal Timing Manual

NCHRP Report 812 was published in 2015 and provides comprehensive guidance on the timing and operation of left-turn phases at signalized intersections. It discusses various types of left-turn phases, including protected-permissive, protected-only, permissive-only, and split-phasing, and offers recommendations for selecting the appropriate type based on intersection characteristics and traffic conditions that relate to the operational or safety benefits at the intersection. Those factors include left-turn and opposing through traffic volumes, number of opposing through lanes, cycle length, speed of opposing traffic, sight distance, and crash history. NCHRP Report 812 developed a flow chart, shown in Figure 1 on page 2, for these factors to help guide the selection of left-turn phasing and recommends being used as a separate evaluation for each left-turn movement on the subject road. Several state DOT's have used this flow chart as a starting point for their guidelines with and without modifications.



V_{lt} = Left-turn volume on subject approach (vehicles per hour)
V_o = Through plus right-turn volume on approach opposing subject left-turn movement (veh per hour)
Prot-Perm = Protected-Permitted (Desirable) or Protected

Figure 1. NCHRP Report 812: Signal Timing Manual – Exhibit 4-16 Left-Turn Phasing Guidelines

NCHRP Web-Only Document 284: Decision Making Guide for Traffic Signal Phasing
This web document recommends a two-step process for selecting protected-only versus protected-permissive left turn phasing:

1. Determine if permissive left turns can be allowed for safety reasons.
2. If so, determine if protected left turns are needed for operational reasons.

It states that if protected-only phasing is used when not needed it can cause the intersection to operate less efficiently by not allowing drivers to turn left in available gaps and taking green time from other movements. For step one, the safety impacts should consider the following factors: sight distance, lane configuration, and crash history. For step two, a gap analysis and/or delay analysis should be conducted to determine if protected-permissive phasing should be considered for operational reasons.

FHWA Signalized intersections: Informational Guide
This guide cites the operational benefits and disadvantages of protected-permissive phasing.

The benefits include:

- Average delay per left-turn vehicle is reduced.
- Protected green arrow time is reduced.
- There is potential to omit a protected left-turn phase.
- Arterial progression can be improved.

The disadvantages include:

- The permissive phase increases the potential for vehicle-vehicle and vehicle-pedestrian conflicts.

The left-turn phasing selection considerations in the guide relate to traffic volumes (left-turn and left/opposing through cross product), opposing traffic speed, left-turn crashes, number of opposing lanes, multi-left-turn lanes, sight distance, lead-lag sequencing, and delay.

FHWA and Texas Transportation Institute: Traffic Signal Operations Handbook, Second Edition
The guidelines in this document use a modified version of the NCHRP Report 812 flow chart for selecting left-turn type phasing, citing the following key factors: left-turn and opposing through traffic volumes, number of opposing through lanes, cycle length, speed of opposing traffic, sight distance, and crash history. In addition to these factors, they give pedestrian safety-based guidelines when determining left-turn phase mode. The guidelines include a pedestrian safety worksheet which requires collecting data related to vehicle and pedestrian volumes and vehicle-pedestrian crash data. The pedestrian safety worksheet calculates the cross product of vehicle

and pedestrian volumes and plots on the graphs shown in Figure 2 to aid in protected versus protected-permissive phase selection.

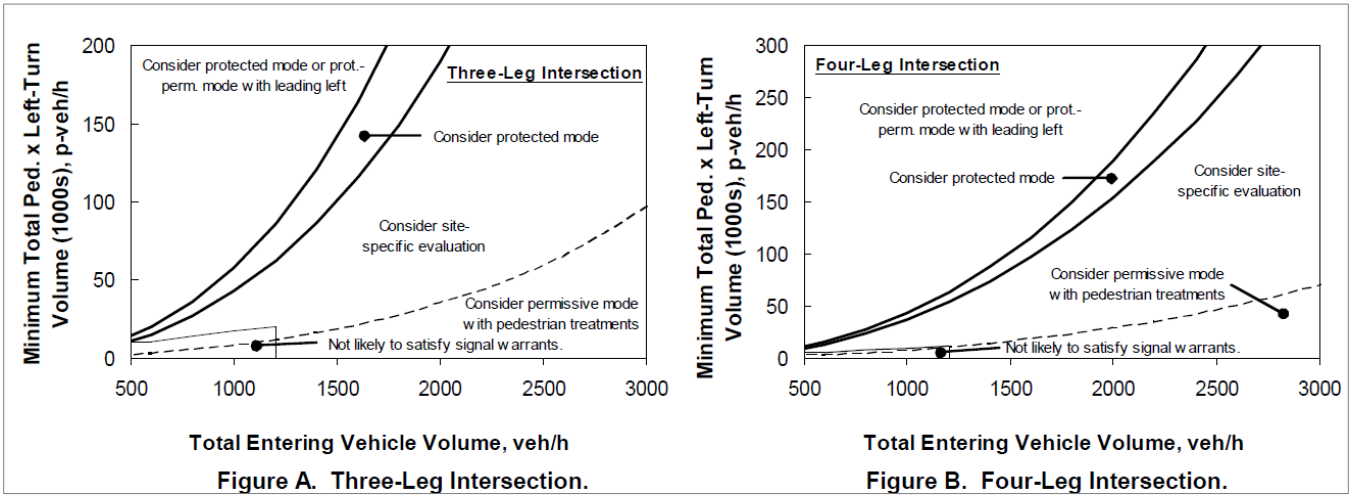


Figure 2. Pedestrian and vehicle volume criteria for phase mode

For crash history, if there are four or more vehicle-pedestrian related crashes within a three-year period, protected-only is recommended.

FHWA Safety Evaluation of Protected Left-Turn Phasing and Leading Pedestrian Intervals on Pedestrian Safety

This study investigated the safety effects of changing the phasing type from protected-permissive phasing to protected-only and implementing a leading pedestrian interval (LPI). With an LPI the pedestrians are given the right-of-way before the adjacent through and conflicting permissive left-turn vehicle phases (typically 3 to 7 seconds) to help provide pedestrians a stronger presence and more visibility in the crosswalk before vehicles are given the right-of-way. The results showed that implementing LPI was a more effective way to improve safety than changing the phase mode to protected-only, reducing vehicle-pedestrian crashes by 13 percent. The protected-only phasing did not have a significant benefit to vehicle-pedestrian crashes but had potential to show a benefit when pedestrian volumes were over 5,500 a day. However, protected-only reduced vehicle-vehicle injury crashes by 5 percent.

3. Summary of Select State Guidance – State-of-Practice

Idaho Transportation Department

In ITD's Traffic Manual: Idaho Supplementary Guidance to the MUTCD from April 2020, Section 4D.17 has guidance on signal indications for left-turn movements. The guidance has a modified version of the NCHRP Report 812 flow chart (shown in Figure 3 and Figure 4 on pages 5 and 6) to select the left-turn phase mode. The flow chart varies from NCHRP Report 812 by removing the opposing traffic speed criteria. ITD's Traffic Manual guidance also states, "When implementing permitted left-turn phasing in conjunction with the pedestrian phase of the same movement,

consider the use of a leading pedestrian interval in MUTCD Section 4E.06 or inhibit the permitted left-turn phase during such time. If crash and volume data indicate a particular left-turn phase for a certain time of day, consider using such left-turn phasing only during that time."

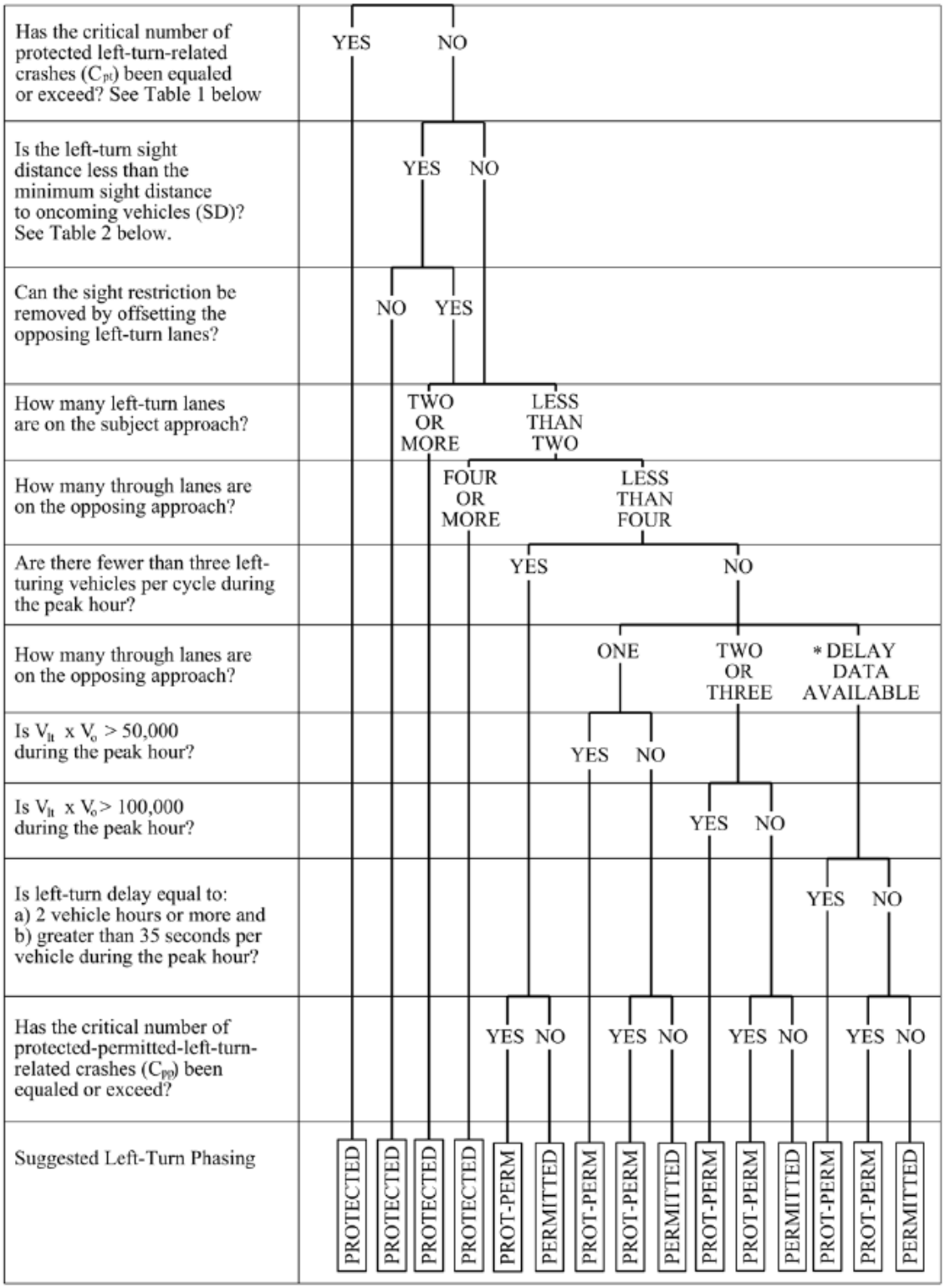


Figure 3. ITD Traffic Manual – Figure 4D-1: Left-Turn Phasing Guide (1 of 2)

Where:

V_{lt} = Left-turn volume on subject approach (vehicles per hour)

V_0 = Through plus right-turn volume on approach opposing subject left-turn movement (veh per hour)

Table 1: Left-Turn Related Crash Frequency

Number of Left-Turn Movements on Subject Road	Period during which Crashes Are Considered (Years)	Critical Left-Turn-Related Crash Count (Crashes Per Period)	
		When Considering Protected-Only (C_{pt})	When Considering Protected-Permitted (C_{pp})
One	1	6	4
	2	11	6
	3	14	7
Two	1	11	6
	2	18	9
	3	26	13

Table 2: Minimum Sight Distance

Oncoming Traffic Speed Limit (Miles Per Hour)	Minimum Sight Distance to Oncoming Vehicles (SD) (Feet)
25	200
30	240
35	280
40	320
45	360
50	400
55	440
60	480

Source: Adapted from the NCHRP Report 812, Signal Timing Manual 2nd Edition

* The left-turn delay referred to in the flowchart is the delay incurred when no left-turn phase is provided (i.e., the left-turn movement operates in the permitted mode).

Figure 4. ITD Traffic Manual – Figure 4D-1: Left-Turn Phasing Guide (2 of 2)

Summary of Other States' Guidance

Guidance and policies from eight other states were reviewed and summarized. These included neighboring states, such as Utah, Oregon and Washington, as well as states with more robust or definitive guidelines, such as Virgina. Table 1 on page 7 summarizes factors that are considered when selecting the left-turn phase mode at a signalized intersection from the state DOT's. The following section after the table provides more detail about each states' guidelines or policy documentation.

Table 1. Left-turn phase mode selection state guidance summary

State DOT	Left-Turn Volume	Opposing Thru Volumes	Crash History	Sight Distance	Number of Left-Turn Lanes	Opposing Number of Thru Lanes	Opposing Speed Limit	Inter-section Geometry	Ped Volume	Left-Turn Delay	Sequence (phase order)	Left-Turn Queues or Storage
ITD	✓	✓	✓	✓	✓	✓		✓		✓		
VDOT	✓	✓	✓	✓	✓	✓		✓	✓		✓	
UDOT	✓	✓	✓	✓	✓	✓	✓					✓
ODOT	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
WSDOT	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
WisDOT	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
ALDOT	✓	✓	✓	✓	✓	✓	✓	✓			✓	
ADOT	✓	✓	✓	✓	✓	✓	✓	✓		✓		
TxDOT	✓	✓	✓	✓	✓	✓	✓		✓			

Viginia Department of Transportation

In 2015, VDOT published Guidance for Determination and Documentation of Left-Turn Phasing Mode. This guideline was the result of a multi-year effort with a multi-disciplinary team across the state. The study effort to establish this guideline included multiple workshops, an academic literature review, and synthesis of select state DOT guidelines and policies. The VDOT guideline includes a comprehensive literature review citing over 20 publications related to left-turn phasing mode and synthesizing eight state agencies guidance in relation to the subject (the state agency synthesis is attached at the end of this document).

The VDOT guideline identifies protected-only mode as the safest left-turn phase mode, with the tradeoff being a decrease in efficiency. It states that the existing literature is consistent in identifying the following factors to be considered when selecting left-turn phase mode: crash history, sight distance, left-turn and opposing through traffic volumes, number of left-turn lanes, and number of opposing through lanes. Within the literature review, it was found that the opposing through lane speed limit and lead-lag sequencing criteria varied between existing literature and agencies as a criterion for phase mode selection.

VDOT's guidelines step through 20 general and specific questions when deciding the left-turn phase mode, which relate to the factors stated above, and also addresses intersection geometry, phasing sequence, and pedestrian volumes. The answers give suggested guidance on VDOT's policies while stating that the selection process is not strictly a quantitative process and engineering judgement should be used.

Utah Department of Transportation

UDOT Division of Traffic and Safety updated their left-turn study guideline in 2023. The guidelines have a step-by-step process to collect the needed data and a flow chart and supplemental tables, shown in Figure 5 and Figure 6 on page 9, to determine the type of left-turn phasing. The following factors are considered in the study: left-turn and opposing through traffic volumes, crash history, sight distance, number of left-turn and opposing through lanes, posted speed limit, split failures using ATSPM data, and queue failures.

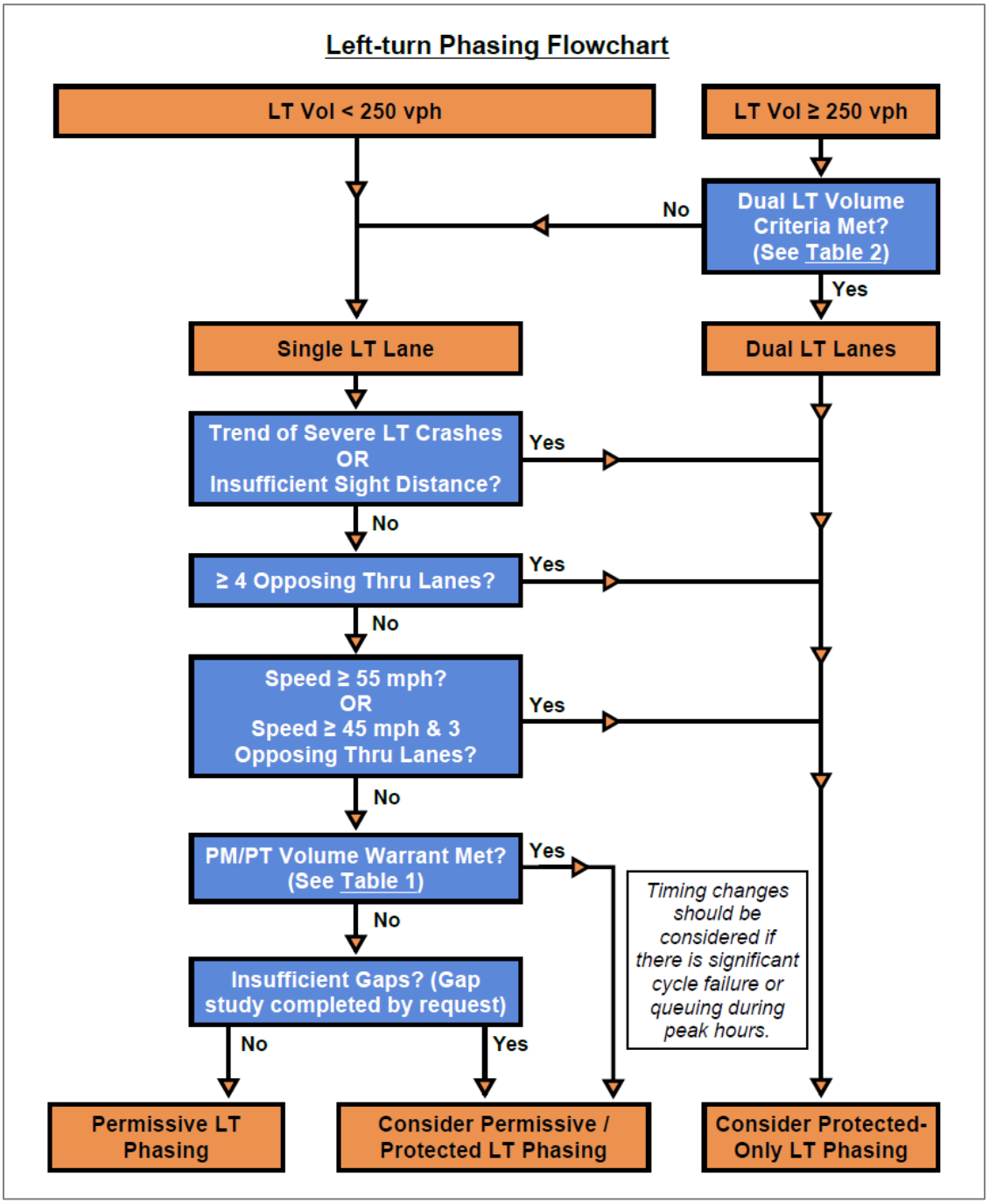


Figure 5. UDOT left-turn phasing flow chart

Table 1. Cross-Product Analysis

Arrival Type	Number of Opposing Thru Lanes	Volume Cross-Product Threshold
Random (no downstream traffic signal within 0.5 mile)	1	50,000
	2 – 3	100,000
Platoon (downstream traffic signal within 0.5 mile)	1	60,000
	2 – 3	120,000

Table 2. Dual Left-turn Capacity Analysis

Left-turn Volumes	Opposing Thru V/C ≥
250 – 269	0.95
270 – 279	0.75
280 – 319	0.65
320 – 359	0.60
360 – 389	0.55
390 – 420	0.50
≥ 420	Any

Figure 6. UDOT left-turn phasing guide supplemental tables

Oregon Department of Transportation

ODOT gives left-turn phase mode recommendations in their 2023 Traffic Signal Policy & Guidelines. ODOT's policy states the left-turn phase mode should be based on an engineering study that considers left-turn and opposing through traffic volumes, posted speed, number of left-turn and opposing lanes, sight distance, intersection geometry, bicycle and pedestrian volumes, phase sequence, and crash history. The policy also states that opposing left-turn modes should be the same for driver expectation, and if one is requiring a more restrictive phase mode, the opposing left-turn lane should match it.

Refer to the VDOT synthesis below for a detailed summary of ODOT's 2006 guidelines, which are similar to the ODOT's 2023 guidelines.

Washington Department of Transportation

WSDOT's 2023 Design Manual provides guidance on left-turn phase mode. Their Design Manual lists considerations for each type of left-turn phase mode (permissive, protected-permissive, protected-only) and includes the following factors: left-turn and opposing through traffic volumes, sight distance, crash history, number of left and opposing through lanes, opposing through speed limit, storage capacity, sequencing, rail crossings within the vicinity of the intersection, and intersection geometry. The manual also details the various signal head types that should be used

for each phase mode option. WSDOT states that a variable mode of operation, where the phase mode changes throughout the day based on vehicle or pedestrian volumes or crashes is allowed.

Refer to the VDOT synthesis below for a detailed summary of WSDOT's 2009 guidelines which are similar to the WSDOT's 2023 guidelines.

Wisconsin Department of Transportation

The WisDOT Traffic Signal Design Manual Section 3-4-1 is dedicated to left-turn phasing and focuses on the following factors: number of left-turn and opposing through lanes, visibility, queue spillback, left-turn delay, intersection geometry, crash history, and volume cross product. Figure 6 is from WisDOT's traffic manual and gives the minimum vehicle volume cross product (left-turn vehicles x through + right-turn vehicles) with respect to number of left-turn and opposing through lanes to provide a left-turn phase. It should be noted that guidance across different state varies whether to include the right-turn lane volume in the cross-product calculation, with some states not including it when right-turn vehicles have a dedicated receiving lane to turn into.

Minimum Vehicular Volumes For Left Turn Analysis

Number of left turn lanes	Number of opposing through lanes	Product of peak hour left turning vehicles and opposing plus right-turn vehicles
1	1	50,000
1	2	100,000

Figure 7. WisDOT minimum vehicle requirements for consideration of a left-turn phase

The traffic manual states that protected-only shall be used with dual or triple turn lanes, and if protected-only phasing is used on one approach, the opposing approach shall also use protected-only or a flashing yellow arrow due to driver perception and safety. When operating speeds are greater than 45 miles per hour, or when vehicles cross more than two opposing through lanes, protected-only phasing should be considered.

Alabama Department of Transportation

The ALDOT Traffic Signal Design Guide and Timing Manual recommends a left-turn warrant analysis when determining left-turn phase mode. The warrants fall into three categories: traffic volumes, intersection geometry, and crash history. Within these categories the number of left turn and opposing through lanes, cycle length, phase sequence, and sight distance are all factors that go into the warrant analysis. Consistent sequencing is recommended by ALDOT for opposing left-turns unless approved by the state or regional traffic engineer.

Figure 8 on page 11 shows the threshold values for left-turn phasing from the ALDOT Traffic Signal Design Guide and Timing Manual. The table uses a combination of traffic volume data, green time, and cycle length to determine if protected left-turn phasing should be considered. ALDOT requires the left-turn volume threshold value be computed separately for each approach.

Table 3.1 – Threshold values for left turn phasing (Source: Texas Transportation Institute)

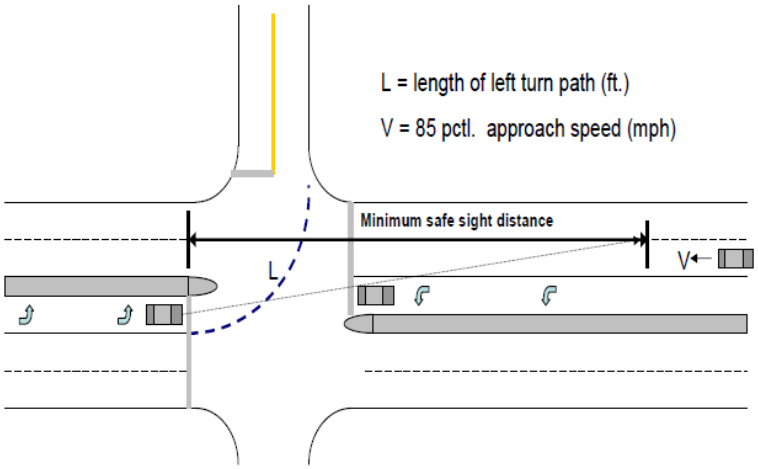
Number of Opposing Lanes†	Opposing volume V adjusted by G/C	Minimum critical left turn volume L (vph)
1	0< V/(G/C) <1000	764(G/C) – 0.634V
	1000< V/(G/C) < 1350	484(G/C) – 0.348V
2	0< V/(G/C) <1000	855(G/C) – 0.500V
	1000< V/(G/C) < 1350	680(G/C) – 0.353V
	1350< V/(G/C) <2000	390(G/C) – 0.167V
3‡	0< V/(G/C) <1000	892(G/C) – 0.448V
	1000< V/(G/C) < 1350	735(G/C) – 0.297V
	1350< V/(G/C) <2400	390(G/C) – 0.112V

Legend: V = opposing volume (vph), G = unprotected green time (sec), C = cycle length (sec)

† Include thru and right turns when determining opposing lanes and volumes, unless the right turn lane is channelized and does not interfere with the movement of left turning vehicles. Opposing left turn lanes are disregarded.
‡ For more than 3 opposing lanes, left turn phasing should be strongly considered.

Figure 8. ALDOT Traffic Signal Design Guide and Timing Manual – Table 3.1: Warrant 1 Volume Thresholds

Figure 9 shows ALDOT's guidance on their geometric warrants for left-turn phasing. The warrant uses a combination of length of left-turn path and approach speed, and if the minimum values in the table are not achieved, left-turn phasing must be provided.



Length of turn path, L (ft)	85th Percentile Approach Speed, V (mph)								
	25	30	35	40	45	50	55	60	65
40	250	290	330	375	415	455	500	540	580
60	315	365	420	470	520	570	620	670	720
80	375	435	495	550	610	725	725	785	845
100	430	495	560	625	690	825	825	890	955
120	480	550	625	695	770	910	910	985	1055
140	530	610	685	765	840	995	995	1075	1150
160	575	660	745	825	910	1075	1075	1160	1240
180	620	710	800	885	975	1150	1150	1240	1325

Figure 9. ALDOT Traffic Signal Design Guide and Timing Manual – Figure 3.8: Minimum Safe Sight Distance

Arizona Department of Transportation
ADOT's Section 600 of their Traffic Engineering Guidelines of Processes considers the following factors for selection of left-turn phase mode: traffic volumes, left-turn delay, crash history, number of left-turn and opposing through lanes, opposing through lane speed limit, intersection geometry, and sight distance.

Refer to the VDOT synthesis below for a detailed summary of their guidelines.

Texas Department of Transportation
The TxDOT 2020 Traffic Signals Manual, Section 6, recommended practice for flashing yellow arrow display for left-turn operations is an engineering study based on the following factors: left-turn and opposing through traffic volumes, crash history, speed limit, sight distance, number of left-turn and opposing through lanes, and pedestrian volumes. They state that it is best to use consistent treatment for left-turns along a corridor for driver expectations, but do not require it if impractical.

APPENDIX B:

LEFT-TURN PHASING SELECTION GUIDANCE

REVIEW OF EXISTING STATE DOT GUIDANCE AND VDOT REGION OFFICE GUIDANCE

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Summary of State DOT Guidance on Left-Turn Phasing

The first section of this document provides a summary of the left-turn phasing guidance from nine state Departments of Transportation. Note that this summary document draws a distinction between "mode" and "sequence." "Mode" refers to the assignment of right-of-way to left-turning vehicles (i.e., Protected Only left turns, Permissive Only left turns, Protected/Permissive left turns, or prohibited left turns). "Sequence" refers to the order that the left-turn movements at an intersection are serviced within the signal cycle (i.e., lead-lead, lag-lag, or lead-lag).

Eight of the nine DOT guidelines that were reviewed include criteria for selection of mode; of those, only Texas and Louisiana include detailed guidance on the selection of sequencing as well. Georgia includes general guidance on sequencing selection. The ninth DOT, Maryland, has no formal statewide policy on mode selection, but has solicited the development of guidance on sequencing. The proposed sequencing guidance is included in this report despite not having been formally adopted/endorsed by Maryland State Highway Administration.

Following is a summary table of criteria used in selection of left-turn phasing mode by the states reviewed in this document.

	Criteria for Consideration in Mode Selection*									
	LT Volume	Crash History	Sight Distance	No. of LT Lanes	Opp. Speed Limit	Opp. Thru Lanes	Intersection Geometry	Ped Volume	LT Demand	Existing Sequence
AZ	✓	✓	✓	✓	✓	✓				
GA	✓	✓	✓	✓	✓	✓	✓	✓		
LA	✓	✓	✓	✓		✓	✓			
MI	✓	✓	✓		✓	✓	✓			
MN	✓	✓	✓	✓		✓	✓			✓
OR	✓	✓	✓	✓	✓	✓	✓	✓		✓
TX	✓	✓	✓	✓	✓	✓			✓	
WA	✓	✓	✓	✓	✓	✓	✓			✓

* Maryland is not included in this table because it has no statewide mode selection guidelines.

The matrix on the next page summarizes each state's guidance for 10 different selection criteria for left turn phasing mode. Additional details on each state's policies can be found later in the document.

Note that the following left-turn phasing guidance pertains to state-operated intersections in the respective states. Locally maintained intersections follow state guidance in many instances; however, a number of jurisdictions in the states covered below have adopted localized variations of their state guidelines on left-turn phasing selection.

