Lindon City
Planning Commission
Staff Report

March 9, 2021

Notice of Meeting
Lindon City Planning Commission

The Lindon City Planning Commission will hold a regularly scheduled meeting on Tuesday, March 9, 2021, in the Council Room of Lindon City Hall, 100 North State Street, Lindon, Utah. The meeting will begin at 6:00 p.m. This meeting may be held electronically to allow a commissioner to participate by video or teleconference. Meetings are broadcast live at www.youtube.com/LindonCity. The agenda will consist of the following items:

Agenda
Invocation: By Invitation
Pledge of Allegiance: By Invitation

Scan or click here for link to download agenda & staff report materials.

1. Call to Order

2. Approval of minutes
   Planning Commission 2/23/2021

3. Public Comment

4. Amended Site Plan – Linden Nursery – 535 North State Street
   The Linden Nursery requests Amended Site Plan approval to relocate an existing 1,536 square foot storage building/barn to a new location closer to State Street in the General Commercial (CG) zone. (10 minutes)

5. Amended Site Plan – **Scott's Miracle Gro** – 347 South 1250 West
   Scott's Miracle Gro requests Amended Site Plan approval to construct a 3,000 square foot storage building at the North East corner of their property in the Light Industrial (LI) zone. (10 minutes)

6. Public hearing for a recommendation to amend the Lindon City zoning map to Planned Residential Development Overlay and a portion to General Commercial–A for the property located at approximately 550 N. State Street and 310 W. 500 N. and to amend the Lindon City General Plan Street Masterplan map. Elwood Holdings and Rhino Realty LLC request a recommendation from the Lindon City Planning Commission for a Zoning Map Amendment and General Plan Amendment at approximately 550 N. State Street and 310 W. 500 N. (Parcel numbers 14:068:0304, 14:067:0187, 14:067:0169, 14:068:0277). The Zone Map Amendment request is to change the zoning on the property to the Planned Residential Development Overlay and a portion to General Commercial–A. The General Plan Amendment request is to amend the Lindon City General Plan Street Master Plan Map to terminate the street at 570 N. into a cul-de-sac and not extend 570 N. to State Street as identified on the Lindon Street Masterplan Map. (60 minutes)

7. Planning Director Report
   - General City Updates

Adjourn
Staff Reports and application materials for the agenda items above are available for review at the Lindon City Planning Department, located at 100 N. State Street, Lindon, UT. For specific questions on agenda items our Staff may be contacted directly at (801) 785-7687. City Codes and ordinances are available on the City web site found at www.lindoncity.org. The City of Lindon, in compliance with the Americans with Disabilities Act, provides accommodations and auxiliary communicative aids and services for all those citizens in need of assistance. Persons requesting these accommodations for City-sponsored public meetings, services programs or events should call Kathy Moosman at 785-5043, giving at least 24 hours' notice.

The above notice/agenda was posted in three public places within Lindon City limits and on the State http://www.utah.gov/pmn/index.html and City www.lindoncity.org websites.

**The duration of each agenda item is approximate only*
Posted By: Kathryn Moosman, City Recorder
Date: 3/5/2021 Time: 5:00 pm
Place: Lindon City Center, Lindon Police Station, Lindon Community Center

Notice of Meeting
Lindon City Planning Commission

Item 1 – Call to Order

Sharon Call
Mike Marchbanks
Rob Kallas
Steve Johnson
Scott Thompson
Jared Schauers
Renee Tribe

The Lindon City Planning Commission held a regularly scheduled meeting on **Tuesday, February 23, 2021 beginning at 6:00 p.m.** at the Lindon City Center, City Council Chambers, 100 North State Street, Lindon, Utah.

REGULAR SESSION – 6:00 P.M.

Conducting:	Sharon Call, Chairperson
Invocation:	Scott Thompson, Commissioner
Pledge of Allegiance:	Steven Johnson, Commissioner

PRESENT	**EXCUSED**
Sharon Call, Chairperson	
Mike Marchbanks, Commissioner	
Rob Kallas, Commissioner	
Steven Johnson, Commissioner	
Scott Thompson, Commissioner	
Jared Schauers, Commissioner	
Renee Tribe, Commissioner	
Mike Florence, Planning Director	
Anders Bake, Associate Planner	
Kathryn Moosman, City Recorder	

Special Attendee:
Councilmember Vanchiere

1. **CALL TO ORDER** – The meeting was called to order at 6:00 p.m.

2. **APPROVAL OF MINUTES** –The minutes of the regular meeting of the Planning Commission meeting of February 9, 2021 were reviewed.

COMMISSIONER JOHNSON MOVED TO APPROVE THE MINUTES OF THE REGULAR MEETING OF FEBRUARY 9, 2021 AS PRESENTED. COMMISSIONER SCHAUERS SECONDED THE MOTION. ALL PRESENT VOTED IN FAVOR. THE MOTION CARRIED.

3. **PUBLIC COMMENT** – Chairperson Call called for comments from any audience member who wishes to address any issue not listed as an agenda item. There were no public comments.

CURRENT BUSINESS –

4. **Plat Amendment – Pear Tree Estates Plat "B" – 134 West 600 North.** Jason Taylor requests plat amendment approval to amend an existing lot in the Pear Tree Estate Subdivision Plat A and Parcel A of the Lexington Cove Parcel A at 134 West 600 North to consolidate the lot and parcel into one lot. in the Residential (R1-20) zone.

Anders Bake, Associate Planner led this agenda item by stating the applicant Jason Taylor is requesting plat amendment approval from the Planning Commission to amend an existing lot in the Pear Tree Estate Subdivision Plat A and Parcel A of the Lexington Cove Parcel A at 134 West 600 North to consolidate the lot and parcel into one lot. The purpose for the plat amendment is to consolidate the property owned by the applicant into one buildable lot that can legally be used for the construction of a house.

Mr. Bake went on to say Lindon City Code 17.32.00 references Utah Code for requirements amending a subdivision plat. He also referenced Utah Code 10-9a-608, noting an applicant may petition the Land Use Authority (Planning Commission) to join two or more of the petitioner fee owner's contiguous lots.

Mr. Bake stated the applicant owns all of the properties that are part of the plat amendment application. The proposed plat includes a vacation of Lot 4 Pear Tree Estates Plat "A" and Parcel A Lexington Cove Plat "A" (these vacations have been noted on the proposed plat). The proposed plat amendment is located in the Residential R1-20 zone. He then referenced the table showing the reviews on the subdivision and lot requirements for a residential lot in the R1-20 zone noting all requirements are met. He then read the conditions listed in the motion.

Mr. Bake noted the City Engineer has completed a review of the plat and all issues have been resolved. He then presented an Aerial Image with Parcels, Proposed Plat, Current Lexington Cove Plat "A" and Current Pear Tree Estates Plat "A" followed by discussion. Chairperson Call pointed out this plat amendment meets all requirements and appears to be a pretty straightforward request.

Chairperson Call called for any further comments or discussion from the Commission. Hearing none she called for a motion.

COMMISSIONER THOMPSON MOVED APPROVE THE APPLICANT'S REQUEST FOR PLAT AMENDMENT APPROVAL OF THE PEAR TREE ESTATES PLAT "B" SUBDIVISION WITH THE FOLLOWING CONDITIONS: 1. THE APPLICANT WILL CONTINUE TO WORK WITH CITY STAFF TO MAKE ALL TECHNICAL CORRECTIONS AS NECESSARY TO THE PLAT PRIOR TO RECORDING; 2. PRIOR TO PLAT RECORDING, THE APPLICANT WILL UPDATE THE FINAL PLAT MYLAR TO INCLUDE NOTARIZED SIGNATURES OF OWNERS' CONSENT TO DEDICATION; AND OBTAIN SIGNATURES OF ALL ENTITIES INDICATED ON THE SUBDIVISION PLAT ATTACHED HERETO; 3. ALL ITEMS OF THE STAFF REPORT. COMMISSIONER KALLAS SECONDED THE MOTION. THE VOTE WAS RECORDED AS FOLLOWS:

CHAIRPERSON CALL	AYE
COMMISSIONER KALLAS	AYE
COMMISSIONER MARCHBANKS	AYE
COMMISSIONER JOHNSON	AYE
COMMISSIONER THOMPSON	AYE
COMMISSIONER SCHAUERS	AYE
COMMISSIONER TRIBE	AYE

THE MOTION CARRIED UNANIMOUSLY.

5. Hillside Protection District Overlay Development – 608 North 800 East.

Brandon Jones requests Planning Commission approval for an exemption or relief

from hillside slope and setback requirements of the Hillside Protection District Overlay zoning ordinance for the property at 608 North 800 East.

Mike Florence, Planning Director, led this agenda item by explaining the applicant, Brandon Jones is requesting that the Planning Commission approve an exemption or relief from hillside slope and setback requirements of the Hillside Protection District Overlay zoning ordinance for the property located at 608 North 800 East.

Mr. Florence commented the Hillside Protection Zone requirements are applicable to residential development of all parcels and lots located in the city having an average slope in excess of twenty (20) percent, as defined in this chapter (17.57.030(2). Title 17.57.030(3) allows an applicant to file an application to request an exemption or relief from specific requirements of the Hillside Protection Zone. He noted the Planning Commission is the final land use authority on granting an exemption or relief of the Hillside Protection Zone code requirements.

Mr. Florence went on to say the Meadows at Bald Mountain subdivision plat was recorded in 2001. A geotechnical investigation was completed as part of the original Meadows at Bald Mountain Subdivision Plat A that allowed for the approval of the subdivision plat. The Meadows at Bald Mountain Subdivision Plat A calls out primary building site parameters for developing on the lot. He noted in 2016, the Planning Commission approved an exemption or relief for this property to reduce the side yard setbacks from 20 feet to 10 feet. A geotechnical report was submitted in 2016 for approval of setback modification. City Engineer, Noah Gordon, pointed out this is one of the last places in the city this overlay will apply to. He added the proposed grating should make things better and noted the telephone poles makes it a little difficult to have a back yard.

Mr. Florence stated the applicant has applied for exemption or relief regarding the following two items:

a) 17.57.050 – No development shall be allowed on or within fifty (50) feet slopes in excess of forty (40) percent, areas subject to land sliding, or other high-hazard geological areas as determined by a soils report or geology report produced pursuant to the requirements of this chapter.
b) 17.57.040(2) - No development shall be permitted on property having an average slope in excess of 30%, as defined in this chapter.

Mr. Florence noted the Lindon City Engineering and Planning Department have reviewed the provided geotechnical report and find no exception as outlined in the code. Mr. Florence also pointed out that staff finds that the geotechnical report addressed, with recommendations, items that are requested for exemption and relief. He added that the geotechnical engineer has provided an opinion as to the effects of the applicant's proposal on the health, safety, and welfare of the general public and nearby residents, and on the safety of the property and improvements in the area and seismic conditions appear to be stable. He indicated that the re-grading of the site to have a slope of 30% of less will meet the requirements of the Hillside Protection zone and Staff has found that the landscape plan needs to be updated as per the requirements found on the Meadows at Bald Mountain Plat A.

Mr. Florence went on to say at some point in the past, the lot had been terraced with boulders to act as a retaining wall along the slope of the property and as part of this development those boulders will be removed. He then referenced the Google Street View showing the neighboring properties that have cut into the hillside for their landscaping. He noted, according to the applicant, the slope grading will help to better match the hillside slopes to the properties on either side of this lot. Mr. Florence also read the conditions as listed in the motion. Mr. Florence then presented an Aerial photo, the applicant letter, Street view picture of the property, Geotechnical report and the Meadows at Bald Mountain subdivision plat followed by discussion.

Commissioner Kallas asked staff if the city would have any responsibility with runoff/drainage from the hills above with the slope and if there are concerns with this particular house or is there a waiver the homeowner must sign. Mr. Florence stated there is not a waiver but stated he can confer with the city attorney regarding a possible waiver. Mr. Gordon said it's not the typical runoff that is a concern but to ensure the grading is done when it is dry and to ensure the vegetation is established so the hillside itself doesn't end up in the back yard. Mr. Gordon also pointed out that the soils report is pretty clear.

Following some additional discussion, the commission was in agreement to approve this request with the conditions as listed in the motion.

Chairperson Call called for any further comments or discussion from the Commission. Hearing none she called for a motion.

THE PLANNING COMMISSION FINDS THAT GRANTING THE REQUESTED EXEMPTION(S) OR RELIEF WILL NOT BE INJURIOUS TO THE HEALTH, SAFETY, AND WELFARE OF THE GENERAL PUBLIC OR NEARBY RESIDENTS, WILL NOT CREATE AN UNDUE HAZARD TO PROPERTY AND IMPROVEMENTS, AND WILL BE CONSISTENT WITH THE PURPOSES OF THIS CHAPTER IDENTIFIED IN SECTION 17.57.010.

COMMISSIONER MARCHBANKS MOVED TO APPROVE THE APPLICANT'S REQUEST FOR APPROVAL OF A HILLSIDE EXEMPTION OR RELIEF ON LOT 7 OF THE MEADOWS AT BALD MOUNTAIN SUBDIVISION PLAT A IN RELATION TO SECTIONS 17.57.050 AND 17.57.040(2) AND AS FOUND IN THE LINDON CITY ZONE CODE WITH THE FOLLOWING CONDITIONS: 1. THE SITE WILL BE CONSTRUCTED AS PER THE "SPECIFIC MEASURE RECOMMENDED BY THE GEOTECHNICAL ENGINEER TO MITIGATE THE IMPACTS OF THE PROPOSAL" AS FOUND IN THE ATTACHED GEOTECHNICAL REPORT; 2. THE SITE WILL BE GRADED AS PER THE APPROVED GRADING PLANS; 3. A SOILS REPORT BE SUBMITTED WITH THE BUILDING PLANS FOR REVIEW BY THE LINDON CITY BUILDING OFFICIAL; 4. ALL MITIGATION RECOMMENDATIONS BE IMPLEMENTED; 5. THE GRADING AND DRAINAGE PLAN BE CONSTRUCTED AS APPROVED BY THE LINDON CITY ENGINEER; 6. PRIOR TO A BUILDING PERMIT BEING ISSUED, THE LANDSCAPE PLAN BE UPDATED TO MEET THE VEGETATION TYPE AND DISTANCE REQUIREMENTS AS ESTABLISHED BY SLOPE PERCENTAGE ON THE MEADOWS AT BALD MOUNTAIN PLAT; 7. THE DEVELOPMENT WILL MEET RELEVANT BUILDING SITE REQUIREMENTS AT FOUND IN 17.57; AND 8. ALL ITEMS OF THE STAFF REPORT. COMMISSIONER SCHAUERS SECONDED THE MOTION. THE VOTE WAS RECORDED AS FOLLOWS:

CHAIRPERSON CALL	AYE
COMMISSIONER KALLAS	AYE
COMMISSIONER MARCHBANKS	AYE
COMMISSIONER JOHNSON	AYE
COMMISSIONER THOMPSON	AYE
COMMISSIONER SCHAUERS	AYE
COMMISSIONER TRIBE	AYE

THE MOTION CARRIED UNANIMOUSLY.

6. Conditional Use Permit – Rocco's Tire Service – 732 North State Street.
Ronald Mann requests Conditional Use Permit approval to operate an automobile tire, lube, and tune up business at 732 North State Street in the General Commercial (CG) zone.

Mr. Bake led this agenda item by stating Ronald Mann is requesting conditional use permit approval to operate an automobile tire, lube, and tune up business located at 732 North State Street. He noted the Standard Land Use Table requires that businesses doing an automobile tire, lube, and tune up business in the General Commercial Zone obtain a Conditional Use Permit. The proposed business will perform all work indoors and within their unit. Mr. Bake stated notices were mailed on February 12, 2021 to adjoining property owners in accordance with Lindon City Code and Staff has received no public comments back at this time.

Mr. Bake stated they will be using the North half of the existing building at 732 North State Street. The unit is designed for auto related uses with two overhead doors in the front of the building. He noted the area behind the building is enclosed with a chain link fence with privacy slats abutting residential properties. The Lindon City Code Section 17.48.040 requires a seven-foot-high masonry or concrete fence along any property line between a non-residential development and a residential use or a residential zone.

Mr. Bake noted the Planning Commission may approve a fence other than a masonry fence if it makes the following findings:

a) The proposed fence/landscape screen provides an adequate buffer for the adjoining residential use.
b) The appearance of the fence/landscape screen will not detract from the residential use and/or nonresidential use of the property.
c) The proposed fence/landscape screen will shield the residential use from noise, storage, traffic or any other characteristic of the nonresidential use that is incompatible with residential uses.

Mr. Bake advised the Planning Commission that they may waive or adjust this fence/screening requirement upon findings that the fence is not needed to protect adjacent residential uses from adverse impacts and that such impacts can be mitigated in another appropriate manner. He added the Planning Commission will also need to determine whether or not the existing fencing will be adequate for the proposed use.

Mr. Bake added Rocco's Tire Services will have four parking stalls available for employee use in the front of the building and about 15 stalls available for customer use in

the rear of the building; this meets the parking code requirement of 12 stalls for the commercial unit.

Mr. Bake stated the applicant has provided a business description outlining the services that he plans on providing at the subject property. This will include tire change and reconditioning work for local automobile dealerships. The applicant has also provided a site plan and liquid waste storage and management plan for his business. It is expected that this business will have a minimal impact on surrounding properties with all work being performed inside the building. He noted the previous businesses that have used this property performed work similar to what Rocco's Tire Services. Mr. Bake then read the conditions as listed in the proposed motion.

Mr. Bake also presented photographs of the property at 732 North State Street, business description, Liquid Waste Storage and management Plan, and the Site and Floor Plan followed by some general discussion. He then turned the time over to the applicant for comment.

The applicant, Ronald Mann, addressed the commission at this time. He stated he owns and operates his current business in Sandy. He noted his business started up with him doing automotive services for friends and family while he had another day job. He indicated that a friend and owner of Planet Auto Sales inquired of his services (Planet Auto Sales is a used car dealership in the city of Lindon). He stated he is applying for a Conditional Use Permit for an automotive business to be located in Lindon and to be in close proximity to Planet Auto Sales. The address of the building is 732 North State Street in Lindon and is currently owned by Jarrod and Ashley Richins.

Mr. Mann stated the nature of his business is to inspect and service vehicles for the used car dealership. He added the process is the dealers will purchase cars and trucks through various auctions in and out of state. The vehicles will then be dropped off to the shop where he will inspect these cars or trucks for maintenance and safety issues. Once approved, he will then perform the necessary lube and tune. Most of the cars purchased by Planet Auto are vehicles in the $9k-$18k price range with miles of 30k to 90k and they sell mostly the small economic cars and most will just need lube and tune. They would also like to build a relationship with the customers that have purchased cars by providing them light maintenance (fluid changes, tune-ups, brakes, and tires). The location works really well for them being that it is close to the dealership.

Mr. Mann stated the portion that will be used for the business is roughly 900 square feet. The hours of operation will be from 9:00 am to 5:00 pm. The number of parking stalls they will use will be four in front of the building (employee) and about 15 in the rear (customer). He noted all liquid waste that is removed from the vehicles is collected in either 20 gallon stand up metal waste containers or floor oil drain pans. These waste containers are then rolled and fluids transferred to a polyethylene tank at the rear of the building and once the tank reaches 75% capacity, the tank is then emptied and taken by Tri-state oil recycling. He pointed out there are no drains inside the building and because of this, they will use a combination of absorbent mats and powder to contain and absorb all spilled fluids. From their experience in the automotive industry and understanding the importance of preventing hazard waste getting into the environment, they will make it a high priority to maintain these standards and they will not allow any waste fluids drain to the gutter.

Following some additional discussion, the commission was in agreement to approve this request with the conditions as listed in the motion.

Chairperson Call called for any further comments or discussion from the Commission. Hearing none she called for a motion.

COMMISSIONER JOHNSON MOVED TO APPROVE THE APPLICANT'S REQUEST FOR A CONDITIONAL USE PERMIT TO USE THE PROPERTY LOCATED AT 732 NORTH STATE STREET FOR AN AUTOMOBILE TIRE, LUBE, AND TUNE UP BUSINESS, WITH THE FOLLOWING CONDITIONS: 1. NO AUTOMOBILES OR AUTOMOBILE PARTS WILL BE STORED OUTSIDE OF THE BUILDING; 2. ALL WORK WILL BE PERFORMED WITHIN THE BUILDING; 3. THE BUSINESS OPERATION WILL BE LIMITED TO VEHICLE DETAILING, LUBE, AND TIRE CHANGES AND TUNEUPS 4. HOURS OF OPERATION WILL BE FROM 9:00 AM TO 7:00 PM; 5. THE APPLICANT WILL COMPLY WITH ALL OF THE COMMERCIAL ZONE REQUIREMENTS FOUND IN SECTION 17.48 OF THE LINDON CITY CODE; AND 6. ALL ITEMS OF THE STAFF REPORT. COMMISSIONER MARCHBANKS SECONDED THE MOTION. THE VOTE WAS RECORDED AS FOLLOWS:

CHAIRPERSON CALL	AYE
COMMISSIONER KALLAS	AYE
COMMISSIONER MARCHBANKS	AYE
COMMISSIONER JOHNSON	AYE
COMMISSIONER THOMPSON	AYE
COMMISSIONER SCHAUERS	AYE
COMMISSIONER TRIBE	AYE

THE MOTION CARRIED UNANIMOUSLY.

4. **<u>New Business: Reports by Commissioners</u> –** Chairperson Call called for any new business or reports from the Commissioners.

Commissioner Johnson asked about the mayor's property on state street and if it is under contract. Mr. Florence stated it has been 4 or 5 months since he has heard that someone was looking at the that particular property. Mr. Florence also mentioned some potential items that may be on the agenda at the March 9th meeting; the Norton property and the Linden Nursery site improvements in preparation for development behind the facility, (Scott's Miracle Grow will be adding a large shed to the property). There was then some general discussion regarding the Norton Property potential agenda item.

Mr. Florence also gave a quick summary for discussion on the email sent out regarding the study of single-family property values in Salt Lake County when located within a ½ mile radius of a high-density residential development. Mr. Florence also spoke on state requirements in regards to accessory apartments noting we will have to look at updating the city ordinance. Councilmember Vanchiere also gave a brief update from the Budget Kick Off meeting that was held on February 17th.

Chairperson Call called for any further comments or discussion. Hearing none she moved on to the next agenda item.

5. **<u>Planning Director Report</u> –** There was no director report at this time.

Chairperson Call called for any further comments or discussion from the commission. Hearing none she called for a motion to adjourn.

ADJOURN –

COMMISSIONER KALLAS MADE A MOTION TO ADJOURN THE MEETING AT 7:35 PM. COMMISSIONER TRIBE SECONDED THE MOTION. ALL PRESENT VOTED IN FAVOR. THE MOTION CARRIED.

Approved – March 9, 2021

_____
Sharon Call, Chairperson

_____
Michael Florence, Planning Director

Item: 4 Amended Site Plan Approval – Linden Nursery 535 N. State Street

Date: March 9, 2021

Project Address: 535 N. State Street
Applicant: Linden Nursery
Property Owner: Platt, Valerie & Edward

General Plan: Commercial
Current Zone: General Commercial (CG)

Parcel ID: 45:244:0001

Type of Decision: Administrative
Council Action Required: No
Presenting Staff: Anders Bake

Summary of Key Issues

1. For amended site plan approval, the planning commission will be evaluating whether the building meets Title 17 development regulations.

Overview

1. The applicant requests amended site plan approval to relocate an existing 1,536 square foot storage building/barn to a new location closer to State Street. This building will be used for storage purposes for the nursery business. It was approved for construction in its current location by the Planning Commission on October 12, 2005. At that time, the Planning Commission did not have any concerns with the building materials or design. The building façade is primarily vinyl siding with windows and aluminum roofing and the applicant does not propose any changes to the building materials.
2. The Linden Nursery is rearranging the layout of their property in order to continue the operation of their business on a smaller portion of the property. The rear portion of the property will then be available for a future residential development. This application only involves changes to the commercial portion of the property and does not relate to the future residential project.
3. In addition to the barn relocation, the Linden Nursery will be making other changes to the layout of their property including additional greenhouse structures, relocating a silo, and adding a concrete pad for mulch bins. The building size and structure types do not require that these changes receive Planning Commission approval.
4. The subject property is located at 535 N. State Street, in the Lindon Nursery Subdivision and the General Commercial Zone.