Summary of Criteria Used in Selection of Protected-Only Mode, by State*†										
	Left Turn Volume	**Crash History**	**Sight Distance**	**Number of Left Turn Lanes**	**Opposing Speed Limit**	**Opposing Thru Lanes**	**Intersection Geometry**	**Pedestrian Volume**	**Left Turn Demand**	**Existing Sequence**
AZ		4 / 6 LT crashes in one year (1 app / 2 opp. app); or 6 / 10 in 2 years	Limited sight distance due to geometry or opposing LT vehicles	Mainline has 2 or more LT only lanes	Opposing speed limit > 45 mph	3 or more opposing thru lanes				
GA		5 or more LT crashes in 2 years	Limited sight distance	Mainline has 2 or more LT only lanes	Opposing speed ≥ 45 mph AND 3 or more opposing thru lanes	3 or more opposing thru lanes AND opposing speed ≥ 45 mph	Unusual intersection geometry	High pedestrian volumes		
LA		4 / 6 LT crashes in one year (1 app / 2 opp. app); or 6 / 10 in 2 years	Limited sight distance (see table in following section)	Mainline has 2 or more LT only lanes	Opposing speed ≥ 45 mph AND 3 or more opposing thru lanes	3 or more opposing thru lanes AND opposing speed ≥ 45 mph	Intersection geometry creates a conflicting left-turn path			
MI		4 / 6 LT crashes in any 12-month period (1 app / 2 opp. app); or 6 / 10 in 2 years	Limited sight distance due to geometry or opposing LT vehicles		Opposing speed limit > 45 mph	3 or more opposing thru lanes				
MN	Peak hour LT volume > 250 vehicles or cross-product > 80,000; AND speed limit ≥ 45 mph	5 or more LT crashes over 3 years	Mainline LT has limited sight distance (per AASHTO)	Mainline has 2 or more LT only lanes		3 or more opposing thru lanes	Intersection geometry creates a conflicting left-turn path			Lead-lag sequence is already in use
OR	LT volume > 300 vph OR volume cross-product > 150,00 / 300,000 (1 / 2 opposing lanes)	LT crashes ≥ 5 per approach in any 12-month period in 3 years	Limited sight distance (see table in following section	Mainline has 2 or more LT only lanes	Opposing speed limit > 45 mph	3 or more opposing thru lanes				Lead-lag is required for efficient operation but a flashing yellow arrow display cannot be installed
TX	Volume cross-product > 133,000 (1 opp. thru lane) or > 93,000 (2 opp. thru lanes)	LT crashes ≥ 5 in any 12-month period in 3 years; ≥ 4 in any 1 year; ≥ 6 in any 2 consec. years; ≥ 8 in any 3 consec. years	Opp. speed ≤ 35 mph and SD < 250 ft; or opp. speed > 35 mph and SD < 400 ft	Mainline has 2 or more LT only lanes	Opposing speed limit ≥ 45 mph	3 or more opposing thru lanes			LT demand ≥ 2 vehicles per cycle in peak hour AND opposing speed limit ≥ 45 mph	
WA		LT crashes on any approach ≥ 3/year or ≥ 5 in two consec. years	Opp. speed ≤ 35 mph and SD < 250 ft, or opp. speed > 35 mph and SD < 400 ft; AND peak hour LT volume exceeds storage capacity	Mainline has 2 or more LT only lanes	Opposing speed limit > 45 mph AND peak hour LT volume exceeds storage capacity	3 or more opposing thru lanes (incl. RT lanes) AND peak hour LT volume exceeds storage capacity	Geometry or channelization is confusing AND peak hour LT volume exceeds storage capacity			

* Consideration of Protected Only mode is warranted by fulfillment of any one of these criteria.

† Maryland is not included in this table because it has no statewide mode selection guidelines.

MINNESOTA

MnDOT's *Signal Design Manual* (2012) includes a subsection on left-turn phasing, with guidelines for selection of Protected Only mode. The manual does not provide specific guidance for Protected/Permissive mode, and provides only a passing reference to sequencing as it pertains to selection of mode.

Protected Only left-turn phasing is recommended upon fulfillment of any one of the following conditions; however, the guidelines state that "engineering judgment and site-specific considerations of safety and efficiency may cause deviations from the operation indicated by these guidelines."

1) When railroad preemption is used and the movement is opposite the track clearance movement or turns across the tracks unless other measures are implemented to address this conflict.

2) Lead-lag left-turn sequence is utilized.

3) Intersection geometrics create a conflicting left-turn path.

4) The left turner faces three or more opposing through lanes. Note that an opposing right turn only lane typically will not be counted along with opposing through lanes.

5) The mainline left turner has limited sight distance as defined in the current AASHTO "*A Policy on Geometric Design of Highways and Streets*." According to AASHTO, opposing left-turning vehicles can be considered as blocking sight distance.

6) Protected/Permissive operation is in place and there are 5 or more left-turn related collisions per year over a 3-year period susceptible to correction by protected-only phasing.[1]

7) Mainline has dual left-turn lanes.

8) Speed 45 MPH or greater AND a peak hour left-turn volume greater than 240 vehicles or a peak hour cross-product greater than 80,000 (100,000 if two opposing lanes).

[1] Note that the use of "correctable crashes" in this document refers to crashes between a left turning vehicle and an opposing through or right turning vehicle that can be avoided with the implementation of Protected Only phasing.

ARIZONA

Section 600 of ADOT's *Traffic Engineering Policies, Guidelines, and Procedures* (2011) includes guidelines for left-turn signal phasing. The guidelines apply to the consideration of left-turn phasing generally, and also to selection of Protected Only mode. There are no specific guidelines for left-turn phasing sequence.

General Guidelines

The guidelines for selection of a separate left-turn phase include three factors: traffic volumes, stopped-time delay, and crash experience.

1) *Traffic Volumes*

Following are the traffic volume cross-product thresholds for consideration of left-turn phasing:

	2-Lane Street	4-Lane Street	6-Lane Street
Rural	50,000	100,000	150,000
Urban	75,000	150,000	225,000

The left-turn volume should be greater than two vehicles per cycle during the peak hour. Engineering judgment is used in determining what percentage, if any, of right turning vehicles are included in the sum of opposing traffic.

2) *Stopped-time Delay*

Left-turn phasing may be considered if the left-turn delay is 2.0 vehicle hours or more during a peak hour on an approach. The left-turn volume should be greater than two vehicles per cycle during the peak hour. The average delay per left-turning vehicle should equal or exceed 35 seconds.

3) *Crash Experience*

Following are crash thresholds for consideration of left-turn phasing:

	One Year Period	Two Year Period
One Approach	4	6
Two Opposing Approaches	6	10

Protected Only Mode

Protected Only mode may be considered if any of the following conditions exist:

- Three or more through lanes of traffic on the opposing leg.

- Posted speed limit of opposing traffic is greater than 45 mph.
- Dual left-turn only lanes.
- Sight distance restrictions to opposing traffic due to geometry or opposing left-turn vehicles.
- Use of Protected/Permissive phasing has resulted in left-turn crash experience that meets the values in the Left-turn Crash Experience table on the previous page.

MARYLAND

NOTE: *Traffic Signal Phase Sequence Guidance* (2011) was developed for the Maryland State Highway Administration (MDSHA) by Sabra, Wang and Associates. The guidance has not been adopted wholesale by MDSHA, although the state has begun using lead-lag sequencing more widely since the report was issued.

Traffic Signal Phase Sequence Guidance provides guidance on left-turn phasing sequence, and only mentions mode as it pertains to selection of sequence. The guidance is classified according to two categories: situations in which sequence is a function of mode; and situations in which sequence is a function of intersection geometry.

Left Turn Sequence as a Function of Mode:

1) For left-turns with Protected Only phasing on opposing approaches, implementation of a lead or lag left-turn phase sequence is **acceptable**.

2) For left turns with Protected Only or Protected/Permissive phasing at a T-intersection, implementation of a lead or lag left-turn phase sequence is **acceptable**.

3) For left turns with Protected Only and permissive mode on opposing approaches, implementation of a lag left-turn phase sequence is **not recommended**.

4) For Protected Only left turns with Protected/Permissive phasing on the opposing approach, implementation of lag left-turn phase sequence is **not recommended**. The Protected/Permissive phase opposing the Protected Only left turn may implement lead or lag phase sequence.

5) For left turns with Protected/Permissive phasing on opposing approaches, implementation of lead-lag phasing is **not recommended** to avoid "Yellow Trap" conditions. Instead, flashing yellow arrow (FYA) signal displays should be utilized if one of the left-turn phases needs to operate as lag.[2]

[2] Note that this recommendation conflicts with guidance in the 2011 Maryland MUTCD, which states that "flashing yellow arrow indications shall not be used in Maryland."

Left Turn Sequence as a Function of Intersection Geometry:

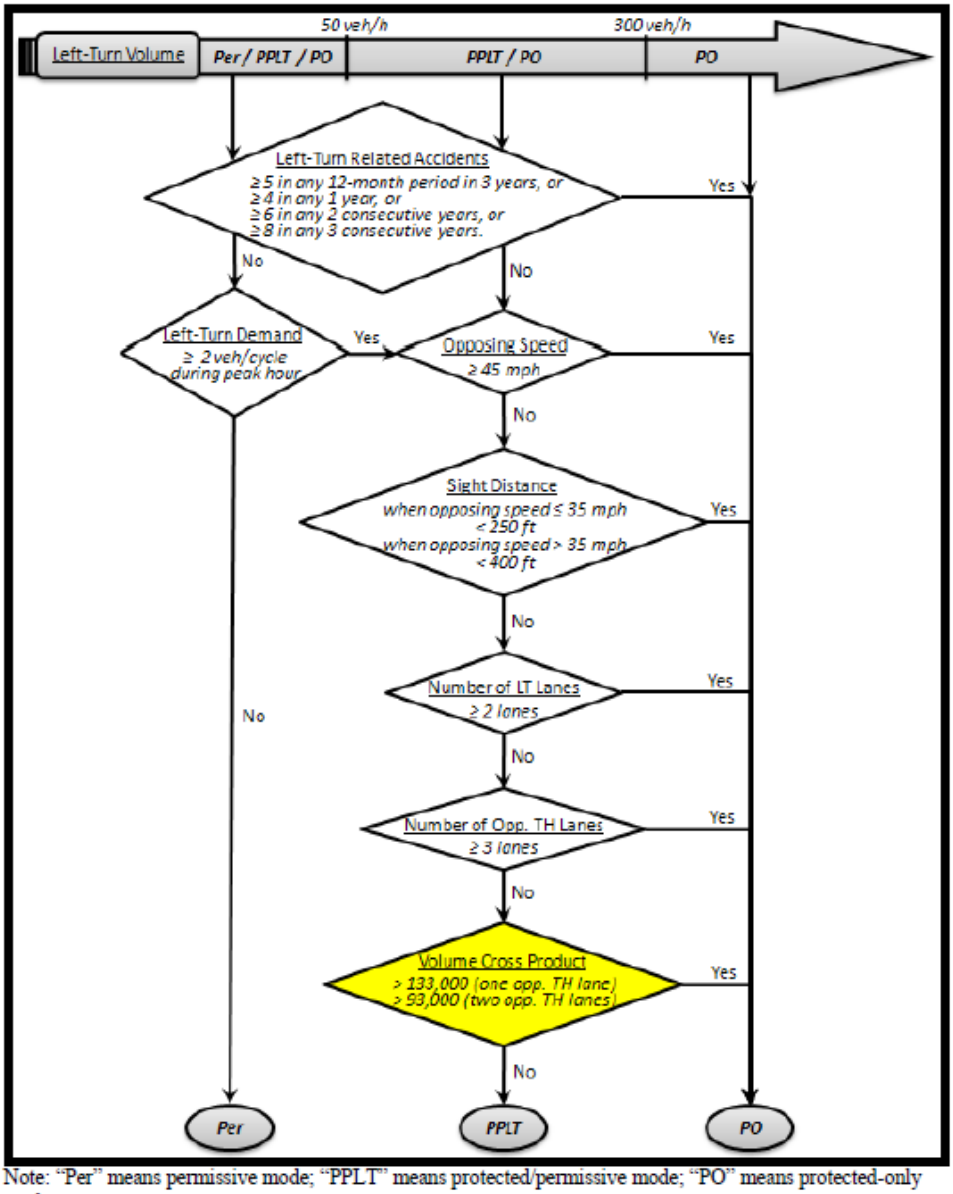
1) For left turns with overlapping paths, a lead-lag phase sequence should be utilized to safely accommodate the turning traffic from opposing approaches.

2) Tight diamond interchanges are characterized by two signalized intersections less than 400 feet apart. Traffic control at signals in such close proximity is typically accomplished using a single traffic controller. The phasing at tight diamonds is a function of whether traffic volumes along the arterial and the ramps are balanced or unbalanced, the presence of other signalized intersections in the vicinity and the width of the interchange. Control strategies for operation include the Texas Three-Phase and the TTI Four-Phase operation. The implementation of a lead-lead, lead-lag or a lag-lag left-turn phasing is an implicit part of the two control strategies.

TEXAS

NOTE: While TxDOT has sponsored a considerable amount of research on left-turn phasing – including the development of selection guidelines – through Texas Southern University and the Texas Transportation Institute (TTI) at Texas A&M University, the state has not formally adopted any of the guidelines developed by these institutions.

Development of Left Turn Operations Guidelines at Signalized Intersections (2008), developed for TxDOT by Texas Southern University, includes guidance on both the selection of mode and the selection of sequencing. The guidance for selection of left-turn phasing mode is described in detail in the report, but is best represented in the form of a flowchart (see next page).



Note: "Per" means permissive mode; "PPLT" means protected/permissive mode; "PO" means protected-only mode.

Development of Left turn Operations Guidelines at Signalized Intersections includes the following guidance for the selection of sequencing, considered separately for Protected Only mode and Protected/Permissive mode.

<u>Guidelines for Selection of Sequencing for Protected-only Mode:</u>

1) If the intersection has heavy pedestrian volume, the lead-lead sequence or lead-lag sequence should be avoided, unless there are other measures that could effectively prevent conflicts between left-turn vehicles and pedestrians.

2) Lead-lag sequence should be considered before lag-lag or lead-lead sequences, especially when left-turn volume is high. The approach with higher left-turn volume should use the leading phase.[3]

3) Use the phasing sequence that is most common along the arterial and in a region.

4) When the signals in an arterial are two-way coordinated, choose the signal phasing sequence that will provide the widest two-way through bandwidth to achieve better signal progression. When the signals in an arterial are one-way coordinated (e.g., during the peak hour period), the lead-lag sequence should be considered and the approach in the coordinated direction should use the leading phase.

Guidelines for Selection of Sequencing for Protected/Permissive Mode:

1) If the intersection has heavy pedestrian volume the lead-lead sequence or lead-lag sequence should be avoided, unless there are other measures that could effectively prevent conflicts between left-turn vehicles and pedestrians.

2) If the left-turn volume level is below 150 vehicles/hr, lead-lead sequence is recommended. If the left-turn volume is higher than 150 vehicles/hr, lead-lag sequence should be considered.

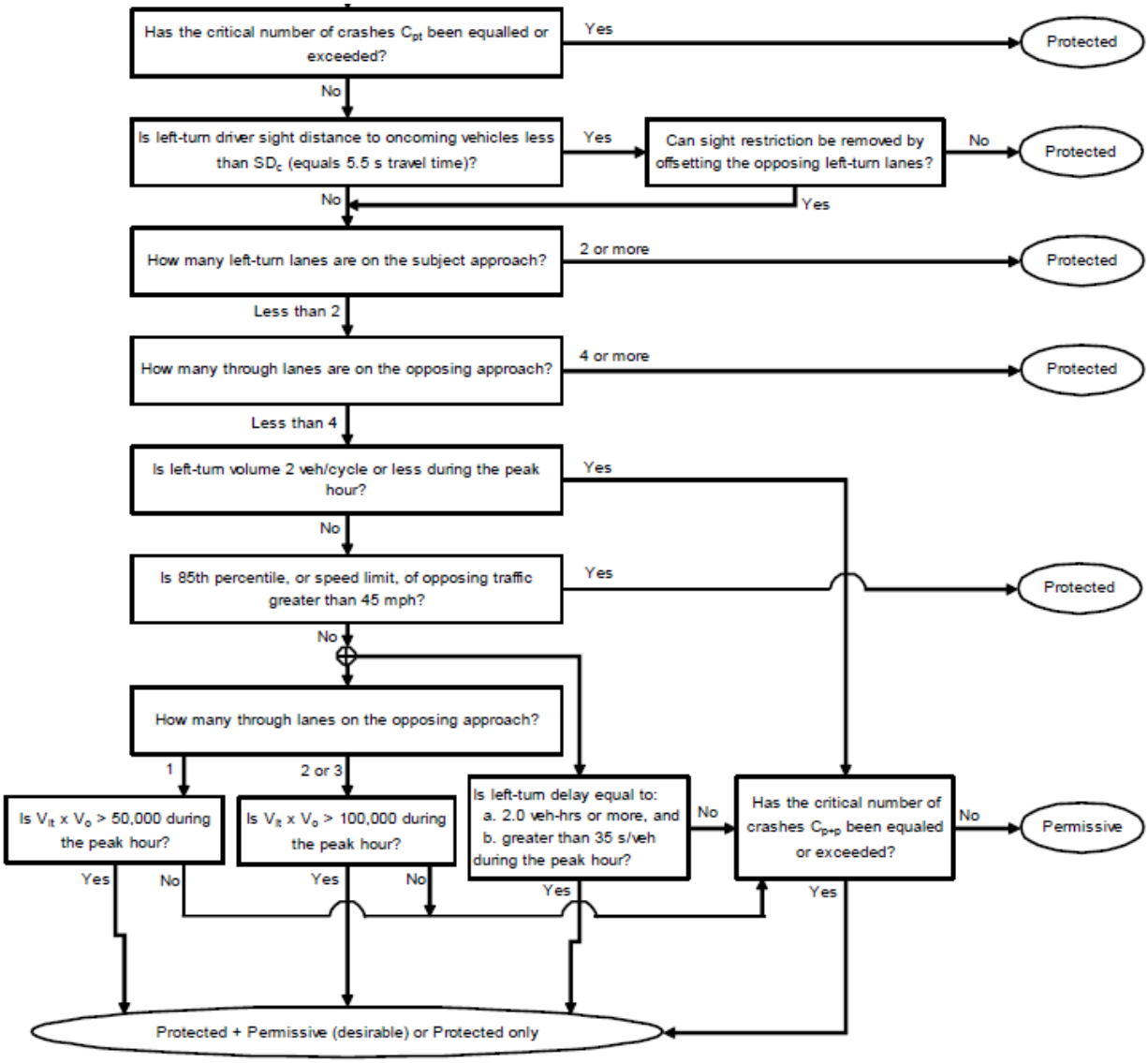
3) If lead-lag sequence is selected, Arlington or Dallas phasing should be considered to prevent the yellow trap problem. (NOTE: The 2009 MUTCD prohibits the use of Dallas phasing in favor of FYA).

4) Use the phasing sequence that is most common along the arterial and in a region.

5) When the signals in an arterial are two-way coordinated, choose the signal phasing sequence that will provide the widest two-way through bandwidth to achieve better signal progression. When the signals in an arterial are one-way coordinated (e.g., during the peak hour period), the lead-lag sequence should be considered and the approach in the coordinated direction should use the leading phase.

TTI's *Traffic Signal Operations Handbook* (2009) also includes guidance for selection of left-turn phasing mode, in the form of a flowchart. This flowchart developed by TTI, also appears in FHWA's *Traffic Signal Timing Manual.*

[3] Note that Texas' guidance that the approach with the higher left turn volume should use the leading phase runs counter to existing practice in the VDOT Central Region.



Number of Left-Turn Movements on Subject Road	Period during which Crashes are Considered (years)	Critical Left-Turn-Related Crash Count When Considering Protected-only, C_{pt} (crashes/period)	When Considering Prot.+Perm, C_{p+p} (crashes/period)
One	1	6	4
One	2	11	6
One	3	14	7
Both	1	11	6
Both	2	18	9
Both	3	26	13

Oncoming Traffic Speed Limit (mph)	Minimum Sight Distance to Oncoming Vehicles, SD_c (ft)
25	200
30	240
35	280
40	320
45	360
50	400
55	440
60	480

Variables

V_{lt} = left-turn volume on the subject approach, veh/h

V_o = through plus right-turn volume on the approach opposing the subject left-turn movement, veh/h

TTI developed an Excel-based left-turn mode worksheet, which can be found on pages A-19 and A-20 of *Development of a Traffic Signal Operations Handbook* (note the slightly different title than the aforementioned TTI publication).

WASHINGTON

The *WSDOT Design Manual* (2009) includes a subsection on left turn phasing, with guidelines for selection of mode. The manual does not address sequencing.

The manual notes that it is not necessary that the left-turn mode for an approach be the same throughout the day. Varying the left-turn mode on an approach among the permissive only, Protected/Permissive, and Protected Only left-turn modes during different periods of the day is acceptable.

Protected-Only

Following are WSDOT's guidelines for protected-only mode:

1) Protected phasing is always required for multilane left-turn movements.

2) Use protected left-turn phasing when left-turning type collisions on any approach equal three per year or five in two consecutive years. This includes left-turning collisions involving pedestrians.

3) Use protected left-turn phasing when the peak hour turning volume exceeds the storage capacity of the left-turn lane because of insufficient gaps in the opposing through traffic and where one or more of the following conditions is present:

    a) Either the posted speed or the 85th percentile speed of the opposing traffic exceeds 45 mph.

    b) The sight distance to oncoming traffic is less than 250 feet when the 85th percentile speed is 35 mph or below, or less than 400 feet when the 85th percentile speed is above 35 mph.

    c) The left-turn movement crosses three or more lanes (including right turn lanes) of opposing traffic.

    d) Geometry or channelization is confusing.

Protected/Permissive

Where left-turn phasing will be installed and conditions do not warrant Protected Only operation, consider Protected/Permissive left-turn phasing. Protected/Permissive left-turn phasing can result in

increased efficiency at some types of intersections, particularly "T" intersections, ramp terminal intersections, and intersections of a two-way street with a one-way street where there are no opposing left-turn movements.

Protected/Permissive left-turn phasing is NOT ALLOWED under the following conditions:

1) On the approaches of a signal where MUTCD Warrant 7 (Crash Experience) is met and there are five left-turning collisions on that approach included in the warranting collisions.

2) When documentation shows that existing protected left-turn phasing was installed due to left-turn collisions.

3) When sight distance for left-turning vehicles, as outlined in AASHTO's *A Policy on the Geometric Design of Highways and City Streets,* cannot be met.

4) On intersection approaches where the opposing approach has three or more lanes (including right turn lanes) and either the posted speed limit or 85th percentile speeds for the opposing approach are at or above 45 mph.

5) On intersection approaches that have dual left-turn lanes.

6) At intersections where lead-lag phasing is employed.

GEORGIA

GDOT published a *Transportation Online Policy & Procedure System* (TOPPS) on left-turn phasing selection (2008). The TOPPS publication includes specific guidelines for the consideration of left-turn phasing and the selection of Protected Only mode. This publication also includes more general guidance on left-turn phasing sequence.

General Guidelines

Left-turn phases will only be considered at those locations where one or more of the following requirements are met:

1) The cross-product, one hour left-turn volume times the opposing one hour through movement volume divided by the number of lanes for the opposing through movement, is greater than 50,000.

2) The left-turn volume exceeds 125 vehicles per hour.

3) Correctable crashes equal or exceed 4 crashes in one year or 6 crashes in two years.

4) Additional criteria including but not limited to sight distance, speed of opposing traffic, number of left-turn lanes, number of opposing through lanes, delay, the angle of the left turn and if the signal is included in a coordinated signal system will also be taken into consideration when evaluating requests for left-turn phases.

Left-turn phases should not be used at intersection approaches where a left-turn lane has not been provided.

Mode

Only when conditions satisfy one or more of the following criteria will a Protected Only left-turn phase be allowed:

1) Left-turn crashes under a protected/permissive phasing equal or exceed 5 crashes in 2 years.

2) Dual left turns.

3) Limited sight distance will not allow permissive turns.

4) Left-turn movements where opposing through traffic is approaching in three or more lanes at speeds greater than or equal to 45 mph.

5) Additional criteria such as intersection skew, high volume of pedestrians and unusual intersection geometrics.

Sequence

Left-turn phases will typically be installed as a leading left-turn movement. Lagging left-turn phases should only be used at locations where it can be demonstrated that significant benefits can be derived by its use with no sacrifice of safety or signal progression.

MICHIGAN

The Michigan DOT's *Left Turn Phasing Signal Guidelines* (2006) include guidance for selection of a separate left-turn phase and for selection of mode. The guidelines do not address selection of sequencing.

General Guidelines

Left-turn protection should be considered at signalized intersections when:

1) The left-turn peak hour volume exceeds 90 vehicles per hour (VPH) or 50 VPH on streets with through traffic over 45 mph, or

2) The product of opposing through hourly volume (VPH) and left-turn hourly volumes (VPH) exceeds 50,000 if there is one opposing lane, or 100,000 if there are two opposing lanes, or

3) A crash pattern is evident at the intersection that could be corrected with left-turn phasing.

Mode

Protected-Only

Protected-only left-turn phasing should be considered when the need for phasing has been identified and the above listed conditions for permissive/protected operation cannot be met for any of the following conditions:

1) Any intersection where the sight distance to opposing traffic is poor due to geometry or opposing left-turn vehicles.

2) The left-turn traffic must cross three or more lanes of opposing through traffic.

3) Previous use of permissive/protected phasing has resulted in four correctable crashes in one consecutive 12-month period or six correctable crashes in two years for one approach, or six correctable crashes in one consecutive 12-month period or 10 correctable crashes in two consecutive years for two opposing approaches.

4) At intersections where the posted speed limit of opposing traffic is greater than 45 mph.

Protected/Permissive

Protected/permissive left turn phasing should be considered, when left-turn demand is present but cannot be accommodated on two phase signal operation alone, or when a crash pattern that could be corrected with left-turn phasing is evident at this intersection and the following is met:

1) Adequate sight distance for left-turning vehicles and opposing through traffic is available.

2) There are no more than two lanes of opposing through traffic (including shared through lanes).

3) Intersection geometrics do not promote hazardous conditions.

OREGON

ODOT's *Traffic Signal Policy and Guidelines* (2006) feature a subsection on left turn phasing, which includes guidance on selection of mode. The guidelines provide only a passing reference to sequencing as it pertains to selection of mode.

Protected-Only

1) Protected-only left-turn phasing shall be used when an engineering study indicates sight distance to oncoming traffic is less than the distances below.

Posted Speed (mph)	Required Sight Distance (ft) One Opposing Through Lane	Required Sight Distance (ft) Two Opposing Through Lanes
20	165	180
25	205	225
30	245	270
35	285	310
40	325	355
45	365	400
50 (*)	425	465
55 (*)	495	540

Source: A policy on Geometric Design of Highways and Streets 2001 Fourth Edition, AASHTO – Table 9-67.
(*) – For speeds > 45 mph, the Stopping Sight Distance (higher value from Table 9-67) is used instead of Intersection Sight Distance.

2) Protected-only left-turn phasing should be considered when an engineering study indicates one of the following conditions is present. Intersection capacity and delay should be considered in the engineering study.

   a) Crash history indicates 5 or more left-turning type crashes per approach in a consecutive 12-month period within the last three years (include left-turning crashes involving pedestrians).

   b) The signal is located in a traffic signal system and lead-lag phasing is required for efficient operation but a flashing yellow arrow display cannot be installed.

   c) Left-turn volume routinely exceeds 300 vehicles per hour or the product of opposing and left-turn hourly volumes exceeds 150,000, if there is one opposing lane, or 300,000, if there are two opposing lanes. Where there is a significant lane imbalance, twice the highest single lane volume can be substituted for the total opposing hourly volume when making this calculation.

   d) The posted speed of opposing traffic exceeds 45 mph.

   e) The left-turn movement crosses three or more lanes of opposing through traffic.

   f) Multiple left-turn lanes are provided.

   g) U-turns are permitted.

h) Additional factors such as high pedestrian volumes, traffic signal progression, intersection geometric design, maneuverability of particular classes of vehicles, adequacy of gaps, or preemption-related operational requirements unique to preemption systems.

i) High percentage of left-turning trucks.

Protected/Permissive

Note that, for all state highway installations, the standard display for protected/permissive phasing is the flashing yellow arrow (FYA) display.

Protected/permissive left turns should be considered when any one of the following criteria is satisfied:

1) Left-turn volume routinely exceeds 200 vehicles per hour or the product of opposing and left-turn hourly volumes exceeds 50,000, if there is one opposing lane; or 100,000, if there are two opposing lanes. Where there is a significant lane imbalance, twice the highest single lane volume can be substituted for the total opposing hourly volume when making this calculation.

2) Projected volumes would warrant it within five years after the traffic signal is placed in service.

3) The opposing left-turn approach has a protected/permissive turn signal or meets one or more of these criteria.

LOUISIANA

The Louisiana DOTD's *Traffic Signal Design Manual* (2002) includes guidance on selection of both mode and sequence.

According to the manual, LADOTD EDSM, Volume VI, Chapter 3, Section 1, Directive 3 states: "Where separate left-turn lanes are provided, a separate left-turn phase should normally be included unless the addition of such a phase causes capacity problems. Each location shall be analyzed for capacity and a decision shall be made by the traffic engineer based on these results."

The manual also includes warrants for selection of a separate left-turn phase for intersections without separate left-turn lanes.

<u>Mode</u>

Protected-Only

Protected Only mode should be considered when any of the following conditions exist:

1) Limited left-turn sight distance – the view of opposing through and opposing right turn traffic is restricted. See table below.