Motion

I move to (*approve, deny, continue*) the applicant's request for amended site plan approval with the following conditions:

1. The applicant will continue to work with the Building Official to make all final corrections to the building plans;
2. The applicant will ensure the 30' rear set back is met from future residential;
3. The plans will meet relevant development specifications as found in the Lindon City Development Manual; and
4. All items of the staff report.

Surrounding Zoning and Land Use

North: General Commercial (CG) – commercial retail
East: General Commercial (CG) – commercial uses
South: General Commercial (CG) – Dastrup Auto / Residential (R1-20) – single-family residential
West: Residential (R1-20) – single-family residential

Development Standards

Building Setbacks

The proposed location of the building meets the following building setback requirements for the General Commercial Zone:

- Front: 20 feet. The building is setback approximately 120 feet from State Street
- Side yard when adjacent to a nonresidential zone: 0 feet. The building is proposed to be setback 92 feet from the north property line.
- Rear yard setback when adjacent to a residential use or residential zone: 40 feet. Under the Planned Residential Development ordinance there is a 30' setback from residential to commercial. The barn will need to be setback 30 feet.

Parking

The site includes about 70 existing parking stalls which is sufficient for the needs of this business. It is expected that the relocation of this building will not increase the parking demand for the property.

Landscaping Standards

The site currently has 20 feet of landscaping along state street. Landscaping was previously approved for this site. The building relocation will not affect the landscaping requirements for this site and there are no proposed changes to the landscaping on the site.

Staff Analysis

The proposed building relocation will allow the Linden Nursery to continue operating their business while making space available for future redevelopment of a portion of their property. The building appears to be in good condition and will allow the applicant to keep their property well maintained with an indoor storage space for nursery materials and equipment.

Exhibits

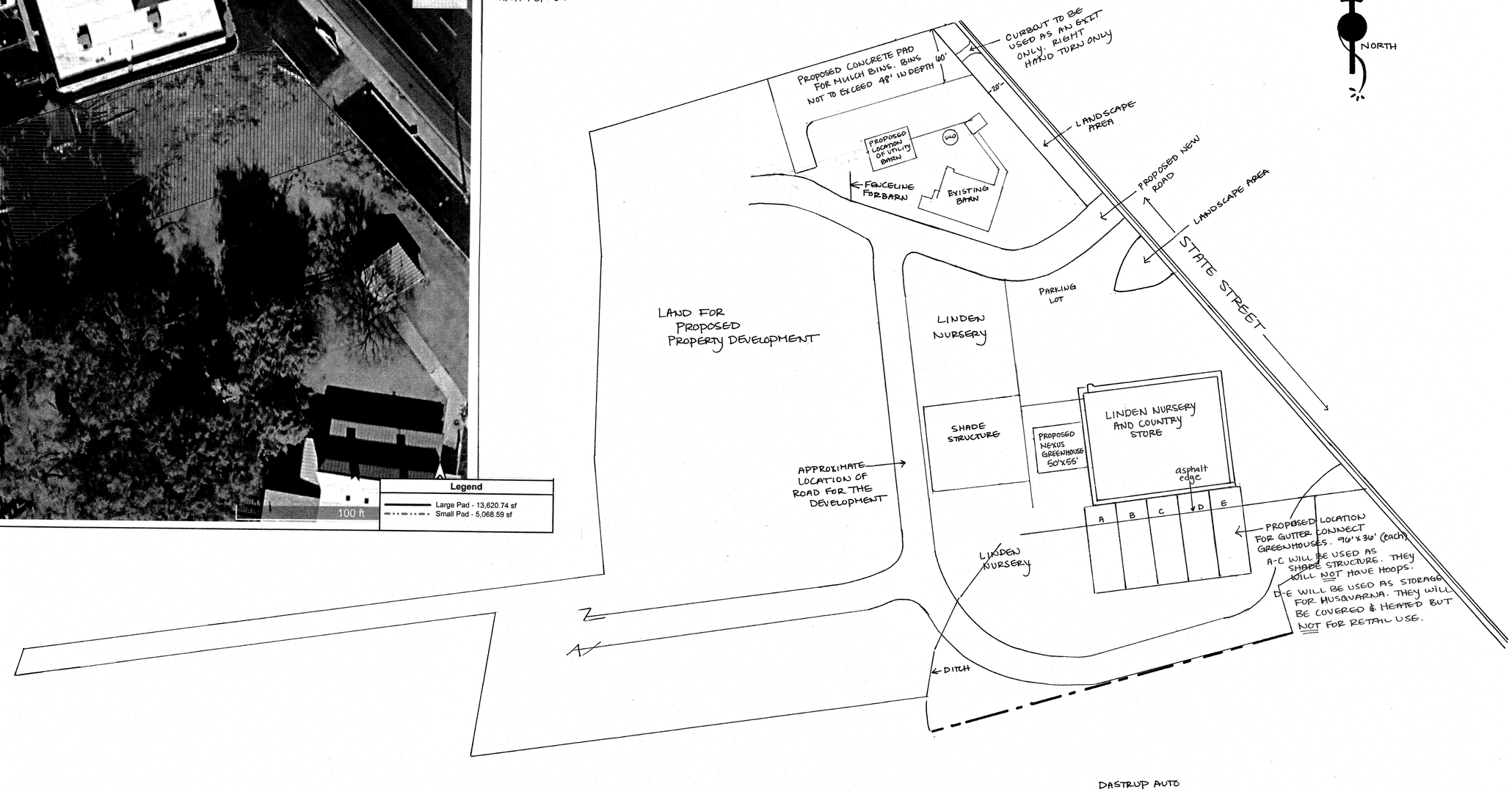
1. Aerial photo
2. Site plan
3. Building elevations
4. Pictures of existing building

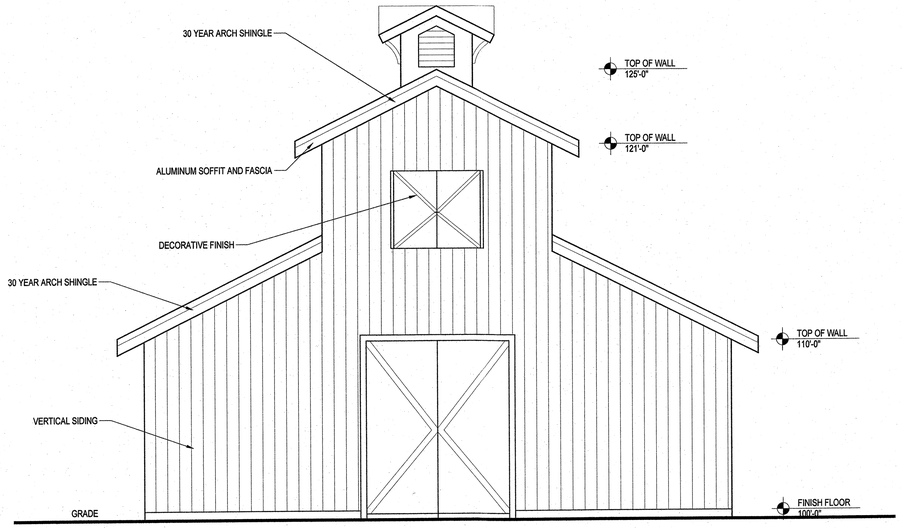
LINDEN NURSERY

SITE PLAN

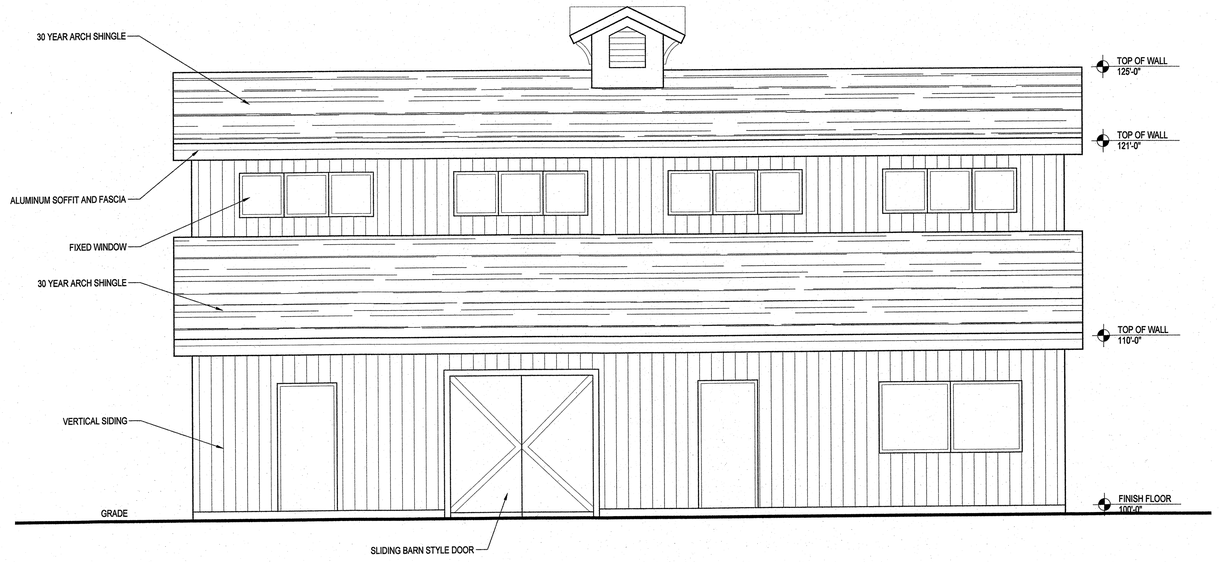
SCALE 1" = 60'

IMAGE OF PROPOSED AREA FOR CONCRETE PAD

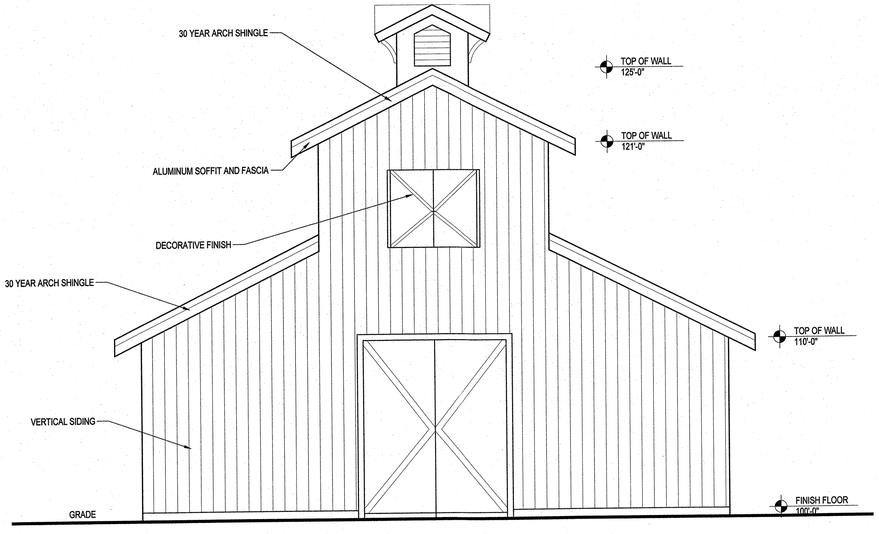




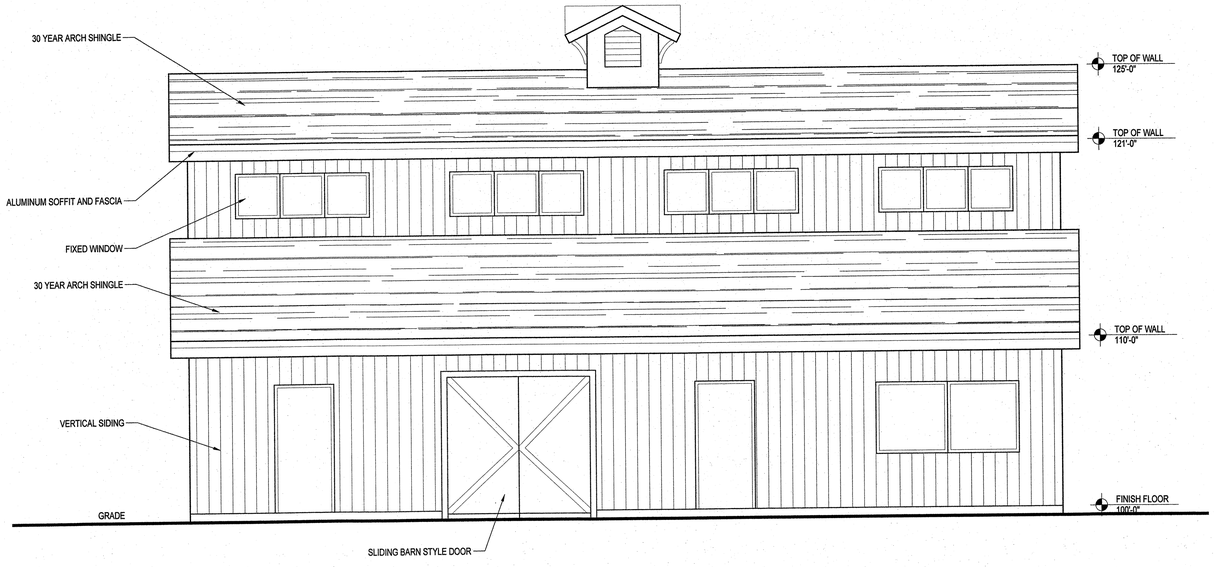
FRONT ELEVATION
SCALE: 1/4" = 1'



SIDE ELEVATION
SCALE: 1/4" = 1'



BACK ELEVATION
SCALE: 1/4" = 1'



SIDE ELEVATION
SCALE: 1/4" = 1'

PROJECT NOTES

EXISTING BUILDING TO BE RELOCATED SEE SITE PLAN

PROJECT TITLE

DAIN & A SSOCIATES
ARCHITECTURE DESIGN PROJECT MAGEMENT
PHONE (801) 225-1442

ELEVATIONS

DATE: November 2020

REVISIONS:

A2

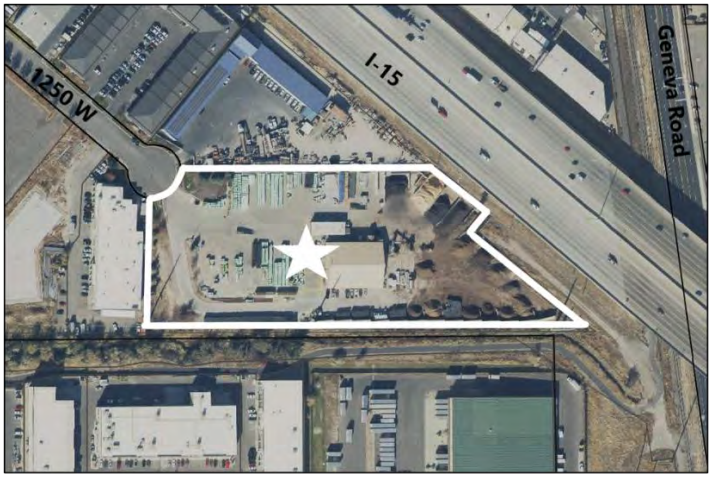
Item: 5 Amended Site Plan Approval – Scott's Miracle Gro 347 South 1250 West

Date: March 9, 2021

Project Address: 347 South 1250 West
Applicant: Scott's Miracle Gro
Property Owner: Hyponex Corporation
General Plan: Light Industrial
Current Zone: Light Industrial (LI)

Parcel ID: 55:658:0001

Type of Decision: Administrative
Council Action Required: No
Presenting Staff: Anders Bake



Summary of Key Issues

1. For amended site plan approval, the planning commission will be evaluating whether the building meets Title 17 development regulations.

Overview

1. The subject property is currently used for an agricultural material manufacturing business with several buildings and materials on the property. The applicant is seeking amended site plan approval to construct a 3,000 square foot storage building at the North East corner of their property.
2. The subject property is located at 347 South 1250 West, in the Wolf Mountain Subdivision and the Light Industrial Zone.

Motion

I move to (*approve, deny, continue*) the applicant's request for site plan approval with the following conditions:

1. The applicant will continue to work with the City Engineer to make all final corrections to the engineering documents;
2. The plans will meet development specifications as found in the Lindon City Development Manual;
3. The applicant will comply with all bonding requirements, if applicable;
4. The building will meet all building setback requirements for the Light Industrial Zone;
5. The proposed building will not be located within the 30-foot perpetual easement in favor of Mountain Fuel Supply Company located along the East property line of the subject property; and
6. All items of the staff report.

Surrounding Zoning and Land Use

North: Light Industrial (LI) – Industrial uses
East: Light Industrial (LI) – I-15
South: Vineyard City Industrial – Industrial uses
West: Light Industrial (LI) – Industrial uses

Development Standards

Building Design

The proposed building is an accessory building on the property that will be used for storage purposes and will not include underground utilities. The proposed building will have a metal exterior on all four sides. The color of the building will include blue walls with a green trim and a gray roof.

The Lindon City Code section 17.49.070(3) states that "All exterior building materials in the Light Industrial zone shall be earth-tone colors. A sample color palette of acceptable earth-tone colors is found in the Appendix of the Lindon City Commercial Design Guidelines." The color palette includes blue, green and gray shades similar to what is found on the building rendering. A colored building rendering and the color palette are attached to this report.

The Lindon City Code section 17.49.070(1), requires that twenty five percent of the exterior of all buildings (except as permitted in 17.49.070(4)) shall be covered with brick, decorative block, stucco, wood, of other similar materials as approved by the Planning Commission.

Section 17.49.070(4) states that the Planning Commission may approve ribless, metal, flat-faced, stucco embossed, or metal sandwich panel buildings when the Planning Commission finds that the building is aesthetically pleasing, adequately trimmed, contrasted with different colors, is well proportioned, blends in with surrounding property, and has a similar look to that achieved by 17.49.070(1).

Building Setbacks

The proposed building location meets the following setback requirements for the Light Industrial Zone:

- Front: 20 feet. The building is over 400 feet from the front property line.
- Side: 0 feet. The building is 2 feet from the North side yard property line.
- Side when adjacent to a street: 15 feet. The building is 35 feet from the East property line adjacent to I-15.

The applicant will also need to show on their updated Site Plan that the proposed building is out of a 30-foot-wide easement in favor of Mountain Fuel Supply company.

Parking

The site includes 19 existing parking stalls which is sufficient for the needs of this business. It is expected that the storage building will not increase the parking demand for the property.

Landscaping Standards

The site currently has 20 feet of landscaping along the cul-de-sac frontage on 1250 West. There is a total of twenty percent landscaping on the property. The applicant is not proposing any additional landscaping as part of this Amended Site Plan Application.

Engineering Requirements

The City Engineer is working through technical issues related to the site plan and will conduct a final review if the planning commission grants final site plan approval.

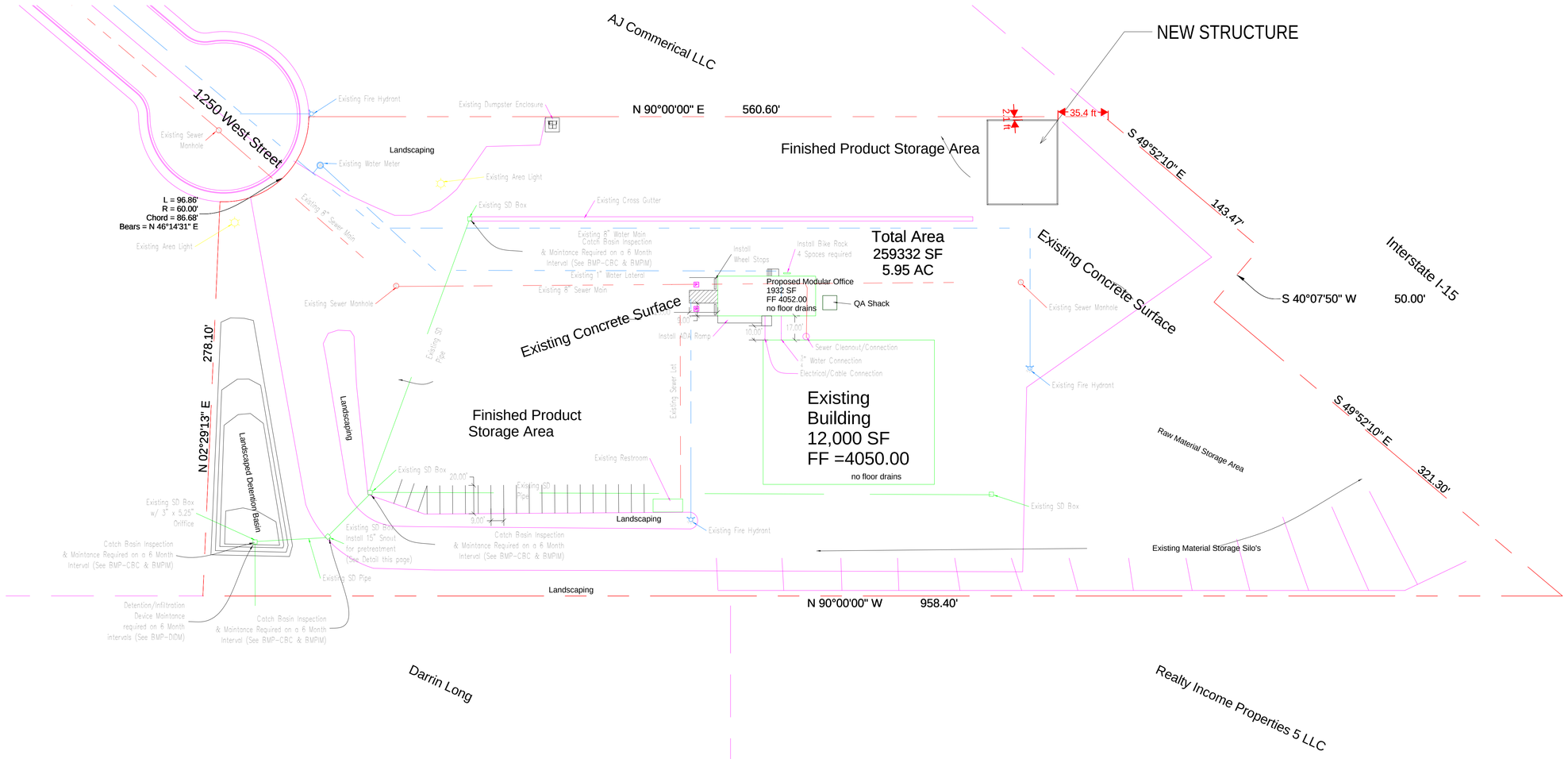
Staff Analysis

The proposed storage building will allow Scott's Miracle Gro to better maintain their property. City staff believes that it would be appropriate for the Planning Commission to approve a metal exterior for this building because it is an accessory storage building and not the main building on the property.

Since the public notice went out, the City has received a letter from a neighboring property owner regarding the proposed building. This letter is attached to the report as exhibit 4. The city also received a call from Yesco who own property and a billboard sign directly East of the subject property. After getting more information regarding the height and location of the building, they no longer have concerns regarding sign visibility.