LEFT TURN SIGHT DISTANCE (URBAN AND SUBURBAN INTERSECTIONS)

OPERATING SPEED (MPH)	SAFE SIGHT DISTANCE (FT.)		
	2-LANE	4-LANE	6-LANE
20	240	260	280
30	360	390	420
40	470	520	560
50	590	650	700
60	710	780	840

Source: Northwestern University Traffic Institute

2) Excessive street width – left-turning traffic must cross three or more lanes and the speed of the opposing traffic is 45 MPH or greater.

3) Inadequate geometry – at intersections where there is inadequate room for opposing left-turn movements on the same street to move simultaneously without conflicting or crossing. Either lead-lag or split phasing must be used.

4) Left-turn crashes – if the peak hour left-turn volume is at least 50 vehicles and the following number of left-turn accidents have occurred:
   - One approach – 4 left-turn accidents in one year or 6 left-turn accidents in two years.
   - Two opposing approaches – 6 left-turn accidents in one year or 10 left-turn accidents in two years.

5) Dual left turns – on approaches where two side by side left-turn lanes exist.

Protected/Permissive

Protected/permissive mode should be considered when any of the following conditions exist:

1) Left turn volumes – where an approach has a peak hour left-turn volume of at least 50 vehicles, and a peak hour product of left-turning vehicles and opposing traffic exceeding 100,000 for four lane streets or 50,000 for two lane streets. (Opposing traffic consists of opposing through and opposing right turning traffic.)

2) Capacity – where intersection capacity is limited and maximum efficiency of the traffic operations is needed.

3) Left turn storage – where left-turn lanes are not present or left-turn lanes are of inadequate length to store the actual left-turn traffic volumes.

4) Left turn accidents – where the left-turn signal phase is not justified by the left-turn accident warrant described in the Protected Only guidance above.

Sequence

Leading Left Turn

Leading left turns should be used in the following circumstances:

1) Lack of left-turn lanes – a leading left-turn signal phase increases the approach capacity on one and two lane approaches without left-turn lanes. This assures that all traffic moves on the approach at the beginning of the green signal phase.

2) Signal coordination – where a time-space diagram indicates that a leading left-turn signal phase will increase the arterial green bandwidth and improve the signal progression.

3) Minimizing conflicts – to minimize conflicts between left-turn and opposing through vehicles by clearing the left turns through the intersection first.

4) Maximize efficiency – left-turning motorists tend to react quicker to a leading left turn than to a lagging left turn.

Lagging Left Turn

Lagging left turns may be used in the following circumstances:

1) Minimize through delay – where left-turn lanes exist, it minimizes the use and length of the protected left-turn phase by allowing left turns to be made during the preceding through green phase when adequate gaps occur in opposing traffic.

2) Signal coordination – where a time-space diagram indicates that a lagging left-turn signal phase will increase the arterial green bandwidth and improve signal progression.

Lead-Lag Left Turn

Lead-lag left turns may be used in the following circumstances:

1) Lack of left-turn lanes – on one and two lane approaches that lack left-turn lanes.

2) Signal coordination – where a time-space diagram indicates that a lead-lag left-turn combination in the proper direction will increase the arterial green bandwidth and improve signal progression.

3) Unequal left-turn volumes – to allow for the separate timing of each left-turn phase when using a pre-timed controller.

4) Inadequate intersection geometry – at intersections where there is inadequate room for opposing left-turn movements on the same street to move simultaneously without conflicting or crossing. Protected-only left turns must be used.

Summary of VDOT Regional Guidance on Left-Turn Phasing

VHB solicited feedback from the VDOT Regional Offices regarding existing guidelines, practices and rules-of-thumb employed by the districts/regions in left-turn phasing selection. Four of the five Regional Operations offices responded to the inquiry. Responses are summarized below.

VDOT CENTRAL REGION OPERATIONS

In assessing the need for left-turn protection, the VDOT Central Region Operations (CRO) uses the following criteria:

- Adequate sight distance including assessment of opposing left-turn sight distance obstruction
- Number/rate of crashes for existing permitted operations
- Opposing volume (no indication if this includes opposing right turn volume)
- Speed limit

If there are three or more opposing through lanes, the CRO recommends Protected Only mode.

In determining the mode and sequence of left-turn signal phasing, the CRO gives priority to the following factors (in order of priority):

1) Safety
2) Traffic volume
3) Roadway geometry
4) Traffic conditions (including queuing, delay, V/C ratio, ped/bike volumes, heavy vehicles, speed limit)
5) Driver gap acceptance

While the CRO provided a prioritized list of factors to consider in determining left-turn phasing mode and sequence, the CRO did not provide specific parameters or thresholds for those factors.

The CRO had the following feedback regarding left-turn phasing sequence:

“It is very helpful as a signal timer to have the ability to lead-lag left-turn movements on the arterial in order to maximize green bandwidth. The CRO uses lead-lead only sequencing for five-section

Protected/Permissive left-turn operation, which seriously impacts the ability to obtain two-way progression and keep the cycle length reasonably short."

VDOT NORTHERN REGION OPERATIONS

The Northern Virginia Region Operations (NRO) developed a series of guidelines for left-turn phasing in 2003, and is currently in the process of revising this document to bring it more in line with current practice and to correct a few problems in the prior version. The new version of the guidelines has not been finalized as of August 2013. Both the old and new guidelines address left-turn mode selection only.

Mode

(The mode selection guidance below comes from a draft of the 2012 guidelines.)

Protected Only phasing shall not be used on an approach without an exclusive left-turn lane, except where all lanes of the approach are served by only one phase. This condition is typical of approaches served by split phasing.

Protected Only left-turn phasing shall be used on an approach to a traffic signal where either of the following conditions exists:

- Sight distance on the approach is insufficient to safely judge a gap in opposing traffic; or
- There is more than one left-turn lane on the approach.

Unless the exception below applies, Protected Only phasing shall be used on an approach where either of the following is true:

- Where there are two or fewer lanes on the opposing approach that can be used by through traffic and the speed limit* on the opposing approach is 55 mph or greater.
- Where there are three or more lanes on the opposing approach that can be used by through traffic and the speed limit* on the opposing approach is 50 mph or greater.

  ** Where the speed limit is not available or not representative of traffic conditions, an alternative measure, such as the 85th-percentile speed, may be used.*

Unless the exception below applies, Protected Only phasing should be used on an approach where either of the following is true:

- On approaches that allow permissive turns, a pattern of angle crashes exists that could be corrected by converting to Protected Only phasing.
- The opposing approach operates with Protected Only phasing. Preliminary VDOT research suggests that crash rates are greater where one approach uses Protected Only lefts and the

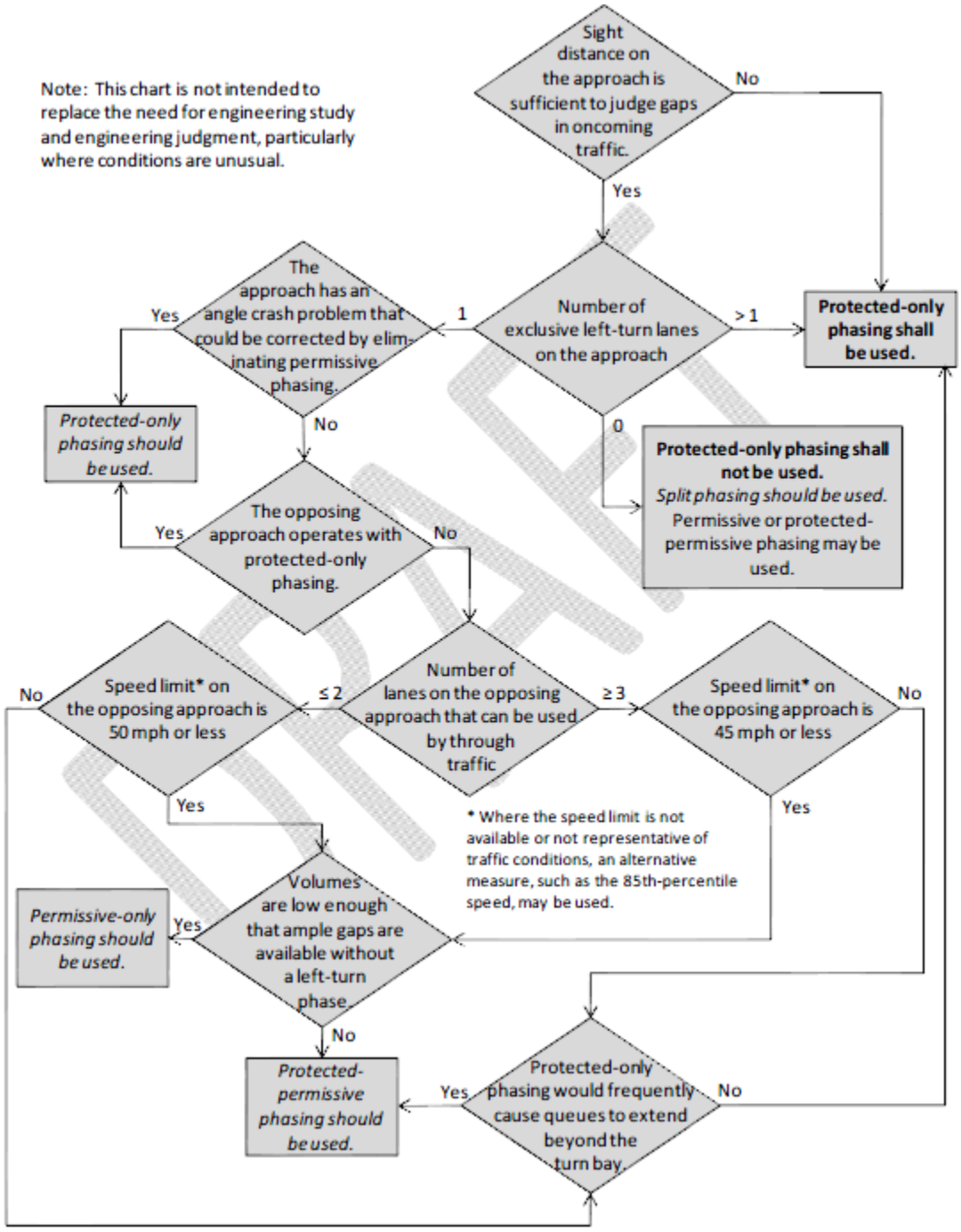
opposing direction uses Protected/Permissive lefts. (However, further research is needed to better understand this trend.)

Exception: Even on an approach that satisfies one or more conditions in the previous two paragraphs, Protected/Permissive phasing should be used if traffic volumes are so high that, if Protected Only phasing were used, a queue would frequently extend out of the left-turn bay, impeding through traffic and potentially contributing to a rear-end crash problem.

Permissive Only left-turn phasing should be used on an approach where all of the following are true:

- The volume of turning traffic and opposing through traffic is low enough that a sufficient number of gaps are available for left-turning traffic to proceed with reasonable delay without a protected phase.
- Sight distance on the approach is sufficient to safely judge a gap in opposing traffic.
- The approach does not have a pattern of angle crashes that could be corrected using Protected Only phasing.

The Northern Virginia District's new guidelines also include a flowchart (see below) to assist in left-turn mode selection.



Sequence

The following information on left-turn sequence selection was provided by the NRO office via email correspondence, and represents general practices and rules of thumb rather than formal guidelines.

In the NRO, typical practice is to use lead-lead phasing for left turns unless there is a reason to do otherwise. The NRO plans to use lead-lag phasing more aggressively in the future to improve corridor progression, but this has been very limited so far. Usually lagging lefts are used only where needed because of geometric constraints (e.g., overlapping left-turn travel paths) or safety reasons (e.g., avoiding a yellow trap).

Lagging lefts can have a disadvantage at coordinated signals when they do not use the full phase duration. The NRO defines the coordination point as the end of mainline green, and as such, a lagging mainline left takes away the controller's ability to vary the length of the left-turn phase without also cutting short the concurrent mainline green. In some cases, NRO has placed the lagging left on max recall to prevent the mainline from ending early, and in other cases NRO has allowed the mainline to end early when the lagging left gaps out. Both of these approaches have disadvantages.

VDOT SOUTHWEST REGION OPERATIONS

The Southwest Region Operations (SWRO) responded to each survey question individually. Following are the SWRO's response to each question.

Q: Does your region have uniform, formal policy or guidance on left-turn phasing at signalized intersections on state-maintained roads? If so, is this policy/guidance available online?

A: SWRO uses guidelines provided in the *Signal Timing Manual* (Figure 4-11), a FHWA document that is available online for free. (NOTE: The same left-turn mode selection flowchart used by SWRO is included in the Texas Transportation Institute's mode selection guidelines, highlighted in the summary of state DOT guidelines above).

In addition to safety, the geometrics of the intersection are considered as primary elements and are interrelated when considering whether permissive left-turn movements are appropriate.

1. Crash history
2. Sight distance
3. Left-turn and opposing through volumes
4. Number of opposing through lanes
5. Speed of opposing traffic

SWRO also considers the following parameters related to operations to determine phasing at signalized intersections.

6. Delay
7. Queuing
8. Cycle length

Q: What are the existing criteria/guidelines for determining the mode and sequence of left-turn signal control in your region?

A: Typically, SWRO uses guidelines provided in the *Signal Timing Manual* and ITE Manual (*Traffic Control Device Handbook* 2001) to determine mode for left-turn movements. Mostly, SWRO provides a lead-lead left-turn phasing sequence. However, depending upon the width of intersection, ability to turn lefts concurrently for opposing left-turning movements especially at intersections with dual left-turn lanes, and demand of traffic volumes SWRO provides lead-lag left-turn phasing. Furthermore, based on the roadway geometry (storage bay length) and demand of traffic volume SWRO considers lag-lag left-turn phasing as well. Please note that SWRO provides Protected Only left-turn phases when lead-lag left-turn phasing is considered.

In addition, field observations and use of traffic engineering software are also considered while selecting mode and sequence of left-turn phases.

Q: In determining the mode and sequence of left-turn signal phasing, what priority do you give to the following parameters:

- Volume
- Roadway geometry (e.g., intersection sight distance, signal sight distance, lateral offset between opposing left-turn lanes, etc.)
- Safety (e.g., crash history / expectancy)
- Signal timing (e.g., green share, corridor progression & bandwidth)
- Traffic conditions (e.g., queuing, delay, V/C ratio, ped/bike volumes, heavy vehicles, posted speed limit)
- Driver gap acceptance

A: SWRO considers safety as the first priority followed by roadway geometry, traffic conditions, volume, driver gap acceptance, and signal timing while determining mode and sequence of left-turn phasing. It is assumed that there is no deficiency in roadway geometry while providing the above list. The crash threshold provided in the *Signal Timing Manual* may be high for Southwest Region because of rural settings. Therefore, SWRO also uses engineering judgment while evaluating mode for left-turn movements based on frequency of left-turn crashes at signalized intersections.

Q: Do you have any suggestions or good experiences about the determination of the mode or the sequence of left-turn signal phasing that you can share?

A: In addition to the guidelines, SWRO considers field observations and sound engineering judgment as critical components while determining the mode and/or sequence of left-turn phasing. Depending upon

the demand of left-turning vehicular traffic and left-turn storage length, SWRO also considers providing protected-only left-turn phase twice in a cycle where a left-turn permissive phase is deemed unsafe because of inadequate sight distance, inadequate available safe gaps for left-turning vehicular traffic to complete their maneuver during the permissive phase and so forth. In addition, considering the driver's expectancy and to provide consistency, SWRO attempts to provide similar left-turn mode along a corridor as geometrics allow.

Some rules of thumb (based on HCM 2000) that SWRO considers are:

1) If left-turn volumes are less than 60 vehicles in an hour, use permissive mode assuming two (2) sneakers per cycle of 120 seconds of cycle length.

2) If left-turn volumes are greater than or equal to 100 vehicles per hour, provide a separate left-turn lane (protected/permissive or protected-only depending on various factors provided in the response to first question earlier). However, if right of way is available, SWRO prefers to provide a designated left-turn lane even though peak hour left-turning volume is lower than 100 vehicles to improve safety and operations of an intersection.

3) If left-turn volumes are greater than or equal to 300 vehicles per hour, provide dual left-turn phase (protected-only).

VDOT NORTHWEST REGION OPERATIONS

The NWRO, after consultation with their Project Delivery Group, which is responsible for design of signals, responded that they "do not have any internal policies beyond those offered in the ITE and MUTCD manuals". The FHWA's *Traffic Signal Timing Manual* was also cited as a potential resource on the occasion that left-turn phasing at an intersection comes into question.

APPENDIX A: Left-Turn Phasing Selection Guidance and Practices from Online ITE Member Forum

VHB solicited feedback from ITE members regarding existing state DOT guidance for left-turn phasing selection. Responses highlighted several states' guidelines, which are summarized in the first section of this document. Other responses included local guidelines, as well as practices and rules of thumb employed by traffic engineering professionals in left-turn phasing selection. Those responses are included below.

From an ITE member who works for the City of Federal Way, WA:

My basic philosophy is the best left-turn phase is a skipped left-turn phase. Waiting for "green for hosts" is a pet peeve of mine, so I avoid protected lefts like the plague.

Here is our current formal policy language:

"Left-turn phasing shall be the least restrictive possible:

1. *Default to permitted.*
2. *Protected/Permitted if needed for capacity. If exclusive left-turn lanes are provided, flashing yellow arrow displays shall be used.*
3. *Protected if sight distance inadequate (based on AASHTO intersection sight distance criteria for left-turns into minor approach - Case F), high pedestrian volumes, high conflicts or accident experience, more than one left-turn lane, or for lead/lag operation."*

Current practice is evolving to flashing yellow arrow everywhere there is a dedicated left-turn lane, and then make the decision about how to run it. One advantage of installing FYA where permitted would otherwise work just fine is in pre-emption, but I also like having the flexibility to address transient peaks in left-turn volumes due to detours or incidents. I also have a location that we will eventually put in FYA even though it's a dual left, and there may be more, even against 3 or 4 opposing lanes, at least by time-of-day. I will run a FYA approach in protected only mode by TOD if there are no gaps available.

As for sequence, if the corridor is coordinated, I'll run whatever gives me the best greenbands. I try to lag heavier movements. If the approach isn't coordinated, I lead most protected lefts (but I lag them if they are particularly heavy), and lag all FYA approaches and have the left-turn detection extend the opposing through movements to maximize the opportunity for the left turn to move without calling up the left-turn phase.

We use 5 left-turn collisions per approach per year as the threshold to go to Protected Only phasing. Other than that and sight distance, I'm really leaning towards LADOT's use of gap availability by TOD.

From a Canadian ITE member:

A very old rule of thumb that I have used for 40+ years is:

- *If there are more than 100 left turns, then a separate left-turn lane is probably required*
- *If there are more than 100 left turns and the opposing volume is more than 400 vph, then a separate left-turn phase is probably required.*

From an ITE member from Sunnyvale, CA:

The beauty of the four section, all arrow P/P left-turn signal is that you can have:

- *protected only, when traffic is heavy and gaps in opposing traffic are few or nil*
- *protected then permitted or, with a queue detector or a delay function on the detector sensor, permitted then protected*
- *permitted left turns when traffic is light, which in a 24 day is most of the time.*

With the "dog house" P/P signals, you cannot prevent a permitted left turn whilst the left-turn green arrow is not displayed and the adjacent through traffic is shown the circular green signal. This can occur when a protected only left turn is the better solution.

Another discussion thread from the ITE online forum included a question regarding criteria for changing from Protected/Permissive mode to Protected Only mode. Following are select responses from that thread.

From an ITE member who works for MassDOT:

One gauge I use is checking conflicting volumes by taking the left-turn volume and multiply it by the opposing through movement and if that number comes out to be over 80,000 then I start considering protecting the left turns. The idea is that the number of conflicting movements don't allow for enough left turns to process which in turn increase the left-turn delay (which will probably show in the analysis). This may cause these motorists to take chances they are typically not comfortable making. Crash history definitely needs to be looked at (not only as good practice) but to determine how frequent crashes are occurring for a particular intersection and compare them to the state averages per million vehicles entering. Looking at the actual police reports may also shed some light on why the crashes are happening such as bad sight distance, ped conflicts, lack of storage, etc. so there may be other ways to fix the issue.

From an ITE member who works for VDOT:

Signal Timing Manual has pretty good guidelines on how to determine permissive vs protected or Protected/Permissive phase. A few parameters to consider are listed below:

1. *Left-turn and opposing through volumes*
2. *Number of opposing through lanes*
3. *Cycle length*
4. *Speed of opposing traffic*
5. *Sight distance*
6. *Crash history*
7. *Delay/Queue*

From an ITE member who works for the city of Boulder, CO:

Actually we've had good success with using Protected/Permissive phasing (by time of day) on dual left-turn lane approaches. We are certainly not the only community in Colorado to do this either. I've yet to see any data that supports the premise that multiple left-turn lanes requires protected only phasing. I've always considered that to be "Folklore".

The ITE Handbook provides both a volume criteria and a safety criteria (4 correctable accidents in one year or 6 correctable accidents in two years) to provide protected phasing. This is the criteria that we use to access a need for protected phasing. Furthermore we make this assessment by time of day (if all the accidents occur in the PM peak we only provide protected phasing in the PM peak).

From an ITE member from Las Vegas, NV:

Allow me to add credence to it being "Folklore" that dual lefts require protected only. When I was starting my municipal traffic engineering career in Richardson (TX) in the early 1980's, dual left-turn lanes were the BIG NEW THING. We went ahead and built signals at all of our major-crossing-major intersections having dual left turns with 5-section left-turn heads, and they almost all ran PPLT 24x7x365. The drivers became accustomed to it, and didn't crash (at a too-high rate).

You can Google Street View just about any major arterial intersection in Richardson today, and you'll see this practice survives 30 years on.

From an ITE member from Sunnyvale, CA:

Denver Colorado has at least one double left-turn lanes permitted left turn crossing a two lane approach. I observed the operation and it seemed to function as intended, safely. Also, I installed eight (four intersections) single lane permitted left turns, six of which crossed three lane approaches and the

other two[.] All enjoyed excellent safety records. One element to success is visibility. If left-turning traffic can see oncoming traffic, they usually make good decisions. When there are no or few adequate gaps in approaching traffic, a protected left turn is necessary, however, there are times in the 24 hour day when a permitted left turn is perfectly safe, regardless of the number of lanes. Then, there are time[s] in between when P/P is best.

From an ITE member who works for the city of Kennewick, WA:

It is not necessarily true that two lanes require Protected Only phasing. We run two locations like that. Our first location was turned on December 20th, 2004. It now serves a Home Depot, Walgreen's, Starbuck's, Pet Smart, and a few other small shops while the other side is single turn lane and serves Wal-Mart, Burger King, Best Western, McDonalds and a gas station.

This setup works fine because the two lanes both have clear vision of oncoming traffic, the opposing traffic is random arrival, and has adequate gaps. The two-lanes were needed for storage due to [its] close proximity to a US Highway. Both turn lanes get used regularly and simultaneous traffic turning from the two lanes is not uncommon. I checked statistics and the actual left turn on the dual lane side gets triggered 20% of cycles or less. The Wal-mart side gets triggered about 50% of the time through the peak hours.

We converted a similar location in 2008 from Protected Only to PPLT with FYA that also works fine.

If you want to check them out use Bing for aerials because Google maps are too old to show current configuration. If you want street level, then use Streetview in Google maps. The first intersection is 27th Avenue and Quillan Street and the second is 10th Avenue and Huntington Street.

From an ITE member who works for the city of Wilmington, NC:

For single left-turn lanes, I rarely find that the signal needs protection 24/7/365. Herein lies one of the wonderful applications of the FYA. It affords the ability to run the needed indication according to the conditions. For duals, we have seen permitted operation and have just discovered the NCDOT is experimenting with them. We have one location out of 212 that we think may lend itself to this operation. Like the previous point, rarely do we need duals in the overnight hours. I think the technology will evolve that we can vary the duals by TOD. Therefore the outside turn lane would run with a standard three section head and the inside with a 4 section FYA. During times when the duals are needed, the FYA would be extinguished and full protection afforded. Later, when appropriate the FYA activated and the outside lane closed with a blankout sign. The three section[s] would stay red and the blankout sign would flash if the detector for that lane became active.

Point here, as technology changes we should seriously examine the past paradigms to see whether application of this technology can provide better service to our customers without sacrificing safety. By

displaying the correct design for the conditions, we are also most likely to gain the best compliance from our roadway users and generate respect for the work we do. Let's also remember that most signals are designed to handle the peak hour load which by logic of the K factor represents only 20% of our users. What about the other 80%?

From an ITE member who works for the city of Irvine, CA:

Very good question. This is something we have had to address more often in my City. In addition to the previous excellent responses, I would like to add two more things to consider:
(1) I'm told that the 100,000 product (LT vs. opposing thru) is losing its luster as a good "threshold" warrant. If that value is attained, fine, but more consideration needs to be given to peaking characteristics of both the LT and opposing thru volumes, and how the volume "curve" looks throughout the day.
(2) Perhaps the bigger issue is the presence of pedestrians. I have received many calls from pedestrians about near-miss incidents where the ped phase serves at the same time as the green ball (i.e., unprotected LT phase). As it turns out (every time!), the pedestrian believes that the ped crossing is exclusive to pedestrians because he/she is not cognizant of what signal indication the motorist is seeing. At the same time, the left-turning motorist is not only surprised that the pedestrian is already out in the crosswalk, but also fails to yield. The upshot is that I'm writing more work orders for the new R10-15 sign with a ***left*** *arrow. Of course, adding the protected LT would resolve virtually all of the uncertainty. Pedestrians view this as a distinct safety enhancement. [Note: Irvine, CA, has protected LT phasing at the vast majority of its signalized intersections; thus, both drivers and peds are subconsciously used to this, which means that the permissive LT is problematic if driver and/or ped is somehow distracted]*

From an ITE member who works for the city of Bellevue, WA:

We no longer view it as a 24/7 decision usually. If you have 5 accidents and they are also in a certain time block (congestion maybe?) we use the FYA displays and just run Protected only during this time block.

In our CBD because of the pedestrian conflicts we use to go to protected quite often, but with FYA we have many we run protected during the day (~12 hours) and FYA overnight (~12 hours). We have been running this for 2 years with no issues. We more recently developed a FYA Ped Protect logic that omits the FYA during the Walk and FDW phase, then can reserve the FYA on mainline if there is enough split left to serve min green and clearance. This is allowing us to use FYA during the day in the CBD, when the only issue was pedestrian conflict complaints.

We have one location that the FYA crosses 3 lanes and is steep uphill (slow acceleration) and has been running without problems for 2 years. I agree with Rick Perez (Federal Way) that the number of lanes crossing has been over-used as a criteria.

I would use FYA displays as the base display, then you have the flexibility to run permissive only, Protected/Permissive, protected only.....you can also lead/lag.

We haven't done dual left-turn lanes with FYA, but are contemplating it. The cross product method several state DOT use may give you an idea of times you need to examine for acceptable gaps and potentially go protected only.

Agenda Item 2B: Coordinated Public Transportation Human Service Plan

Meeting Date: February 3, 2025

Summary of Item:
The Bipartisan Infrastructure Law continued the requirement of a Coordinated Human Service Public Transportation Plan (49 USC 5310). The Coordinated Human Service Public Transportation Plan (Coordinated Plan) aims to bridge the gaps in transportation services for these vulnerable populations. The plan requires states, urban areas, and transportation providers to develop a coordinated, comprehensive strategy that addresses the transportation needs of these populations. It promotes cooperation among transportation providers, human service agencies, and other stakeholders to improve coordination and efficiency in service delivery.

The plan elements are:

- Review of activity since the last Coordinated Plan;
- Assessments of available services;
- Assessment of transportation needs and gaps in service;
- Strategies to address the identified needs;
- Prioritized strategies.

The Coordinated Plan updated the demographics using the American Community Survey (ACS) 2022 data. One comment on the draft plan was using the ACS definition of disability and not the Americans with Disability Act. The ADA guidance includes many more types of disabilities than included in the ACS data. No other source of disability data has been identified,

The Coordinated Plan identified service, facilities, infrastructure, and knowledge and information gaps as areas where services can be enhanced. Strategies were identified for the three gaps, divided into high, medium, and low priorities. The high-priority strategies focus on technology and facility improvements.

The Coordinated plan develops and prioritizes FTA 5310 Enhanced Mobility of Seniors and Individuals with Disabilities projects.

The regulatory guidelines for the FTA 5310 program were updated on November 1, 2024. Staff did not identify any changes to the regulation that would affect the plan compliance.

Recommendation:

Approve Resolution 2025-2 Providing for the approval of the Coordinated Public Transportation Human Service Plan.

Resolution 2025-2 Providing for the approval of the Coordinated Public Transportation Human Service Plan

WHEREAS, the Bannock Transportation Planning Organization has been designated by the Governor of Idaho Metropolitan Planning Organization for the Pocatello Urbanized area;

WHEREAS, the Infrastructure Investment and Job Act (IIJA), Title 49 United States Code § 5310, requires a coordinated Public Transportation Human Service plan be developed to address the Enhanced Mobility of Seniors and Individuals with Disabilities; and

WHEREAS, the plan followed the guidance of Federal Transit Administration Circular C 9070.1G Enhanced Mobility of Seniors and Individuals with Disabilities Program Guidance and Application Instructions; and

WHEREAS, the Idaho Transportation Department Facilities requires Metropolitan Planning Organization areas to have a Coordinated Public Transportation Human Service plan; and

WHEREAS, a local committee with participation by seniors, individuals with disabilities, representatives of public, private, and non-profit transportation and human services providers met several times during 2024 to review the plan and recommended the adoption of the existing plan; and

WHEREAS, the Coordinated Public Transportation Human Service plan public comment period was from October 2 to October 18, 2024. Plan considered and updated as the new 2023 Coordinated Public Transit-Human Services

NOW, THEREFORE, BE IT RESOLVED by the Bannock Transportation Planning Organization Policy Board approved the Coordinated Public Transit-Human Services Transportation Plan.