Exhibits

1. Aerial photo
2. Site plan
3. Building elevations
4. Colored building rendering
5. Commercial Design Standards Color Palette
6. Letter from neighbor



SITE PLAN
SCALE: 1" = 40'-0"

2

DESIGNGROUP
3167 North Canyon Road
Provo, UT 84604
Phone: 801.358.9840
shane@w2designgroup.com

STATE OF UTAH
SHANE
WILLIAMS
10189741-030
LICENSED ARCHITECT

MIRACLE GRO STORAGE BUILDING

SCOTT'S MIRACLE GRO
347 S 1250 W
LINDON UT 84042

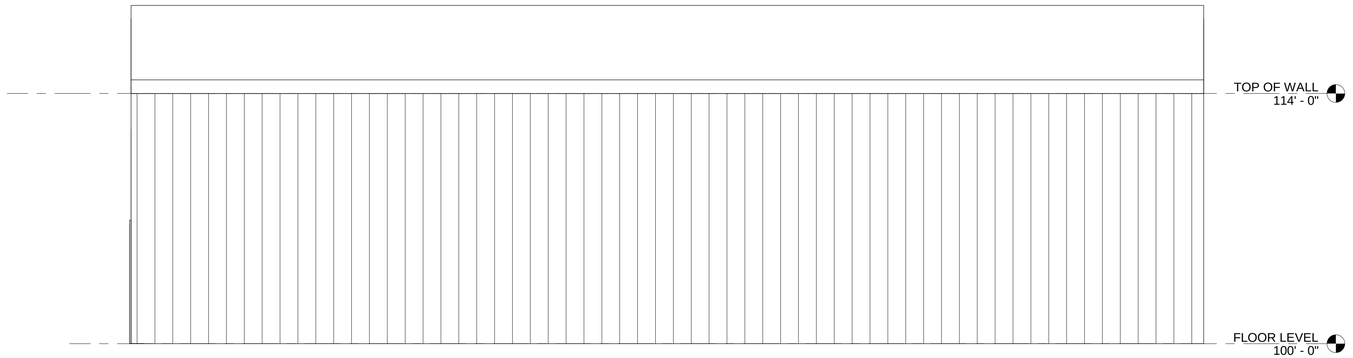
Revision Date	Revision Number

PROJECT NO.	Project Number
DATE	00.00.00
DRAWN BY	Author
CHECKED BY	Checker

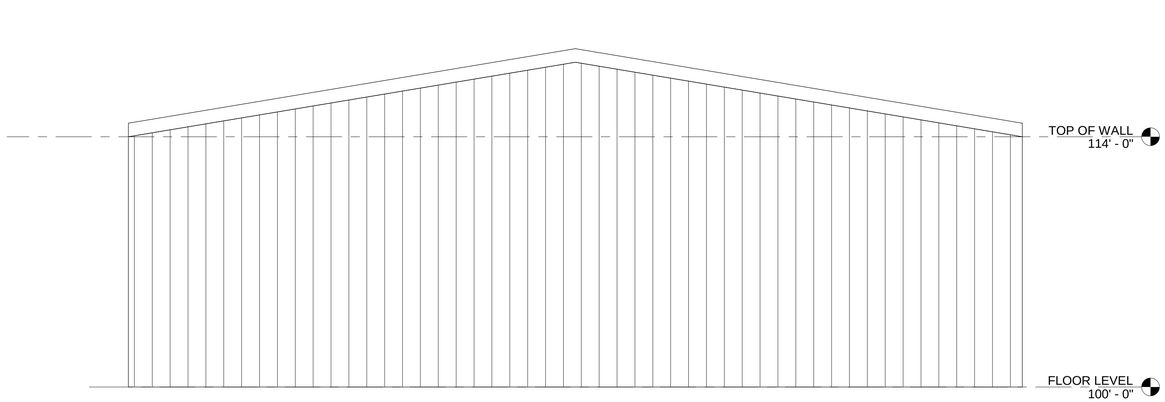
SHEET DESCRIPTION
CIVIL SITE PLAN

SHEET NUMBER
C-1

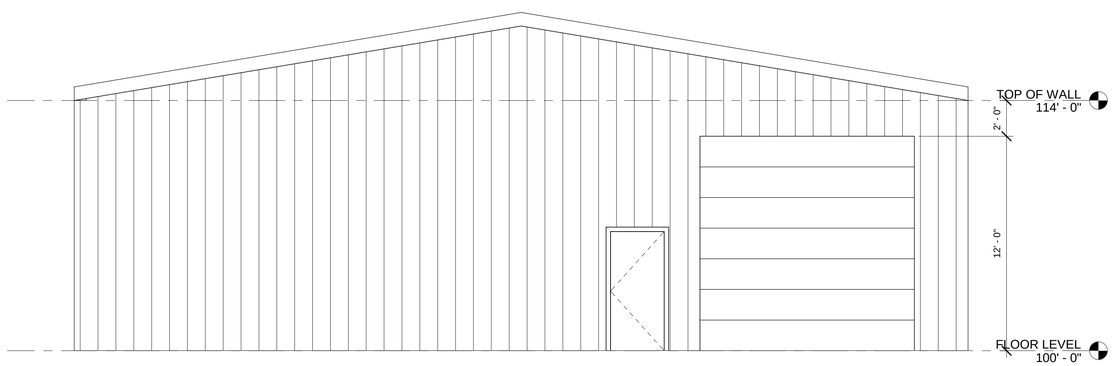
2/19/2021 9:35:01 AM C:\Users\Shane\OneDrive - w2designgroup.com\Scott's Miracle Grow\02 Storage Building\Scotts Storage Shed.rvt



EAST AND WEST 3
SCALE: 1/4" = 1'-0"



NORTH 2
SCALE: 1/4" = 1'-0"



SOUTH 1
SCALE: 1/4" = 1'-0"

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STATE OF UTAH
SHANE
WILLIAMS
10189741-030
LICENSED ARCHITECT

MIRACLE GRO STORAGE BUILDING

SCOTT'S MIRACLE GRO
347 S 1250 W
LINDON UT 84042

Revision Date	Revision Number

PROJECT NO.	Project Number
DATE	00.00.00
DRAWN BY	Author
CHECKED BY	Checker

SHEET DESCRIPTION
EXTERIOR ELEVATIONS

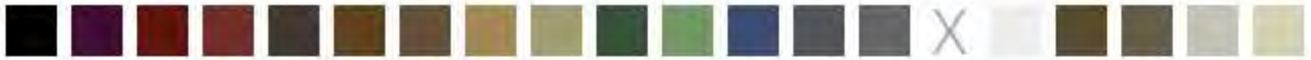
SHEET NUMBER
A-2.01

COLOR SELECTOR

Use our interactive Color Selector to create different color combinations that fit your building needs.

40 Year High Durability Coatings from CO Building Systems are designed and field tested to provide long term weathering durability. Our finishes offer excellent protection against the elements with exceptional resistance to chalk and fade.

SELECT YOUR COLOR BELOW

ROOF		GALVALUME
ROOF TRIM		PATINA GREEN
WALLS		OCEAN BLUE
WALL TRIM		PATINA GREEN

COLOR SHOWN MAY VARY SLIGHTLY FROM THE ACTUAL COLOR. PLEASE CONTACT CO BUILDINGS FOR A METAL COLOR CHIP TO VERIFY SELECTION.

IV. Utah Mountain Desert Color Palette

328 South 1250 West ● Lindon, UT 84042
(801) 796-0400 ● Fax (801) 796-0523
Email: sales@ssiarts.com
www.ssiarts.com

March 4, 2021

Lindon City Planning Department

Re: Scotts Miracle Gro amended site plan (Utah County Parcel #556580001)

We are the business that shares our East property line with Scotts and wish to express our concern with adding any additional capacity at this location.

They are already spilling out into the cul-de-sac and street (1250 W) in front of our property. They are currently using the street to stage, load and unload semi-trucks and trailers, often blocking access to our property for our employees and clients. Ideally all their shipping operations should happen on their property, not on public streets and we are fearful that adding another structure will put further limits on where they can safely load and unload trucks.

Thanks for your time and consideration.

Regards,

Ryan Cooke
General Manager
Scenic Solutions

office: (801) 796-0400
direct: (801) 922-9105
www.ssiarts.com

328 South 1250 West
Lindon, UT 84042

Item: 6 Public Hearing – Zoning Map and General Plan Street Master Plan Amendments - Approximately 550 N. State Street

Date: March 9, 2021

Project Address: 550 N. State Street and 310 W. 500 N.

Applicant(s): Elwood Holdings and Rhino Realty, LLC

Property Owner: Elwood Holdings LLC , Scott L. Norton (et al)

Parcel ID: 14:068:0304, 14:067:0187, 14:067:0169, 14:068:0277

Size: 13.5 acres

General Plan: Commercial
Current Zone: General Commercial

Presenting Staff: Michael Florence
Type of Decision: Legislative
Council Action Required: Yes

Summary of Key Issues

1. Whether to recommend approval or denial to the City Council for a request to amend the Lindon City Zoning Map from Commercial General to Commercial General-A and the Planned Residential Development Overlay for the development area.
2. Whether to recommend approval or denial to the City Council for a request to amend the Lindon City General Plan Street Masterplan Map to terminate 570 N. at approximately 300 W. with a cul-de-sac.

Overview

1. Elwood Holdings LLC is proposing to develop 3.924 acres of the commercial frontage along State Street and 500 N. as commercial tenant space. They are also proposing to construct 73 townhomes and 4 single family homes on 7.589 acres.
2. Rhino Realty LLC, is petitioning to rezone 1.917 acres of commercial frontage along State Street for an expansion to the Low Book Sales vehicle dealership
3. The Lindon City General Plan Street Masterplan calls out extending 570 N. to State Street as a future local road.
4. The City passed an amendment to the Planned Residential Overlay Zone in August 2020.
5. The Planned Residential Development Overlay Zone (ordinance section 17.76.040) requires that the following items be submitted as part of a zone map amendment application:
   - Concept site plan; building elevations; and renderings for the subject site.
6. The PRD ordinance also requires that "any concept plan presented to the Planning Commission and City Council for approval shall first be reviewed by the Development Review Committee to ensure the proposal is technically feasible."

Zone Map Amendment Motion

I move to recommend (*approval, denial, or continuation*) of ordinance 2021-3-O to amend the Lindon City zoning map from General Commercial to General Commercial-A and to the Planned Residential Development Overlay as identified on exhibit 2 for the properties located at approximately 550 N. State Street and 310 W. 500 N. (14:068:0304, 14:067:0187, 14:067:0169, 14:068:0277).

General Plan Street Master Plan Amendment Motion

I move to recommend (*approval, denial, or continuation*) of ordinance 2021-4-O to amend the Lindon City General Plan Street Masterplan Map to terminate 570 N. at approximately 300 W. with a cul-de-sac.

General Plan Considerations and Goals

The following General Plan and Moderate-Income Housing goals and objectives were evaluated when the city adopted the Planned Residential Development Overlay Zone but should be considered again for the zone change.

Land Use Considerations and goals

- The goal of housing and residential areas in Lindon City is to provide a housing and living environment that supports and complements the unique rural quality and character of Lindon City.
- Maintain and enhance the pleasing appearance and environmental quality of existing residential neighborhoods by avoiding encroachment of land uses which would adversely impact residential areas (i.e. increased traffic, noise, visual harmony, etc.) and by proving adequate screening and buffering of any adjacent commercial or industrial development including parking and service areas.
- Encourage creative approaches to housing development which will maintain and protect natural resources and environmental features.
- Expand the range of retail and commercial goods and services available within the community.
- Promote new office, retail, and commercial development along State Street and 700 N.
- Carefully limit any negative impact of commercial facilities on neighboring land-use areas, particularly residential development.
- The identity of Lindon should be strengthened by land uses which contribute to the unique character of the community
- The relationship of planned land uses should reflect consideration of existing development, environmental conditions, service and transportation needs, and fiscal impacts.
- Developed areas should be protected and revitalized by promoting new development and the adaptive reuse of existing community resources.
- A variety of housing types should be provided where appropriate, and innovative development patterns and building methods that will result in more affordable housing should be encouraged;
- Transitions between different land uses and intensities should be made gradually with compatible uses, particularly where natural man-made buffers are not available.
- Growth should be guided to locations contiguous to existing development to provide city services and transportation in a cost-effective and efficient manner.

General Plan Transportation Considerations and Goals

- The goal of the transportation plan is to have a balanced circulation system which provides for safe and efficient movement of vehicles and pedestrians, reinforces surrounding land development patterns and other city priorities, and enhances regional circulation facilities.
- The City shall coordinate land use and circulation planning to:
    - Provide for land development opportunities created by major transportation routes and interchanges within and around Lindon;
    - Ensure that decisions regarding future land development and roadway construction are closely coordinated and mutually supportive
- Planning shall minimize localized traffic congestion and operational problems and ensure adequate access to and circulation around commercial and industrial areas, public facilities, and other activity centers.
- Planning shall minimize non-local and commercial traffic within residential neighborhoods and shall provide for the safe and efficient movement of trucks and service vehicles with the community in a manner that does not adversely affect nearby land uses.
- Through streets are encouraged

Moderate Income Housing Goals and Support

- Allow for alternative housing types or moderate-income residential development in commercial and mixed-use zones, commercial centers, or employment centers.
- Evaluate whether the City would allow moderately higher density developments as part of a mixed commercial development that would be located in strategic commercial areas or centers to help with development potential.

Surrounding Zoning and Land Use

North: GC-A, CG and R1-20 – Commercial businesses and single-family homes
East: R1-20 –single-family homes and chapel
South: GC and R1-20 – Commercial businesses, single-family home, chapel
West: GC-A and GG– Commercial businesses

Zoning – Site Requirements

Below is a summary of the PRD site requirements. Some of these items will be refined when the applicant files for site plan and subdivision approval.

PRD Ordinance Requirements	Proposal
Property size – minimum one acre	13.43 acres
Proposed new commercial	Expansion of Low Book Sales, three new commercial buildings. 5.841 acres
Townhome project size	7.589 acres
Number of residential units	73 townhomes, 4 single family homes
Density – shall not exceed an average density of 10 units per acre	10.14. At the last minute, city staff found a discrepancy between the subdivision plat acreage and the site plan. The developer will need to reduce the density to be at 10 units per acre or less.
State Street setback – 300'	The applicant is not showing residential buildings within the 300' commercial setback however the plan is showing a residential driveway and the building setback. The applicant is identifying additional commercial space near commercial pad site 4. The Planning Commission and City Council may consider a reduction in this depth upon evaluating the following: a. Viable commercial options remain for the site; b. A commercial lot is irregularly shaped; c. The reduction does not limit future redevelopment opportunities of the commercial property
Residential building setbacks • 30' rear setback from existing single family • 25' front setback • 16' side yard setbacks • 20' corner side yard setbacks	The concept plan meets the setback requirements with the exception of Unit 1 which will only meet the setback requirements if that planning commission and city council allow for encroachment into the 300' commercial setback.

• Front and rear setbacks may be modified where design items such as common open space or other design features are proposed	
Perimeter Fence – 7' masonry or concrete	The civil engineering site plan identifies that a 7' masonry fence will be installed
Open Space/Landscaping – 20% common open space. The land use authority can approve private rear yard	The project plan shows 28% open space with both private fenced areas. However, there are setback and remanent areas that staff feels should not be counted towards the 20% open space requirement. Those areas are identified in the below map and are circled. The PRD ordinance states "setback areas that are in usable size segments and where a common amenity is provided can be counted towards the common open space requirement" (17.76.070(9)(b)(i). The open space calculation should be recalculated for review. If an amenity can be provided in the identified open space areas then according to the ordinance it can be counted towards the 20%.
	
Parking • 2 parking spaces per unit • .5 spaces per unit for visitor parking • 65% of units have a 2-car garage • 50% of driveways may be counted toward visitor parking requirement	• Parking meets the PRD ordinance • 74 units require 154 parking stalls • All units have a two-car garage • Each driveway parks two vehicles • 19 off-site visitor stalls are required and the plan shows 19
Trees – planted every 30 feet when abutting single family homes	Trees are planted every thirty feet on the North property line abutting single family homes.
Lighting plan – a lighting plan for streets and a photometric study are required	The applicant has internal street lighting identified on the civil drawings. City staff will review the lighting locations. A photometric

	study will need to be provided as part of the site plan review
Pedestrian connections – • Development must connect each separate building with internal concrete walkways • One pedestrian access to a public street	The applicant is working on final plans with the City. Final design will be approved at site plan approval. A pedestrian sidewalk is shown from the development to State Street and connecting the development to 570 N.
Access and streets • 29' for public streets	The plan shows two access points to the development. One access from State Street and a second access from 500 N. The streets will be public and meet the minimum 29' asphalt width requirement.

Zoning – Building Requirements

Below is a summary of the PRD building requirements. Some of these items will be refined when the applicant files for site plan and subdivision approval.

PRD Ordinance Requirements	Proposal
Height – 2 stories with a maximum height of 35 feet	Two stories. Overall building height not provided
Building Types and Variety • At least two different building types shall be included in projects larger than two acres and with multiple buildings. Buildings shall be differentiated from other building types through type of building, variations to building materials, color, rooflines, and the use of architectural features such as awnings, light fixtures and eave details • Ordinance (17.76.030) calls out different building types as detached single family, twin homes, tri-plex, multi-unit buildings and townhouses.	The plan shows a combination of 4 and 6 plex townhome buildings and 4 single family homes.
Architectural and Façade Design – • Buildings shall have a variety of materials to architecturally set them apart and to create unique and separate buildings • More than a single-color application and more than a single material application • 60% primary building materials (wood clapboard, cementitious fiber board, wood board and batten, wood siding, brick, stone • 30% maximum EIFS or Stucco • Wall variation and recesses • Buildings shall incorporate a variety architectural element • Eaves and rooflines are encouraged	Building rendering are provided in the exhibit section. A complete review the building facades and material treatments will be completed with the site plan approval review The exterior material are a combination of hardi-board, stucco and brick The applicant for site plan approval, will need to provide different material uses for the buildings The renderings show trim materials around the doors and windows The garage doors are of a coordinating color and have windows

• Garage doors are recessed, consistent with the building design, front loading garages shall include windows • Stucco-textured foam trim moldings shall not be the only application to enhance facades • All windows along a front façade shall incorporate at least two of the following: o Mullions and/or transoms o Trim or molding of a different color o Canopies, shutters, awnings o Recessed inset by 2 inches	Windows incorporate mullions, transoms, trim and shutters
The front façade of any residential building shall not face or front the rear yard of a single-family home	None of the front facades face or front the rear yard of a single-family home
Roof Pitch – all buildings shall have a pitched roof consistent with the overall architectural style of the building	Pitched roof
Frontage, Orientation and Entrances • Buildings front onto a public, private driveways • Building shall have expansive windows, entryways, balconies, terraces, or other architectural design features oriented to the street • Building entrances shall be the primary feature of the front façade and identify access to the individual units • Stoops or front porches raised a minimum of one foot	All buildings front onto a public street except for units 1-3 which will front onto a private driveway. The current plan however shows public utilities in the 21' driveway. Under the PRD ordinance section 17.76.080(21), this driveway section would need to be made public because there are proposed public utilities and meet the 29' street width standard like the rest of the development. The applicant has done a good job with the window and entry requirements of addressing the main feature of the home.

Traffic Impact Study

Trip Generation Evaluation

A Traffic Impact Study has been provided to the City for review and is attached to the staff report. The report evaluated the following intersections:

- Hwy 89/600 N.
- Hwy 89/550 N.
- Hwy 89/500 N.
- 2 Proposed site access.

The report notes that traffic volumes were evaluated on Thursday, January 7, 2021. The existing a.m./p.m. peak traffic volumes are found on page 18, figure 3-1. The report identifies the Peak Hours for traffic are from 7:45-8:45 a.m. and 4:45-5:45 a.m. In traffic reports, the operation of an intersection is rated from letters A-F with F identified as failing. Page 19, Figure 3-2 provides the existing Level of Service for each intersection. According to the report, all existing intersections currently perform at or above a level C except the intersection of Highway 89 and 500 N. which at the pm peak hour the eastbound turn movement from Highway 89 operates at a level D.

The Traffic Impact Study looks at the intersection Level of Service at four different periods: existing (map 3-1), regional growth (maps 4-1, 4-2) (increased traffic resulting from influences outside the

immediate study area), background forecast (maps 4-3, 4-4, 4-5, 4-6) (existing and regional growth forecast combined– not including the site), and analysis of future conditions with the site development (maps 6-1, 6-2, 6-4,6-5). The study also looked at trips from the site (map 5-2)

The traffic study indicates that the Level of Service for the intersections will not change between the existing time frame and regional growth.
However, the total forecast that includes the existing use, regional growth, and the development identifies the following: (see pages 19, 40 & 41 of the traffic study):

- The Highway 89 and development intersection (labelled #3 in the report) has a Level of Service F in the peak pm hours in both 2022 and 2026 (pages 40 & 41)
- The Highway 89 and 500 N. intersection (labelled #4 in the report) has a Level of Service F in the peak pm hours in both 2022 and 2026 total forecasted (pages 40 & 41). The intersection in the am peak is reduced from a Level of Service C to a Level of Service D.
- In reviewing the traffic study, it appears that the study indicates that the changes in Level of Service are more due to regional growth than the development.
- There are a few intersections that the Level of Service is reduced put this is due to regional traffic on State Street and not necessarily from the development.

In explaining the Level of Service F for these two intersections, the traffic engineer has provided the following explanation:

"The LOS "F" shown in PM conditions represents fewer than 15 vehicles making side street lefts during the peak hour. The analysis software used (Synchro) tends to overestimate side street delays and does not take into account the platooning effect that will be created by up and down stream signals. A platoon is the bunching of vehicles that occurs at a signal which provides gaps between other platoons and signals. These gaps created by the signals give vehicles plenty of opportunities to make the left. A useful metric for understanding these types of delays is the volume to capacity ratio abbreviated "v/c". A review of the analysis shows that the v/c ratio is 0.242 for the movement with the highest delay of these two intersections. This suggests that the movement is only using 24.2% of the capacity available. Said conversely, the movement has approximately 75% of its capacity still available for additional traffic. Additionally, a review of the queues for these movements shows queues of fewer than one vehicle. A table has been provided, attached, to summarize the two intersections in question, the forecasted LOS, v/c ratios, and queues. With this information in mind no improvements would be recommended for either location."

The traffic engineer provided in the report the trip distribution numbers during peak times.

- To/from the north on Highway 89: 60%
- To/from the east on 600 N: 5%
- To/from the east on 500 N: 5%
- To/from the south on Highway 89: 30%

One concern that City staff brought up with the traffic engineer was that the eastbound traffic distribution from the site on 500 N. seemed low at 5%. The report finds that this is less than five vehicles trips during the am/pm peak hours. The response from the traffic engineer is that "trip generation for the proposed site is generally low. A review of routing to the elementary school suggests that Route 89 provides similar times for travel."

Conclusions and Recommendations from the traffic engineer

- Under existing traffic conditions, the signalized intersections (600 N.) within the study area currently operate at overall acceptable levels of service (LOS) "D" or better during the weekday AM and PM peak hours.

- Under background future 2022 and 2026 traffic conditions, without the development of the subject site, delays would increase slightly at study intersections due to regional traffic growth. Intersections will continue to operate consistent with existing conditions.
- The proposed site development would generate, upon completion and full occupancy 53 net new weekday AM and 64 net new weekday PM peak hour vehicle trips as well as 951 net new weekday daily trips.
- Under total future traffic conditions with development of the site, all study intersections, including proposed site accesses would operate at overall acceptable levels of service consistent with background with improvement conditions. Unsignalized side street approaches will operate with additional capacity available and all queues will be contained within the effective storage. Thus, no additional roadway improvements as part of the site development are required.
- The proposed development will preclude a future connection of 570 N to connect with Hwy 89. This connection is not necessary for the already established grid of streets. Precluding this connection will maintain that the proposed commercial development be oriented to Hwy 89.
- It is recommended that the proposed development provide access consistent with the attached plan.
- It is recommended that the applicant preclude the connection of 570 N. shown on the City of Lindon's Street Master Plan consistent with the attached plan.

Lindon City performed two traffic counts on 500 N. The first count was conducted between 6/17/202 to 6/25/2020 which showed 228 average daily trips over a twenty-four-hour period. The second count was conducted between 9/16/2020 to 9/23/2020 which identified 258 average daily trips over a twenty-four-hour period.