Adopted by the BTPO Policy Board meeting on February 3, 2025

Attest:

_____ _____

Linda Leeuwrik, Chair

Mori R Byington

Coordinated Human Service Public Transportation Plan

Prepared By
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Bannock Transportation Planning Organization

Bannock Transportation Planning Organization operates its programs and services without regard to race, color, and national origin in accordance with Title VI of the Civil Rights Act. Any person who believes she or he has been aggrieved by any unlawful discriminatory practice under Title VI may file a complaint with the Bannock Transportation Planning Organization.

For more information on Bannock Transportation Planning Organization's civil rights program and procedures to file a complaint, contact 208 233-9322, email: mori@bannockplanning.org, or visit our administrative office at 214 E. Center Street Suite 70, Pocatello, Idaho 83201. For more information, visit www.bannockplanning.org.

A complainant may file a complaint directly with the Idaho Transportation Department Office of Civil Rights, Office of Civil Rights Program Manager, PO Box 7149 Boise, ID 83707-1129 Phone 208-334-8884 https://apps.itd.idaho.gov/apps/ocr/complaint.aspx

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Introduction

Since 1998, federal legislation has required coordinated planning efforts to address the challenges faced by older adults and individuals with disabilities, such as accessing transportation services. These groups often have limited access to private vehicles or face physical and financial barriers that prevent them from using traditional public transportation.

Transportation is a vital component of daily life, especially for older adults and people with disabilities who rely on accessible and reliable services to maintain their independence and quality of life. Recognizing this, the Bipartisan Infrastructure Law continued the requirement of a Coordinated Human Service Public Transportation Plan (49 U.S.C. 5310). The Coordinated Human Service Public Transportation Plan (Coordinated Plan) aims to bridge the gaps in transportation services for these vulnerable populations. The plan requires states, urban areas, and transportation providers to develop a coordinated, comprehensive strategy that addresses the transportation needs of these populations. It promotes cooperation among transportation providers, human service agencies, and other stakeholders to improve coordination and efficiency in service delivery.

The primary objective of this Coordinated Plan is to address the transportation needs of older adults and people with disabilities when existing services are unavailable, insufficient, or inappropriate. By targeting these specific needs, the plan ensures that all individuals have access to the necessary transportation options that enable them to participate fully in their communities.

Funding

The Federal Transit Administration allocates funds authorized in 49 U.S.C. 5310 based on each state's share of the population for older adults and people with disabilities. These formula funds are then apportioned to direct recipients, which include:

- State Departments of Transportation for rural and small urban areas
- Designated recipients chosen by the governor for large urban areas

In Idaho, the Idaho Transportation Department and the state's six Metropolitan Planning Organizations work together to fund projects and strategies identified in the Coordinated Plan.

Planning Guidance

The Federal Transit Administration Circular C.9070.1G provides guidelines on developing a Coordinated Public Transportation-Human Service Transportation Plan and the required four elements. The four required elements are:

- An assessment of available services that identifies current transportation providers (public, private, and nonprofit);
- An assessment of transportation needs for individuals with disabilities and seniors (an individual who is 65 years of age or older);

- Strategies, activities, and projects to address the identified gaps between current services and needs, as well as opportunities to achieve efficiencies in service and delivery and
- Priorities for implementation based on resources, time, and feasibility of implementing specific strategies and/or activities identified.

Plan Development Process

This Coordinated Plan is the third version and builds upon the previous efforts and the knowledge of the experience of public transportation providers, nonprofit organizations, government agencies, and individuals. The coordinated plan will roughly follow the four elements required. The plan elements are:

- Review of activity since the last Coordinated Plan;
- Assessments of available services;
- Assessment of transportation needs and gaps in service;
- Strategies to address the identified needs;
- Prioritized strategies.

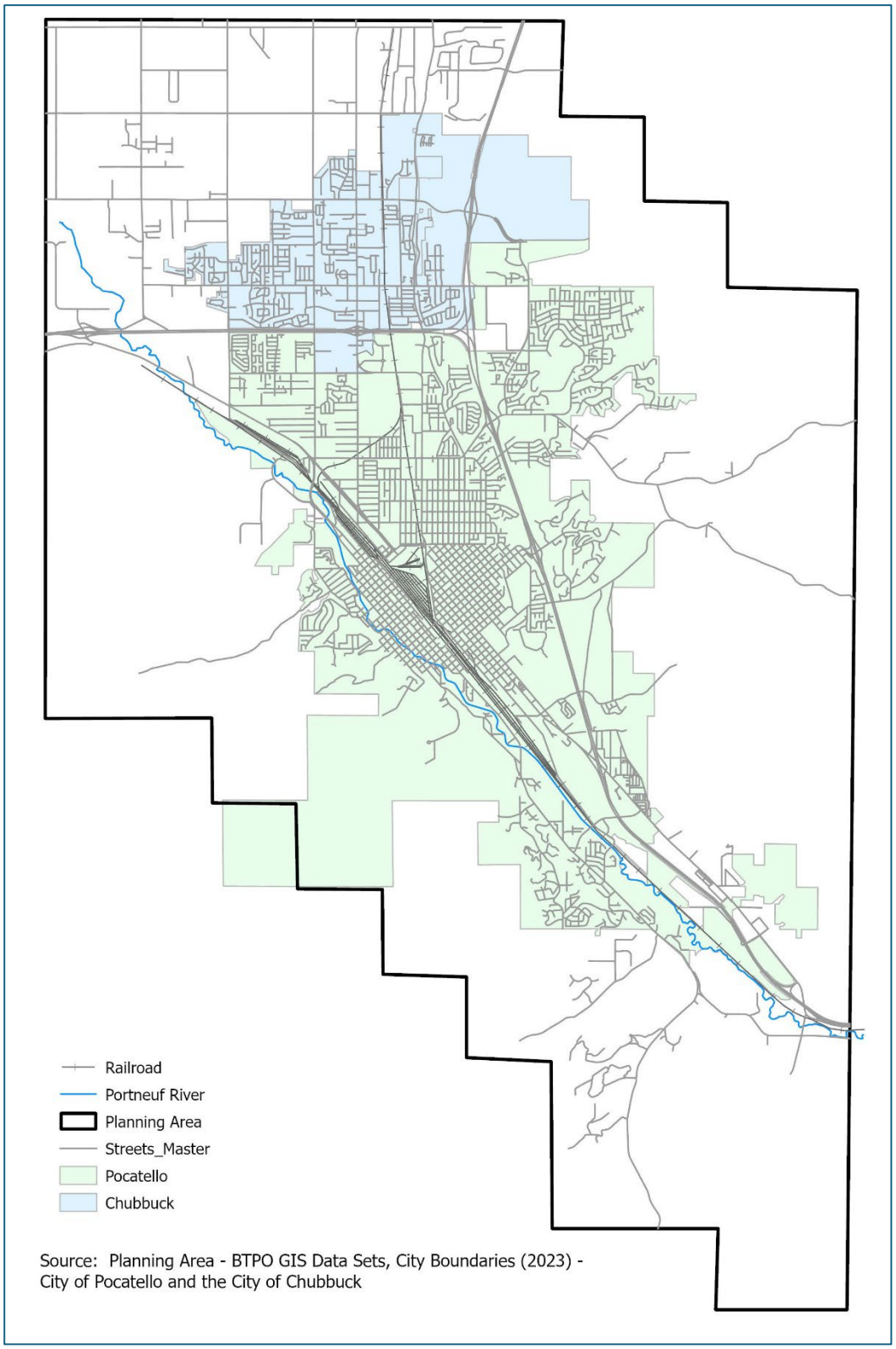
A group of agencies representing older adults and persons with disabilities was revised from previous planning efforts. They include:

- Area Agency on Aging
- Aid for Friends
- Southeast Idaho Council of Governments
- Pocatello Regional Transit
- Bannock County Veterans Services
- Housing Alliance and Community Partnerships
- Idaho Commission for the Blind and Visually Impaired

Study Area

The BTPO planning area is the study area (Figure 1). The study area includes the cities of Pocatello and Chubbuck and the Pocatello Urbanized Area.

Figure 1 Planning Area



Objectives

The Coordinated Plan has three primary objectives that guide its implementation:

- Improve access to transportation services: The plan aims to increase access to transportation services for individuals with disabilities and older adults by identifying gaps in existing services and developing strategies to fill them.
- Increase involvement of stakeholders: The plan encourages expanding mobility management services and additional outreach to ensure stakeholders know the transportation choices available and how to access these options.
- Improve the bus and physical infrastructure to improve mobility of the elderly and persons with disabilities.

Demographics

The data for this analysis comes from the U.S. Census Bureau American Community (ACS) Survey, 2018-2022 ACS 5-Year Estimates, based on data collected from January 1, 2018 to December 31, 2022.

The BTPO planning area includes a sliver of Power County (Census Tract 9601). The majority of the planning area, including the focus area of this plan, is in Bannock County. The maps and tables show Census Tract 9601 data, but the area of the tract within the planning area has few households or people.

Census Tracts 2 and 9818 are not completely contained within the BTPO planning area. An analysis of the area outside the planning area concluded that it was very similar, so no adjustments were made. Additionally, a large portion of these Tracts include federal or state-owned land.

The demographics included are those characteristics that impact the delivery of services or the ability to access those services. The first two target demographics (elderly and persons with a disability) are directly related to the program and provide location information. The last two target demographics (households without access to a vehicle or internet subscription) affect the need for services and the ability to get information about transit or rider services.

Knowing the percentage of each characteristic helps to identify the general regional trends. BTPO uses 150 percent of the regional average to determine Census Tracts with a high concentration of a characteristic. The data helps to identify those Census Tracts with a high concentration of characteristics and where specific efforts should be focused.

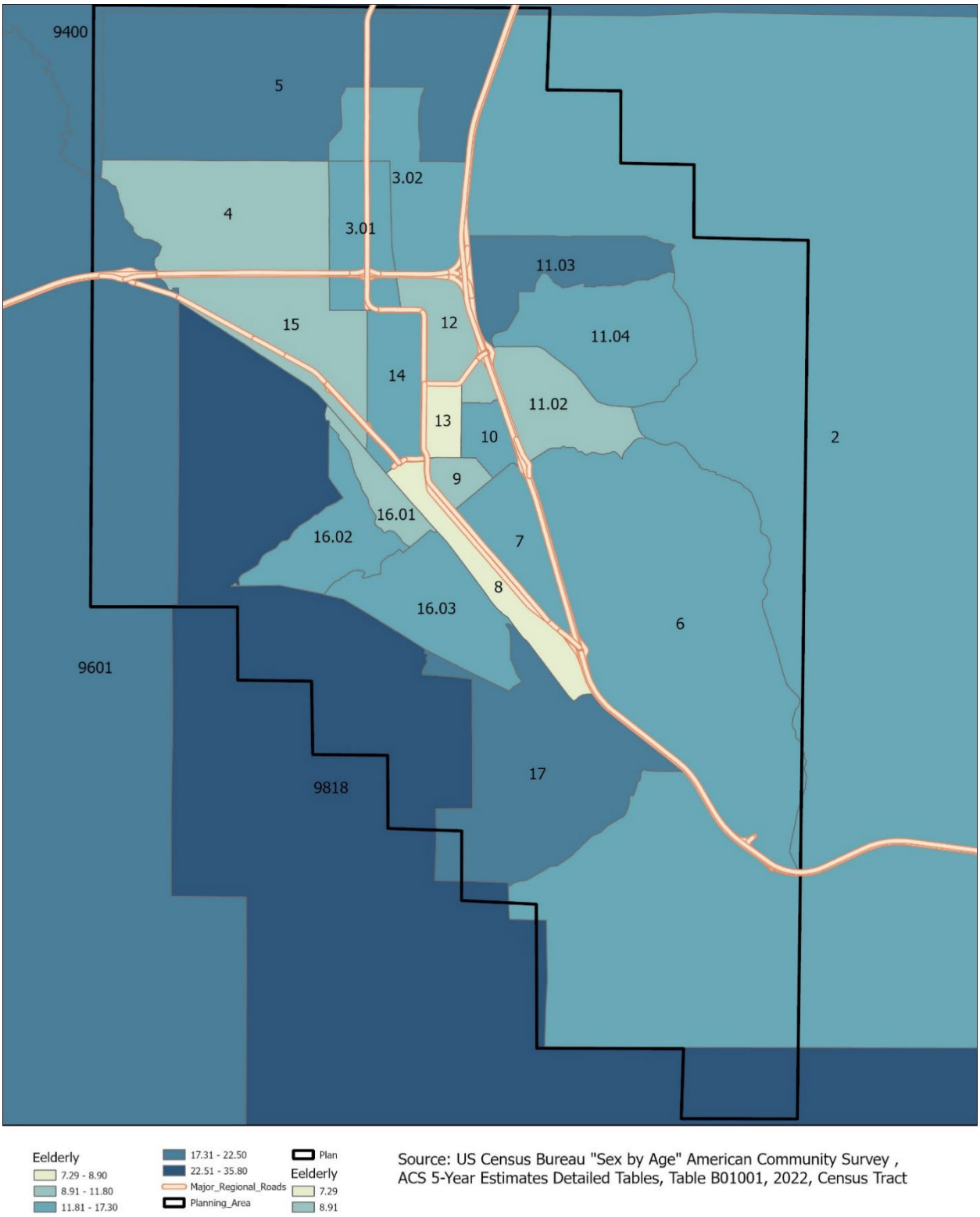
Elderly

According to the ACS 2022 data, persons 65 years and older represent 15% of the population in the BTPO planning area. Table 1 lists the Census Tract population and the population and percentage of persons 65 years of age and older.

Table 1 Elderly Population Data for the BTPO Planning Area

Tract	Total Population	65 and Over	Percent 65 and Older
Census Tract 2	4076	707	17.3%
Census Tract 3.01	3872	643	16.6%
Census Tract 3.02	5465	871	15.9%
Census Tract 4	6693	754	11.3%
Census Tract 5	1980	383	19.3%
Census Tract 6	3478	538	15.5%
Census Tract 7	4706	676	14.4%
Census Tract 8	3034	219	7.2%
Census Tract 9	2199	259	11.8%
Census Tract 10	3107	428	13.8%
Census Tract 11.02	3934	437	11.1%
Census Tract 11.03	4536	810	17.9%
Census Tract 11.04	3287	524	15.9%
Census Tract 12	3730	378	10.1%
Census Tract 13	2591	231	8.9%
Census Tract 14	4132	562	13.6%
Census Tract 15	5937	618	10.4%
Census Tract 16.01	2711	302	11.1%
Census Tract 16.02	3787	624	16.5%
Census Tract 16.03	2825	388	13.7%
Census Tract 17	3571	773	21.6%
Census Tract 19	5716	1242	21.7%
Census Tract 9400	1642	316	19.2%
Census Tract 9818	425	152	35.8%
Bannock	87,434	13,076	15.4%
BTPO	75,575	10,659	15.0%
High Concentration Tract			22.5%
Census Tract 9601 Power County	1,661	315	19.0%

Figure 2 Percent of Population Over 65 Years Old



Persons with Disabilities

The term disability, for the study, is defined in 42 U.S. Code § 12102 (1). The term "disability" means, with respect to an individual:

- A physical or mental impairment that substantially limits one or more major life activities of such individual;
- A record of such an impairment; or
- Being regarded as having such an impairment.

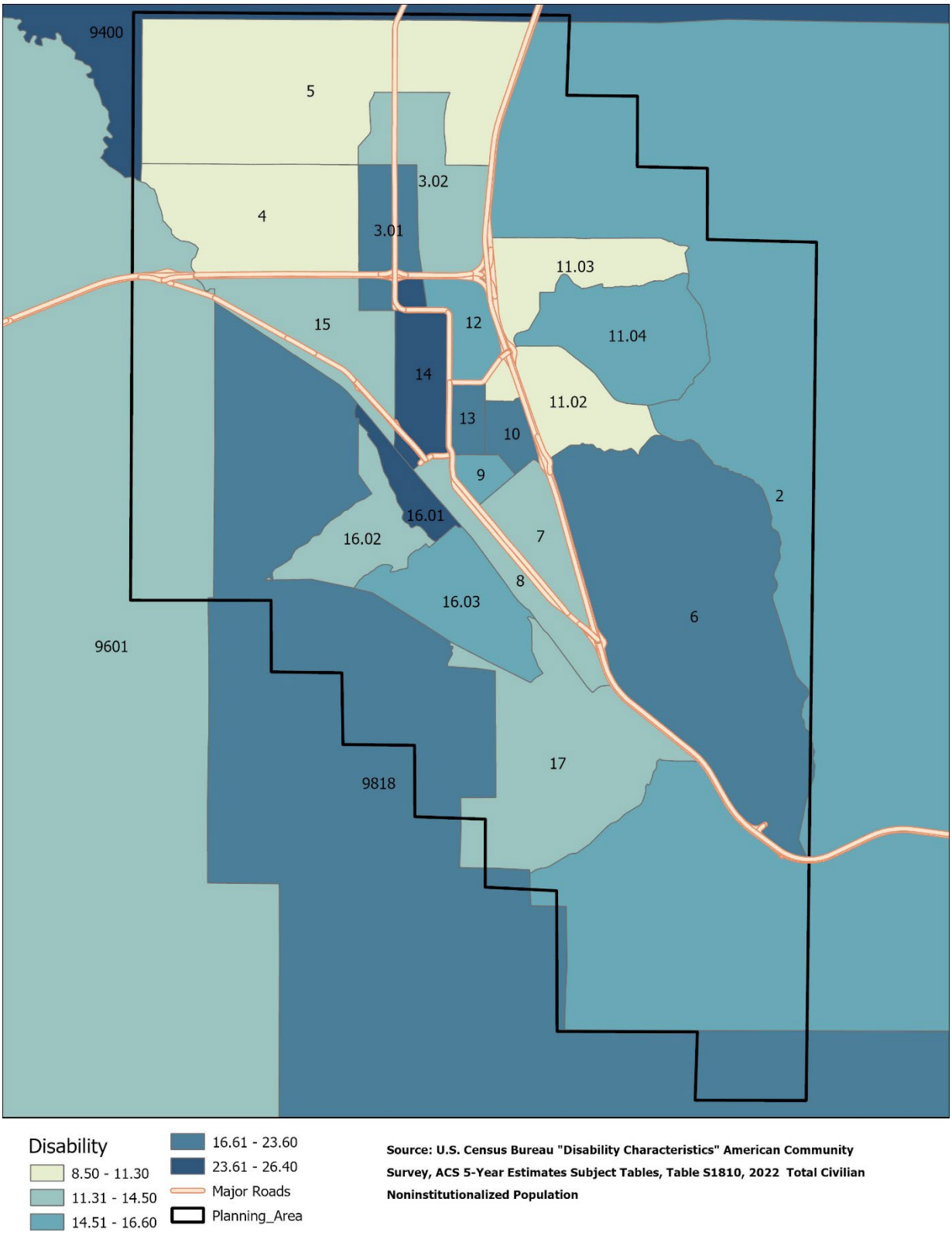
The focus is on limiting major life activities. The ACS survey covers six disability types: hearing, vision, cognitive, ambulatory, and self-care difficulty. Respondents who answer yes to any of the six questions are considered disabled for this report. The definitions are not exact, but the ACS is the best data source for limiting life activities. According to the ACS 2022 data, Persons with a Disability represent 15.7% of the population in the BTPO planning area. Table 2 lists the Census Tract non-institutionalized population and the percentage with a disability.

Table 2 Percent of Population with a Disability

Tract	Total civilian non-institutionalized population	With a disability	Percent Population with a disability
Census Tract 2	4,076	607	14.90%
Census Tract 3.01	3,868	730	18.90%
Census Tract 3.02	5,431	675	12.40%
Census Tract 4	6,693	572	8.50%
Census Tract 5	1,980	199	10.10%
Census Tract 6	3,121	586	18.80%
Census Tract 7	4,572	602	13.20%
Census Tract 8	3,018	427	14.10%
Census Tract 9	2,199	353	16.10%
Census Tract 10	3,104	625	20.10%
Census Tract 11.02	3,856	347	9.00%
Census Tract 11.03	4,491	436	9.70%
Census Tract 11.04	3,287	545	16.60%
Census Tract 12	3,730	575	15.40%
Census Tract 13	2,591	502	19.40%
Census Tract 14	4,123	1,087	26.40%
Census Tract 15	5,893	763	12.90%
Census Tract 16.01	2,706	664	24.50%
Census Tract 16.02	3,787	513	13.50%
Census Tract 16.03	2,452	400	16.30%
Census Tract 17	3,568	502	14.10%
Census Tract 19	5,713	823	14.40%

Tract	Total civilian non-institutionalized population	With a disability	Percent Population with a disability
Census Tract 9400	1,642	418	25.50%
Census Tract 9818	425	91	21.40%
Bannock	86,326	13,042	16.1%
BTPO	74,470	11,103	15.7%
High Concentration Tract			23.6%
Census Tract 9601 Power County	1,661	241	14.50%

Figure 3 Person of Non-Institutionalized Population with a Disability



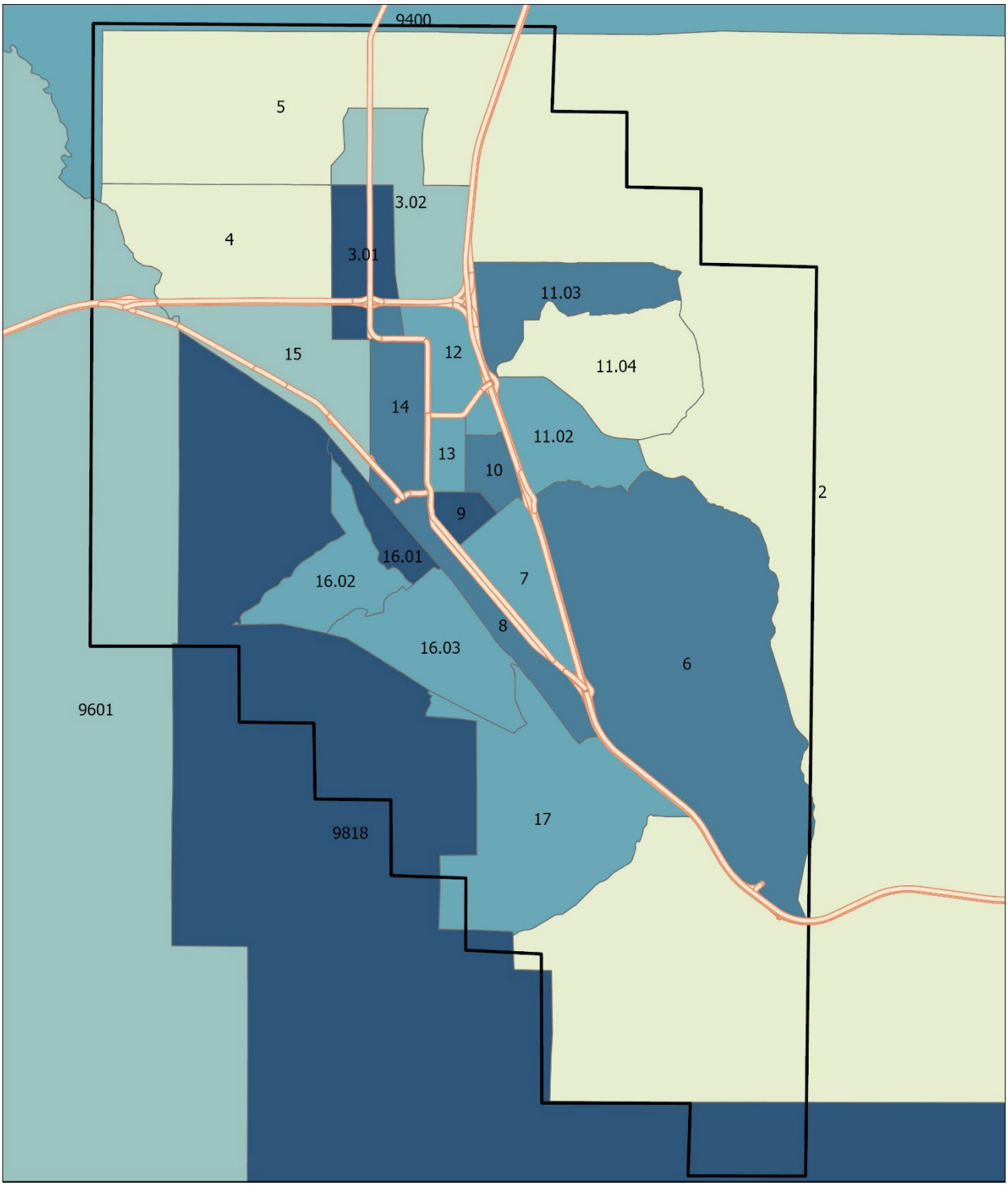
Zero Vehicle Households

The ACS survey question asks how many vehicles are available and kept at home for household members. According to the ACS 2022 data, households with no access to a vehicle represent 10.9 % of the households in the BTPO planning area Table 3.

Table 3 Percent of Households with Zero Vehicle Available

Census Track	Households	No Vehicles	Percent Zero Vehicle Households
Census Tract 2	1,376	11	1.6%
Census Tract 3.01	1,685	510	30.3%
Census Tract 3.02	1,887	76	4.0%
Census Tract 4	2,258	0	0.0%
Census Tract 5	687	16	2.3%
Census Tract 6	1,177	124	10.5%
Census Tract 7	1,497	134	9.0%
Census Tract 8	1,213	138	11.4%
Census Tract 9	1,064	290	27.3%
Census Tract 10	1,423	172	12.1%
Census Tract 11.02	1,350	114	8.4%
Census Tract 11.03	1,524	162	10.6%
Census Tract 11.04	1,108	24	2.2%
Census Tract 12	1,173	102	8.7%
Census Tract 13	990	84	8.5%
Census Tract 14	1,702	178	10.5%
Census Tract 15	2,180	84	3.9%
Census Tract 16.01	1,482	464	31.3%
Census Tract 16.02	1,487	140	9.4%
Census Tract 16.03	1,237	90	7.3%
Census Tract 17	1,355	130	9.6%
Census Tract 19	2,031	94	4.6%
Census Tract 9400	620	60	9.7%
Census Tract 9818	198	42	21.2%
County	**32,704**	**3,239**	10.6%
BTPO	**28,479**	**3,032**	10.9%
High Concentration Tract			16.4%
Census Tract 9601 Power County	589	18	3.00%

Figure 4 Percentage of Households with Zero Vehicles Available



Source: U.S. Census Bureau. "Household Size by Vehicles Available." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B08201, 2022,

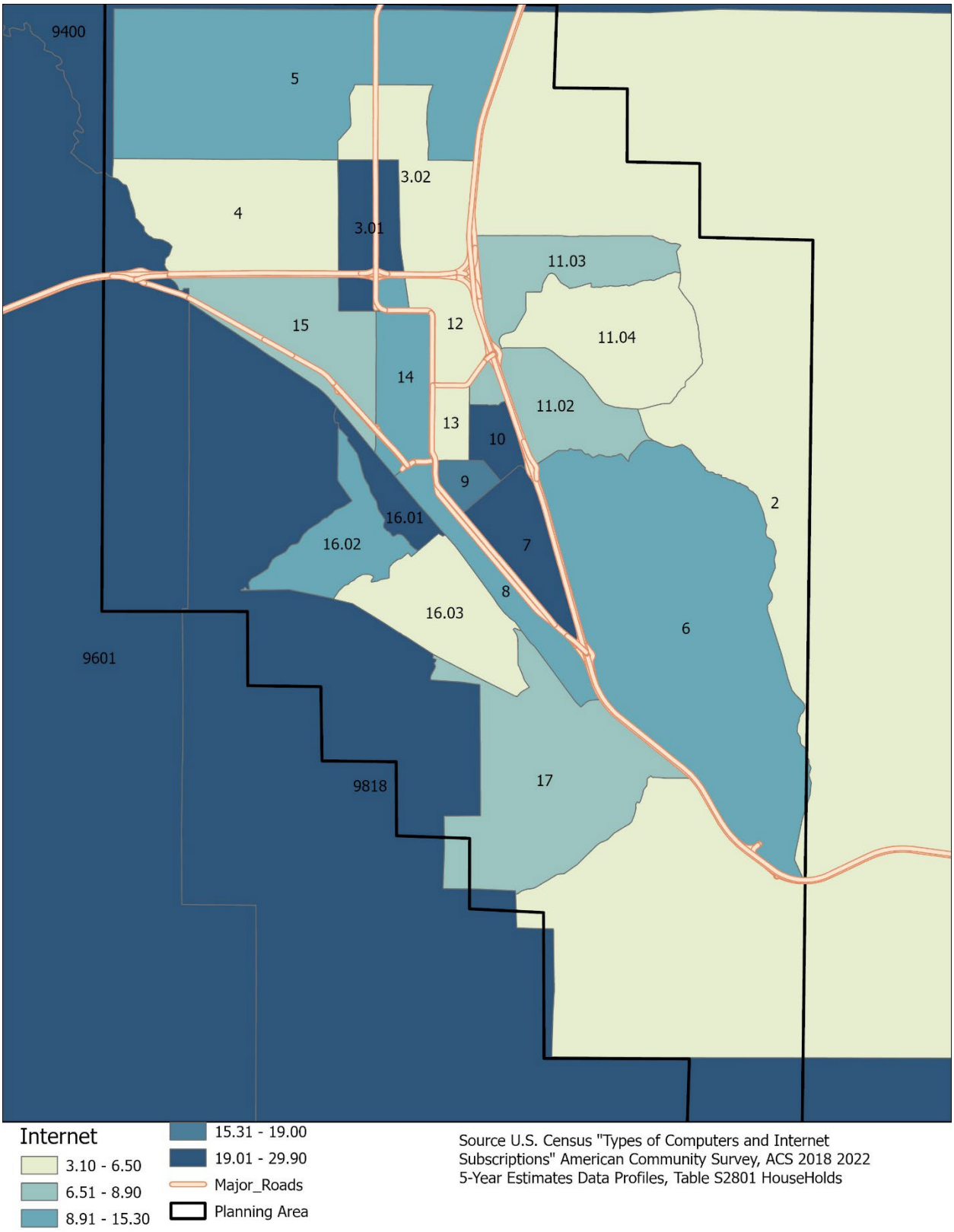
Internet Availability

Whether it is scheduling a ride or looking up travel information, access to the internet is critical to people's ability to access transportation services. Applications and websites are becoming increasingly important in personal mobility. The ACS data has questions about computers and smartphones. The ability of those devices to access the internet is a critical component. Table 4 shows that 12.6% of the planning area's households do not have an internet subscription. An Internet subscription includes Broadband, Cellular data plan, or Satellite Internet service.