Proposal to Terminate 570 N. into a cul-de-sac Evaluation

The traffic study, on page 44, addresses the applicants reasoning for the General Plan Street Masterplan amendment. Main points from the study highlight the following:

- In the existing condition, 600 N. and 500 N. provide an east-west connection from Locust Avenue to Hwy 89. Additional connections are available at 1000 S./700 N. to the north and 400 N. to the south which, similarly to 600 N. provides signalized access to these east-west connections. These connections are spaced approximately a quarter mile apart from each other.
- Due to the existing grid connections being spaced every quarter mile an additional grid connection would serve very few users. Opportunities to make the east-west connection between Hwy 89 and Locust Avenue are frequent (every quarter mile) and often provide signalized access.
- The planned grid connection would not primarily serve as an east-west grid connection but instead would provide additional opportunity for residents to the east of the proposed site to access the rear of the site. The proposed configuration would help maintain that the commercial traffic be oriented to Hwy 89 which is appropriate.
- Concerns were raised that without this connection a higher concentration of proposed site traffic would be seen on 500 N east of the site. It is anticipated that the majority of commercial traffic will use the newly constructed site entrance along Hwy 89. As shown on Figure 5-2, the proposed development will add fewer than five (5) trips to 500 N during either peak hour.
- The proposed development, and subsequent preclusion of a 570 N connection from Locust Avenue to Hwy 89, will have no negative impact on the surrounding network. Sufficient grid connections exist to provide circulation and access to the commercial and surrounding residential developments.

Staff Analysis

While the planning commission is not providing site plan approval, city staff has identified items that the planning commission should consider as it prepares a recommendation of the zone change to the City Council. City staff has outlined these items in the following analysis.

The project density is 10.14 units per acre. At the last minute, city staff found a discrepancy between the subdivision plat acreage and the site plan. The developer will need to reduce the density to be at 10 units per acre or less.

Townhome units 1-3 are proposed to have public utilities in the driveway. Under the PRD ordinance if there are public utilities in a roadway then the access needs to be a public street and meet the 29' width requirement.

The open space should be recalculated to ensure the 20% open space requirement is being met or show how the identified areas provides a common amenity.

The encroachment into the 300' commercial setback and the side yard setback of unit #1 into the commercial area. In the case of the commercial encroachment at the Linden Nursery development, the encroachment provided more than the 300' commercial setback behind the existing building due to site constraints and needs of the existing business. For this development proposal, the additional property depth for the commercial development on lot 4 does not give much benefit to that future commercial development.

For the Commercial General-A zone change, the City has a well-established dealership that is in the top category of sales tax generating businesses in City. The planning commission should evaluate the long-term success of the business while also considering goals of the General Plan. The dealership expansion does take up just over half of the commercial frontage.

For the traffic study, city staff believe that further clarification should be provided on recommendations for the intersections that have a Level of Service F, particularly those entering onto Highway 89 heading southbound. In addition, the traffic engineer should provide further information on the percentages of traffic distribution particularly as it pertains to eastbound on 500 N. from the proposed development.

One of the main considerations for adding or removing streets from a master plan is neighborhood connectivity, traffic circulations and traffic congestion.

In connecting streets to arterials like State Street, many cities recommend arterial connections at quarter mile intervals. 600 N. and 500 N. are good example of this. Those streets have a separation of approximately .28 of a mile. Because of this, UDOT probably would not grant a stop light at the intersections at 550 N. State.

In 2017, the regional transportation agencies put together the Utah Street Connectivity Guide. See website link below. This guide encourages cities to connect locations to key destinations (schools, parks, commercial center, etc.) within the community. Items cities should look at is how to reduce automobile vehicle miles traveled, how connectivity can reduce traffic volumes on arterial streets, and increase other mobility uses for pedestrians and bikers. In addition, to consider shorter block lengths that will increase more active transportation choices. The planning commission should consider if the development meets these recommendations and if the cul-de-sac at 570 furthers these ideas.

https://mountainland.org/img/transportation/Studies/Utah%20Street%20Connectivity%20Guide.pdf

Public Notices

Public Hearing Notices required per Lindon City Code section 17.14, were mailed to properties within 800 feet and to each affected entity. Notices were also published in the Daily Herald, and published on the State Public Notice website and City website.

Exhibits

1. Aerial photo
2. Proposed zone map amendment changes
3. Surrounding Area General Plan Land Use Map
4. Surrounding Area Zoning Map
5. General Plan Street Master Plan Map
6. Site plan
7. Commercial and residential renderings
8. Traffic study
9. Future intersection level of service and queue summary
10. Planned Residential Development Overlay Zoning Ordinance

Exhibit 1 – Aerial Photo

Exhibit 2


Proposed
CG-A Zone
Proposed Planned
Residential Development
Overlay Zone

Exhibit 3 – General Plan - Vicinity Map

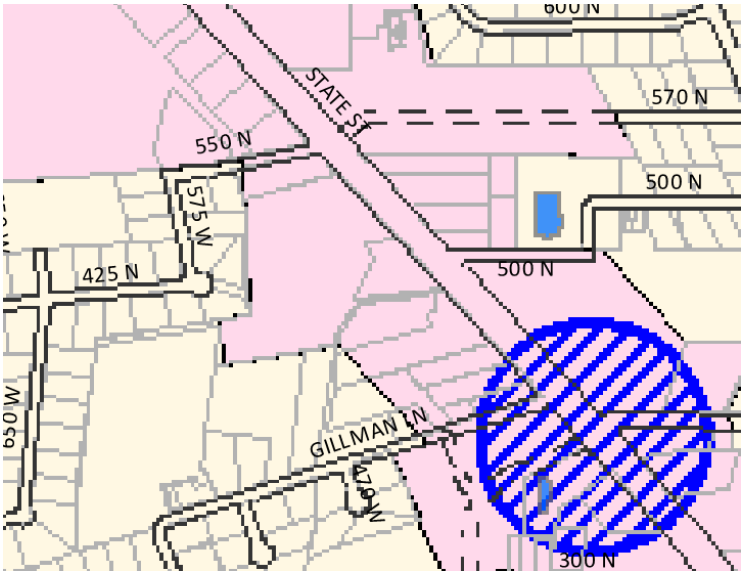


Exhibit 4 – Zoning Map – Vicinity Map

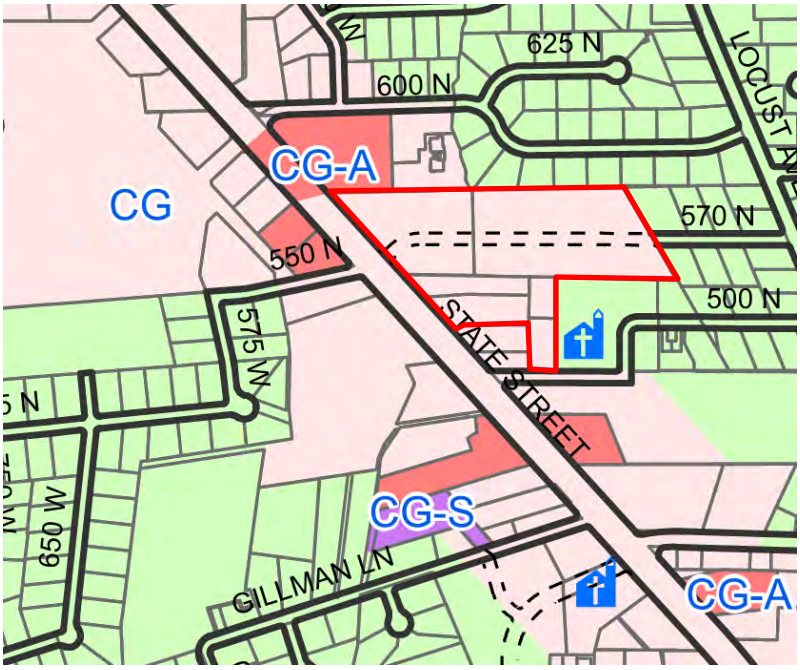
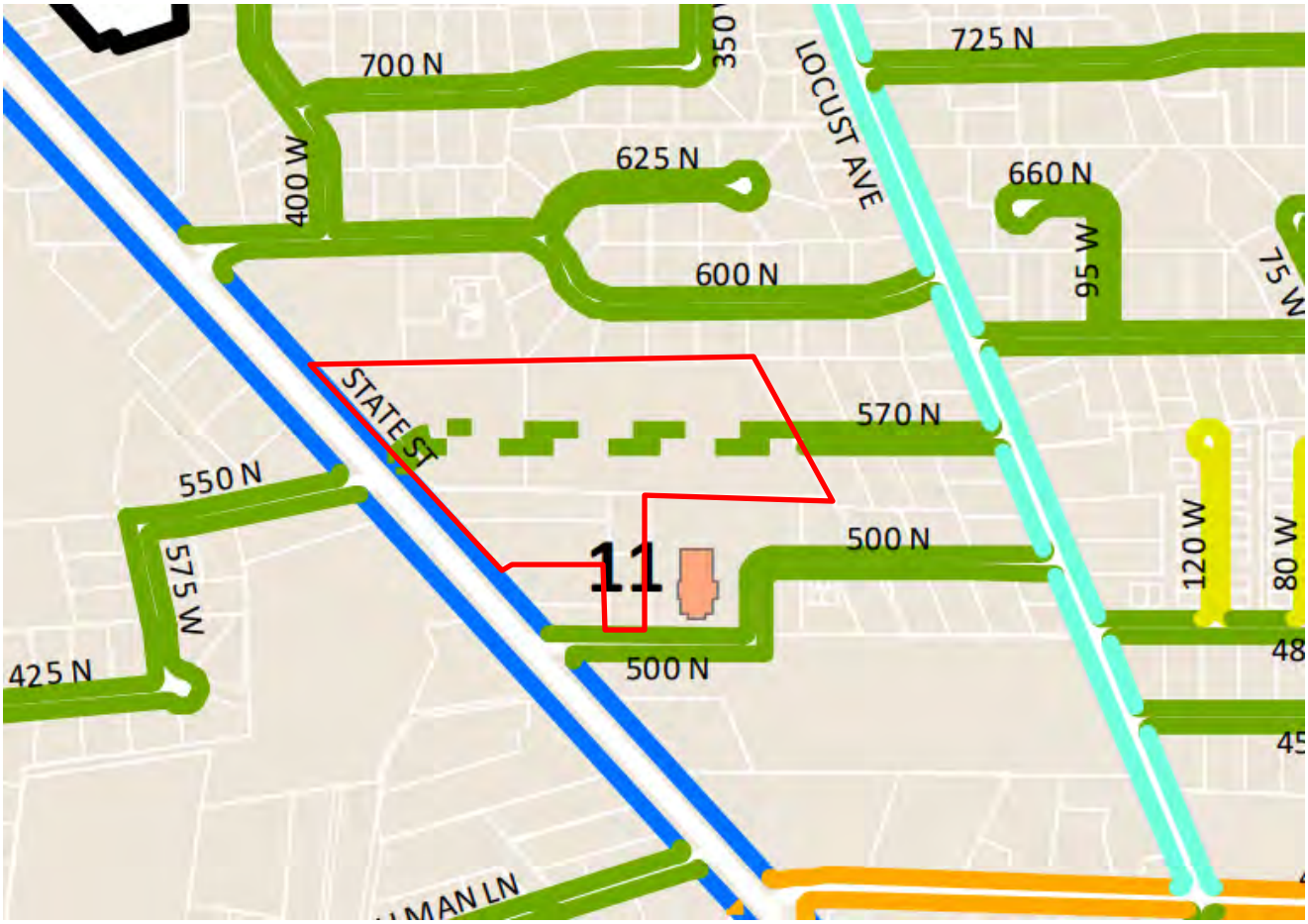
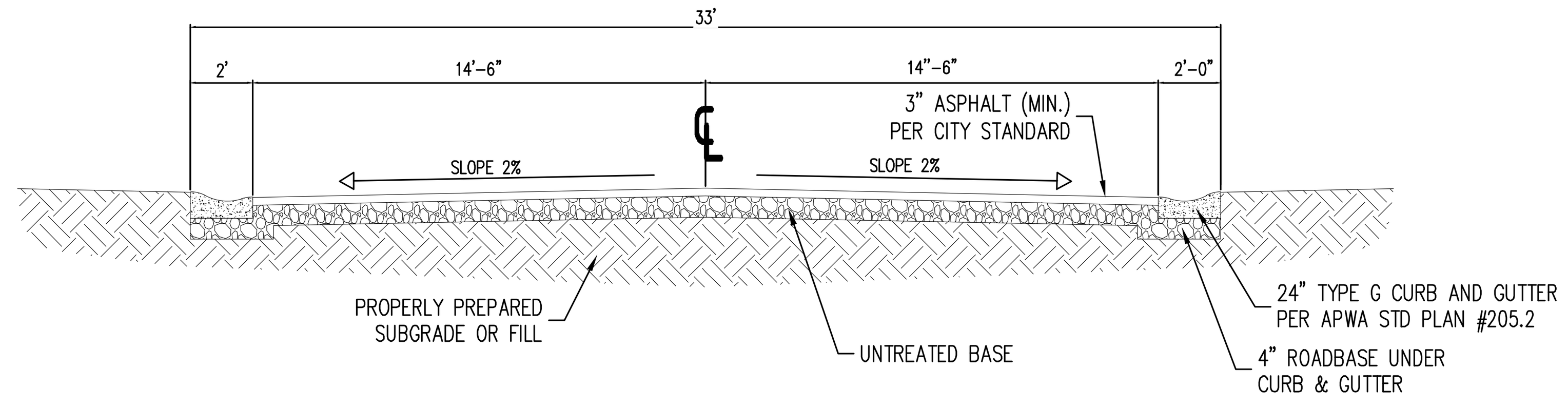


Exhibit 5

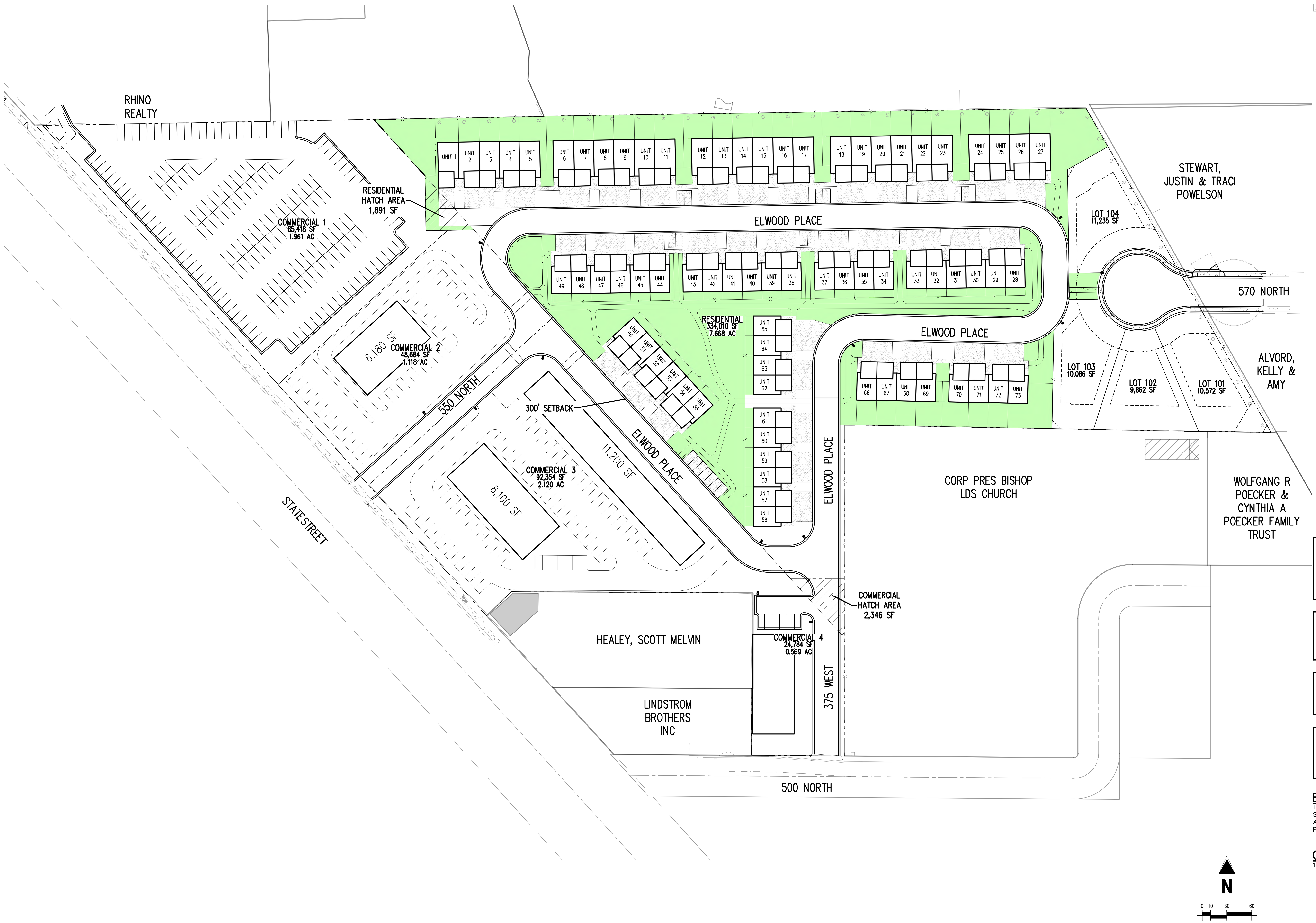


- Freeway
- Street RW Arterials
- Street RW Future Arterials
- Street RW Major Collectors
- Street RW Future Major Collectors
- Street RW Minor Collectors
- Street RW Future Minor Collectors
- Street RW Local
- Street RW Future Local
- Street RW Private
- Street RW Public Other
- Landmarks

Exhibit 6



33' ROAD CROSS SECTION



SITE LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY BOUNDARY LINE
- RIGHT OF WAY BOUNDARY LINE
- EXISTING TO REMAIN
- PROPOSED NEW
- EXISTING FENCE
- PROPOSED TREE
- PROPOSED SITE LIGHTING
- PROPOSED CURB AND GUTTER
- EXISTING CURB AND GUTTER
- PROPOSED SIDEWALK
- EXISTING SIDEWALK

COMMERCIAL
TOTAL ACREAGE: 5.83

RESIDENTIAL SITE SUMMARY		
DESCRIPTION	AREA (SF)	PERCENTAGE
PAVEMENT	171,621	51.4%
BUILDINGS	54,911	16.4%
LANDSCAPING	107,478	32.2%
OPEN SPACE	95,970	28.7%
TOTAL SITE	334,010 SF 7.67 ACRE	

TOTAL UNITS: 77
TOWNHOMES: 73 UNITS
CUL-DE-SAC: 4 UNITS

PARKING
EACH UNIT PROVIDES 2 CAR GARAGE
GUEST REQ'D: 0.5 STALL/UNIT = 37
18 IN UNIT DRIVEWAYS
19 OFFSTREET PARKING

CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL INFORMATION FOR FINAL ACCEPTANCE OF WORK FOR ANY LOCAL, STATE OR FEDERAL AGENCY, UTILITY DISTRICT OR ANY OTHER AGENCY OR DISTRICT HAVING APPROVAL AUTHORITY OVER WORK. THIS INFORMATION MAY INCLUDE, BUT IS NOT LIMITED TO, AS-BUILT PLANS, CERTIFICATIONS, INSPECTIONS AND REPORTS.

CONTRACTOR RESPONSIBLE FOR AS-BUILT DRAWINGS, TESTS, REPORTS AND/OR ANY OTHER CERTIFICATES OR INFORMATION AS REQUIRED FOR ACCEPTANCE OF WORK FROM CITY, UTILITY DISTRICTS OR ANY OTHER GOVERNING AGENCY.

NOTE: CONTRACTOR SHALL PROTECT ALL EXISTING SURVEY MONUMENTATION. CONTRACTOR SHALL HAVE LICENSED SURVEYOR REPLACE ANY DAMAGED OR DISTURBED MONUMENTATION AT THEIR COST.

NOTE: CONTRACTOR MUST COORDINATE WORK WITH UTILITY COMPANY AND CITY PRIOR TO BEGINNING WORK AND IS RESPONSIBLE FOR ALL MATERIALS, LABOR, REPAIRS, ETC. TO COMPLETE WORK AND RESTORE AREA TO SAME STATE PRIOR TO STARTING WORK

BENCHMARK

THE PROJECT BENCHMARK IS A WITNESS CORNER TO THE SW COR. SEC. 28, T5S, R2E, SLB&M. 3" UTAH COUNTY BRASS CAP FLUSH ON ASPHALT SET IN CONCRETE DATED 1979 (FOUND)
PROJECT BENCHMARK ELEVATION = 4347.19'

CAUTION – NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

Know what's below. Call before you dig.