Table 4 Percentage of Households without an Internet Subscription

Tract	Total households	Without an Internet subscription	Without an Internet subscription
Census Tract 2	1,376	89	6.47%
Census Tract 3.01	1,685	503	29.85%
Census Tract 3.02	1,887	85	4.50%
Census Tract 4	2,258	101	4.47%
Census Tract 5	687	86	12.52%
Census Tract 6	1,177	152	12.91%
Census Tract 7	1,497	372	24.85%
Census Tract 8	1,213	186	15.33%
Census Tract 9	1,064	201	18.89%
Census Tract 10	1,423	284	19.96%
Census Tract 11.02	1,350	117	8.67%
Census Tract 11.03	1,524	127	8.33%
Census Tract 11.04	1,108	72	6.50%
Census Tract 12	1,173	36	3.07%
Census Tract 13	990	64	6.46%
Census Tract 14	1,702	226	13.28%
Census Tract 15	2,180	195	8.94%
Census Tract 16.01	1,482	368	24.83%
Census Tract 16.02	1,487	205	13.79%
Census Tract 16.03	1,237	74	5.98%
Census Tract 17	1,355	120	8.86%
Census Tract 19	2,031	261	12.85%
Census Tract 9400	620	148	23.87%
Census Tract 9818	198	39	19.70%
County	32,704	4,111	13.1%
BTPO	28,479	3,574	12.6%
High Concentration Tract			
Census Tract 9601 Power County	598	123	20.6%

Figure 5 Percent of Households without Internet Subscription



Assessments of Available Services

The section provides information on the availability of transportation services within the planning area. The information was compiled using surveys, phone calls, internet searches, and stakeholder interviews. Public and client-based are the two types of transportation providers. Public transportation are those services open to the public with no or limited restrictions. Public transportation providers in the region include:

- Pocatello Regional Transit
- Shoshone-BannocK Tribes Public Transit Services
- Uber (Limited ADA vehicles)
- Lyft (Limited ADA vehicles)

Client-based services are those that provide transportation services to only clients. Most of the providers on the list that follows only provide non-emergency medical transportation from Medicare. Some will provide other transportation services to clients. Client providers include:

- Pocatello Regional Transit Paratransit (Door-to-Door services)
- Idaho Transportation Company (Limited taxi services to clients with 24-hour notice)
- Joann's Shuttle
- SHUDL
- Joe's Shuttle Service LLC
- Diamon Peak Health Care
- United Way of Southeastern Idaho

Public Transportation Services

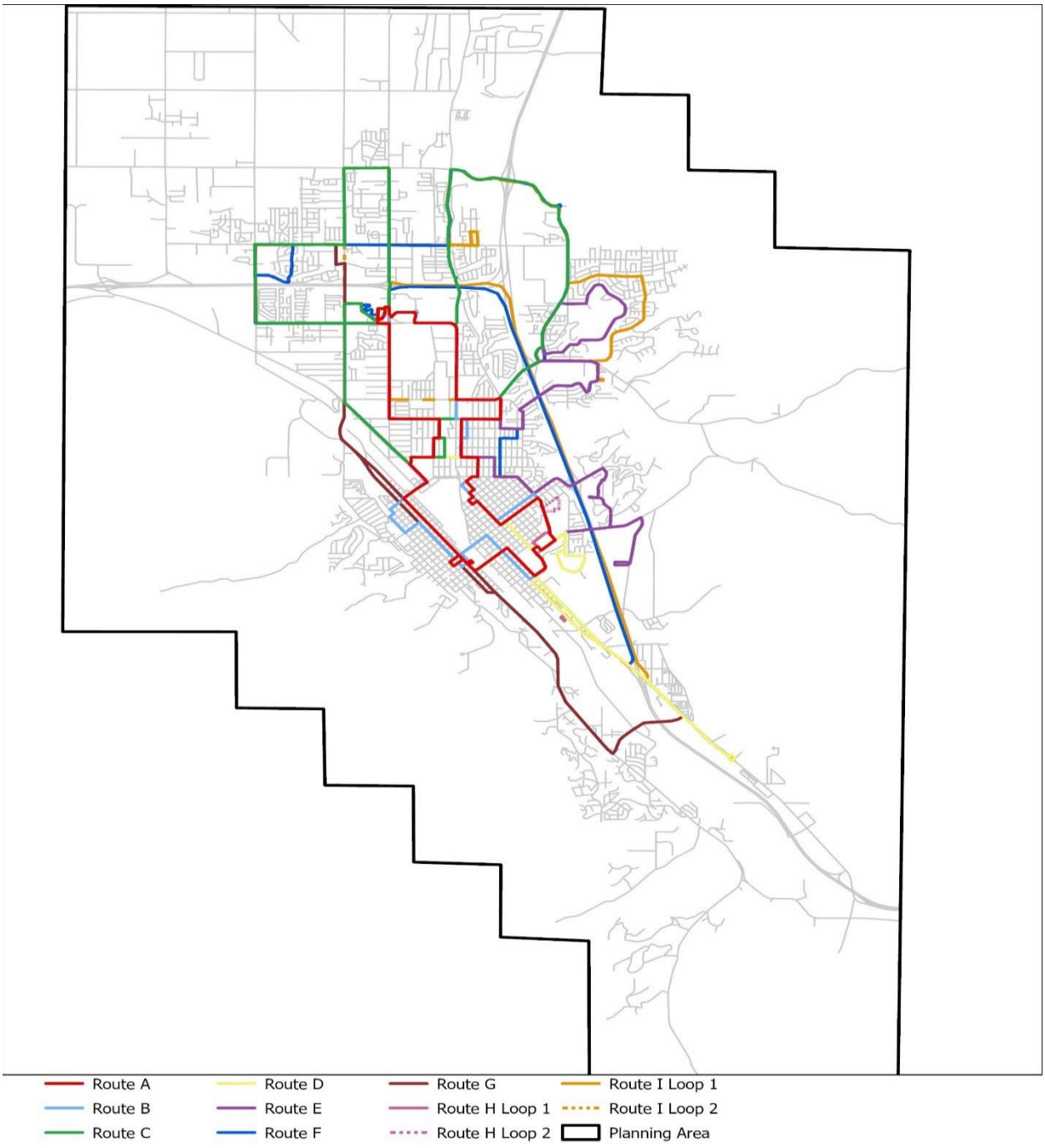
Shoshone-BannocK Tribes Public Transit Services operates an on-demand fixed route service from Fort Hall to Pocatello. Services must be scheduled a day in advance of service. The route operates from 6 am to 6 pm Monday and Tuesday, 6 am to 10 pm Wednesday -Friday, and 10 am to 6 pm Saturday and Sunday. The stops in the study area are the Pine Ridge Mall, Walmart, and Idaho State University.

Pocatello Regional Transit (PRT) is the region's designated public transit service provider. PRT operates fixed routes and paratransit within the urban area. PRT operates a fixed route system from Monday through Friday from 6:00 am to 7:00 pm, with a slightly shorter service on Saturday (9:00 am to 6:00 pm). There is no fixed route service on Sunday. PRT also operates a paratransit service on the same schedule as the fixed route.

Fixed Routes

Fixed Route services include any transit service in which vehicles run along an established path at preset times. Typically, fixed-route service is characterized by fixed schedules and designated bus stops where passengers board and deboard. PRT operates eleven fixed routes throughout the urban area (Figure 6).

Figure 6 Pocatello Regional Transit Fixed Routes



Paratransit (Door-to-Door)

Paratransit is an alternative mode of flexible passenger transportation that does not follow fixed routes or schedules. PRT offers services for seniors and Americans with Disabilities Act (ADA) paratransit within urban areas. The paratransit services offered by PRT are demand-responsive

transport, which offers on-demand door-to-door service from any origin to any destination in a service area.

Regular operating hours run with the fixed route services Monday through Friday from 6:00 am to 7:00 pm with a $2.00 per-trip fare and on Saturday from 9:00 am to 6:00 pm with a $2.00 per-trip fare.

Premium Service hours (outside regular operating hours) are Monday through Friday before 8:00 am, after 7:00 pm, and on Saturday before 9:00 am and after 6:00 pm. All trips performed during Premium Service hours require a $5.00 per-trip fare

Senior paratransit services will provide rides with a 24-hour reservation to persons over 60 at a suggested donation of $2.00 per trip. The service provides door-to-door transportation services.

In revisions to the Code of Federal Regulations (CFR) Title 49 Part 37, the Federal Transit Administration defined the combined requirements of the ADA and the Rehabilitation Act for transit providers. These requirements included "complementary" paratransit to destinations within a ¾ mile of all fixed routes (49 CFR 37.131) and submission of a plan for complying with complementary paratransit. PRT operates its paratransit services to the entire service area, even outside the ¾ mile requirement. To use the ADA paratransit services, PRT must prequalify a person. This prequalification determines if a person has a physical, visual, or mental functional limitation that causes them to be unable to use the accessible fixed route system.

Transportation Needs and Gaps

A transportation need is an individual's desire or requirement to travel to a specific destination for various purposes. It represents the demand for mobility and the necessity to reach a particular place.

Example:

- A person must travel from home to their workplace every weekday morning.
- A patient needs to get medical treatment every day.

A transportation gap is a barrier within the transit services or infrastructure that hinders an individual's ability to use public transit effectively. These gaps can arise from various issues, such as inadequate service coverage, limited operation hours, poor accessibility, or lack of connectivity between different modes of transportation. Such gaps prevent people from meeting their transportation needs using available transit options.

Example:

- A neighborhood is not served by any bus route, making it difficult for residents to get to shopping or medical services without a car.
- A bus service operates only until 7 pm, leaving people who want to travel without a reliable means to get home after that time.

Key Differences:

- Transportation Need represents the desire or requirement to travel to a specific destination. Needs are personal and situational and driven by individual schedules and destinations.
- Transportation Gap represents a barrier that prevents the effective use of transit services.

Understanding these terms helps planners, policymakers, and transit agencies address the community's real needs by identifying gaps and how they can be bridged to ensure more efficient and inclusive transportation solutions.

Categories of Needs and Gaps

Identifying transportation needs has been difficult. Since 2012, BTPO has engaged the public and reviewed surveys from other organizations like the Southeast Idaho Council of Governments and reports like the Bannock County Community Action Plan to validate and determine if the needs and gaps identified in 2013 still exist.

For this update, a survey of seniors and persons with disabilities was the focus. Surveys were distributed to housing authorities, senior centers, and paratransit riders from February to March 2024. Eight-three surveys were returned. The complete results are included in Appendix A. Most respondents were 65 or older (56.79%), and 81.39% had a disability. Key takeaways from the survey are:

- The elderly and persons with disability rely on others to provide transportation services.
- I cannot drive or have access to a working vehicle.
- I have some disability or health condition which prevents me from providing my transportation.
- Transportation is an issue in medical appointments, grocery stores, and shopping trips.
- Planning for transit services and the lack of evening services are barriers to using paratransit services.
- Pedestrian infrastructure is a barrier to using fixed transit routes.

Service Gaps

Figure 7 shows a rough service area for the PRT. The buffer shows a 1/3 mile buffer around each transit stop. PRT fixed routes cover most of the region's commercial and residential neighborhoods. Figure 8 shows the 1/3 mile buffer for the bus stops accessible by a sidewalk. The service area a bus stop can reach is much less than the 1/3 mile buffer that does not consider sidewalk accessibility.

Not all PRT routes run during the entire day. Eliminating limited service routes like F, G, H, and I, some areas are also not serviced. Figure 9 shows the five fixed transit routes that run all day.

The following geographic service gaps exist:

- No all-day fixed-route service to the to the Johnny Creek Area;
- Limited service to the west bench area (zero car concentration area);

- Limited service to medical and social service locations on (Alvin Ricken Drive, Hospital Way, Hiline); and
- Limited Fixed Route service is available for recreational opportunities (Bartz Way, Movie Theater).
- Limited Fixed Route service hours are available in the evening and on Sundays.

The fixed routes typically operate on one-hour headway. The time between bus picks up at the specific stop is one hour. The headway time restricts the times riders can catch the service, limiting when riders can travel.

The Door-to-Door Services provide rides for eligible riders with a disability and persons over 60. Pickup times are scheduled in half-hour increments, one hour before the requested drop-off time, to accommodate all patrons best. The bus will arrive in a thirty (30) minute window one hour before your drop-off time. These restrictions limit the ability to meet specific appointment requirements without a waiting period at either end of the trip.

The fixed route system operated most routes from 6:15 am to 7:00 pm. The Saturday service is shortened in the morning and evenings, and there is no Sunday service. These restrictions present issues for people who want to travel earlier in the morning or later in the evening.

Figure 7 Pocatello Regional Transit Service Area

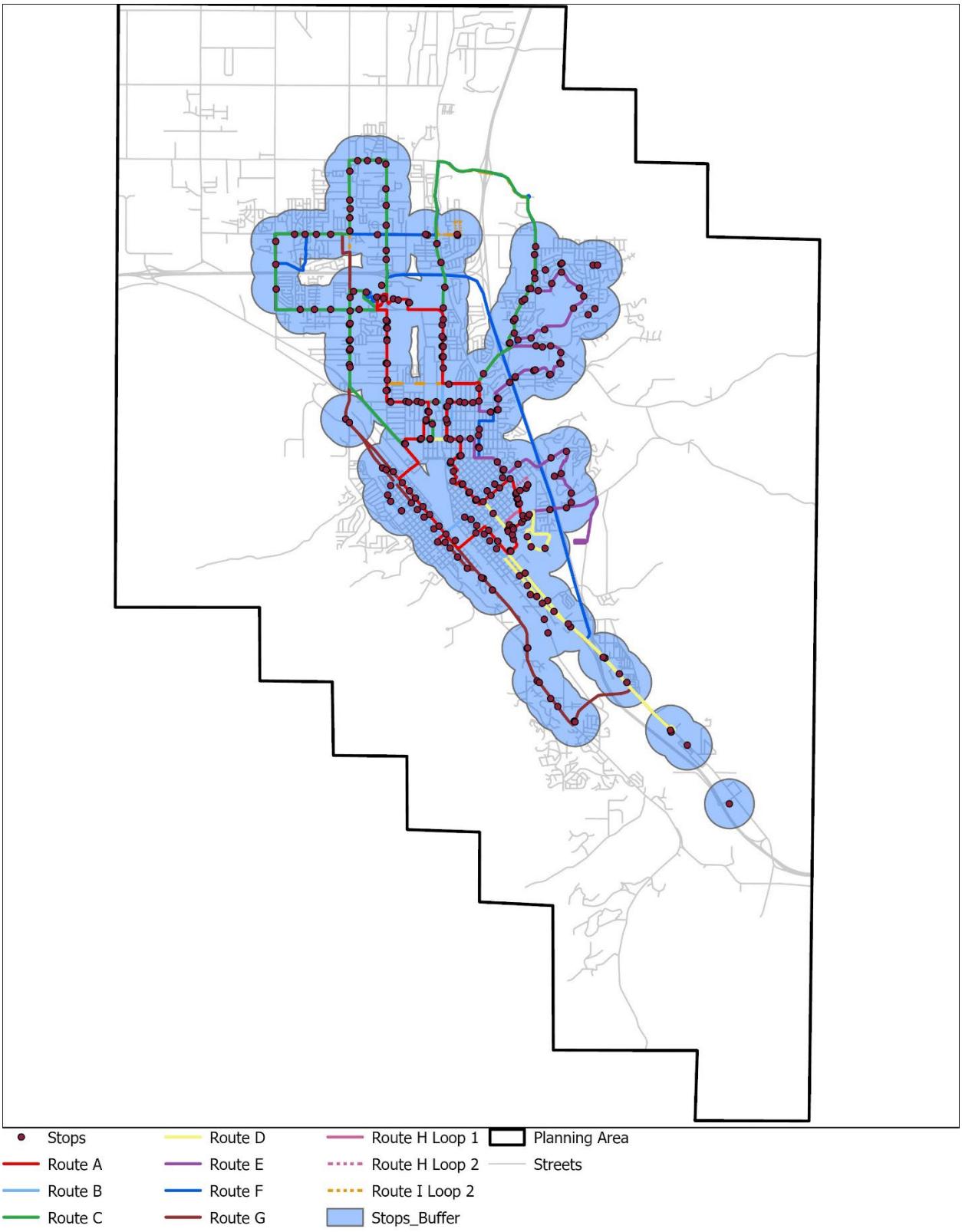


Figure 8 Bus Stop Accessible by Sidewalks Service Areas

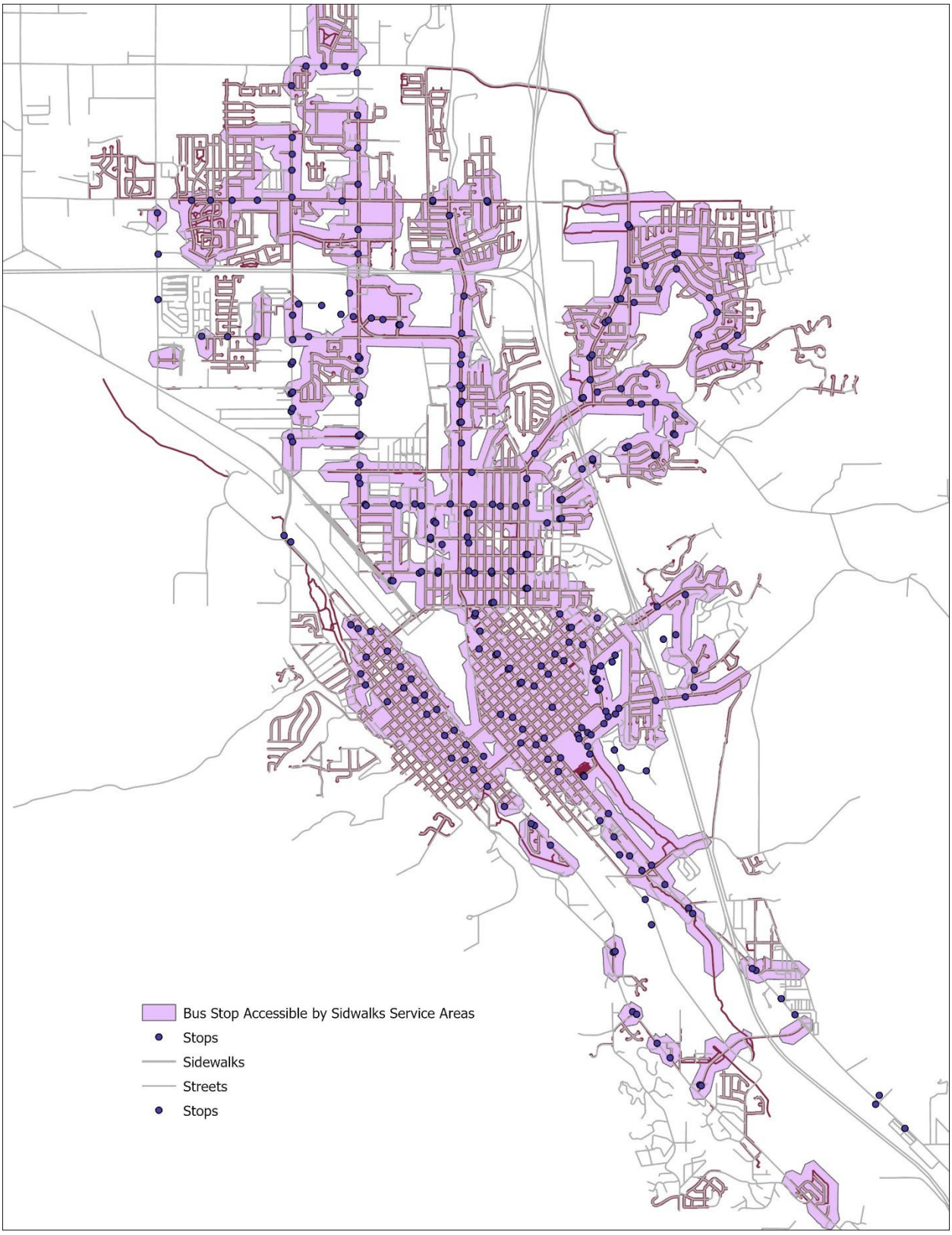
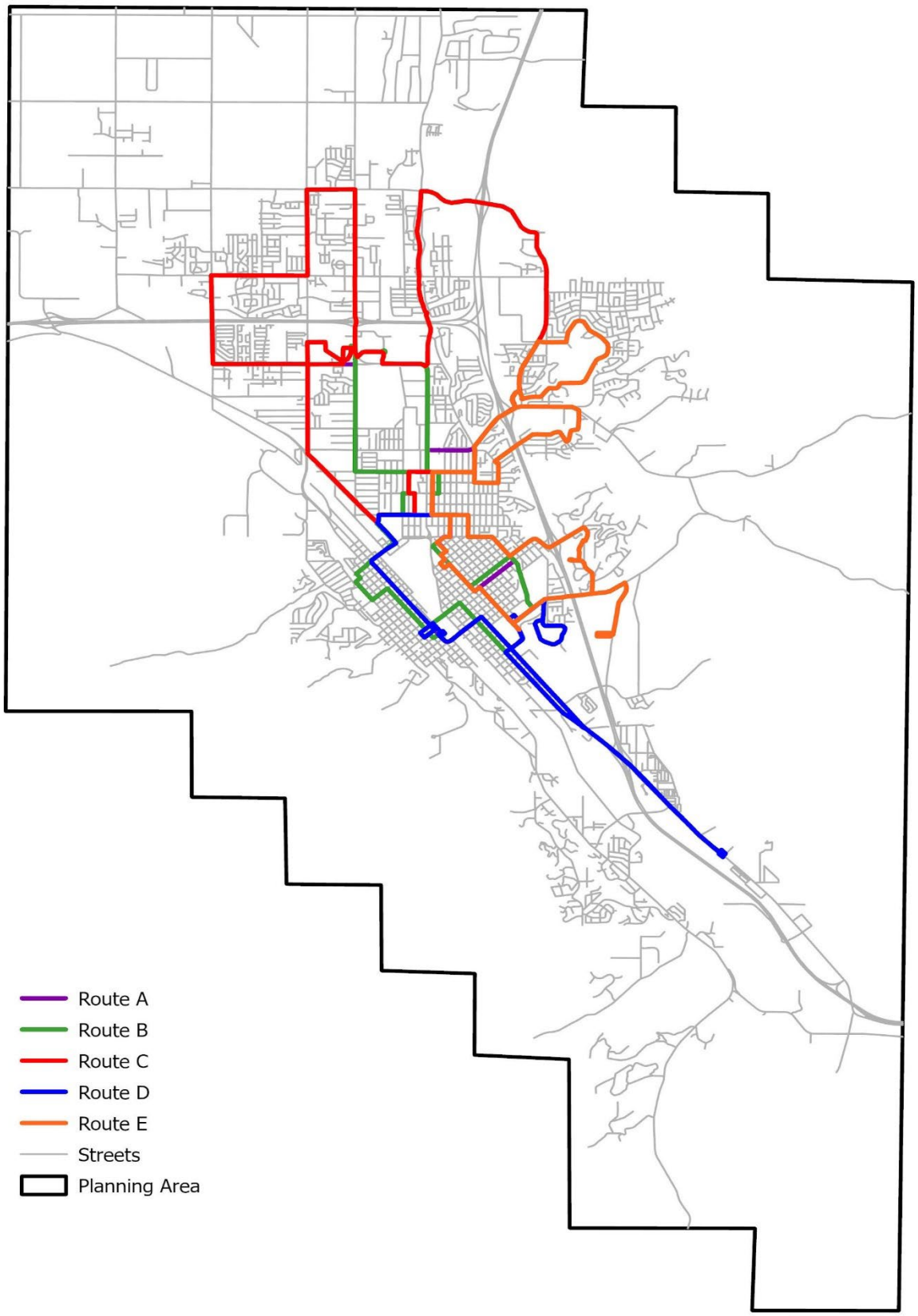


Figure 9 PRT Fixed Routes that Operate All Day



Facilities and Infrastructure Gaps

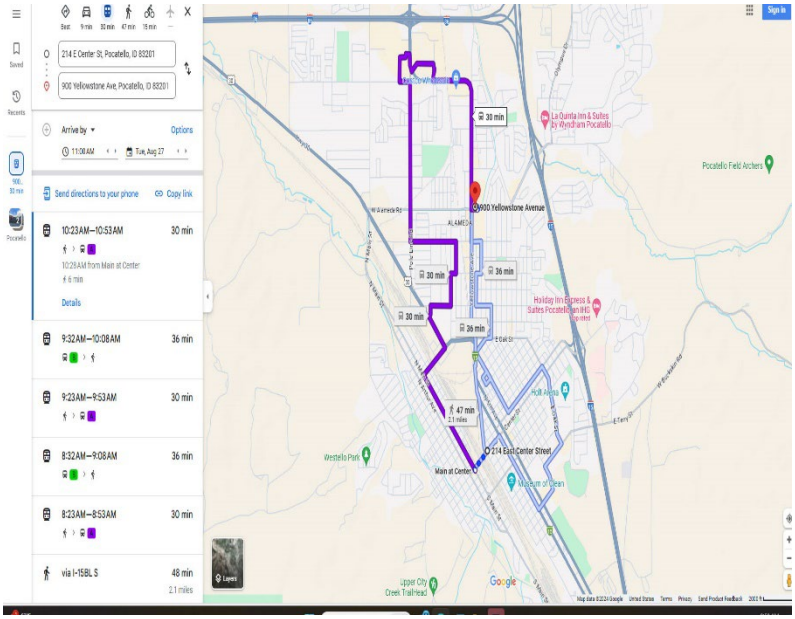
The actual bus operation is only part of the transit trip. For each trip, a passenger must walk from their origin to a bus stop and from a bus stop to their destination. Facility and infrastructure gaps occur when accessible pedestrian facilities do not exist from the trip origin or destination to the transit stop. Facilities and Infrastructure gaps can also occur where no bus shelters or benches are available at specific locations.

A 2020 Bus Stop Analysis found that 52 percent of the transit stops were accessible. Most of the transit stops in commercial zones are accessible, but not all are. The lack of sidewalks or curb ramps can be a deterrent to the use of the transit system. Residential areas are like commercial areas in that neighborhoods have accessible facilities. Many of the older neighborhoods in Pocatello and Chubbuck lack pedestrian facilities, which can prevent access to the fixed transit routes.

Transit facilities like shelters and benches provide an escape from the outside weather (wind, rain, or snow) while a passenger waits for the bus. There are currently a limited number of all-weather facilities on the fixed route system. Increased numbers can remediate the barrier weather can create.

Knowledge and Information Gaps

Figure 10 Example of Google Transit Trip Planner



Knowledge and Information gaps occur when potential users are unaware of the transportation services provided or how to use the provided service. Technologies like Google Transit have improved the information available to riders. Figure 10 shows an example of a trip plan built in the PRT Rider Tool section of their website.

In the users survey, just over half were aware of the services provided by PRT. The survey was distributed primarily to people who would be considered transit-dependent.

PRT has made significant progress in addressing many issues related to knowledge and information over the last four years. Updates to the website have vastly improved the information presented to the public. Google Transit uses the fixed routes system as a static route map, which will soon change. New scheduling software for the fixed routes could be expanded to allow those using the door-to-door service access via a website.

Prioritized Strategies

Nineteen strategies have been developed to help achieve the objectives of the Coordinated Plan. Each strategy is a specific action or activity that can reduce or eliminate identified service gaps in the transit system. For each strategy, one or more project types could be developed to implement the strategy. The strategies are grouped by high, medium, and low priority. The priority reflects the implementation strategies that are the focus over the next four years.

High Priority Strategies

Improve Intelligent Transportation System (ITS) technology to decrease travel times and pickup windows for paratransit.

ITS technology allows computers to select the best route for each vehicle to decrease travel time. Improvements to the system and implementation of additional technology can decrease travel time.

Improve Intelligent Transportation System Technology for same-day service.

Many times, there are appointments or transportation needs which need to occur as soon as possible. The existing paratransit services require a 24-hour reservation, a barrier to this type of trip. For those who do not have access to the fixed route, the trip could be prevented. Develop procedures and rules that allow the ride scheduling software to schedule rides on the same day.

Provide route-specific trip information at each bus stop.