Galloway
2015 W. Grove Pkwy, Suite H
Pleasant Grove, UT 84062
303.770.8884
GallowayUS.com

LICENSED PROFESSIONAL ENGINEER 7699058 BOYD PREECE STATE OF UTAH

LINDON HEIGHTS VILLAGE
CONSTRUCTION DOCUMENTS
550 NORTH STATE STREET
LINDON, UT

#	Date	Issue / Description	Init.

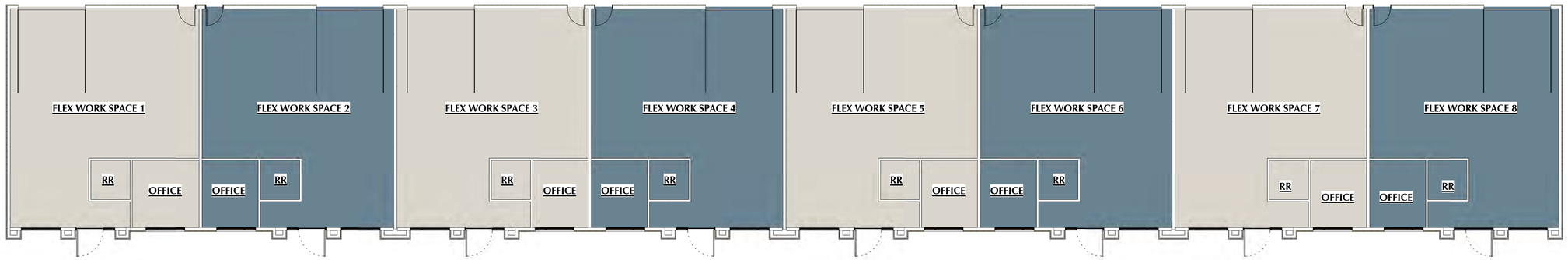
Project No:	ELH1.21
Drawn By:	RCL
Checked By:	BAP
Date:	02/05/2021

OVERALL SITE PLAN

C1.0

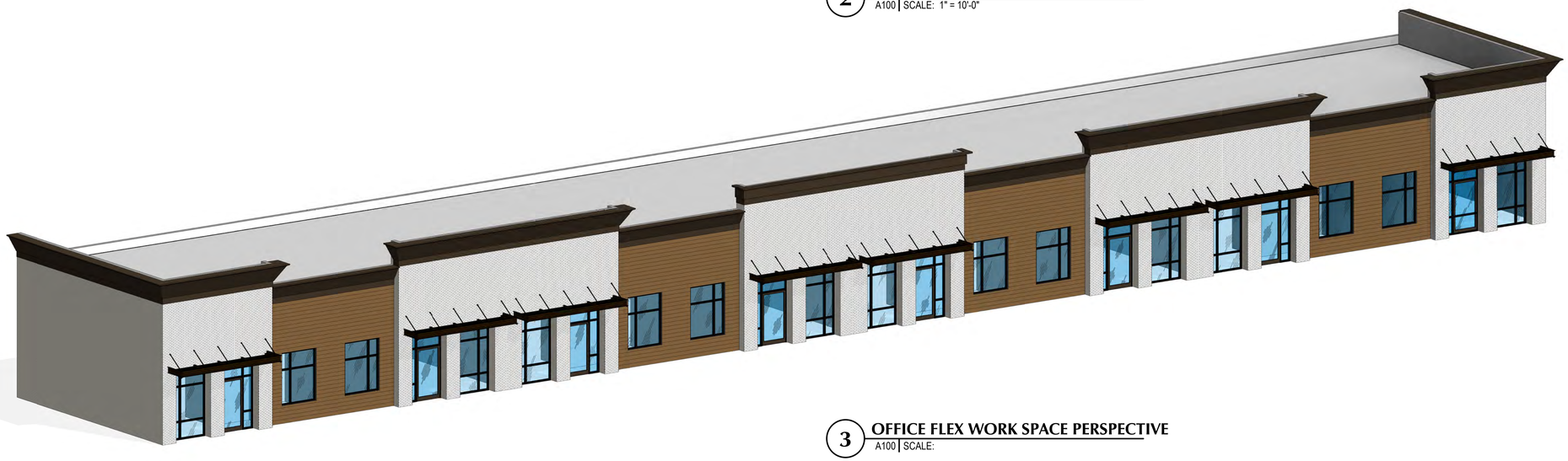
Exhibit 7

DATE	ISSUE/REVISION



1 **OFFICE FLEX WORKSPACE - FLOOR PLAN**
A100 | SCALE: 1" = 10'-0"

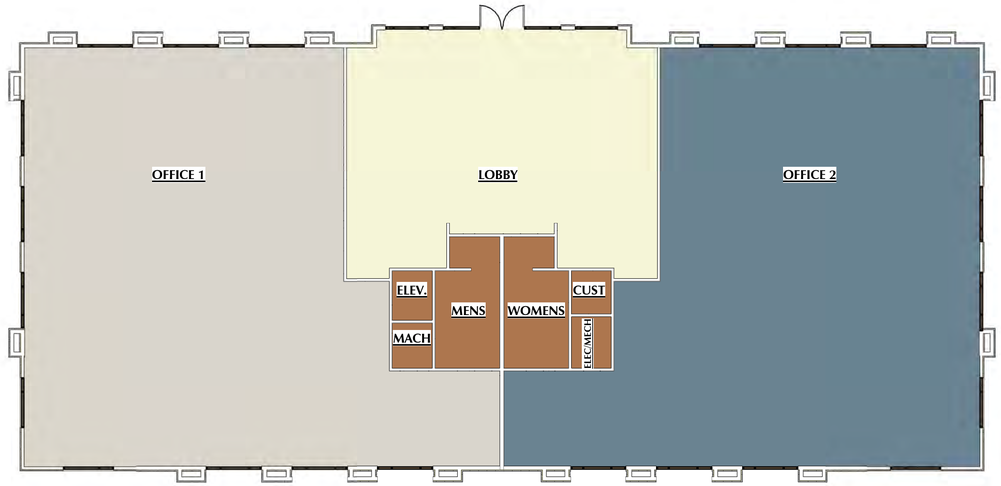
2 **OFFICE FLEX WORKSPACE- FRONT ELEVATION**
A100 | SCALE: 1" = 10'-0"



3 **OFFICE FLEX WORK SPACE PERSPECTIVE**
A100 | SCALE:

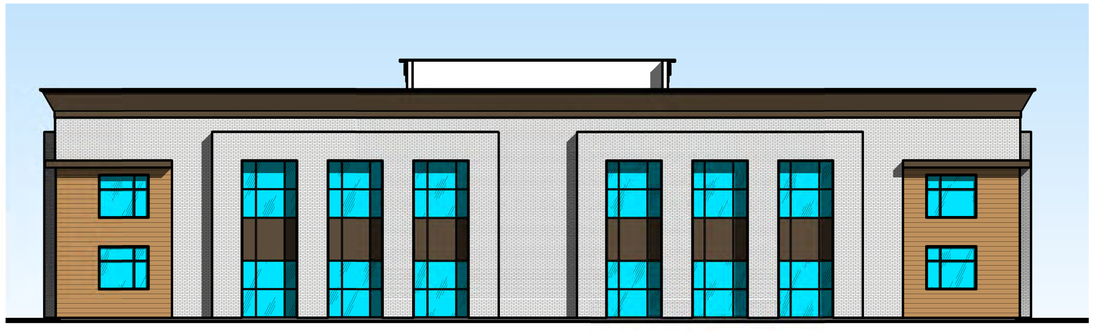
	PROJECT NO. CL 21-003
	DATE FEBRUARY 18,2021
	PROJ. MAN. CLL
	CHECKED BY CLL
LINDON HEIGHTS PLAZA LINDON HEIGHTS PLAZA 550 NORTH STATE STREET LINDON, UTAH	SCHEMATIC DESIGN
OFFICE FLEX WORK SPACE- SCHEMATIC SHEET DESCRIPTION	A100 SHEET NUMBER

DATE	ISSUE/REVISION



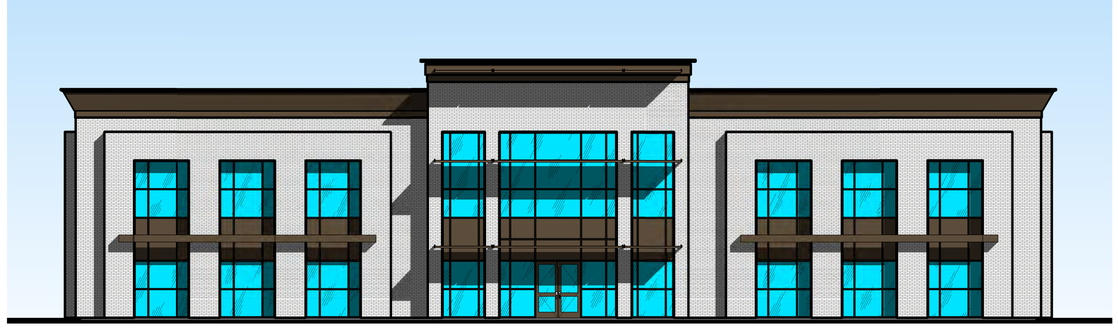
4 MEDICAL OFFICE PERSPECTIVE

A101 | SCALE:



1 MEDICAL OFFICE FLOOR PLAN

A101 | SCALE: 1" = 10'-0"



3 MEDICAL OFFICE REAR ELEVATION

A101 | SCALE: 1" = 10'-0"

2 MEDICAL OFFICE FRONT ELEVATION

A101 | SCALE: 1" = 10'-0"

	PROJECT NO. CL 21-003
	DATE FEBRUARY 18,2021
	PROJ. MAN. CLL
	CHECKED BY CLL
LINDON HEIGHTS PLAZA	SCHEMATIC DESIGN
LINDON HEIGHTS PLAZA 550 NORTH STATE STREET LINDON, UTAH	
MEDICAL OFFICE SCHEMATIC DESIGN SHEET DESCRIPTION	A101 SHEET NUMBER

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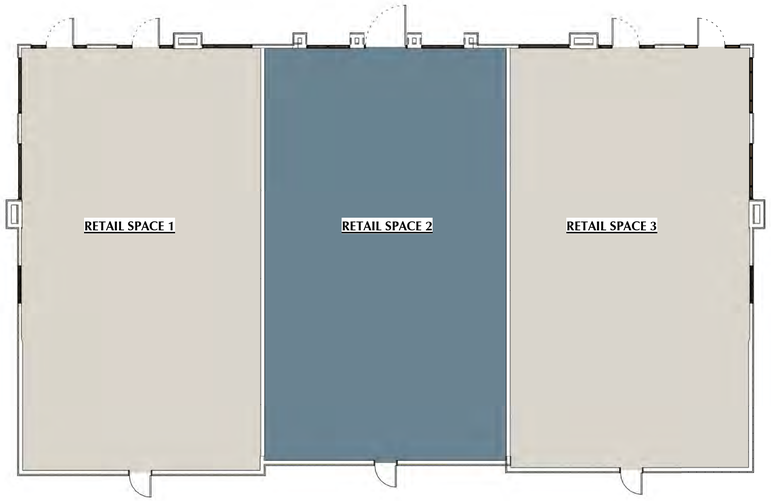
DATE	ISSUE/REVISION



1 RETAIL - FLOOR PLAN
A102 | SCALE: 1" = 10'-0"

3 RETAIL PERSPECTIVE
A102 | SCALE:

2 RETAIL FRONT ELEVATION
A102 | SCALE: 1" = 10'-0"

	PROJECT NO. CL 21-003
	DATE FEBRUARY 18,2021
	PROJ. MAN. CLL
	CHECKED BY CLL
LINDON HEIGHTS PLAZA LINDON HEIGHTS PLAZA 550 NORTH STATE STREET LINDON, UTAH	SCHEMATIC DESIGN
RETAIL SCHEMATIC DESIGN SHEET DESCRIPTION	A102 SHEET NUMBER

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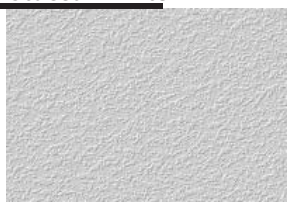
BRIGHTON HOMES

Color Scheme Option 3

Stucco - White



Hardie Board Lap - Boothbay Blue

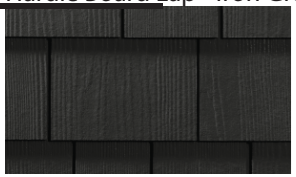
Trim - Arctic White

Brick - Interstate, Dartmouth

Color Scheme Option 4

Stucco - Light Mist

Hardie Board Lap - Iron Grey



Trim - Arctic White

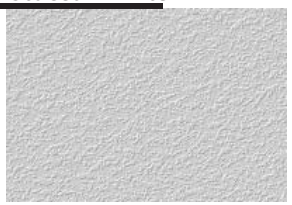
Brick - Interstate, Dartmouth

*Elevations for Illustrative Purposes Only

BRIGHTON HOMES

Color Scheme Option 1

Stucco - White



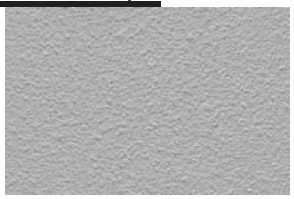
Hardie Board Lap - Light Mist

Trim - Arctic White

Brick - Interstate, Dartmouth

Color Scheme Option 2

Stucco - Light Mist



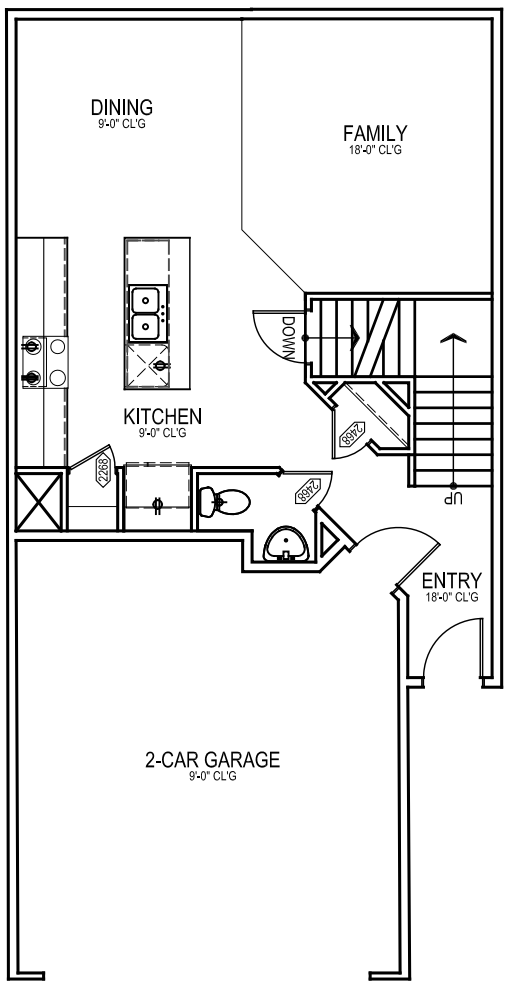
Hardie Board Lap - Night Grey

Trim - Arctic White

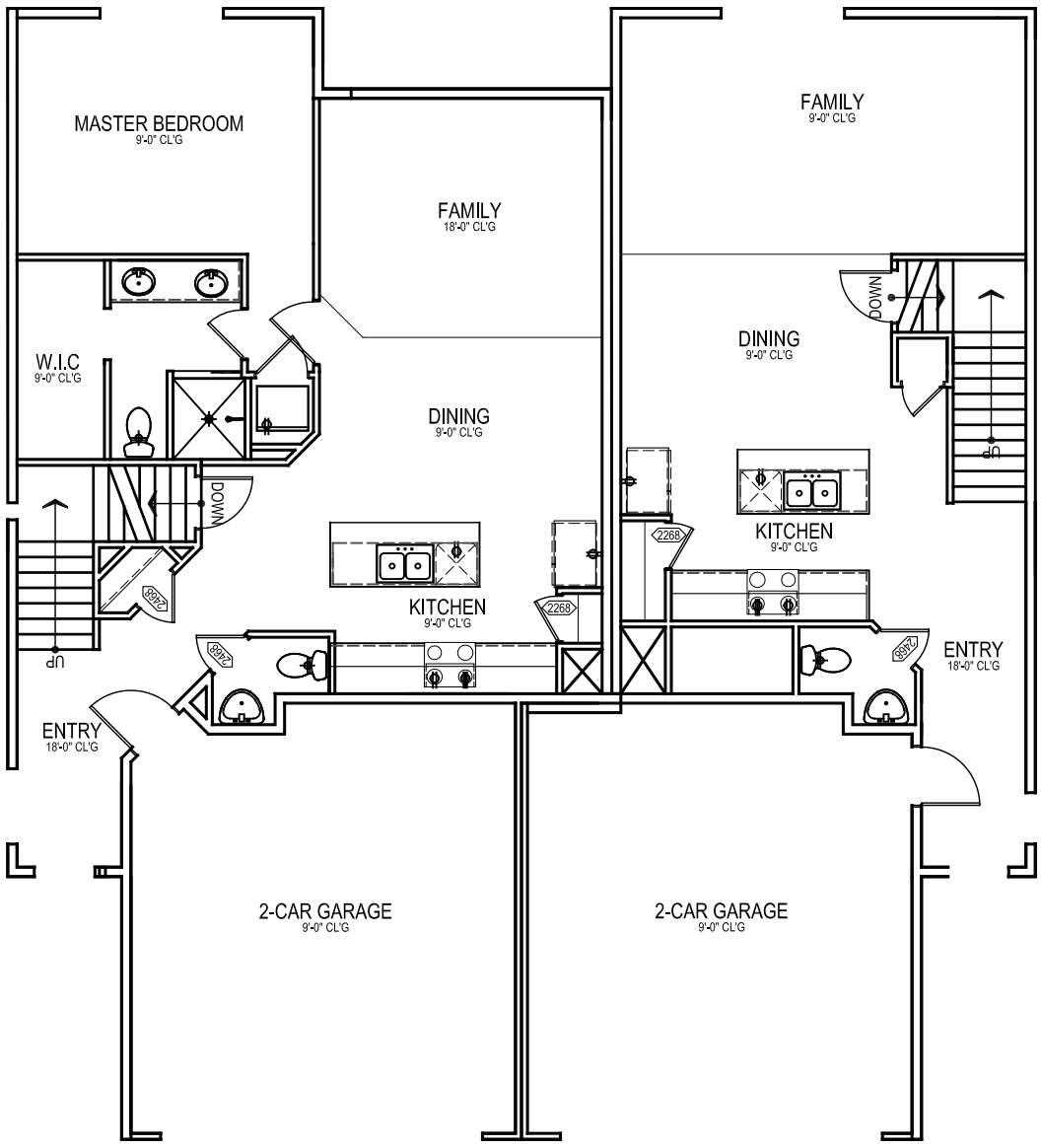
Brick - Interstate, Dartmouth

*Elevations for Illustrative Purposes Only

PRODUCT 1 FLOOR PLAN
LEVEL 1

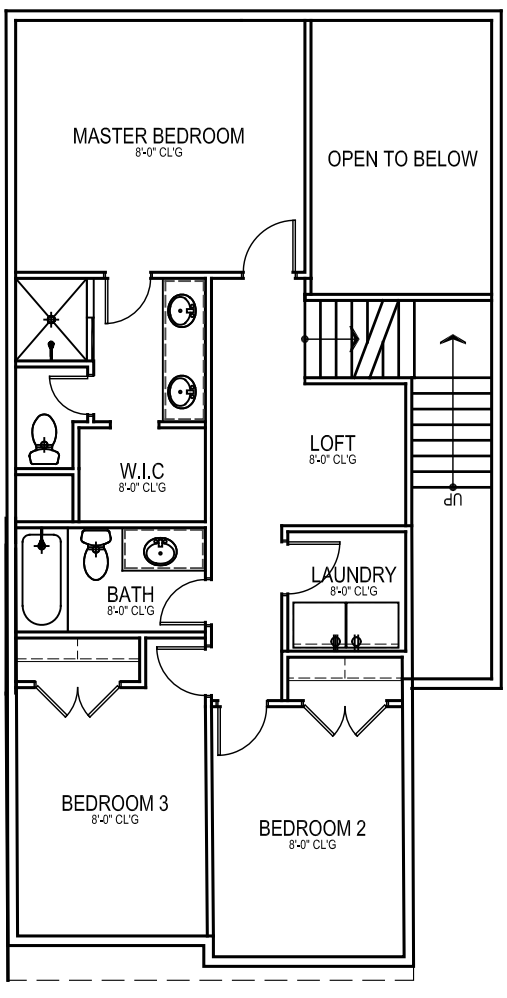


PRODUCT 2 FLOOR PLAN
LEVEL 1

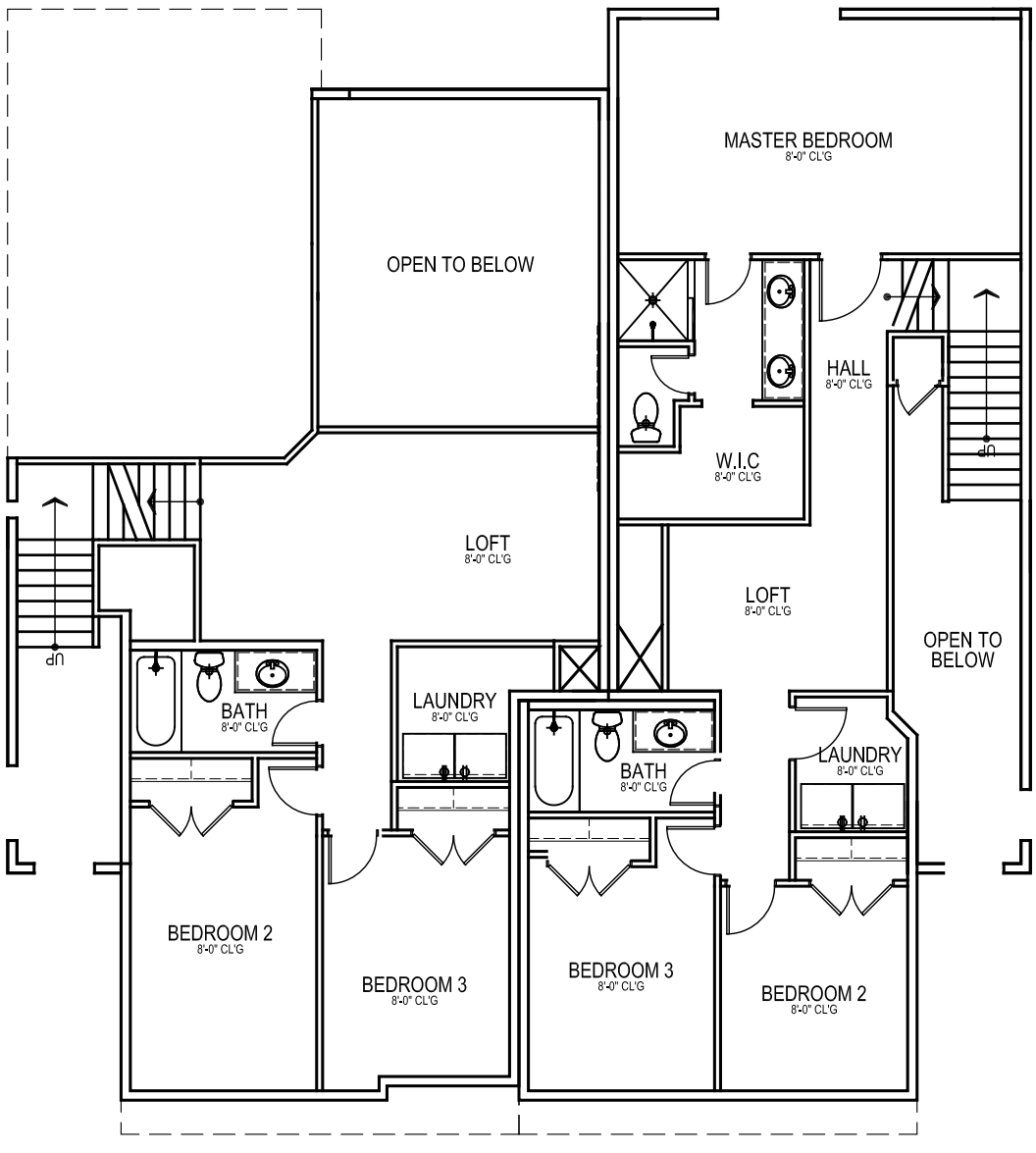


PRODUCT 3 FLOOR PLAN
LEVEL 1

PRODUCT 1 FLOOR PLAN
LEVEL 2



PRODUCT 2 FLOOR PLAN
LEVEL 2



PRODUCT 3 FLOOR PLAN
LEVEL 2

TRAFFIC IMPACT STUDY

LINDON TOWNHOMES

Lindon, Utah

PREPARED FOR:
Infinite Realty

PREPARED BY:
Brian Horan, PE
Daniela Gonzalez

Galloway & Company, Inc.
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111

DATE:
January 20th, 2021
Revised March 3, 2021

TABLE OF CONTENTS

Appendices:

A. Full Sized Site Plan
B. Scope of Work
C. LOS Descriptions
D. Traffic Counts
E. Existing Synchro Outputs
F. Background (without site development) Synchro Outputs
G. Pass-by and Internal Capture Information
H. Future (with site development) Synchro Outputs

Executive Summary

Site Location and Study Area

The property that comprises the application area for the proposed development is approximately 16.6 acres in size and is occupied by a number of single-family homes and an agricultural use. It is located East of US Hwy-89, south of 600 N, north of 500 N, and west of the 570 N Cul-de-sac in the City of Lindon, Utah. It is zoned General Commercial (GC).

The study area, as reviewed and agreed to by the City of Lindon ("Staff"), is generally bounded by 600 N to the north, US Hwy 89 to the west, 500 N to the south and the site boundary to the east. The study area for the project includes those intersections identified by Staff that could be affected by the proposed development:

- Hwy 89/ 600 N
- Hwy 89/ 550 N
- Hwy 89/ 500 N
- Proposed site access

Description of Proposed Development

The Applicant, Infinite Realty, seeks approval of a rezoning of the property to a Planned Residential Overlay from General Commercial (GC) to allow a mix of GC and Residential Zoning (10 units/acre density) in order to redevelop the site with a mix of commercial and residential uses. Site access is being proposed via a full movement access along Hwy 89 and a full movement access along 500 N. The proposed single-family homes would access solely to 570 N via a newly constructed cul-de-sac.

Conclusions and Recommendations

Conclusions

Based on the results of this traffic impact study, the following may be concluded:

- Under existing traffic conditions, the signalized intersections within the study area currently operate at overall acceptable levels of service (LOS) "D" or better during the weekday AM and PM peak hours.

- Under background future 2022 and 2026 traffic conditions, without the development of the subject site, delays would increase slightly at study intersections due to regional traffic growth. Intersections will continue to operate consistent with existing conditions.

- The proposed site development would generate, upon completion and full occupancy 53 net new weekday AM and 64 net new weekday PM peak hour vehicle trips as well as 951 net new weekday daily trips.

- Under total future traffic conditions with development of the site, all study intersections, including proposed site accesses would operate at overall acceptable levels of service consistent with background with improvement conditions. Unsignalized side street approaches will operate with additional capacity available and all queues will be contained within the effective storage. Thus, no additional roadway improvements as part of the site development are required.

- The proposed development will preclude a future connection of 570 N to connect with Hwy 89. This connection is not necessary for the already established grid of streets. Precluding this connection will maintain that the proposed commercial development be oriented to Hwy 89.

Recommendations

- It is recommended that the proposed development provide access consistent with the attached plan.
- It is recommended that the Applicant preclude the connection of 570 N shown on the City of Lindon's Street Master Plan consistent with the attached plan.

I. Introduction

Overview

This report presents the results of a Traffic Impact Study (TIS) conducted in support of a rezoning to redevelop the subject parcel with a mix of commercial and residential uses in the City of Lindon, Utah. Currently, the site is vacant.

Per the requirements of the "Lindon City – Traffic Impact Study Requirements" (Requirements), a traffic study is required for a project with an ADT of 500 to 3,000 trips or peak hour < 500 trips. The following TIS satisfies the requirements as laid out in the Requirements.

Per the Requirements, "a pre-application meeting with the Lindon City Engineer is required to cover basic information as listed below:

- Scope (Submitted to Lindon City and Developer)
- Establish Study Area
- Establish Trip Generation
- Establish Trip Distribution
- Study Intersections
- AM/PM Peak Hours and/or Weekend Peak Hours"

This meeting was held on December 14, 2020 at 10:00 AM with Planning and Engineering Staff. A Scope of Work document prepared by Galloway was circulated before the meeting took place and used to speak from. All elements referenced above and on the form were discussed and an updated form was then circulated to Planning and Engineering Staff following the meeting.

The basis of this traffic impact assessment includes confirmation of the study area by City staff as outlined in the scope and information from the Applicant including preliminary site concepts.

Site Location and Study Area

The property that comprises the application area for the proposed development is approximately 16.6 acres in size and is occupied by a number of single-family homes and an agricultural use. It is located East of US Hwy-89, south of 600 N, north of 500 N, and west of the 570 N Cul-de-sac in the City of Lindon, Utah as shown on Figure 1-1. It is zoned General Commercial (GC). Site access is being proposed via a full movement access along Hwy 89 and a full movement access along 500 N.

The Applicant, Infinite Realty, seeks approval of a rezoning to a Planned Residential Overlay to allow for the construction of townhomes on the eastern portion of the property. A reduction of the Applicant's proposed conceptual site plan is provided on Figure 1-2. A full-size copy of the plan is provided in Appendix A.

The study area, as discussed with City staff, is generally bounded by 600 N to the north, US Hwy 89 to the west, 500 N to the south and the site boundary to the east. A copy of the updated scope of work document and correspondence is provided in Appendix B.

Tasks undertaken during this study included the following:

1. Reviewed the Applicant's proposed development plans and other background data.

2. Conducted a virtual field reconnaissance of existing roadway and intersection geometries, traffic controls, and speed limits.

3. Conducted peak hour turning movement counts at the key intersections.

4. Analyzed existing levels of service at each of the key study intersections based on the methodologies set forth in the Highway Capacity Guidelines 6th Edition as reported by Synchro version 11.

5. Forecasted regional growth estimates. These volumes were applied to the major study intersections and site entrances.

6. Forecasted background future traffic volumes based on baseline traffic counts, and regional traffic growth for 2022 and 2026 build-out conditions.

7. Calculated background levels of service at each of the key study intersections for the projected build-out years based on background future traffic forecasts, and the existing lane use and traffic controls.

8. Estimated the number of AM and PM peak hour trips that would be generated by the proposed commercial and residential use based on ITE 10th Generation Trip Generation Rates and methodologies.

9. Prepared AM and PM peak hour total future traffic forecasts based on background traffic forecasts plus site traffic assignments for the 2022 (buildout year) as well as 2026 (long range) conditions.

10. Calculated total future levels of service for each of the key study intersections based on projected total future traffic forecasts, existing/future traffic controls and intersection geometries.

11. Identified roadway improvements required to accommodate future traffic volumes as necessary.

Sources of data for this analysis included the Institute of Transportation Engineers (ITE), Trip Generation, 10th edition, the Highway Capacity Guidelines HCM 6th, Infinite Realty, City of Lindon, Utah, Utah Department of Transportation (UDOT) and the files/library of Galloway.

Site Description and Access

Site Conditions
The terrain proximate to and surrounding the site is generally classified as "level".

Hazardous Conditions
Based on the field reconnaissance in the vicinity of the subject site, no hazardous features or constraints were identified.

Proposed Site Access
Access to the site is being proposed via a full movement access along Hwy 89 and a full movement access along 500 N.

Existing Zoning
The subject site is currently zoned GC and is occupied with single-family and agricultural uses. Figure 1-3 depicts the existing zoning associated with the subject property, as well as neighboring properties as shown on the City of Lindon zoning map.

Nearby Uses
The properties along Hwy 89 are generally zoned with GC zonings and developed with commercial uses. Properties are zoned with residential districts to the east and west of Hwy 89 beyond the commercial uses that are oriented to the highway.

General Plan Land Use Recommendations for the Property
According to the City's General Plan, the subject property is planned for commercial development. The commercial mix of uses proximate to the existing residential conforms with this land use designation.

Lindon City Street Master Plan
The Lindon City Street Master Plan designates a connection of the existing 570 N to be construction as extending from its existing western terminus through the subject property to Hwy 89. The proposed project would preclude this connection from being made. The Lindon City Street Master Plan is provided as Figure 1-4.

FIGURE 1–1
Site Location

Lindon Townhomes
Lindon, UT

MOVEMENT
SIGNALIZED INTERSECTION
STOP SIGN
YIELD SIGN

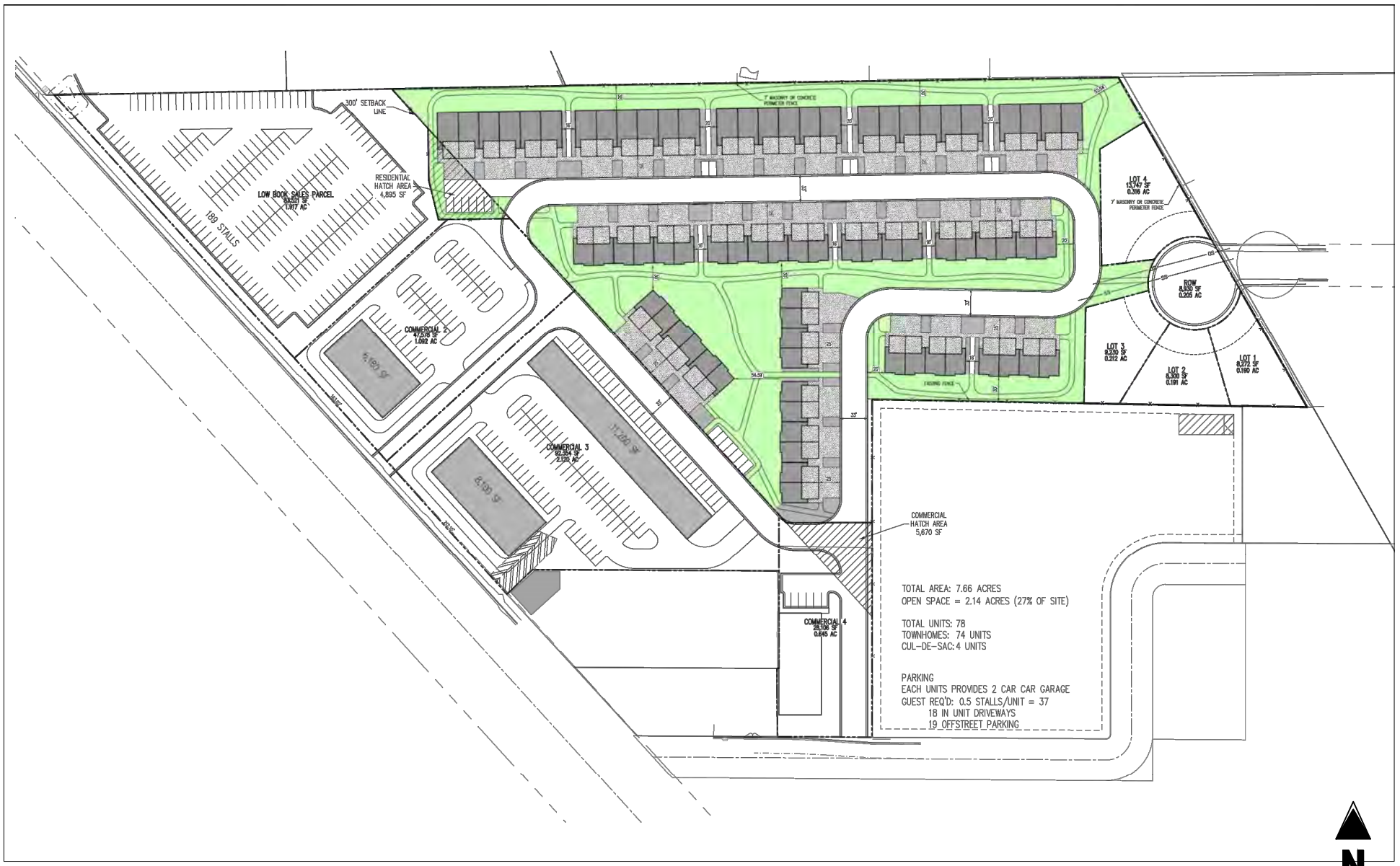


FIGURE 1–2
Site Plan

Lindon Townhomes
Lindon, UT

MOVEMENT
SIGNALIZED INTERSECTION
STOP SIGN
YIELD SIGN

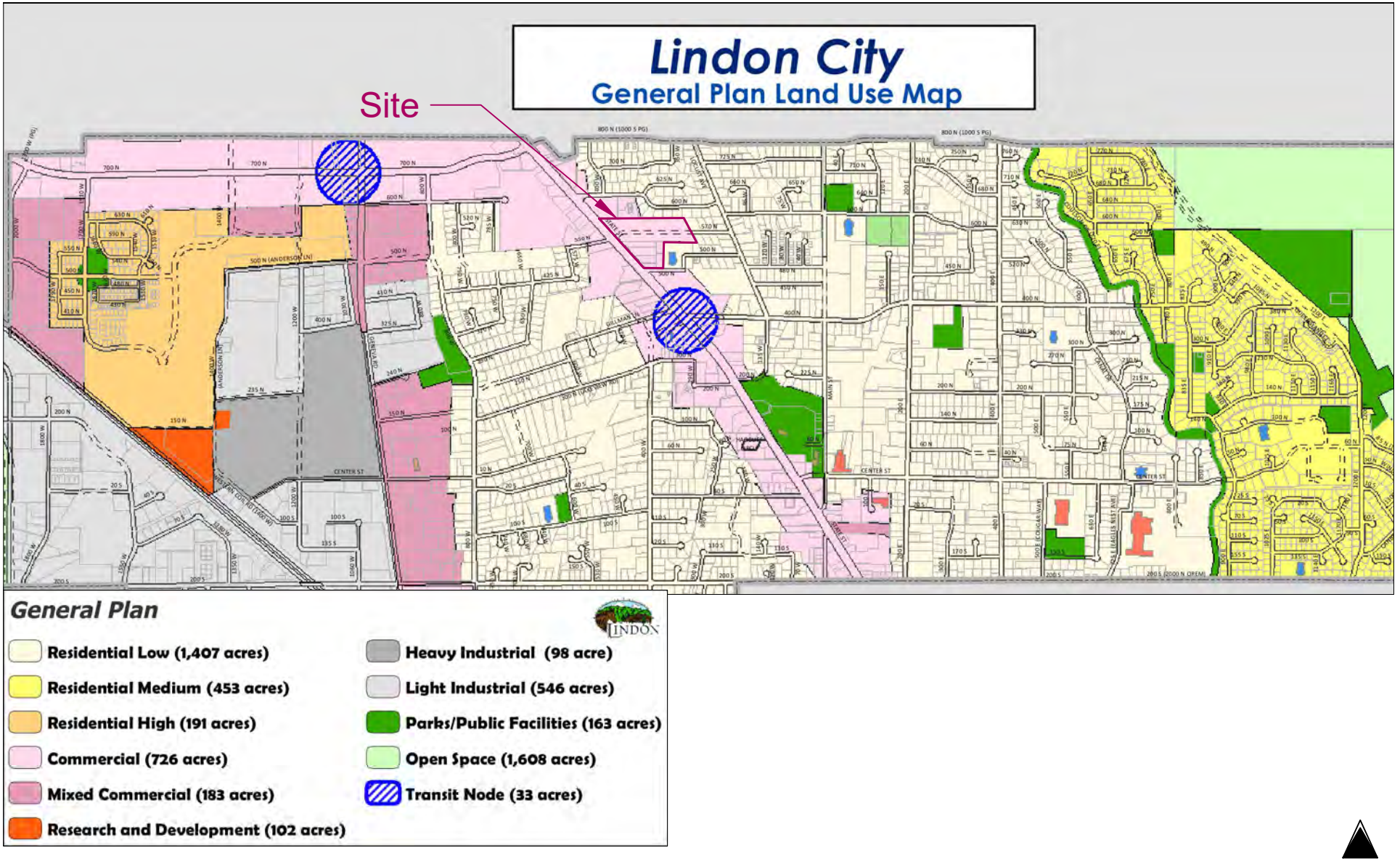


FIGURE 1–3
Existing Zoning

Lindon Townhomes
Lindon, UT

MOVEMENT
SIGNALIZED INTERSECTION
STOP SIGN
YIELD SIGN

Lindon City Street Master Plan
March 2018

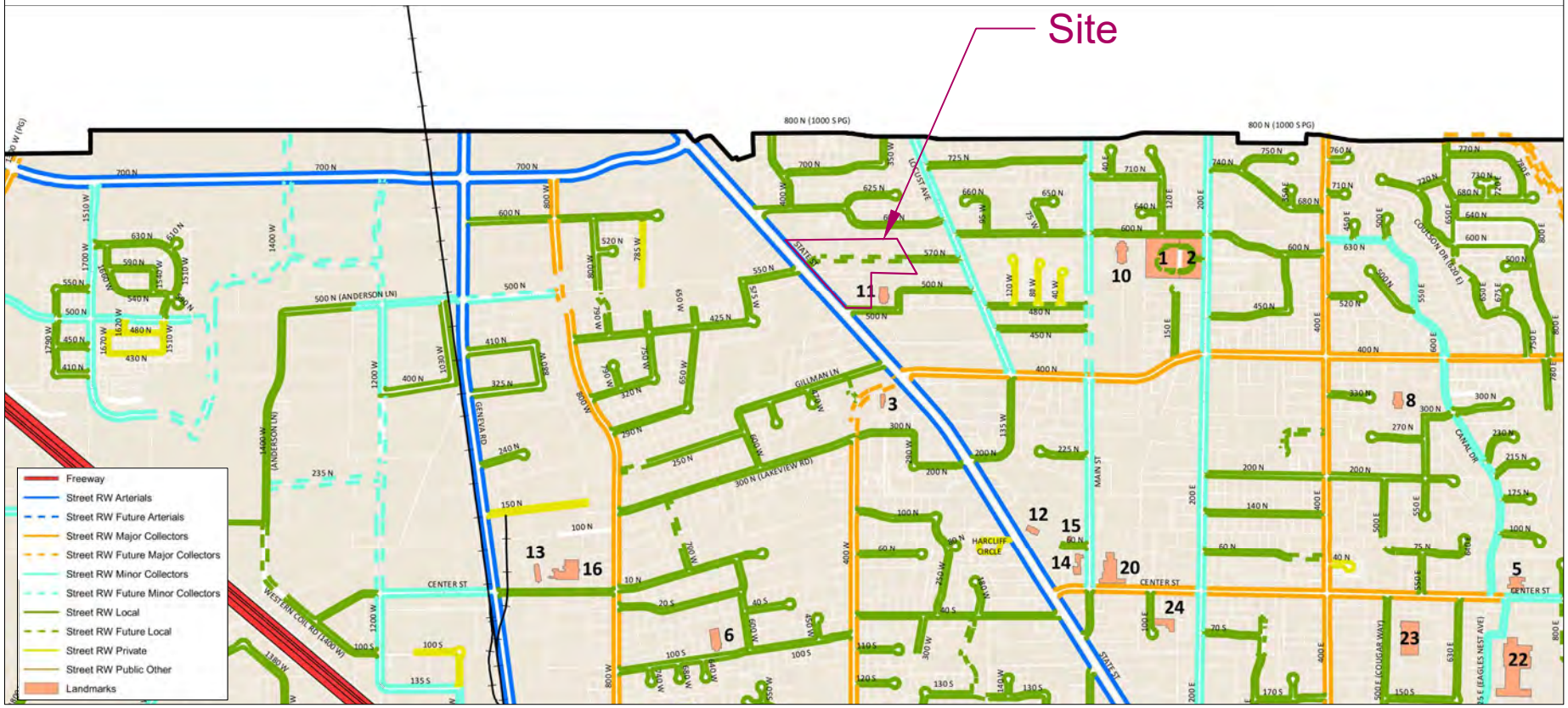


FIGURE 1–4
Street Master Plan

Lindon Townhomes
Lindon, UT

MOVEMENT
SIGNALIZED INTERSECTION
STOP SIGN
YIELD SIGN

II. Background Information

Study Area

During the scoping meeting the study area and study intersections were agreed upon. The scoping form is provided as Appendix B. As discussed, and agreed upon, the traffic study focuses primarily on the following intersections:

Existing Intersections

- Hwy 89/ 600 N
- Hwy 89/ 550 N
- Hwy 89/ 500 N

Proposed Site Intersections

- Hwy 89/ Site Entrance
- Site Entrance/ 500 N

Study Assumptions

For purposes of this analysis only, the proposed uses are assumed to be built and occupied in one phase in 2022. As requested by Staff and per the Requirements, a long-term analysis of 2026 was also provided.

Study Methodology

Synchro software version 11 was used to evaluate levels of service at each of the study intersections during the weekday AM and PM peak hours. Synchro is a macroscopic model used for optimizing traffic signal timing and performing capacity analyses. The software can model existing traffic signal timings or optimize splits, offsets, and cycle lengths for individual intersections, an arterial, or a complete network. Synchro allows the user to evaluate the effects of changing intersection geometrics, traffic demands, traffic control, and/or traffic signal settings as well as optimize traffic signal timings.

The levels of service reported for the signalized and unsignalized intersections analyzed herein were taken from the Highway Capacity Manual (HCM) 6th reports generated by Synchro 11. Level of service descriptions are included in Appendix C.

In order to maintain a conservative analysis a default percent heavy vehicle (%HV) factor of 2% was used for all movements in the study area.

Existing Roadway Network

Regional access to the subject site is provided by Hwy 89 which the site receives direct access to/from. Regional access to the area is provided via interstate 15. Local access is provided via the proximate grid of streets. Figure 2-1 depicts existing lane use and traffic controls in the vicinity of the subject site. The following provides a description of each of the roadways within the study network.

Hwy 89 (State Street)

Hwy 89 is an undivided six-lane roadway with turn lanes. The posted speed limit is 40 mph in the vicinity of the subject site. The roadway is classified as an Other Principal Arterial by the Utah Department of Transportation (UDOT). The intersection with 600 N operates under signal control.

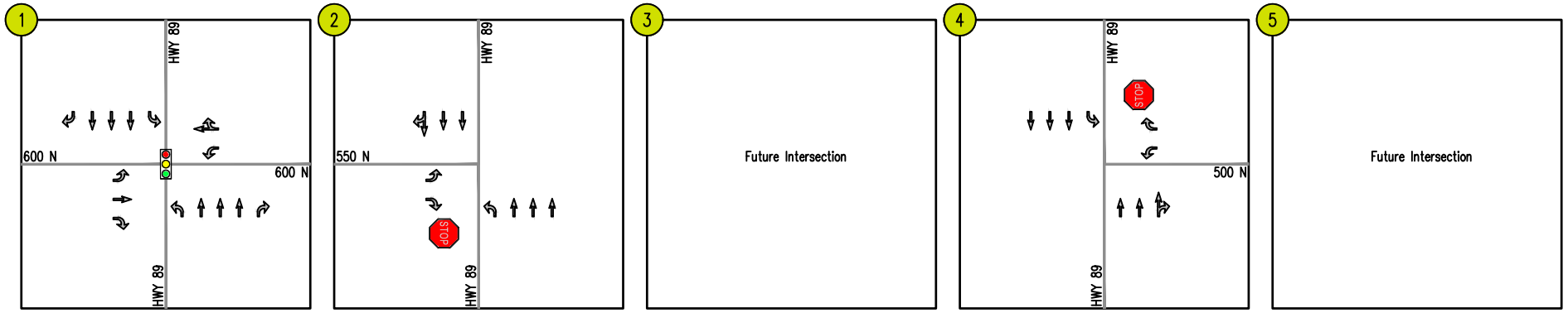
600 N
600 N is an undivided two-lane local roadway. The assumed speed limit is 25 mph in the vicinity of the subject site. The roadway provides access to commercial uses closest to Hwy 89 and residential uses to the east.

550 N
550 N is an undivided two-lane local roadway. The assumed speed limit is 25 mph in the vicinity of the subject site. The roadway provides access to commercial uses closest to Hwy 89 and residential uses to the west.

500 N
500 N is an undivided two-lane local roadway. The assumed speed limit is 25 mph in the vicinity of the subject site. The roadway provides access to commercial uses closest to Hwy 89 and residential uses to the east.

Assumed Improvements

No funded/programmed roadway improvements were identified in the study area. It was noted that the potential for a center running bus rapid transit (BRT) is being discussed for Hwy 89. This change to Hwy 89 would be beyond the study years assumed in this analysis. The implementation of a BRT for Hwy 89 would require a corridor analysis for Hwy 89.



0 100 200 500

SCALE: 1"=500'

N

FIGURE 2–1
Existing Lane Use and Traffic Control

Lindon Townhomes
Lindon, UT

MOVEMENT
SIGNALIZED INTERSECTION
STOP SIGN
YIELD SIGN

III. Analysis of Existing Conditions

Traffic Volumes

Weekday AM and PM peak hour traffic volumes counts were conducted on Thursday January 7, 2021 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM at the study intersections by L2 Data Collection. Based on a review of the intersection volumes the individual and network peak hours were consistent and utilized for the analysis. The peak hours were 7:45 AM to 8:45 AM and 4:45 PM to 5:45 PM.

The existing volumes are summarized on Figure 3-1. Copies of traffic counts are included in Appendix D. Existing peak hour factors (PHF) were also computed by approach from the traffic counts and applied to the analysis with a minimum of 0.85 and a maximum of 0.92.