The current bus system relies on printed schedules that have pickup times for only selected (time stops) bus stops. Passengers are left to estimate when the bus will pass their specific stop. Time stops are when the vehicle will be at a specific time. The stops between two-time stops can change their actual stop time depending on the activity on the route. The farther away a stop is located from a time stop, the less certain the pickup time is. This strategy would improve the information at bus stops to maximize the certainty of the schedule.

Improve ITS routing software to reduce pickup windows and provide pickup time notification service to passengers.

The technology should be improved to expand the ability to predict pickup time and notify passengers of pickup time. While not everyone has a mobile phone or other devices, the numbers are increasing. The system should be expanded to include text message notifications and mobile scheduling.

Provide all-weather passenger waiting facilities at all transfer stations and high-volume stops.

Bus shelters that protect from the weather are critical to passenger comfort. Shelters provide seating for those passengers who cannot stand for long periods. The facilities should include a bench, protection from weather, and passenger information.

Develop and implement a bus bench placement program.

The user survey listed the lack of a place to sit as an issue with using fixed-route transit services. It is impractical to place a bus bench at every location. Specific criteria could be established to provide bus benches where needed to make that transit stop usable by seniors and persons with disabilities.

Maintain or expand mobility management within the urban area.

Lack of information seemed to be a common theme in the need analysis. Mobility management is a tool that can be used to improve information dissemination and coordination between agencies. The strategy would be to increase access to information and improve the coordination of transportation services within the BTPO planning area.

Medium Priority Strategies

Provide next bus display (vehicle tracking system) at major bus stops and transfer locations.

Next bus is a vehicle tracking system that uses global positioning satellite information to predict when the next bus will arrive at any given bus stop. This information provides real-time information to passengers who can make better travel decisions.

Provide accessible routes to transit stops.

Most bus stops in commercial zone locations are accessible. Many of the existing bus stop locations are also accessible, but some routes to those accessible stops are not. This strategy would specifically target locations with a high percentage of the target population or high-demand destinations. Providing accessible routes to these destinations can increase the number of people using the fixed route system.

Coordination meetings with regional partners and Agencies

BTPO formed the project advisory committee to assist in developing the Coordinated Plan. The committee has provided a lot of useful information. Information, programs, and issues have been discussed, and several actions have been taken. Continuing this committee in some form can provide a needed conduit to coordinate the needs of human services and other agencies with public and private transportation providers.

Low Priority Strategies

Evaluate bus stop locations in target population neighborhoods.

The strategy would target new bus stops or routes in service areas with above-average senior, low-income, disabled, or zero-vehicle households.

Relocate or locate additional bus stop locations to improve accessibility.

The strategy would evaluate and recommend modification of existing bus stop locations or where to place new bus stops.

Provide Paratransit feeder service collection locations.

Some live where fixed route service is impractical due to population density or trip length. Paratransit vehicles can collect and deliver passengers to the nearest fixed route in those areas. Feeder stops would need to be located and signed before service starts. A passenger would schedule a trip via the standard Paratransit scheduling system.

Decrease fixed route headways.

The current PRT system operates most routes with a one-hour headway. Due to the region's transit system design, determining headways is complicated. Headway is the distance or time between vehicles. In this strategy, the headway is defined as the distance or time between vehicles with a common destination. The strategy aims to increase the system's flexibility to meet variable travel schedules.

Maintain fixed route destination information (travel time) on the website and in printed material.

PRT fixed route information is available through Google Transit. The strategy intends to improve customer information on where exactly a transit vehicle is and when they could reach a specific transit stop. Improving the route destination information can include adding a real-time display of transit vehicles to electronic sources such as the PRT website or through mobile devices.

Improve trip directness to significant origin/destination locations.

For many reasons, transit vehicles often do not take the most direct route to a location. Primarily, transit routes are not designed to serve point-to-point trips. They are designed to facilitate mobility within a region. People's travel, however, is point-to-point. The strategy aims to reduce travel time on fixed routes between significant employment, commercial, and medical locations.

Add additional Paratransit vehicles during high-demand times.

Pickup windows and travel time in the paratransit system are affected by the number of vehicles on the road at any given time. Adding vehicles during peak travel time can reduce travel time and pickup windows.

Improve information available on the website and mobile devices

Fixed route information and information on paratransit, hours, and cost of services are as important as the location of fixed-route buses. The strategy aims to distribute as much information in an easy-to-access format as possible.

Section 5310 Funding

The governor has designated the Idaho Transportation Department as the designated recipient for Section 5310 funds in urbanized areas with a population between 50,000 and 200,000. The Idaho Transportation Department has allowed BTPO to be the lead agency for the competitive selection of projects to meet the identified needs and gaps of the Coordinated Plan.

Eligible Activities

Section 5310 funds are available for capital and operating expenses to support the provision of transportation services to meet the specific needs of seniors and individuals with disabilities. The activities are further categorized as traditional and non-traditional. Traditional projects must account for at least 55% of the funds expended. Non-traditional projects can account for up to 45% of funds expended.

Examples of traditional capital expenses, which an eligible subrecipient must carry out, include, but are not limited to:

- Rolling stock and related activities for Section 5310-funded vehicles
- Acquisition of expansion or replacement buses or vans and related procurement, testing, inspection, and acceptance costs
- Vehicle rehabilitation or overhaul
- Preventive maintenance
- Radios and communication equipment
- Vehicle wheelchair lifts, ramps, and securement devices
- Passenger facilities related to Section 5310-funded vehicles
- Purchase and installation of benches, shelters, and other passenger amenities
- Support facilities and equipment for Section 5310-funded vehicles
- Extended warranties that do not exceed the industry standard
- Computer hardware and software
- Transit-related Intelligent Transportation Systems (ITS)
- Dispatch systems
- Fare collection systems

Examples of Non-Traditional capital expenses include, but are not limited to:

- Public transportation projects (capital only) are planned, designed, and carried out to meet the special needs of seniors and individuals with disabilities when public transportation is insufficient, inappropriate, or unavailable
- Public transportation projects (capital and operating) that exceed the requirements of the ADA
- Public transportation projects (capital and operating) that improve access to fixed-route service and decrease reliance by individuals with disabilities on ADA-complementary paratransit service
- Alternatives to public transportation (capital and operating) that assist seniors and individuals with disabilities with transportation

Eligible Subrecipent For Traditional Section 5310 Projects

Traditional projects may be allocated to the following agencies:

- A private nonprofit organization
- A state or local governmental authority that:

- is approved by a state to coordinate services for seniors and individuals with disabilities; or
- certifies that no nonprofit organizations are readily available in the area to provide the service.

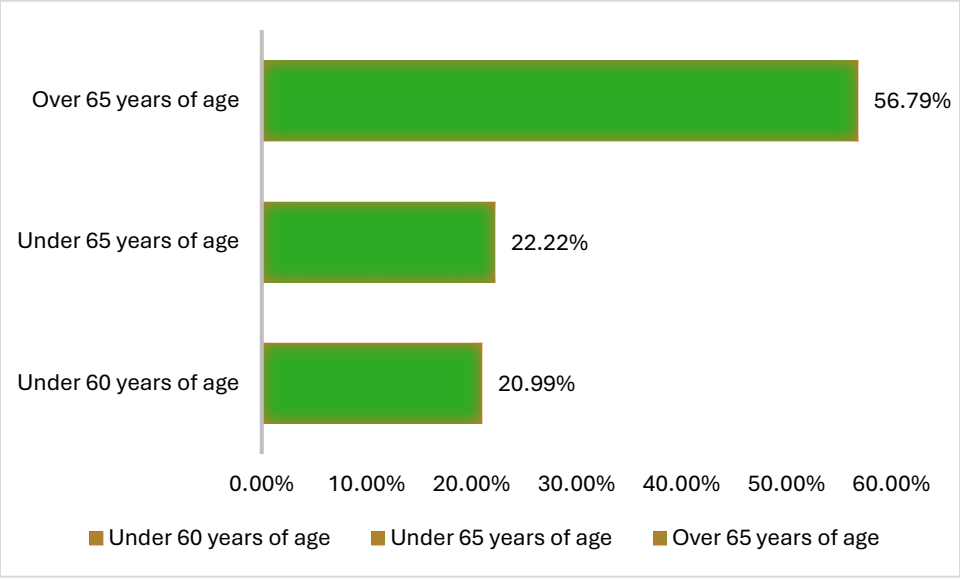
Eligible subrecipients For Non-Traditional Section 5310 Projects:

- Eligible subrecipients for other eligible Section 5310 activities include:
- State or local governmental authority
- A private nonprofit organization,
- Operator of public transportation that receives a Section 5310 grant indirectly through a recipient.

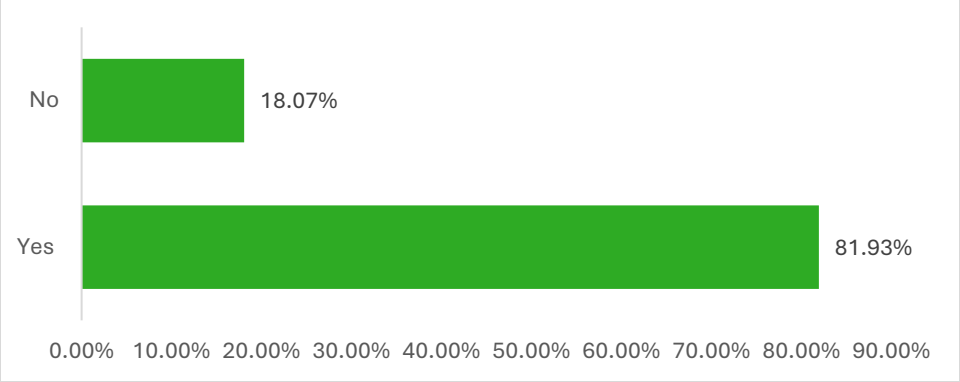
Appendix A – Survey Summary

A survey was distributed to local housing agencies, senior centers, and riders of the PRT door-to-door service. The survey was provided electronically (online) and as a paper copy. The survey was available during February and March 2024.

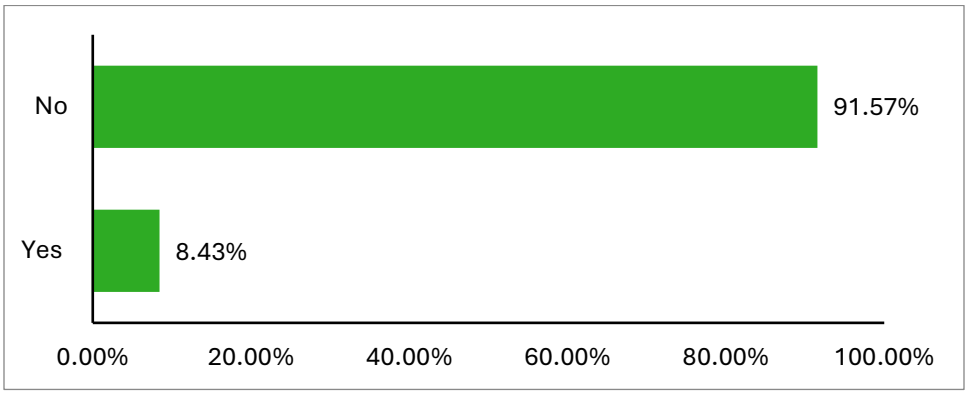
Question 1: What best describes your age?



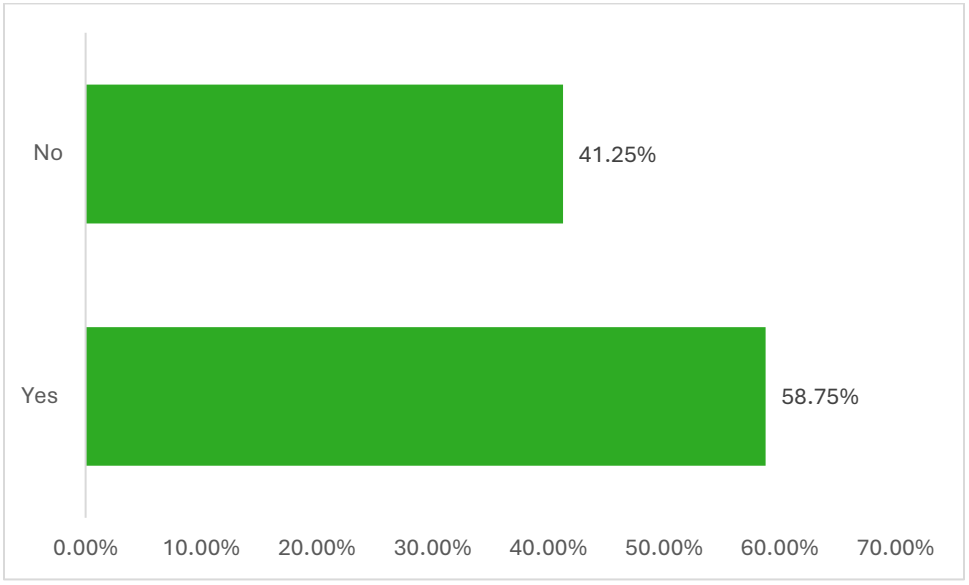
Question 2: Do you have a disability?



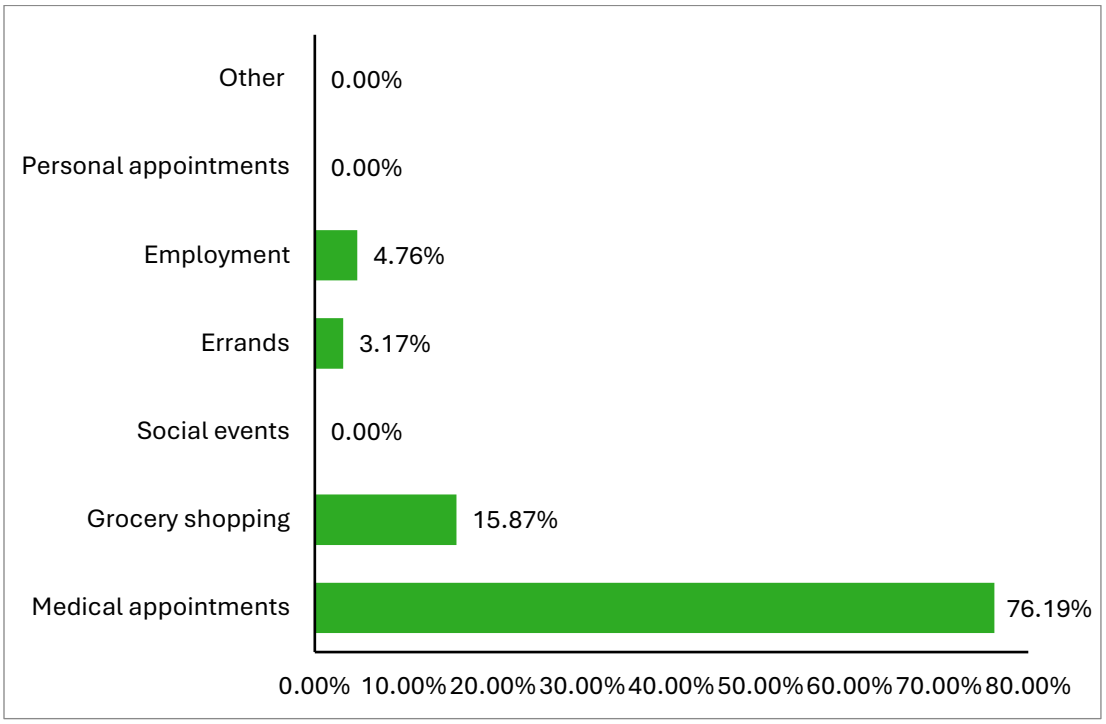
Question 3: Are you a Veteran?



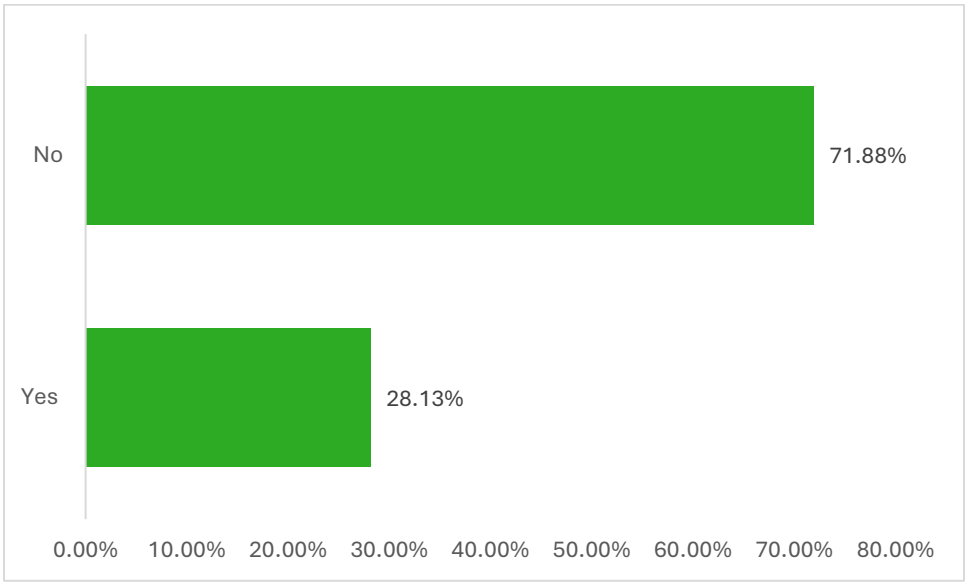
Question 4: Do you rely on a person, not a member of your household, organization, or company, to provide transportation services?



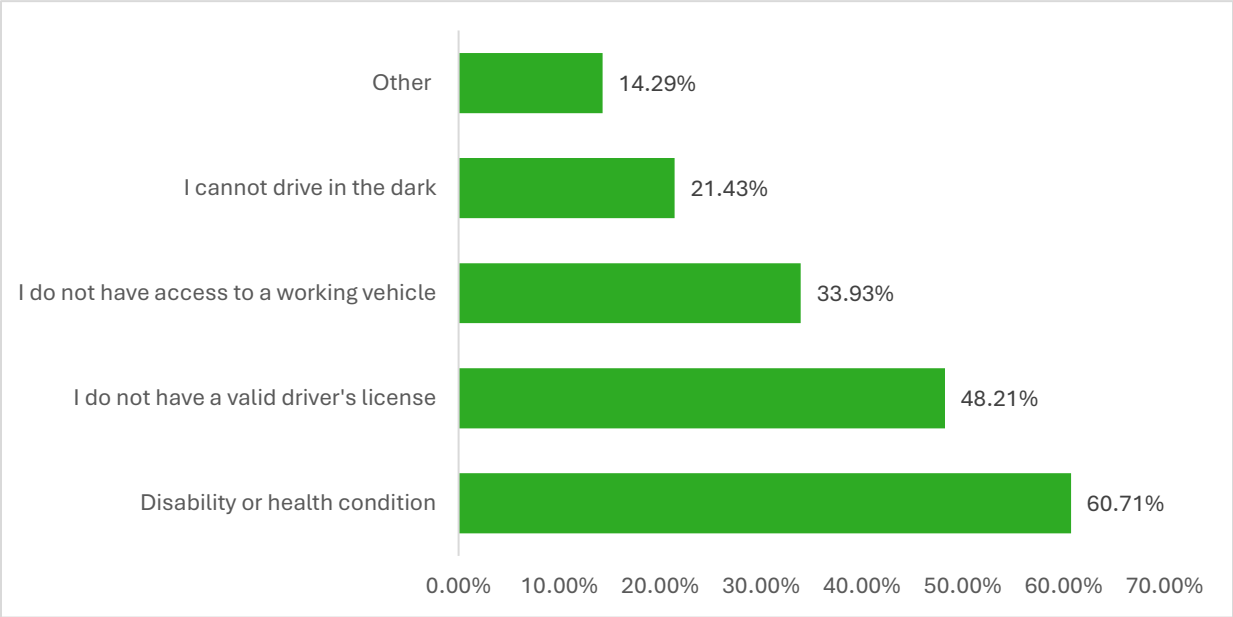
Question 5: What is your most common destination?



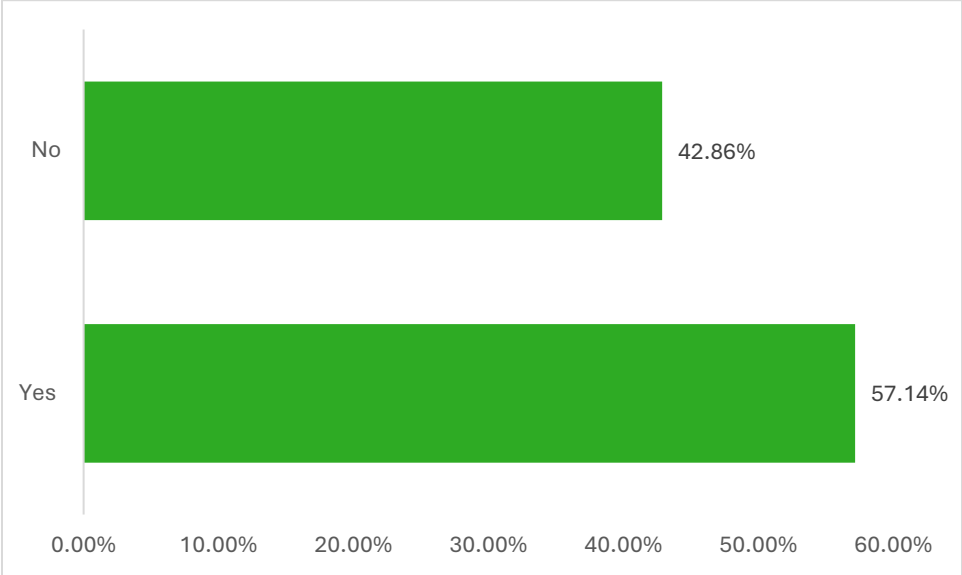
Question 6: Are you able to drive yourself when you travel?



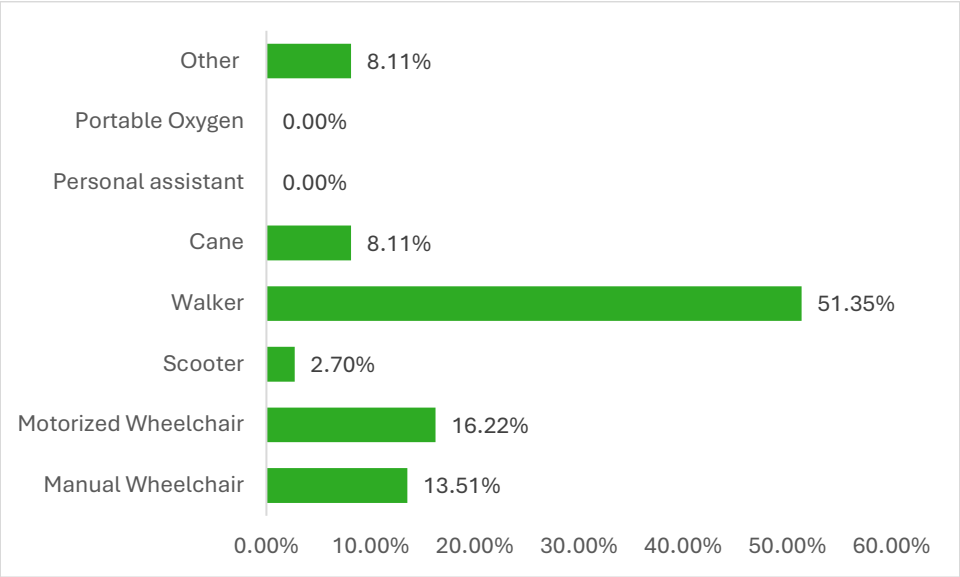
Question 7: Are you unable to travel by yourself due to (check all the apply)



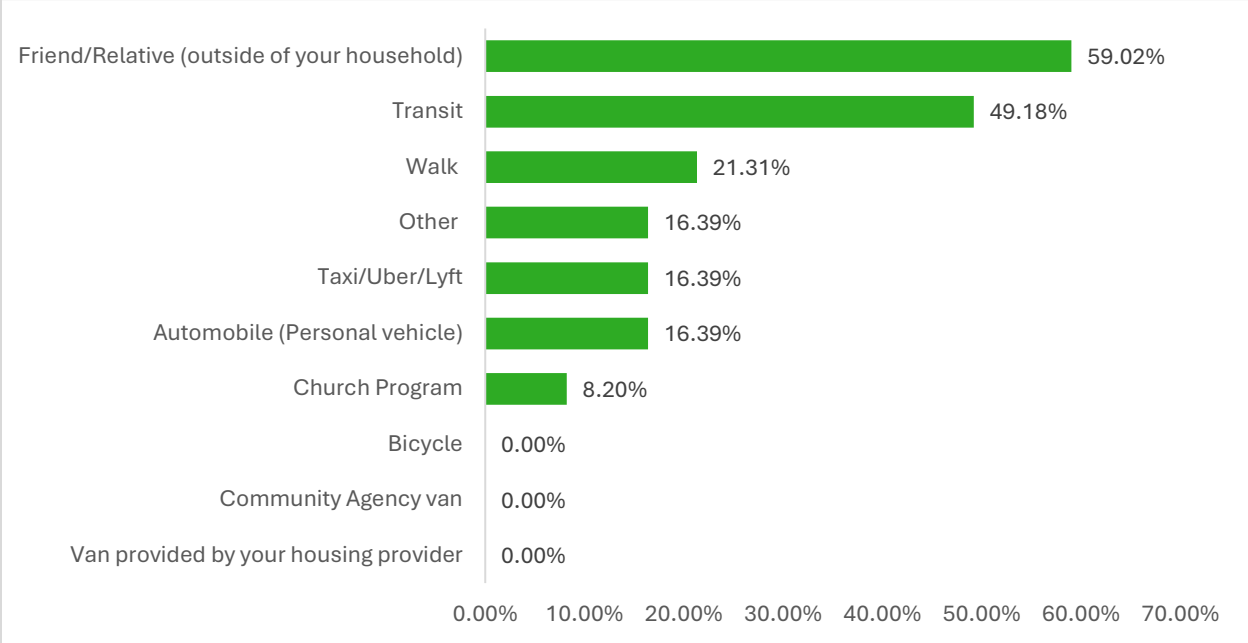
Question 8: Do you use a mobility device (like a wheelchair, service animal, or personal attendant?



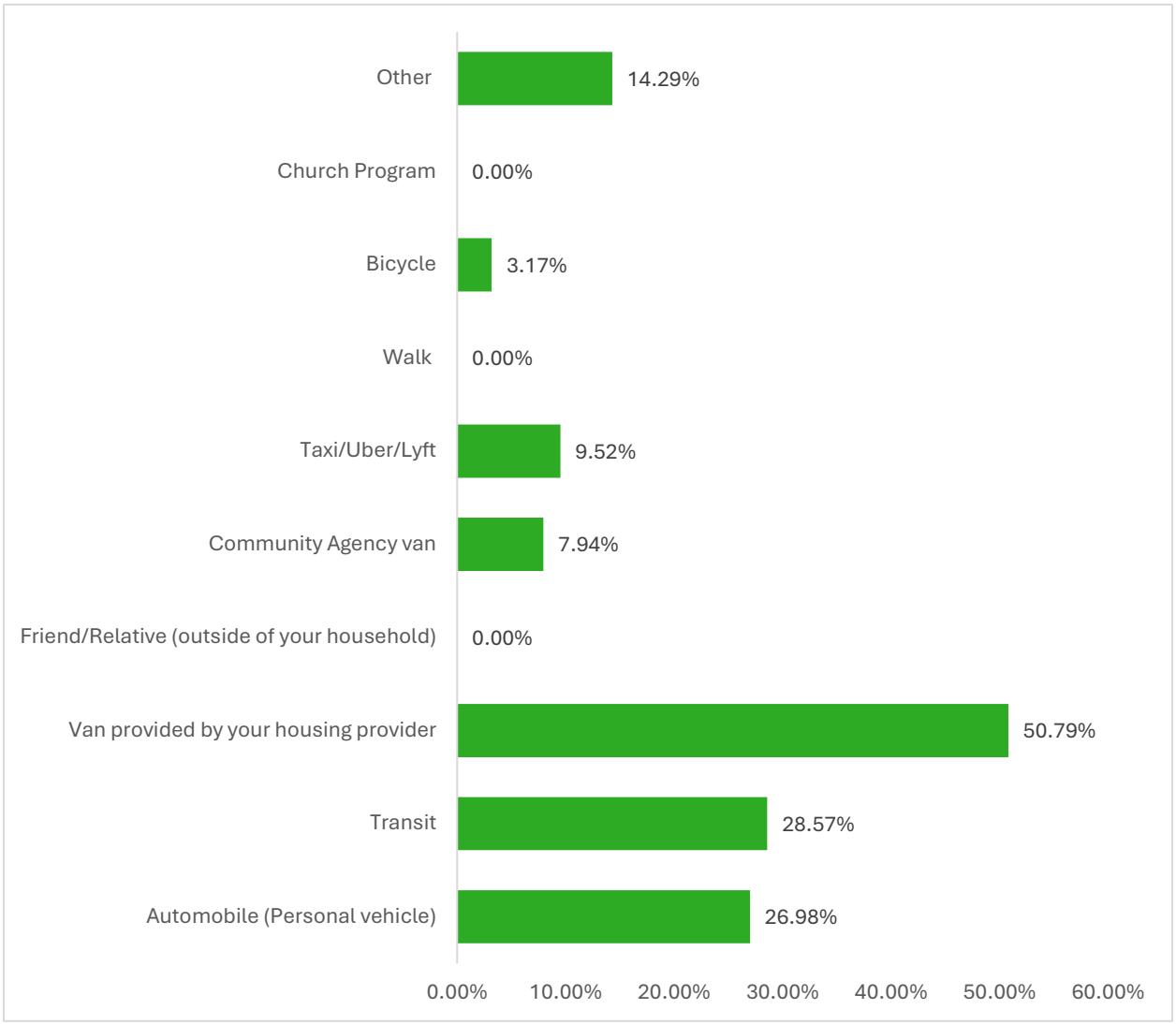
Question 9: If Yes, what type?