Operational Analysis

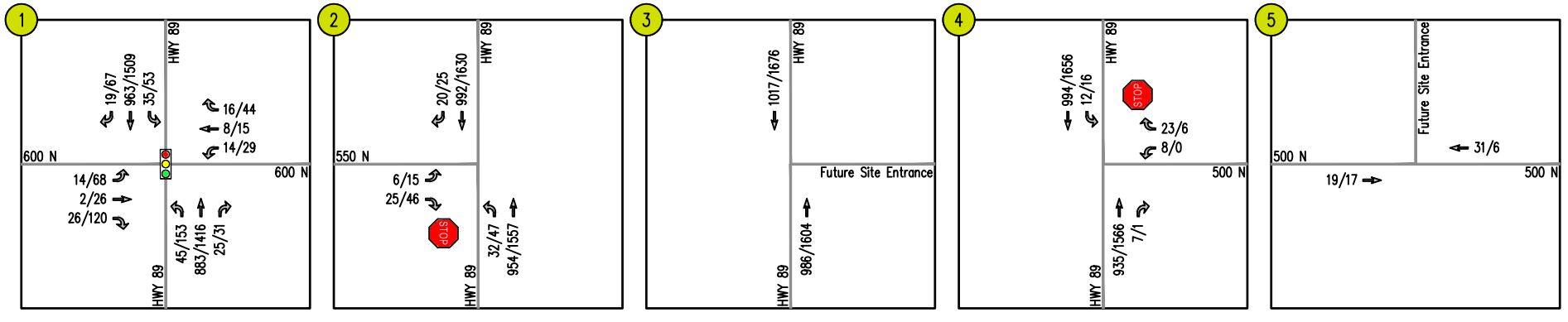
Capacity/level of service (LOS) analyses were conducted at the study intersections based on the existing lane use and traffic controls shown on Figure 2-1, existing baseline vehicular traffic volumes shown on Figure 3-1. The capacity analysis results are presented in Appendix E and summarized in Table 3-1 and on Figure 3-2.

As shown in Table 3-1, the study intersections currently operate at overall acceptable levels of service (LOS) “D” or better during the weekday peak hours. The one exception is the side street approach at the 550 N/Hwy 89 unsignalized intersection operates at LOS “F”. It should be noted that this approach experiences low volume and operates with a volume to capacity (v/c) ratio that suggests additional capacity is available at this approach. Additionally, the nearby signalized intersection creates platooning opportunities for vehicles to exit the approach that Synchro does not account for.

Existing Intersection Queues

An analysis of intersection 95th-percentile queues was performed at key locations. The results of the queuing analysis, as reported by Synchro, are summarized in Table 3-2.

As shown in the table, the existing queues are generally contained within the effective storage within the study area.



0 100 200 500

SCALE: 1"=500'

N

FIGURE 3–1
Existing Volumes

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

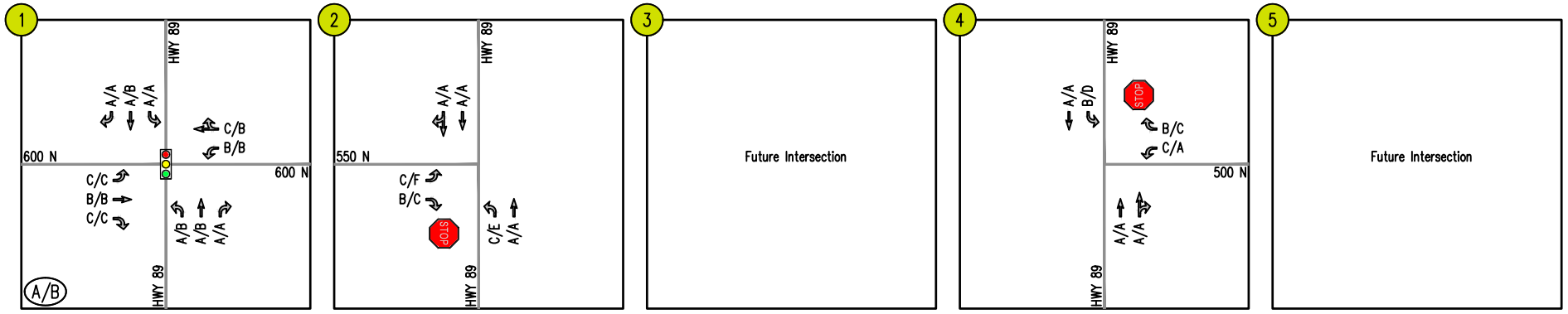
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 3–2
Existing LOS

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN

Table 3-1
Lindon Townhomes
Existing Intersection Level of Service Summary

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing 2021 AM Peak Hour	Existing 2021 PM Peak Hour
1 600 N/HW 89	Signal		EBL	C (20.4)	C (21.2)
		600 N	EBT	B (19.5)	B (18.5)
			EBR	C (20.9)	C (22.2)
		600 N	WBL	B (19.8)	B (19.3)
			WBTR	C (20.6)	B (19.5)
			NBL	A (3.9)	B (11.2)
		HWY 89	NBT	A (6.8)	B (10.6)
			NBR	A (5.4)	A (6.8)
			SBL	A (3.7)	A (6.5)
		HWY 89	SBT	A (7.0)	B (11.1)
			SBR	A (5.4)	A (7.1)
			Overall	**A (7.3)**	**B (11.5)**
2 550 N/HWY 89	STOP	550 N	EBL	D [27.0]	F [117.8]
			EBR	B [14.4]	C [23.7]
		HWY 89	NBL	C [16.4]	E [38.3]
			NBT	A [0.0]	A [0.0]
		HWY 89	SBTR	A [0.0]	A [0.0]
3 Site Entrance/HWY 89	STOP	Site Entrance	WBL	n/a	n/a
		Site Entrance	WBR	n/a	n/a
		HWY 89	NTR	n/a	n/a
		HWY 89	SBL	n/a	n/a
			SBT	n/a	n/a
4 500 N/HWY 89	STOP	500 N	WBL	C [23.3]	A [0.0]
		500 N	WBR	B [13.8]	C [19.2]
		HWY 89	NTR	A [0.0]	A [0.0]
		HWY 89	SBL	B [14.8]	D [27.5]
			SBT	A [0.0]	A [0.0]
5 500 N/Site Entrance	STOP	500 N	EBLT	n/a	n/a
		500 N	WBTR	n/a	n/a
		Site Entrance	SBL	n/a	n/a
			SBR	n/a	n/a

Notes : (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(2) Numbers in parenthesis () represent delay at signalized intersections in seconds per vehicle.

Table 3-2
Lindon Townhomes
Existing Intersection Queueing Summary

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Existing 2021 AM Peak Hour	Existing 2021 PM Peak Hour
1 600 N/HW 89	Signal		EBL	200	16	49
		600 N	EBT	-	5	23
			EBR	-	0	34
		600 N	WBL	-	16	26
			WBTR	-	19	28
			NBL	-	10	50
		HWY 89	NBT	-	83	186
			NBR	-	0	0
			SBL	-	9	17
		HWY 89	SBT	-	92	203
			SBR	-	0	11
2 550 N/HWY 89	STOP	550 N	EBL	-	2.5	30
			EBR	50	5	20
		HWY 89	NBL	-	7.5	32.5
			NBT	-	0	0
		HWY 89	SBTR	-	0	0
3 Site Entrance/HWY 89	STOP	Site Entrance	WBL	-	n/a	n/a
		Site Entrance	WBR	50	n/a	n/a
		HWY 89	NTR	-	n/a	n/a
		HWY 89	SBL	-	n/a	n/a
			SBT	-	n/a	n/a
4 500 N/HWY 89	STOP	500 N	WBL	-	2.5	0
		500 N	WBR	50	5	2.5
		HWY 89	NTR	-	0	0
		HWY 89	SBL	-	2.5	7.5
			SBT	-	0	0
5 500 N/Site Entrance	STOP	500 N	EBLT	-	n/a	n/a
		500 N	WBTR	-	n/a	n/a
		Site Entrance	SBL	-	n/a	n/a
			SBR	50	n/a	n/a

Notes : (1) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.

IV. Analysis of Future Conditions without Site Development

Methodology

The future traffic forecasts, without the proposed new use, were developed for 2022 and 2026 conditions based on a composite of existing baseline traffic volumes and regional traffic. A 1% growth factor per year was applied to existing traffic along Hwy 89.

Regional Growth

Increases in traffic associated with regional growth were estimated at one (1.0) percent per year compounded for through movements along Hwy 89 up to 2022, as well as to 2026. This growth accounts for increases in traffic resulting from influences outside of the immediate study area. The resulting increases in traffic within the study area are reflected on Figure 4-1 for 2022 build-out year conditions, and Figure 4-2 for 2026 build-out conditions.

Background Traffic Forecasts

The existing traffic forecasts depicted on Figure 3-1 and the regional growth shown on Figure 4-1 (2022) and Figure 4-2 (2026) were added together to yield the background future traffic forecasts shown on Figure 4-3 for 2022 conditions and Figure 4-4 for 2026 conditions.

Background Future Levels of Service

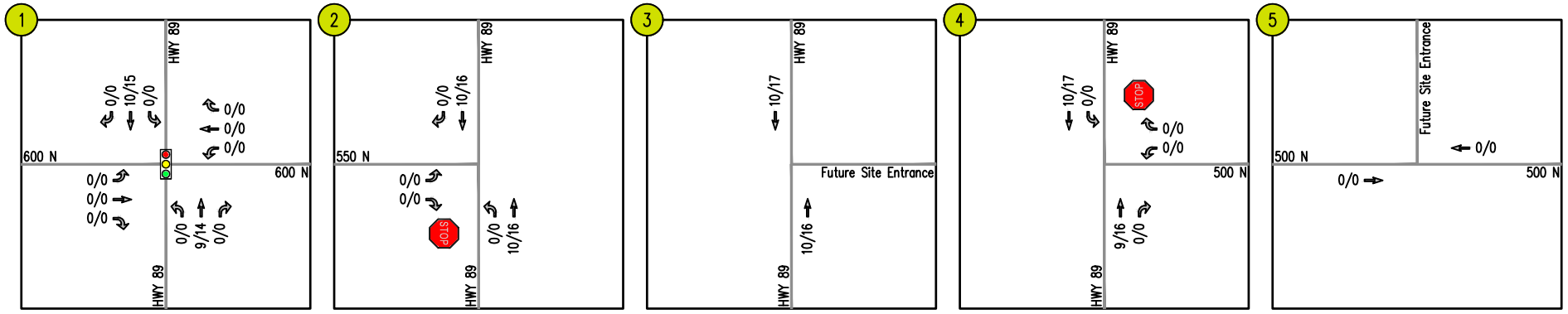
Capacity analyses of 2022 and 2026 future traffic conditions without the proposed development are provided in Appendix F and summarized in Table 4-1. The forecasted levels of service are also depicted graphically on Figure 4-5 for 2022 conditions and Figure 4-6 for 2026 conditions.

As shown on Table 4-2, the signalized intersections within the study area would continue to operate at overall acceptable levels of service (“D” or better) during the AM and PM peak hours, consistent with existing conditions. Minor increases in delay are forecasted due to growth along the arterials within the study area. Background future LOS is generally consistent with existing conditions for all approaches within the study area.

Background Future Queueing

An analysis of intersection queues was performed at key locations under background future traffic conditions. The results of the queuing analysis are summarized in Table 4-2.

As shown in the table, queues within the study network will generally increase due to regional traffic growth. The increase in 95th-percentile queues within the study area are forecasted to be minor. No queues are forecasted to exceed their effective storage consistent with existing conditions.



0 100 200 500

SCALE: 1"=500'

N

FIGURE 4–1
Growth 2022

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

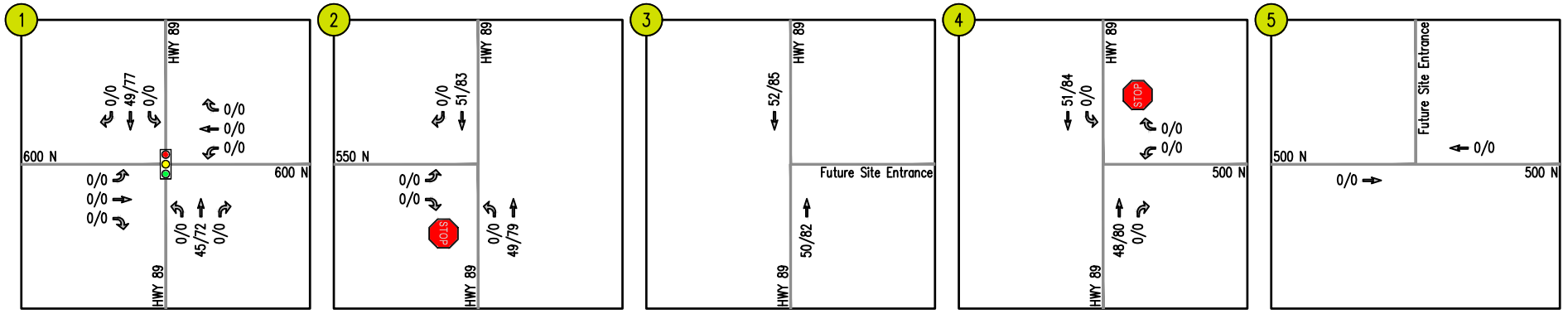
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 4–2
Growth 2026

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

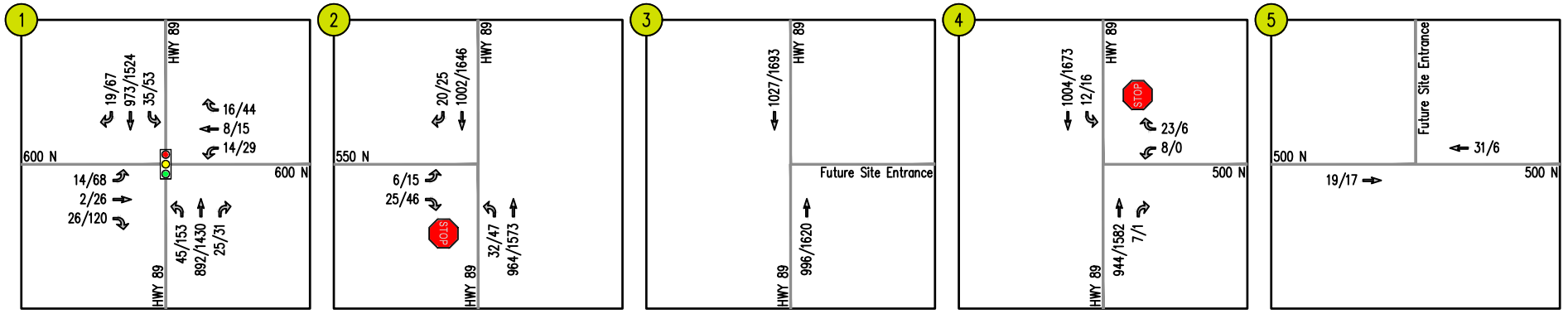
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 4–3
Background Forecasts 2022

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

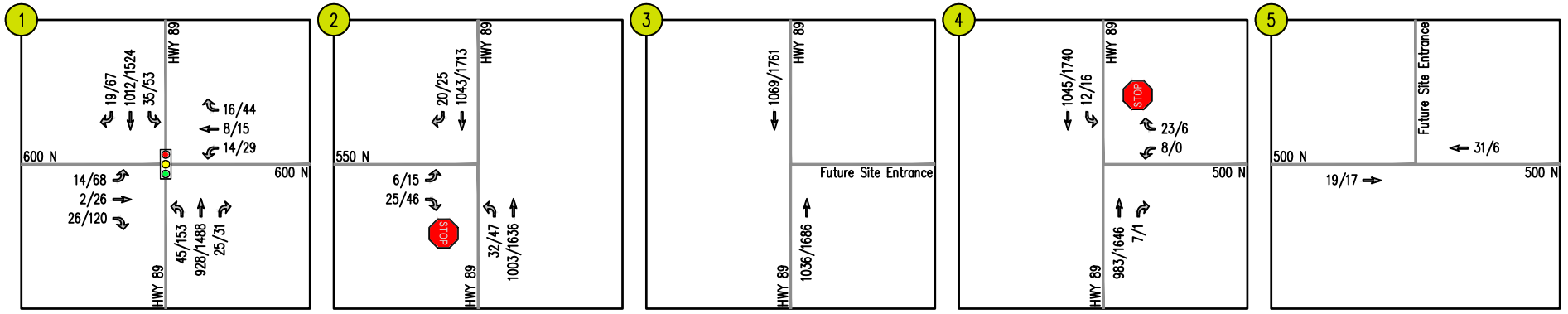
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 4–4
Background Forecasts 2026

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

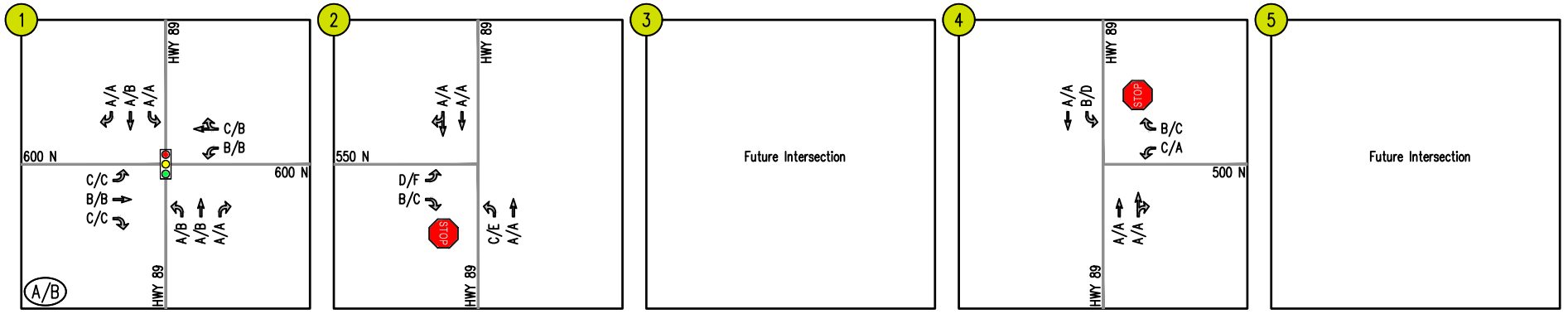
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 4–5
Background LOS 2022

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

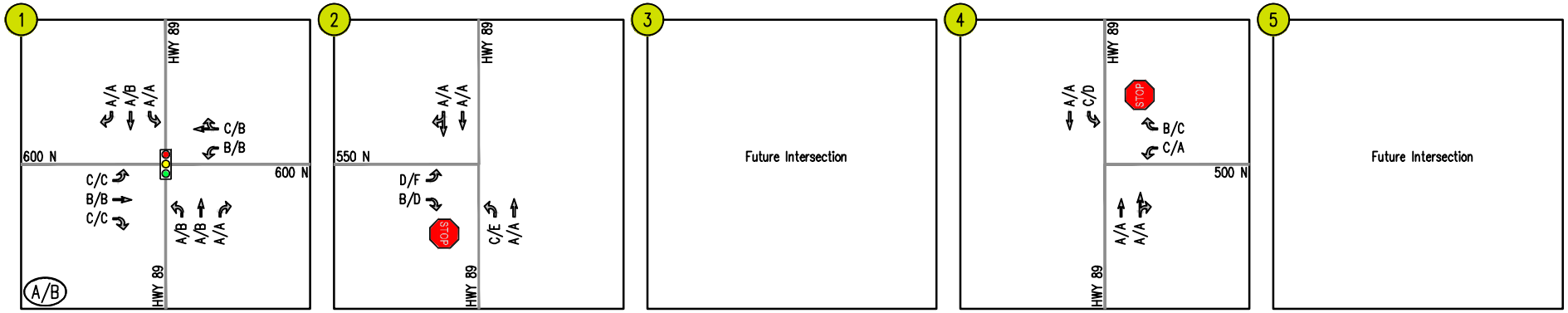
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 4–6
Background LOS 2026

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN

Table 4-1
Lindon Townhomes
Background Intersection Level of Service Summary

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing 2021 AM Peak Hour	Existing 2021 PM Peak Hour	Background 2022 AM Peak Hour	Background 2022 PM Peak Hour	Background 2026 AM Peak Hour	Background 2026 PM Peak Hour
1 600 N/HW 89	Signal		EBL	C (20.4)	C (21.2)	C (20.4)	C (21.2)	C (20.4)	C (21.2)
		600 N	EBT	B (19.5)	B (18.5)	B (19.5)	B (18.5)	B (19.5)	B (18.5)
			EBR	C (20.9)	C (22.2)	C (20.9)	C (22.2)	C (20.9)	C (22.2)
		600 N	WBL	B (19.8)	B (19.3)	B (19.8)	B (19.3)	B (19.8)	B (19.3)
			WBTR	C (20.6)	B (19.5)	C (20.6)	B (19.5)	C (20.6)	B (19.5)
			NBL	A (3.9)	B (11.2)	A (3.9)	B (11.3)	A (4.0)	B (11.9)
		HWY 89	NBT	A (6.8)	B (10.6)	A (6.9)	B (10.6)	A (7.0)	B (11.0)
			NBR	A (5.4)	A (6.8)	A (5.4)	A (6.8)	A (5.4)	A (6.8)
			SBL	A (3.7)	A (6.5)	A (3.7)	A (6.6)	A (3.7)	A (6.8)
		HWY 89	SBT	A (7.0)	B (11.1)	A (7.1)	B (11.2)	A (7.2)	B (11.6)
			SBR	A (5.4)	A (7.1)	A (5.4)	A (7.1)	A (5.4)	A (7.1)
			Overall	**A (7.3)**	**B (11.5)**	**A (7.3)**	**B (11.6)**	**A (7.4)**	**B (11.9)**
2 550 N/HWY 89	STOP		EBL	D [27.0]	F [117.8]	D [27.4]	F [124.9]	D [29.1]	F [152.1]
		550 N	EBR	B [14.4]	C [23.7]	B [14.5]	C [24.0]	B [14.8]	D [25.4]
			NBL	C [16.4]	E [38.3]	C [16.6]	E [39.2]	C [17.2]	E [44.0]
		HWY 89	NBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
			SBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		HWY 89							
3 Site Entrance/HWY 89	STOP	Site Entrance	WBL	n/a	n/a	n/a	n/a	n/a	n/a
		Site Entrance	WBR	n/a	n/a	n/a	n/a	n/a	n/a
		HWY 89	NTR	n/a	n/a	n/a	n/a	n/a	n/a
			SBL	n/a	n/a	n/a	n/a	n/a	n/a
		HWY 89	SBT	n/a	n/a	n/a	n/a	n/a	n/a
4 500 N/HWY 89	STOP	500 N	WBL	C [23.3]	A [0.0]	C [23.5]	A [0.0]	C [24.7]	A [0.0]
		500 N	WBR	B [13.8]	C [19.2]	B [13.9]	C [19.4]	B [14.2]	C [20.2]
		HWY 89	NTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
			SBL	B [14.8]	D [27.5]	B [14.9]	D [28.1]	C [15.4]	D [30.2]
		HWY 89	SBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
5 500 N/Site Entrance	STOP	500 N	EBLT	n/a	n/a	n/a	n/a	n/a	n/a
		500 N	WBTR	n/a	n/a	n/a	n/a	n/a	n/a
			SBL	n/a	n/a	n/a	n/a	n/a	n/a
		Site Entrance	SBR	n/a	n/a	n/a	n/a	n/a	n/a

Notes : (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(2) Numbers in parenthesis () represent delay at signalized intersections in seconds per vehicle.