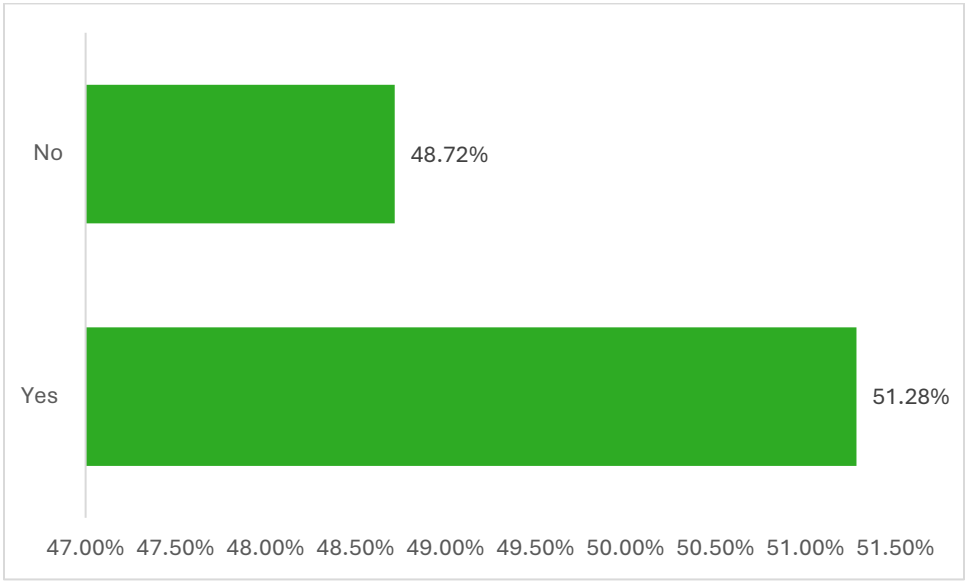
Question 10: In a typical month, which of the following forms of transportation do you use? (Check all that apply)



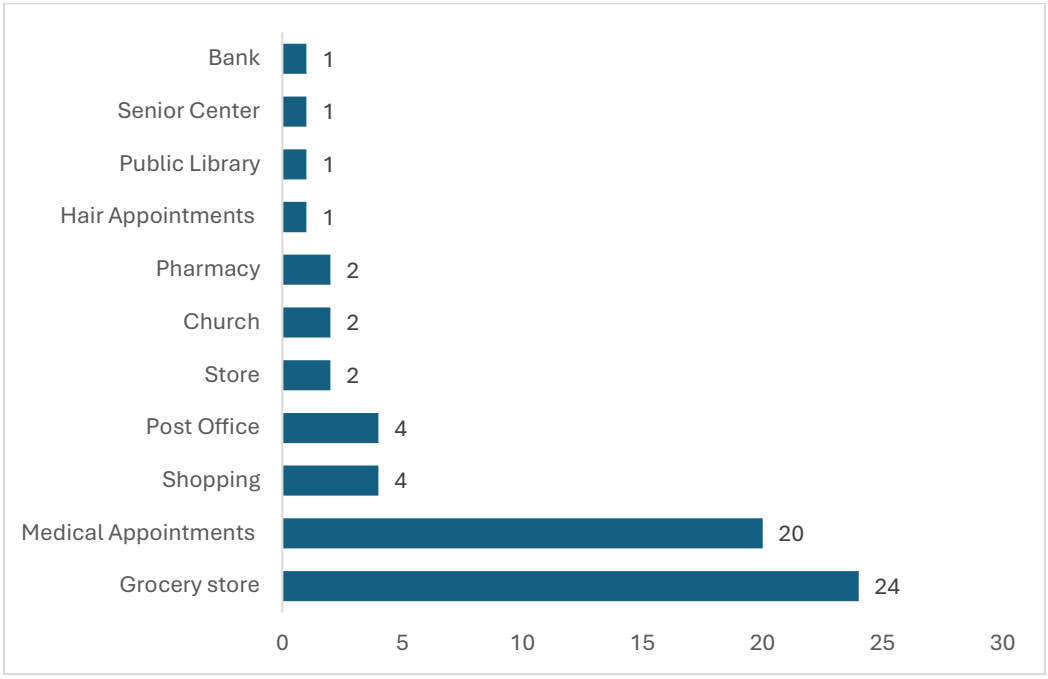
Question 11: In a typical month, which of the following forms of transportation do you use MOST?



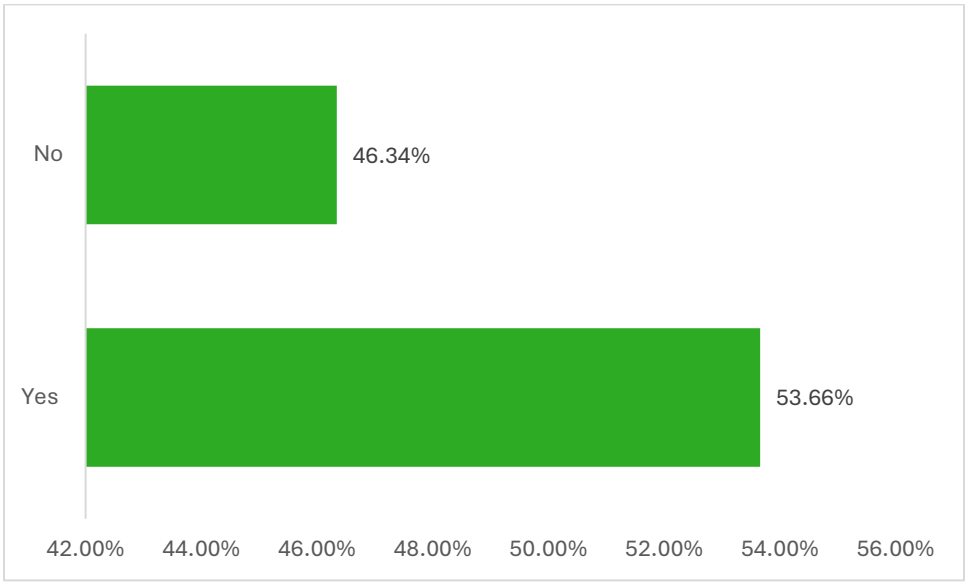
Question 12: Do you have difficulty leaving your home due to lack of transportation?



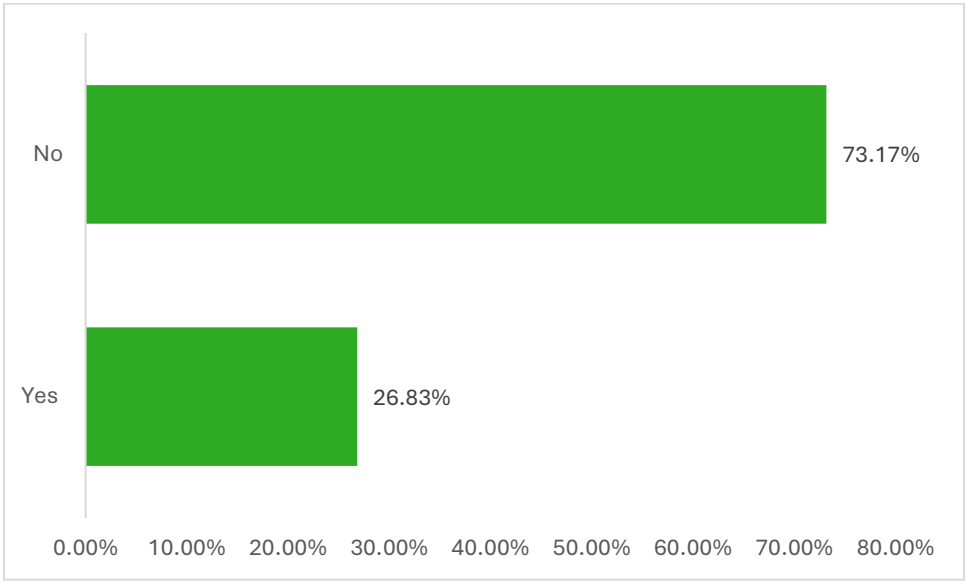
Question 13: Are there places that you have trouble getting to because of transportation problems? If so, please name the top three places. (For example, post office, grocery store, or medical appointments)



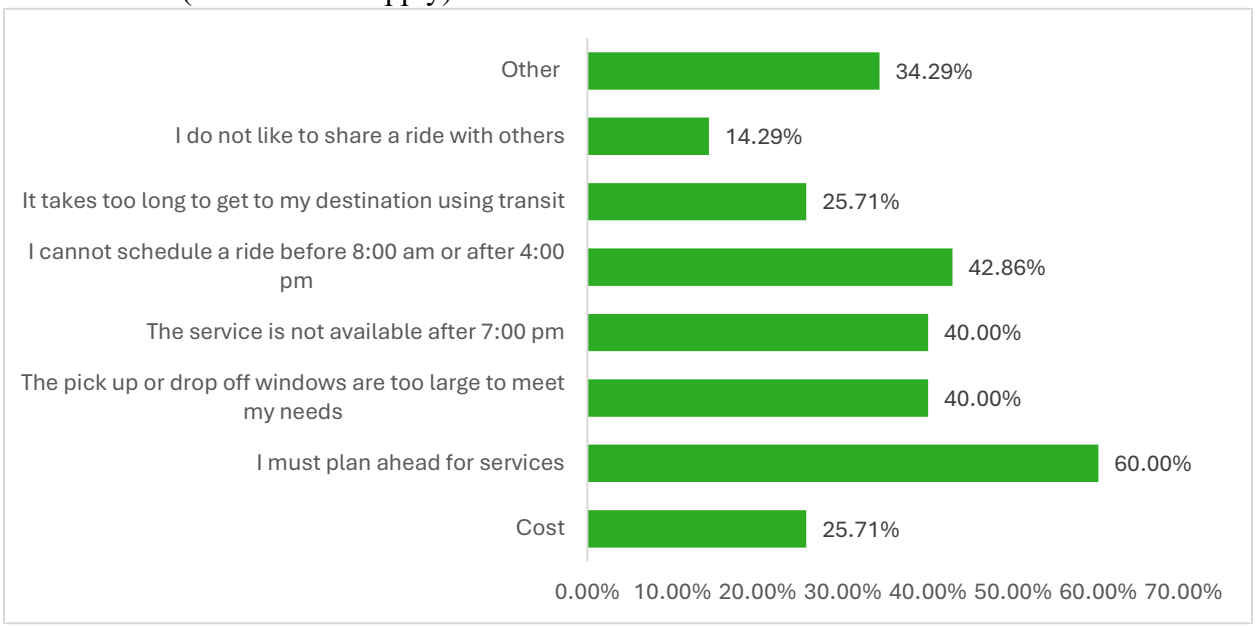
Question 14: Are you aware of the following Pocatello Regional Transit Demand Response?



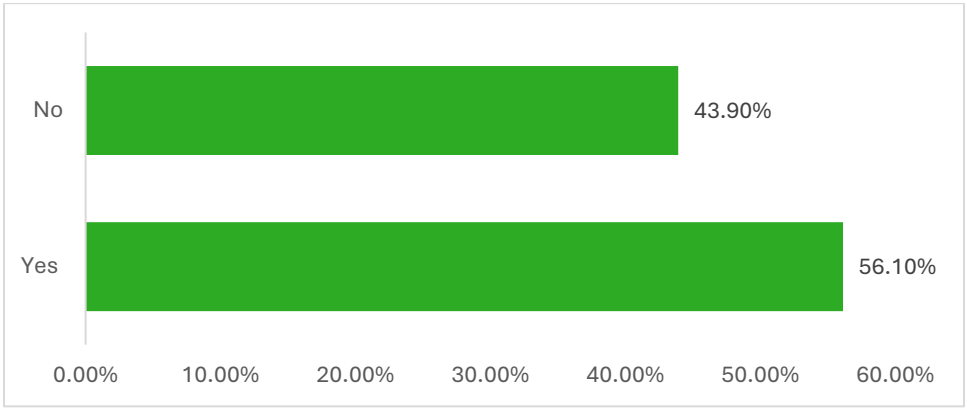
Question 15: Do you use Pocatello Regional Transit Door-to-Door Services?



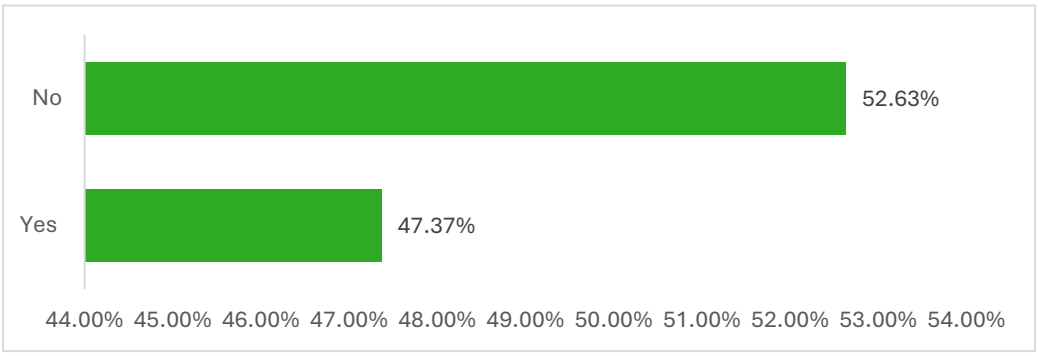
Question 16: Have you encountered any barriers in using Pocatello Regional Transit Door-to-Door Service (check all that apply)



Question 17: Are you aware of the Pocatello Regional Transit fixed route services?

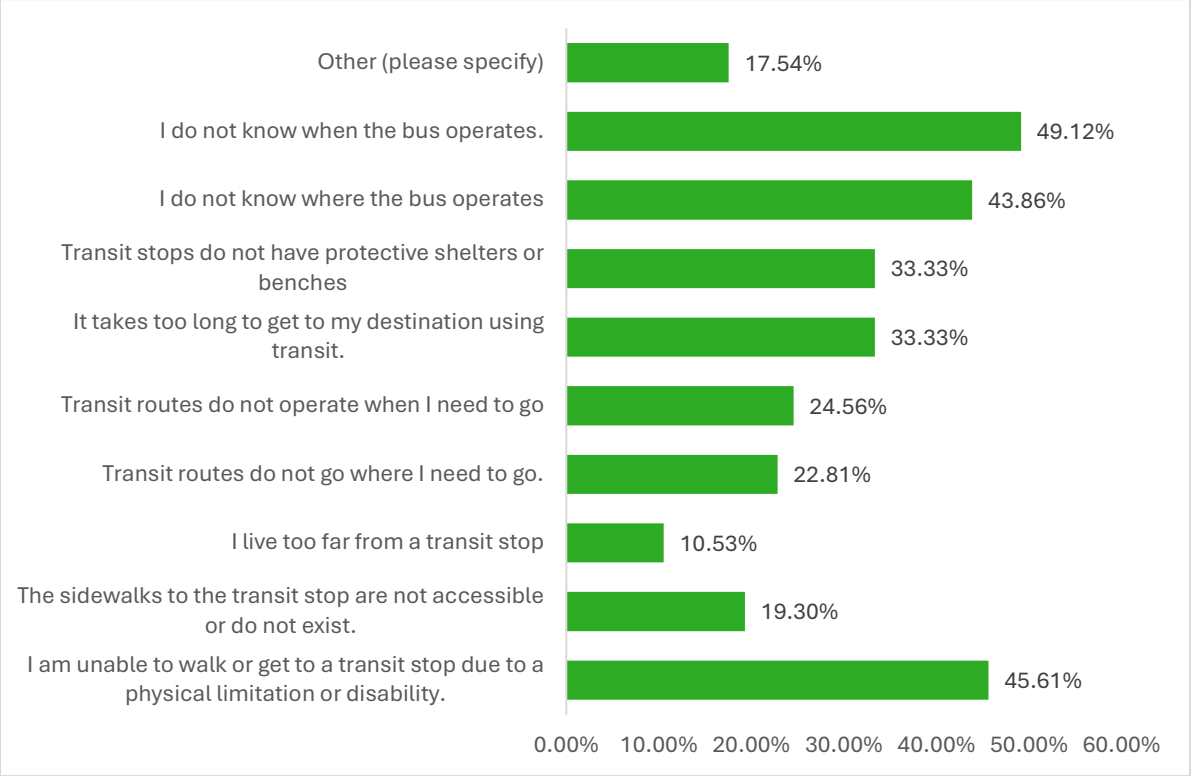


Question 18: Are you able to access the Pocatello Regional Transit fixed bus routes?



Question 19: Have you

encountered barriers that prevent you from using Pocatello Regional Transit fixed bus routes? (check all that apply)



Appendix B – Public Involvement

The draft plan comment period was advertised in the Idaho State Journal. The information was also published on the BTPO website, newsletter, and social media platforms.

Opportunity to Comment on the draft Coordinated Human Service Public Transportation Plan

The Bannock Transportation Planning Organization invites the public to participate in evaluating and providing comments on the draft Coordinated Human Service Public Transportation Plan (Coordinated Plan).

The primary objective of this Coordinated Plan is to address the transportation needs of older adults and people with disabilities when existing services are unavailable, insufficient, or inappropriate. By targeting these specific needs, the plan ensures that all individuals have access to the necessary transportation options that enable them to participate fully in their communities.

The Draft Coordinated Human Service Public Transportation Plan can be found on the BTPO website https://www.bannockplanning.org

Public Comment Period

End Date: October 18, 2024

How to Participate

We welcome and value your input. You can submit your comments in one of the following ways:

- **Email:** Send your comments to admin@bannockplanning.org
- **Mail:** Address your comments to:

Bannock Transportation Planning Organization
PO Box 6129
Pocatello, Idaho 83205-6129

Comments Received

BTPO received one comment before and one after the comment period ended. Both were the same content. The letter is attached below.

Disability Rights Idaho

PEOPLE EMPOWERED.
VOICES HEARD.
EQUITY ACHIEVED.
DIFFERENCES CELEBRATED.

October 18, 2024

Bannock Transportation Planning Organization
P.O. Box 6129
210 East Center Street
Pocatello, Idaho 83201

Sent via email: admin@bannockplanning.org.

RE: Coordinated Human Service Public Transportation Plan Draft

Dear Bannock Transportation Planning Organization:

Disability Rights Idaho (DRI), Idaho's Protection and Advocacy system, writes to provide comment to the Coordinated Human Services Public Transportation Plan Draft (the "Plan"). As Idaho's Protection and Advocacy system, DRI is a private non profit organization funded by federal grants that provides advocacy and legal services to individuals with disabilities.

DRI staff reviewed the Plan and have provided comments below. The general comments are DRI's main takeaways from the plan, while the specific comments relate to specific parts of the plan and action items we have identified as priorities for people with disabilities.

A. General Comments:

a. Definition of Disability: The definition of disability, as used in the Plan, does not match the funding statute for this project. That statute, 49 U.S.C.

9542 W Bethel Ct., Boise, ID 83709 • (208) 336-5353 • (866) 262-3462
www.disabilityrightsidaho.org • info@disabilityrightsidaho.org

5310, uses the ADA definition of disability, which is meant to be interpreted broadly. As described on page 7 of the Plan, the ACS survey used a much more limited definition of disability. This does not comply with the statutory requirement to assess the transportation needs of people with disabilities and likely resulted in survey data that fails to account for significant transportation needs of people with disabilities the Plan is supposed to address.

b. Lack of Timelines: The Plan identifies the Planning Organization's top seventeen (17) strategies and divides them into high priority, medium priority, and low priority groups. We have outlined specific concerns with particular strategies below. In general, DRI suggests that the Planning Organization add timelines for initiation and completion of each strategy to the Plan. In addition, the Plan should include information on how resources will be allocated to the various strategies so that the communities impacted are able to assess the likelihood that strategies will be implemented. As it stands, the Plan includes no information regarding the Planning Organization's expectations for what strategies they are likely to complete. As explained below, many of the medium and low priority strategies directly address the specific transportation gaps identified in the survey of people with disabilities and elderly residents. Ensuring these strategies are implemented is paramount to reach the Planning Organization's stated goal of improving access to transportation for the identified groups.

c. Stakeholder Involvement: DRI is concerned about the limited group of stakeholder organizations invited to participate in the Plan development process. The Planning Organization failed to include organizations or individuals who work most directly with people with disabilities in the service area.

i. There are many agencies in the service areas that work with and advocate for Idahoans with disabilities. While DRI appreciates the involvement from the stakeholders and agencies that were included, agencies such as Life Center for Independent Living and DRI possess valuable training and knowledge that could improve the Plan.

ii. The lack of involvement from the Shoshone Bannock Tribes is also concerning. Tribal members with disabilities use transportation services within the planning area regularly, and they have experienced issues with the transit system that create barriers to access. DRI shared the Plan with the members of the tribal community, and they will also be submitting formal comments.

B. Specific Questions/Concerns

a. Infrastructure

i. On page 23, the Plan mentions that some accessible stops do not have accessible routes and that remedying this is a medium priority strategy. Inaccessible routes render their destinations inaccessible, and accordingly, DRI suggests raising the priority of ensuring pathways to stops are also accessible, and that new stops are designed to be ADA compliant. It is likely that this inaccessibility is a primary barrier for people with disabilities and elderly residents who would otherwise use these bus routes. Further, DRI suggests focusing improvements on the stops serving mostly elderly people and people with disabilities.

ii. On pages 22 23, the Plan lists developing and implementing a bus bench placement program as a high priority strategy but indicates that not all stops will receive benches. Benches, like other requirements of accessibility, benefit all users of the transportation system. Benches are a low cost means of improving accessibility, and seating at each stop is a minimum requirement for bus stop accessibility.

1. If project resources are insufficient to include a bench at each stop, DRI suggests prioritizing the stops most utilized by people with disabilities. This means prioritizing stops near medical offices, social society offices, housing facilities and community centers used by people with disabilities, not just the high volume stops used by the general community. Prioritizing stops used by those with disabilities may also include more rural stops which would be overlooked if volume of riders is the primary criterion for choosing stops that receive benches.

b. Adding New Stops

i. DRI suggests moving the second "low priority" strategy ("relocate or locate additional bus stop locations to improve accessibility,") to a higher priority. Creating new bus stops directly addresses a very specific service gap identified by the population targeted by this project.

ii. If adding more stops is not feasible, DRI suggests responding to the service gap and the facilities and infrastructure gap by relocating or switching stops so that they serve the primary locations survey respondents indicated they most need to access: medical offices, the hospital, and social services agencies.

c. The Limited Service Gap

i. DRI is concerned that there is no high priority strategy to reflect the issue of limited service. As indicated in the description of Service Gaps on page 16 and in the survey responses to questions 18 and 19 on pages 35 and 36, this is a significant barrier to people with disabilities accessing transportation services. The Plan demonstrates this through both a lack of physical accessibility to existing stops and through the lack of stop locations convenient for people with disabilities and routes to places important to the community (such as medical offices and social security locations.) Despite the identification of these issues as priorities by the target population, the strategies to remedy these issues are mostly in the low priority group. The only high priority strategy related to this issue is for a bus implementation program, which we discuss below.

d. Information Access

i. To ensure the most accessible communication possible, DRI suggests increasing the priority level for maintaining fixed routes destination information. The planning organization should prioritize placing information on transportation services websites, and the information should be mobile friendly to ensure a wide range of availability. Even where people don't have internet, most people have a phone. Further, the information online should be

screen reader friendly and should be available in various formats (such as in an audio version, a printable version, and in braille).

ii. Many of the prioritized strategies mention information dissemination, but the Plan lacks information about the means and methods of that dissemination other than to place information at bus stops. DRI is concerned that placing information *at* stops will not solve the identified information access issues. Spreading the information in other ways, such as through websites, mail, in other community centers, or in an email newsletter, would increase information access for those with disabilities.

DRI appreciates the time and effort that has gone into the plan to date and looks forward to its implementation. DRI is available to work with the Bannock Transportation Planning Organization as it improves transportation access for people with disabilities and elderly residents of the service area. Please feel free to contact us if you have any questions.

Sincerely

/s/ Susan Pierson

Sue Pierson, Legal Director, Adult Unit
Hannah Williams, Staff Attorney, Adult Unit

Disability Rights Idaho
9542 W. Bethel Ct.
Boise, ID 83709

Agenda Item 2C: FY 2024 Unified Planning Work Progam Annual Report

Meeting Date: February 3, 2025

Summary of Item:

Attached is the FY 2024 Annual Report. The report outlines the activities of last year and provides a summary of the budget expenditures. Table 1 is the summary of the task budget and expenditures. Most tasks were under budget, but an amendment will address some areas in the FY 2025 UPWP.

A summary of the areas where the actual expenses exceeded the line item budget.
Administration

- Software - The line was over budget by $2,262. The overages were caused by an increase in renewal costs that were not anticipated.
- Audit - The actual audit cost was $1,228 over budget. The cost is a reflection of the work completed.

Metropolitan Transportation Plan

- A consultant bill was received after the end of FY 2023. I did not anticipate the bill being late. The public notice line item was under budget by more than the consultant bill, but an amendment should have changed the lines.

Modeling

- Supplies ran over by $1,850 due to the purchase of ink and paper for the plotter.

Traffic Data Collection

- The cell modems purchased to eliminate the phone changes on the Automatic Traffic Reports were intended to be purchased as supplies. Shiela determined that it should be coded as equipment.
- A traffic counter was purchased and coded to local. The cost overage is offset by the modeling task having a balance in the cast amount of equipment. The equipment better fits the Traffic Data Collection task than modeling.

Table 1 Task Budget and Expenditures

		Budget				Expenditure this Year				Funds Remaining			
FY 2024 Budget by Task	Code	Labor Cost	Contract Services	Other Direct Cost	Total Cost	Labor Cost	Contract Services	Other Direct	Total	Labor	Other Direct	Contract Servies	Total
TASK													
Task 1 Administration	**S0 - 710**	$37,733.13		$46,361.07	$84,094.20	$35,835.38	$0.00	$40,373.36	$76,208.74	$1,897.75	$5,987.71	$0.00	$7,885.46
Task 2 Public Participation	**S0 - 747**	$9,296.40		$12,155.76	$21,452.16	$8,853.25	$0.00	$11,852.14	$20,705.39	$443.15	$303.62	$0.00	$746.77
Task 3 Transportation Improvement Program	**SO - 712**	$6,972.30		$1,825.00	$8,797.30	$6,486.22	$0.00	$2,021.24	$8,507.46	$486.08	-$196.24	$0.00	$289.84
Task 5 Transportation Modeling & Data Analysis	**SO - 720**	$18,149.00		$33,680.00	$51,829.00	$17,313.39	$0.00	$27,948.60	$45,261.99	$835.61	$5,731.40	$0.00	$6,567.01
Task 6.1 Metropolitan Transportation Plan	**SO - 739**	$2,324.10		$3,250.00	$5,574.10	$1,708.33	$1,726.90	$0.00	$3,435.23	$615.77	$3,250.00	-$1,726.90	$2,138.87
Task 6.2 Public Transportation Human Service	**SO - 735**	$13,342.00		$2,200.00	$15,542.00	$11,677.63	$0.00	$268.39	$11,946.02	$1,664.37	$1,931.61	$0.00	$3,595.98
Task 6.3 Safe Transportation Options Planning	**SO - 731**	$16,268.71		$3,000.00	$19,268.71	$12,312.65	$0.00	$2.65	$12,315.30	$3,956.06	$2,997.35	$0.00	$6,953.41
Task 4 LOCAL - TRAFFIC Data Collection	**86 - 758**	$4,852.00		$13,645.00	$18,497.00	$4,929.49	$0.00	$15,198.45	$20,127.94	-$77.49	-$1,553.45	$0.00	-$1,630.94
Task 7 SMART Grant	**S1 - 745**	$0.00	$354,434.00	$962,640.00	$1,317,074.00	$0.00	$121,203.66	$670,548.97	$791,752.63	$0.00	$292,091.03	$233,230.34	$525,321.37
Task 8.1 Traffic Operations	**S1 - 745**	$18,149.00		$3,087.00	$21,236.00	$22,310.10	$0.00	$0.00	$22,310.10	-$4,161.10	$3,087.00	$0.00	-$1,074.10
Task 8.2 Coordinated Traffic Signals	**S1 - 745**	$4,648.20	$55,135.00	$312,640.00	$167,848.20	$3,737.95	$49,205.43	$29,560.74	$82,504.12	$910.25	$283,079.26	$5,929.57	$85,344.08
Task 8 LOCAL FUNDS	**75 - 724**	$0.00		$10,251.00	$10,251.00	$15.75	$0.00	$7,816.93	$7,832.68	-$15.75	$2,434.07	$0.00	$2,418.32
Total		$131,734.84	$409,569.00	$1,404,734.83	$1,741,463.67	$125,180.14	$172,135.99	$805,591.47	$1,102,907.60	$6,554.70	$599,143.36	$237,433.01	$638,556.07
Planning		$104,085.64		$102,471.83	$206,557.47	$94,186.85		$82,466.38	$178,380.13	$9,898.79	$20,005.45	-$1,726.90	$28,177.34
Local		$23,001.00		$16,732.00	$39,733.00	$27,239.59		$15,198.45	$42,438.04	-$4,238.59	$1,533.55	$0.00	-$2,705.04
SMART Grant				$962,640.00	$1,317,074.00	$0.00	$121,203.66	$670,548.97	$791,752.63	$0.00	$292,091.03	$233,230.34	$525,321.37
Traffic Signal		$0.00		$312,640.00	$167,848.20	$3,737.95	$49,205.43	$29,560.74	$82,504.12	$910.25	$283,079.26	$5,929.57	$85,344.08

Fiscal Year 2024 Annual Report

Fiscal Year 2024 Annual Report

Prepared By

Bannock Transportation Planning Organization
PO Box 6129
Pocatello, Idaho 83205

BANNOCK
Transportation Planning
ORGANIZATION

Notifying the Public of Rights under Title VI

Bannock Transportation Planning Organization

Bannock Transportation Planning Organization operates its programs and services without regard to race, color, and national origin in accordance with Title VI of the Civil Rights Act. Any person who believes she or he has been aggrieved by any unlawful discriminatory practice under Title VI may file a complaint with the Bannock Transportation Planning Organization.

For more information on Bannock Transportation Planning Organization's civil rights program and procedures to file a complaint, contact 208 233-9322, email mori@bannockplanning.org, or visit our administrative office at 214 E. Center Street Suite 70, Pocatello, Idaho 83201. For more information, visit www.bannockplanning.org.

A complainant may file a complaint directly with the Idaho Transportation Department Office of Civil Rights, Office of Civil Rights Program Manager, PO Box 7149 Boise, ID 83707-1129 Phone 208-334-8884 https://apps.itd.idaho.gov/apps/ocr/complaint.aspx

Table of Contents

Introduction

The Bannock Transportation Planning Organization's (BTPO) annual report summarizes the activities in fiscal year 2024. The Unified Planning Work Plan (UPWP) is developed annually with member agencies. The UPWP guides the federal funds planning activities in the planning area.

The Fiscal Year 2024 UPWP had eleven (11) task categories. A task is a specific activity or project accomplished in the year. Tasks to be continued are projects/activities not completed within the fiscal year and are continuing in the next fiscal year.

The annual report compares what was planned to what occurred. For each task, a recap of the activities, deliverables, and costs will be compared to the year's result. The report is divided into sections: the Consolidated Planning Grant, SMART grant, Local Projects, and Traffic Operations.

Consolidated Planning Grant

BTPO is a Metropolitan Planning Organization (MPO). As an MPO, we receive planning funds from the Federal Highway Administration and the Federal Transit Administration. The Idaho Transportation Department combines the two planning fund sources into one fund called the Consolidated Planning Grant.

Task 1.0 Administration

Description

The administration task provides for administrative needs, including financial reporting, budgeting, federal report requirements, and other activities related to the organization's operation. The administrative task also provides staff support to BTPO's standing committees and other agencies that BTPO is a member of. The coordination component allows staff to provide local and state coordination between agencies.

Tasks Completed

- Facilitated and conducted nine Policy Board meetings, seven Technical Advisory Committee meetings, three Signal Coordination meetings, and two Interagency Consultation Committee meetings
- Amended the FY 2024 UPWP
- Completed FY 2024 Audit

- The Memorandum of Understanding with the Idaho Transportation Department on MPO operations has been approved.
- Staff completed the development and approval of the FY 2025 UPWP.

Tasks to be continued

- Delayed the Title VI and Environmental Justice plan updates. The demographic data was completed for the report.

Funding Summary

Table 1: Task 1.0 Administration Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$84,.094.2	$76,208.74	$7,885.46	90.6%

Task 2.0 Public Outreach

Description

This task focuses on informing the public about transportation planning and operation. BTPO's primary methods of informing the public include the website, email news updates, social media posts, and newspaper notices. The public involvement plan outlines the specific approach for each project type.

Tasks Completed

- The Public Participation Plan 2024 was approved.
- A new public engagement platform (Social Pinpoint) was added to the website for specific work tasks.
- Update the website throughout the fiscal year.

Tasks to be continued

- The update to the contact list for stakeholder groups will be completed in FY 2025.

Funding Summary

Table 2: Task 2.0 Public Participation Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$21,452.16	$20,705.39	$718.77	97.5%

Task 3.0 Transportation Improvement Program (TIP)

Description

The TIP process cooperates between the Idaho Transportation Department, Local Highway Technical Assistance Council (LHTAC), Pocatello Regional Transit, and member agencies. It lists all federally funded projects within the region and is a subset of the State Transportation Investment Program (STIP). The TIP is the required Program of Projects for the Federal Transit Administration's projects.

Tasks Completed

- Amended the FY 2024 – 2030 Transportation Improvement Plan eight times.
- Attended urban balancing meetings to discuss the TIP and statewide activities.
- The FY 2025 – 2031 Transportation Improvement Program and conformity determination were approved.

Funding Summary

Table 3: Task 3.0 Transportation Improvement Program Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$8,797.30	$8,507.46	$289.84	96.7%

Task 4.0 Transportation Data Collection and Management

Description

The task provides the data needed to conduct transportation system plans. Historically, BTPO and the Idaho Transportation Department are the region's primary providers of vehicle usage data. BTPO also has eleven pedestrian and bicycle counters on greenways

throughout the planning area. Reviewing the counting program and making recommendations for future improvement is a subtask.

Tasks Completed

- Updated the traffic count map to include ITD and BTPO collected traffic counts.
- Conducted traffic counts at various locations.
- Worked on a strategy to allow the continuation of the traffic count program after 2025

Tasks to be continued

- The strategy to transition the traffic count program from BTPO staffed to other methods was continued to FY 2025.

Funding Summary

Table 4: Task 4.0 Transportation Data Collection and Management Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Local	$18,497.00	$20,127.94	-$1,630.94	108.8%

Task 5.0 Transportation Modeling, Demographic, and GIS

Description

The task has an extensive interrelated scope. The purpose of the task is to develop and maintain the tools and data needed to support other planning projects. BTPO maintains a travel demand model, Synchro model, and Geographic Information Systems. Included in the task is collecting and tracking performance measures data. An annual report will summarize performance measures and other transportation data. Update the 2023 housing unit and employment data.

Tasks Completed

- Update the local street map from Bannock County source data
- Calculated the annual regional Vehicle Miles Traveled
- Tracked the annual housing unit growth by Traffic Analysis Zone
- Updated the demographic data set using the 2022 American Community Survey.

- Staff completed an analysis of the Functional Classified Roadways.

Table 5: Task 5.0 Transportation Modeling, Demographic, and GIS Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$51,829.00	$45,261.99	$6,576.01	87.3%

Task 6.1 Metropolitan Transportation Plan

Description

The Metropolitan Transportation Plan is a twenty-plus-year plan on how the transportation network operates today and a vision of future networks.

Tasks Completed

- The 2050 Metropolitan Transportation Plan and Conformity Demonstration was approved.
- The 2050 Metropolitan Transportation Plan was amended to include a new funded project.

Table 6: Task 6.0 Metropolitan Transportation Plan Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$5,574.10	$3,435.23	$2,138.87	61.6%

Task 6.2 Public Transit/Human Service Coordination Plan

Description

The coordination plan identifies the transportation needs of individuals with disabilities, older adults, and low-income people, provides strategies for meeting these needs, and prioritizes transportation services for funding and implementation. The planning effort includes participation by seniors, individuals with disabilities, public, private, and nonprofit transportation representatives, and human services providers.

Tasks Completed

- Completed user survey and analyzed the results.
- The draft Coordinated Plan public review process was completed.

Tasks to be continued

- The final approval of the Coordinated Plan will occur in FY 2025

Funding Summary

Table 7: Task 6.2 Public Transit/Human Service Coordination Plan Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$15,542.00	$11,946.02	$3,595.98	76.9%

Task 6.3 Safe Accessible Transportation Options Planning

Description

Description: The task will improve all users' safe and accessible transportation options by developing a complete street policy and working with local agencies to implement bicycle and pedestrian facilities.

Tasks Completed

- Staff attended three regional trail working group meetings on the status of the regional trail system.
- The Complete Street Policy was approved.

Table 8: Task 6.3 Safe Accessible Transportation Options Planning Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Consolidated Planning Grant	$19,268.71	$12,315.30	$6,953.41	63.9%

Task 7.0 SMART Grant

Description

BTPO received a Strengthening Mobility and Revolutionizing Transportation (SMART) grant to prototype technologies and procedures to improve the safety and reliability of the Yellowstone Corridor.

The innovative Transportation solutions project will install sensors along the Yellowstone Corridor. The project seeks to improve safety and reliability along the corridor.

Tasks Completed

- The Data Management, Evaluation, and Implementation plans were developed.
- The equipment for the project was purchased.
- Contracted to install the sensors at the twenty project intersections.
- Determine the current condition for Travel Time and Planning Time Index

Tasks to be continued

- Determine the current condition for the selected performance measures.
- Modify the time-of-day plans and pedestrian crossing times based on the performance measure finding.
- Evaluate the effectiveness of the sensors in improving the performance measures.

Funding Summary

Table 9: Task 7.0 SMART Grant Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Local	$1,317,074.00	$791,752.63	$525,312.37	60.1%

Task 8.1 Traffic Operations and Management

Description

Coordinate operations and planning of the Pocatello/Chubbuck Coordinated Traffic Control Centers. Provide maintenance resources to maintain the coordination traffic control system. BTPO serves as the coordination and oversight element of the control center.

Tasks Completed

- Held committee meetings.
- The financial report was sent to member agencies.
- Provided supplies and equipment in response to maintenance requests.

Funding Summary

Table 10: Task 8.1 Traffic Operations and Management Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Local	$167,848.2	$82,504.12	$85,344.08	49.20%

Task 8.2 Coordinated Traffic Signal Coordination

Description

Coordinate operations and planning of the Pocatello/Chubbuck Coordinated Traffic Control Centers. Provide maintenance resources to maintain the coordination traffic control system. BTPO serves as the coordination and oversight element of the control center.

Tasks Completed

- Held committee meetings.
- The financial report was sent to member agencies.
- Provided supplies and equipment in response to maintenance requests.

Funding Summary

Table 11: Task 8.2 Coordinated Traffic Signal Coordination Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Local	$21,236.00	$22,310.1	-$1,074.10	105.1%

Task 9 BTPO Local Operations

Description

To provide local dollars for expenditures not qualifying for reimbursement under federal guidelines. Program dollars for professional services for BTPO Policy Board-related events, meeting expenses, memberships, training, and equipment/software needs.

Tasks Completed

The task covered training and meeting expenses for the agency.

Funding Summary

Table 12" BTPO Local Operations Funding Summary

Funding Source	Amounted Budgeted	Amount Expended	Balance	Percent Expended
Local	$10,251.00	$7,832.68	$2,418.32	76.4%

Agenda Item 2D: FY 2025 Unified Planning Work Program Change and Amendment 1

Meeting Date: February 3, 2025

Summary of Item:
BTPO uses Synology Network Attached Storage (NAS) drive as a shared file server. The server works well, but it cannot be accessed off-site. I have been trying to upgrade the unit to allow VPN remote access.

The conference computer takes so long to load that I no longer use it. I had Lazer Express evaluate the computer needs and how to update the NAS for more storage and configure the VPN.

I have attached the quote. I am asking Lazer Express to remove the upgrade to the fiscal computer. I think the current computer is acceptable for the activity.

The cost is $2,194 for the:

- NAS Upgrade and VPN configuration
- Conference Room PC and widows software
- Installation and configuring the system

Staff requests to include the Local operations budget from $8,817 to $11,011:

Changes

- Equipment and computer - $1,265
- Software- $169
- Repair and Maintenance - $760

The funds would come from the Local Operations Line budget, which has an unprogrammed balance of $4,335. If approved, this balance would decrease to $2,141.

Staff is working on Amendment 1 of the FY 2025 UPWP. There are several areas where change is required, and some tasks need to be reevaluated. They include:

- Carryover was higher than anticipated. The anticipated amount was $174,716, and the actual amount was $231,626. The staff has requested that ITD move the $231,626 into the FY 2026 Consolidated Planning Grant.
- Some line items list audit, insurance, ESRI, and Quickbooks had higher renewal costs than anticipated.

- The Synchro Model update was included in the FY 2024 UPWP, but the purchase did not occur, and the funds were not moved in the FY 2025 UPWP.
- The City of Pocatello's application to fund an update to the Bicycle and Pedestrian plan was not approved. The Multimodal and Complete Street Prioritization project anticipated the approval to complete some of the project tasks. A reevaluation of the project is occurring.

The amendment will be ready by the March Meeting.

Recommendation

Staff recommends increasing the Local operation budget from $8,817 to $11,011 to cover equipment, installation, and configuring conference room computer and NAS upgrades.

Agenda Item 2E: FY 2025 – 2031 Transportation Improvement Program Amendment 2

Meeting Date: February 3, 2025

Summary of Item:
FTA Section 5307 funds were transferred from the Idaho Falls Urban Area to the Pocatello Urban Area in FY 2023. The funds were included in the existing capital project Key number 24782. Staff thought those funds were in a grant and did not need to be tracked in the TIP. The additional description of ADA sidewalk repair was removed from Key number 24782. Amendment 2 of the FY 2025 – 2031 Transportation Improvement Program adds a new FY 2025 project for the ADA Sidewalk Repair project.

Pocatello Reginal Transit tracks the project administration and indirect cost of transit operations separately from the other activities. Staff was concerned that this project description should be included within each project. Discussion with FTA clarified that either way was acceptable. A new project is needed to have a separate indirect cost activity. Key Number 24783 Transit Capital Project Administration has $282,918 in 2025, 2026, 2027, and 2028.

Resolution 2025-1 Providing for Amendment 2 of the FY 2025 – 2031 Transportation Improvement Program is attached.

Recommendation
Approve Resolution 2025-1 Providing for Amendment 2 of the FY 2025 – 2031 Transportation Improvement Program is attached.

Resolution 2025-1 Providing for Amendment 2 of the FY 2025 – 2031 Transportation Improvement Program

WHEREAS, the Bannock Transportation Planning Organization has been designated by the Governor of Idaho Metropolitan Planning Organization for the Pocatello Urbanized area;

WHEREAS, the Infrastructure Investment and Job Act (IIJA), Title 23 United States Code Section 134, Title 49 United States Code Section 5303 requires metropolitan planning organizations to develop and approve a Transportation Improvement Program;

WHEREAS, the 1990 Clean Air Act Amendment Requires all transportation plans and programs in non-attainment and maintenance areas to demonstrate conformity to applicable state implementation plans;

WHEREAS, IIJA, Title 23 United States Code Section 134, Title 49 United States Code Section 5303 requires projects contained in the transportation improvement program to be financially constrained;

WHEREAS, the scope of Transit Capital (24783) was changed to include the repair of sidewalks to meet ADA requirements, and that change required a new project to describe the activities.

WHEREAS, the Pocatello Regional Transit is tracking administrative costs separately from other costs. The Federal Transit Administration has determined a new project is needed to cover the administrative costs.

WHEREAS, a public comment period was held between January 11 and January 29, 2025, and all comments were shared with the BTPO Policy Board;

WHEREAS, the Bannock Transportation Planning Organization has reviewed the TIP Amendment and has determined that the projects are consistent with the Metropolitan Transportation Plan

NOW, THEREFORE, BE IT RESOLVED by the Bannock Transportation Planning Organization Policy Board to approve the FY 2025- 2031 Transportation Improvement Program Amendment 2 as shown in Exhibit 1 is adopted.

Adopted by the BTPO Policy Board meeting on February 3, 2025

Attest:

_____ _____

Linda Leeuwrik, Chair Mori R Byington

BTPO Policy Board

Planning Director

Exhibit 1 Amendments to the FY 2025 -2031 Transportation Improvement Program

Project (key number)	Funding Category	Phase	2025	2026	2027	2028	2029	2030	2031/PD
Transit Other Capital Project Administration (24782)	5307-Sub	Construction	$281,918	$281,918	$281,918	$281,918			
		Development							
		Right-of-Way							
Project (key number)	**Funding Category**	**Phase**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031/PD**
Transit Capital, ADA Sidewalk Repair (24783)	5307-Sub	Construction	$357,000						
		Development							
		Right-of-Way							

Agenda Item 2F: On-Call Engineering Agreement with DKS

Meeting Date: February 3, 2025

Summary of Item:
BTPO has had a Professional Service On-Call Engineering Service agreement with Six Mile (now DKS) since 2000. The agreement expired on September 30, 2024.

The On-Call agreement assists Traffic Signal Coordination and Maintenance Operations and Management committees in updating traffic signal coordination and conducting other studies. The scope of services is for projects within the BTPO annual Unified Planning and Work Program. The specific work tasks may change yearly but focus on traffic signal coordination improvement and transportation planning activities.

The scope of services includes some or all the following tasks:

Transportation Planning tasks that will be provided under this on-call engineering services shall include but not be limited to the following:

- Prepare and/or review planning studies.
- Perform transportation modeling.
- Prepare and/or review traffic impact studies.
- Review Bicycle lanes and facility plans.
- Provide other transportation planning-related professional services as required.

Traffic Engineering tasks that will be provided under this on-call engineering service shall include but not be limited to the following:

- Prepare traffic engineering plans for school zones and railroad crossings.
- Prepare traffic signal plans.
- Convert and implement Synchro timing Plan into Kinetic databases.
- Prepare traffic signal preemption timing calculations and analyses for railroad crossings.
- Perform traffic signal coordination timing analyses using Synchro.
- Perform traffic engineering studies, including traffic safety analyses, and provide recommended improvements.
- Plan Intelligent Transportation Systems (ITS).
- Provide research and recommendations on traffic-related ordinances and policies.
- Provide other traffic engineering-related professional services as required.

The agreement has a not-to-exceed $40,000 annual clause. The specific projects are identified in project orders, which outline the tasks and costs for each project. The

agreement is for two years, starting on February 3, 2025, and ending on February 3, 2027.

Recommendation

Approve the Bannock Transportation Planning Organization Professional Service and Consultant Agreement On-Call Engineering Servies with DKS.

Bannock Transportation Planning Organization

Professional Service and Consultant Agreement

On-Call Engineering Servies

THIS AGREEMENT between the Bannock Transportation Planning Organization, whose address is 214 East Center Street, Suite 70, Pocatello, Idaho 83201, hereinafter called "BPTO", and **DKS Associates** whose address is 1050 SW 6th Avenue, Suite 600, Portland, OR 97204, hereinafter called "Consultant."

NOW, THEREFORE, the parties hereby agree as follows:

I. Agreement Administrator:

This Agreement shall be administrated by Mori Byington, Planning Director.

II. Duties and Responsibilities of Consultant

The Consultant shall perform services and provide deliverables as described in Attachment A, incorporated herein by reference. This Agreement shall have no force or effect until Attachment A is finalized, signed by the parties, and attached to this Agreement. Project status meetings will be held bi-monthly or monthly, upon reasonable notice and request of the BTPO, to review the work's progress.

III. Coordination

BTPO is the lead for the project, but the ownership and control of the intersections where the project will occur, but the City of Pocatello, the City of Chubbuck, and the Idaho Transportation Department are responsible for the operations of these intersections. The Consultant will coordinate with each agency before any work or activity within public rights-of-way.

IV. Duties and Responsibilities of BTPO

BTPO shall provide to the Consultant, upon request, copies of any records or data on hand that are pertinent to the work under the Agreement.

V. Project Orders

Outside of attendance at signal coordination meetings, all expenditures are authorized through a project order. The project order describes the task or activity and provides a cost estimate. No work can progress until a project order is signed.

VI. Scope of Services

Attachments A, attached hereto, constitute the scope of services agreement between the parties regarding the subject matter covered under the Agreement.

VII. Term of Agreement and Notice to Proceed

This CONTRACT shall be for two (2) years beginning on February 3, 2025, and ending on February 3, 2027, unless terminated sooner, as this CONTRACT outlines. The terms of this CONTRACT may, at BTPO's sole discretion, be extended for two additional one-year periods beyond the expiration date. Any modification or extension of this CONTRACT termination date shall be in writing.

VIII. Basis of Payment

The Consultant shall bill the BTPO monthly for the fee due to the Consultant based upon an hourly rate for work completed for each itemized task pursuant to this Agreement during the billing period. The service fee is based on the Idaho Transportation Department Approved overhead rate plus a 12% fixed fee. BTPO shall pay invoices for satisfactorily completed work within thirty (30) days of the date of receipt. The Consultant shall provide all information necessary to determine the total amount(s) due. Total compensation for the services performed shall not exceed $40,000 annually.

IX. Ownership

All information furnished to the Consultant for its use pursuant to this Agreement shall belong to the BTPO and shall be returned to the BTPO in good order upon completion of the Agreement or the request of BTPO. All documents, reports, and any other data developed by the Consultant for BTPO in the performance of this Agreement shall become the property of BTPO. BTPO shall retain exclusive ownership rights to all work produced by the Consultant under this Agreement.

X. Save Harmless

The Consultant shall exonerate, indemnify, and hold the BTPO harmless from and against and assume full responsibility for payment of all federal, state, and local taxes or contributions imposed or required under unemployment insurance, social security, workman's compensation, and income tax laws for the Consultant or the Consultant's employees engaged in the performance of this Agreement.

The Consultant shall maintain insurance of the types and in the amounts typically maintained by legal professionals of the same type as the Independent Consultant, including, but not limited to, comprehensive general liability insurance in the minimum amount of $1,000,000 per occurrence and professional malpractice insurance, all with insurance companies properly licensed to do business in Idaho and reasonably satisfactory to the Client.

The Consultant shall protect, indemnify, and save the BTPO harmless from and against any damage, cost, or liability, including reasonable attorney's fees for any or all injuries to persons, property, or claims for damages arising from any acts or omissions of the Consultant, its employees, or sub-consultants.

XI. Default And Termination

For Cause: Consultant default occurs if the Consultant fails to perform any conditions of this Agreement, or the Consultant fails to prosecute the work to endanger the performance of this Agreement. The Consultant does not cure such defects in performance within ten (10) business days after receipt of written notice from the BTPO informing it of such defects in performance. If, at the end of such cure period, the Consultant is still in default or non-compliance, then the BTPO may terminate this Agreement.

For Convenience: The BTPO may terminate this Agreement for its convenience at any time upon thirty business days written notice to Consultant. BTPO's sole obligation shall be to pay for services satisfactorily rendered to the date of such a termination.

XII. Anti-Discrimination Clause

Acceptance of this Agreement binds the Contractor to Section 601, Title VI, Civil Rights Act of 1964: In that "No person in the United States shall, on the grounds of race, color, national origin, sex, or age, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance." In addition, "No otherwise qualified handicapped individual in the United States shall, solely because of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."

XIII. General Provisions

Neither party shall be liable or deemed to be in default for any delay or failure in performance under this Agreement or interruption of service resulting from Acts of God, civil or military authority, acts of war, riots, or insurrections.

IN WITNESS WHEREOF, the Parties hereto have set their hands on the day and year in the Agreement first written above,

Consultant's Legal Name: **DKS Associates**	
Consultant's Authorized Representative's Printed Name **Larry J. White**	**Title** **Principal**
Signature	**Date**

BTPO Authorized Representative's Printed Name	**Title**
Signature	**Date**

Attachment A

The scope of services is for projects within the BTPO annual Unified Planning and Work Program. The specific work tasks may change yearly but focus on traffic signal coordination improvement and transportation planning activities.

The City of Pocatello, the City of Chubbuck, the Idaho Transportation Department, and BTPO established the Pocatello/Chubbuck Urbanized Area Traffic Signal Coordination and Maintenance Cooperating Agreement to coordinate maintenance and improvement activities related to the traffic signals on the coordinated system. The system has forty signals currently on the coordinated system.

The scope of services includes some or all the following tasks:

Transportation Planning tasks that will be provided under this on-call engineering services shall include but not be limited to the following:

- Prepare and/or review planning studies.
- Perform transportation modeling.
- Prepare and/or review traffic impact studies.
- Review Bicycle lanes and facility plans.
- Provide other transportation planning-related professional services as required.

Traffic Engineering tasks that will be provided under this on-call engineering service shall include but not be limited to the following:

- Prepare traffic engineering plans for school zones and railroad crossings.
- Prepare traffic signal plans.
- Convert and implement Synchro timing Plan into MaxTime databases.
- Prepare traffic signal preemption timing calculations and analyses for railroad crossings.
- Perform traffic signal coordination timing analyses using Synchro.
- Perform traffic engineering studies, including traffic safety analyses, and provide recommended improvements.
- Plan Intelligent Transportation Systems (ITS).
- Provide research and recommendations on traffic-related ordinances and policies.
- Provide other traffic engineering-related professional services as required.

Agenda Item 2G: 2025 Safety Performance Measures

Meeting Date: February 3, 2025

Summary of Item:
Annually, the Idaho Transportation Department and the MPOs are required to establish safety targets.

The statewide safety targets have been established by the Idaho Transportation Department's Office of Highway Safety in the following categories (using 5-year averages and 5-year rates for 2020-2024):

1. 5-Year Average Number of Fatalities: 238
2. 5-Year Fatality Rate per 100 million VMT: 1.32
3. 5-Year Average Number of Serious Injuries: 1,224
4. 5-Year Serious Injury Rate per 100 million VMT: 6.82
5. 5-Year Average Number of Non-motorized Fatalities and Serious Injuries: 116

Supporting the state targets or developing our targets.
The regional data for 2024 is still in draft form, but based on the 2019 -2023 data, the BTPO area is tracking below the ITD targets.

5-Year Fatality Rate per 100 million VMT: ITD 1.32 BTPO 1.1

5-Year Serious Injury Rate per 100 million VMT: ITD 6.82 BTPO 6.3

The average number of Non-motorized Fatalities and serious injuries is harder to determine. We have used the BTPO planning area percentage of the state population to indicate bicycle and pedestrian crashes. BTPO is approximately 4.5 percent of the state population. The state had an average of 116 non-motorized crashes from 2020 -2024. Although not the same years, the 4.5 percent of 116 is 5.2 percent, lower than the 6 we averaged between 2019 and 2023.

5-Year Average Number of Non-motorized Fatalities and Serious Injuries: ITD 116 BTPO 6

Request/Recommendation

Staff is recommending that BTPO support the ITD safety targets.

Agenda Item 2H: Establishment of Membership Dues for FY 2026

Meeting Date: February 3, 2025

Summary of Item:
The formula for the membership dues is established in the Articles of Association.

Total membership assessment for dues shall be established annually by the Policy Board. The share for each member shall be determined in a two-part formula, which allocates fifty (50) percent of the funding required to the percentage of the urban area population and fifty (50) percent based on the number of votes held by each member organization.

Member Organization	Population 50% of Funding	Voting 50% of Funding	Percentage of Total Dues
City of Pocatello - 3 votes	72.42%	37.5%	54.96%
City of Chubbuck - 2 votes	20.02%	25.0%	22.51%
Bannock County - 1 Vote	7.56%	12.5%	10.03%
Pocatello Regional Transit - 1 vote	0.00%	12.5%	6.25%
Idaho Transportation Department - 1 vote	0.00%	12.5%	6.25%
2020 Urban Population	77,766	100.0%	100.00%

Staff recommends a two percent increase to the annual membership dues for fiscal year 2025.

Local Match	Local Match Total	Pocatello	Pocatello Regional Transit	Chubbuck	Bannock County	Idaho Transportation Department
FY 2019	$56,128	$31,213	$3,508	$12,494	$5,405	$3,508
FY2020	$56,128	$31,213	$3,508	$12,494	$5,405	$3,508
FY 2021	$57,250	$31,837	$3,578	$12,744	$5,513	$3,578
FY 2022	$57,250	$31,837	$3,578	$12,744	$5,513	$3,578
FY 2023	$57,250	$31,837	$3,578	$12,744	$5,513	$3,578
FY 2024	$58,395	$32,095	$3,650	$13,145	$5,856	$3,650
FY 2025	$58,395	$32,095	$3,650	$13,145	$5,856	$3,650
FY 2026	**$59,563**	**$32,736**	**$3,723**	**$13,408**	**$5,973**	**$3,723**
Change 2024 - 2025	$1,168	$642	$73	$263	$117	$73

Agenda Item 2I: Election of Officers

Meeting Date: February 3, 2025

Summary of Item:
The Articles of Association establish that a chair and vice-chair be elected at the February or March meeting. The term of office is one year, but there is no limit on the number of terms.

Linda Leeuwrik is the current chair, and Roger Hernandez is the vice chair.

Request/Recommendation:
Elect a chair and a vice chair for 2025.

Agenda Item 3A: Executive Director Update

Meeting Date: February 3, 2025

Summary of Item:
Staff will provide an update on the executive director search.

Agenda Item 3B: Transportation Improvement Program Administrative Amendments

Meeting Date: February 3, 2025

Summary of Item:

Amendment 9

The amendment modifies the following:

- SICOG, Safe Routes to School Coordinator and Activities(22914) – In FY 20254, move $50,000 from development to construction.

The Planning Director approved Amendment 9 on November 8, 2024.

Amendment 10

The amendment modifies the following:

- US 91, Yellowstone Ave; Breneman to Knudsen (21911)– Increase construction cost by $117,776 to match the engineer's estimates.

The Planning Director approved Amendment 10 on November 20, 2024.

2025 -2031 BTPO Transportation Improvement Program Amendment 1

Amendment 1 modifies the FY 2025 – 2031 TIP changes that occurred before the FY 2025 – 2031 TIP was approved.

The amendment modifies the following:

- SICOG, Safe Routes to School Coordinator and Activities(22914) – In FY 2025, move $50,000 from development to construction. Change the $108,000 in FY 2026, 2027, and 2028 from development to construction.
- Monte Vista to Pocatello Creek Road Pathway (KN23697) – The FY 2024 -2030 TIP was amended to add construction funds in FY 2025 for $758,470. The amendment adds the project and provides for the FY 2025 funding.
- US 91, Yellowstone Ave; Breneman to Knudsen (21911)– Increase construction cost by $117,776 to match the engineer's estimates.