Table 4-2
Lindon Townhomes
Background Intersection Queueing Summary

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Existing 2021 AM Peak Hour	Existing 2021 PM Peak Hour	Background 2022 AM Peak Hour	Background 2022 PM Peak Hour	Background 2026 AM Peak Hour	Background 2026 PM Peak Hour
1 600 N/HW 89	Signal		EBL	200	16	49	16	49	16	49
		600 N	EBT	-	5	23	5	23	5	23
			EBR	-	0	34	0	34	0	34
		600 N	WBL	-	16	26	16	26	16	26
			WBTR	-	19	28	19	28	19	28
			NBL	-	10	50	10	50	10	50
		HWY 89	NBT	-	83	186	84	188	88	199
			NBR	-	0	0	0	0	0	0
			SBL	-	9	17	9	17	9	17
		HWY 89	SBT	-	92	203	93	206	97	219
			SBR	-	0	11	0	11	0	11
2 550 N/HWY 89	STOP		EBL	-	2.5	30	2.5	32.5	2.5	35
		550 N	EBR	50	5	20	5	20	5	20
			NBL	-	7.5	32.5	7.5	32.5	10	37.5
		HWY 89	NBT	-	0	0	0	0	0	0
		HWY 89	SBTR	-	0	0	0	0	0	0
3 Site Entrance/HWY 89	STOP	Site Entrance	WBL	-	n/a	n/a	n/a	n/a	n/a	n/a
		Site Entrance	WBR	50	n/a	n/a	n/a	n/a	n/a	n/a
		HWY 89	NTR	-	n/a	n/a	n/a	n/a	n/a	n/a
			SBL	-	n/a	n/a	n/a	n/a	n/a	n/a
		HWY 89	SBT	-	n/a	n/a	n/a	n/a	n/a	n/a
4 500 N/HWY 89	STOP	500 N	WBL	-	2.5	0	2.5	0	2.5	0
		500 N	WBR	50	5	2.5	5	2.5	5	2.5
		HWY 89	NTR	-	0	0	0	0	0	0
			SBL	-	2.5	7.5	2.5	7.5	2.5	10
		HWY 89	SBT	-	0	0	0	0	0	0
5 500 N/Site Entrance	STOP	500 N	EBLT	-	n/a	n/a	n/a	n/a	n/a	n/a
		500 N	WBTR	-	n/a	n/a	n/a	n/a	n/a	n/a
			SBL	-	n/a	n/a	n/a	n/a	n/a	n/a
		Site Entrance	SBR	50	n/a	n/a	n/a	n/a	n/a	n/a

Notes : (1) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.

V. Site Analysis

Overview

The Applicant is proposing to develop the 16.6-acre site with a mix of commercial and residential uses. For purposes of this study, the site will be developed in one phase to be complete in 2022. The following mix of uses and development programs were analyzed:

- 6,180 SF of medical office
- 19,300 SF of shopping center
- 74 DU of townhome
- 4 DU of single-family detached

Proposed Site Access

As shown on the Applicant's plan (Figure 1-2), access to the majority of the site is being proposed via a full movement access to Hwy 89 and an additional full movement access to 500 N. These locations will provide access to the commercial and townhome developments. The single-family homes will get access via cul-de-sac provided at the terminus of 570 N.

Trip Generation

Overview

Trip generation estimates for the weekday AM and PM peak hours, as well as the weekday average daily traffic (ADT), were derived from the standard Institute of Transportation Engineers (ITE) Trip Generation Manual rates/equations, as published in the 10th edition. The trip generation analysis is presented in Table 5-1.

Pass-by Trips

According to ITE, in some cases the driveway volumes at a particular land use are different from the amount of traffic added to the adjacent street system. Uses such as retail establishments attract a portion of their trips from traffic that is already present on the road network. Pass-by trip are those trips which are made as intermediate stops on the way to a primary destination. An example of a pass-by trip would be one in which a driver stops at a gas station on his/her way home from work.

The proposed use would experience pass-by trips consistent with the primary uses located on site. In recognition of this phenomenon and consistent with ITE published data, which is provided in Appendix G, a thirty four percent (34%) pass-by reduction was applied to the commercial portions of the trip generation analysis:

As shown in Table 5-1, the commercial development is anticipated to generate 13 weekday AM, and 33 weekday PM peak hour pass-by trips at buildout. Therefore, these trips would be drawn from the existing road network and assigned to the future site entrances accordingly. Pass-by trip assignments at key study intersections are shown on Figure 5-1.

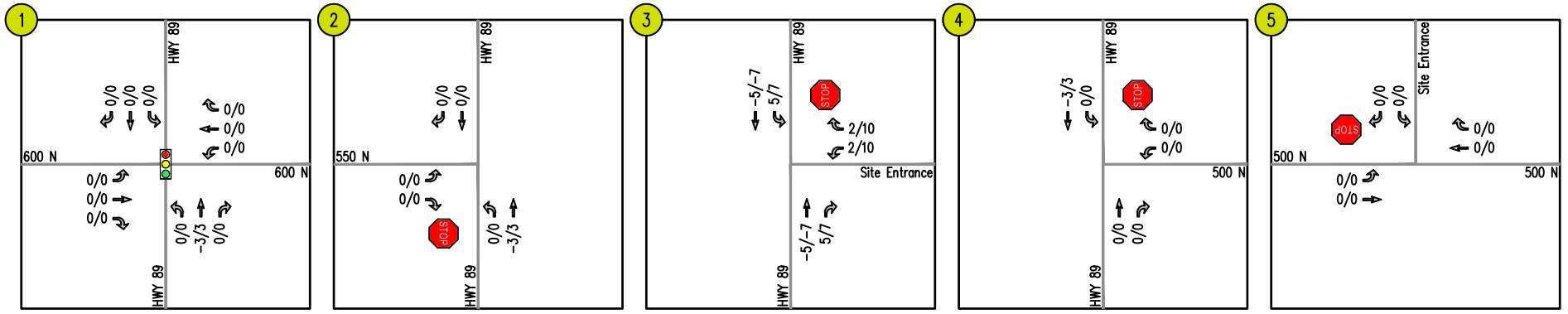
Internal Capture
Due to the mixed-use nature of the proposed development it is assumed that a number of trips would be shared between the residential, and commercial uses. These are trips that are going from one use on site to another use on site and should not be counted as separate trips for each use. This "internal capture reduction" rate is provided by National Cooperative Highway Research Program ("NCHRP") Transportation Research Board ("TRB")'s 8-51 Trip Capture Estimation Tool. The tool suggests that an internal capture rate of approximately 6% in the AM peak hour and 28% in the PM peak hour can be expected. As shown in Table 5-1, 4 AM peak hour trips (2 in and 2 out) and 38 PM peak hour trips (19 in and 19 out) can be anticipated to be captured between the uses on site. The NCHRP worksheets can be found in Appendix G.

Net Site Trips
The vehicle trips that would be generated by the proposed development plan are summarized in Table 5-1. As shown in Table 5-1, the site would generate upon completion and full occupancy, 53 net new weekday AM and 64 net new weekday PM peak hour vehicle trips as well as 951 net new weekday daily trips.

Site Trip Distributions
The distribution of the anticipated trips generated by the completion of the proposed development was based on an examination of existing traffic counts and local knowledge. Existing travel patterns indicate the following distribution is appropriate in the forecasting of future site traffic:

- To/from the north on Hwy 89: 60%
- To/from the east on 600 N: 5%
- To/from the east on 500 N: 5%
- To/from the south on Hwy 89: 30%

Site Trip Assignments
The assignment of the new vehicle trips generated upon the future build-out of the development project was based on the above distribution. The trips assignments are depicted on Figure 5-2.



0 100 200 500

SCALE: 1"=500'

N

FIGURE 5–1
Pass–by Trips

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

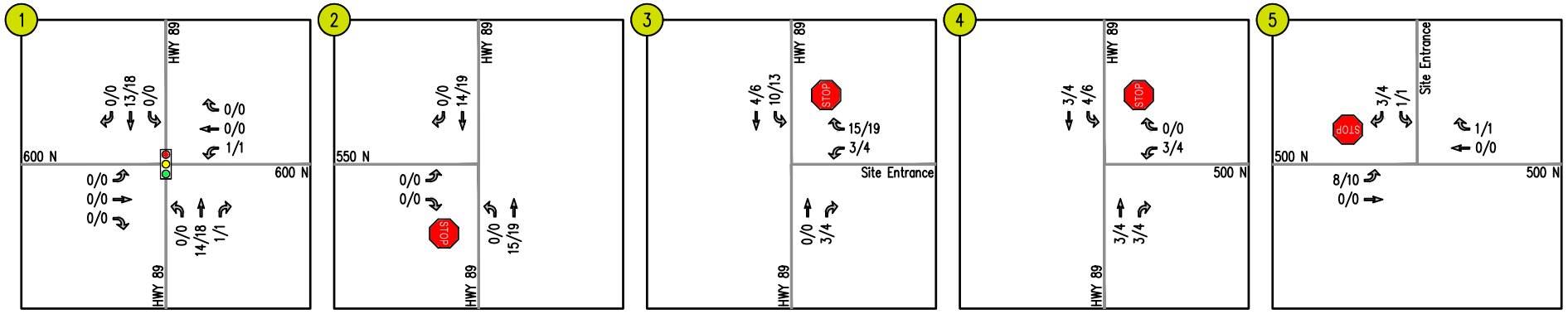
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 5–2
Site Trips

Lindon Townhomes
Lindon, UT

(A/A) INTERSECTION LOS

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN

Table 5-1
Lindon Townhomes
Site Trip Generation

Land Use	Land Use Code	Amount	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Average Daily Trips
Proposed Use										
Medical Office	720	6,180	SF	15	4	19	6	17	23	215
Shopping Center	820	19,300	SF	11	7	18	36	38	74	729
Retail Subtotal				26	11	37	42	55	97	944
Retail Pass-by Trips				*(9)*	*(4)*	*(13)*	*(14)*	*(19)*	*(33)*	*(321)*
Townhomes (Mid-Rise)	221	74	DU	7	18	25	20	13	33	402
Single Family Detached	210	4	DU	2	6	8	3	2	5	54
Residential Subtotal				9	24	33	23	15	38	456
Internal Capture				*(2)*	*(2)*	*(4)*	*(19)*	*(19)*	*(38)*	*(128)*
Net New Trips				**24**	**29**	**53**	**32**	**32**	**64**	**951**

Note(s):
(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation Manual, 10th Edition

VI. Analysis of Future Conditions with Site Development

Total Future Traffic Forecasts

The 2022 and 2026 total future traffic forecasts associated with the proposed development were developed by combining the baseline traffic volumes shown on Figure 3-1, background future forecasts shown on Figure 4-3 (2022), Figure 4-4 (2026), and the total site trip assignments shown on Figure 5-2. The resulting total future traffic forecasts are provided on Figure 6-1 for 2022 and Figure 6-2 for 2026.

Total Future 2022 and 2026 Levels of Service with Proposed Development

Future levels of service with the proposed development plan were estimated at key study intersections based on the future traffic volumes shown on Figures 6-1 and Figure 6-2, the future lane use on Figure 6-3, the HCM 6th methodologies for signalized and unsignalized intersections. The results of these analyses are provided in Appendix H and presented in Table 6-1. Total future levels of service are also presented graphically on Figure 6-4 (2022) and Figure 6-5 (2026).

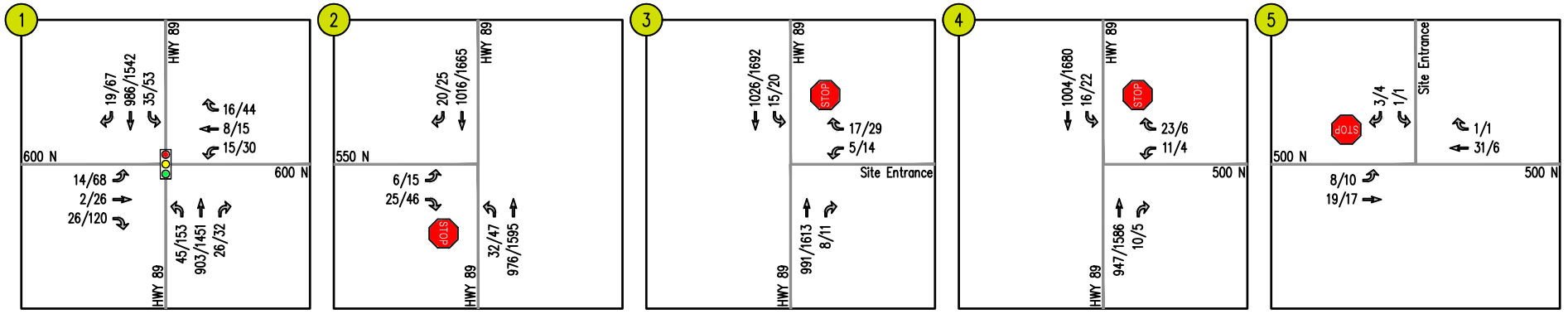
As shown in Table 6-1, levels of service under future site development conditions would remain generally consistent with future background conditions (i.e., without site development). Overall delays would experience minor increase due to site trips. The signalized intersections within the study area would continue to operate at acceptable overall LOS “D” or better in the AM and PM peak hours in both the 2022 and 2026 scenarios.

The proposed site entrance along 500 N is forecasted to operate at LOS “B” or better during the AM and PM peak hours. The proposed site entrance along Hwy 89 would experience an exiting westbound left move at LOS “F” in the PM peak hour. Similarly, to many side street approaches along Hwy 89, volumes would be low at this movement and would experience the benefit of platooning from the nearby signalized intersections. The capacity analysis shows v/c ratios that are well below 1.0 which suggest capacity is available at these side street approaches.

These results indicate that the development of the site would not require additional road improvements.

Total Future 2022 and 2026 Queuing

Total future queues were forecasted using Synchro software. The results of the queuing analysis are summarized in Table 6-2. In general, vehicle queues would not increase significantly as a result of the proposed development.



0 100 200 500

SCALE: 1"=500'

N

FIGURE 6–1
Total Future Forecasts 2022

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

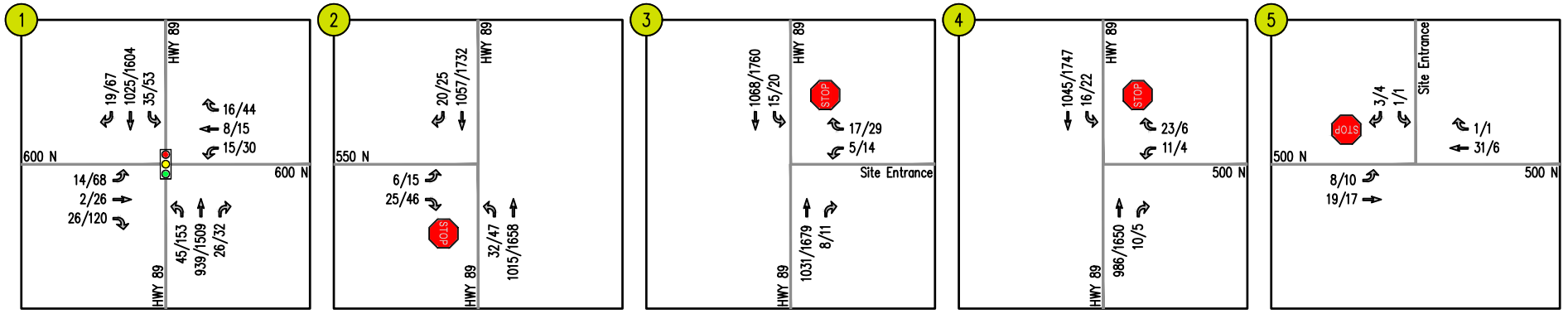
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 6–2
Total Future Forecasts 2026

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

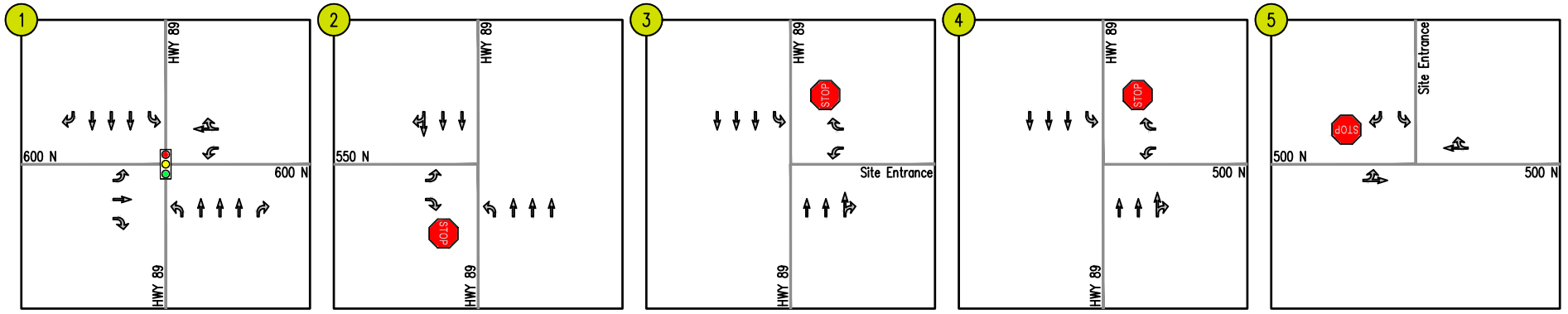
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP STOP SIGN

YIELD SIGN



0 100 200 500

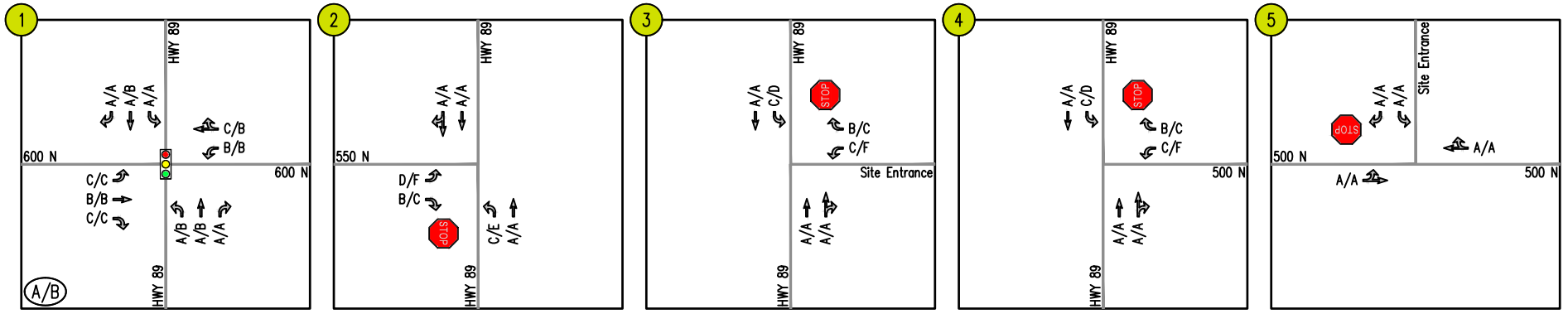
SCALE: 1"=500'

N

FIGURE 6–3
Total Future Lane Use and Traffic Control

Lindon Townhomes
Lindon, UT

MOVEMENT
SIGNALIZED INTERSECTION
STOP STOP SIGN
YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 6–4
Total Future LOS 2022

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

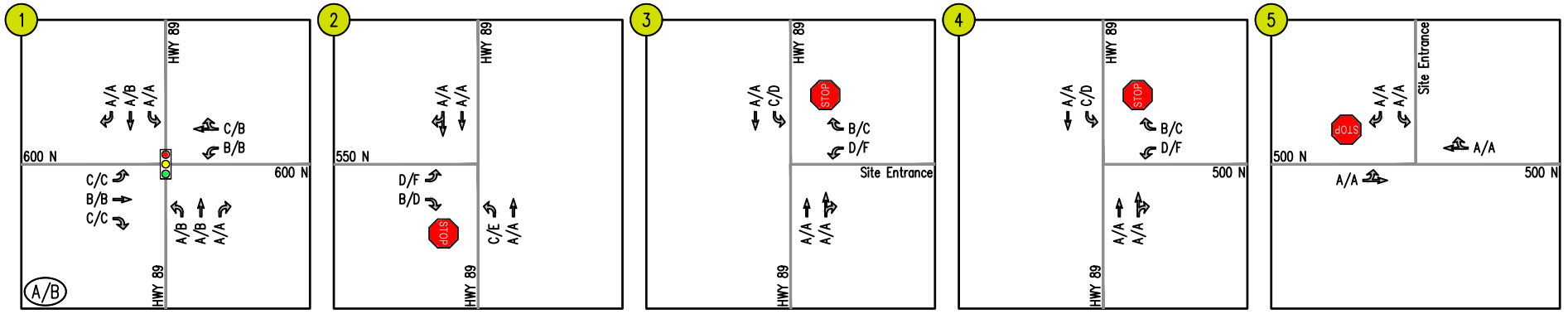
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP STOP SIGN

YIELD SIGN



0 100 200 500

SCALE: 1"=500'

N

FIGURE 6–5
Total Future LOS 2026

Lindon Townhomes
Lindon, UT

A/A INTERSECTION LOS

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

MOVEMENT

SIGNALIZED INTERSECTION

STOP STOP SIGN

YIELD SIGN

Table 6-1
Lindon Townhomes
Total Future Intersection Level of Service Summary

Intersection	Operating Condition	Street Name	Approach/ Movement	Background 2022 AM Peak Hour	Background 2022 PM Peak Hour	Background 2026 AM Peak Hour	Background 2026 PM Peak Hour	Total Future 2022 AM Peak Hour	Total Future 2022 PM Peak Hour	Total Future 2026 AM Peak Hour	Total Future 2026 PM Peak Hour
1 600 N/HW 89	Signal		EBL	C (20.4)	C (21.2)	C (20.4)	C (21.2)	C (20.4)	C (21.2)	C (20.4)	C (21.2)
		600 N	EBT	B (19.5)	B (18.5)	B (19.5)	B (18.5)	B (19.5)	B (18.5)	B (19.5)	B (18.5)
			EBR	C (20.9)	C (22.2)	C (20.9)	C (22.2)	C (20.9)	C (22.2)	C (20.9)	C (22.2)
		600 N	WBL	B (19.8)	B (19.3)	B (19.8)	B (19.3)	B (19.8)	B (19.3)	B (19.8)	B (19.3)
			WBTR	C (20.6)	B (19.5)	C (20.6)	B (19.5)	C (20.6)	B (19.5)	C (20.6)	B (19.5)
			NBL	A (3.9)	B (11.3)	A (4.0)	B (11.9)	A (3.9)	B (11.5)	A (4.0)	B (12.1)
		HWY 89	NBT	A (6.9)	B (10.6)	A (7.0)	B (11.0)	A (6.9)	B (10.8)	A (7.0)	B (11.1)
			NBR	A (5.4)	A (6.8)	A (5.4)	A (6.8)	A (5.4)	A (6.8)	A (5.4)	A (6.8)
			SBL	A (3.7)	A (6.6)	A (3.7)	A (6.8)	A (3.7)	A (6.7)	A (3.8)	A (6.9)
		HWY 89	SBT	A (7.1)	B (11.2)	A (7.2)	B (11.6)	A (7.1)	B (11.3)	A (7.2)	B (11.7)
			SBR	A (5.4)	A (7.1)	A (5.4)	A (7.1)	A (5.4)	A (7.1)	A (5.4)	A (7.1)
			Overall	**A (7.3)**	**B (11.6)**	**A (7.4)**	**B (11.9)**	**A (7.4)**	**B (11.7)**	**A (7.4)**	**B (12.0)**
2 550 N/HWY 89	STOP		EBL	D [27.4]	F [124.9]	D [29.1]	F [152.1]	D [27.9]	F [128.8]	D [29.7]	F [163.9]
		550 N	EBR	B [14.5]	C [24.0]	B [14.8]	D [25.4]	B [14.6]	C [24.4]	B [14.9]	D [25.9]
			NBL	C [16.6]	E [39.2]	C [17.2]	E [44.0]	C [16.8]	E [40.6]	C [17.5]	E [45.2]
		HWY 89	NBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		HWY 89	SBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
3 Site Entrance/HWY 89	STOP	Site Entrance	WBL	n/a	n/a	n/a	n/a	C [24.7]	F [70.2]	D [26.0]	F [79.5]
		Site Entrance	WBR	n/a	n/a	n/a	n/a	B [14.1]	C [21.6]	B [14.4]	C [22.7]
		HWY 89	NTR	n/a	n/a	n/a	n/a	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		HWY 89	SBL	n/a	n/a	n/a	n/a	C [15.6]	D [30.3]	C [16.2]	D [32.8]
			SBT	n/a	n/a	n/a	n/a	A [0.0]	A [0.0]	A [0.0]	A [0.0]
4 500 N/HWY 89	STOP	500 N	WBL	C [23.5]	A [0.0]	C [24.7]	A [0.0]	C [24.1]	F [57.4]	D [25.3]	F [63.4]
		500 N	WBR	B [13.9]	C [19.4]	B [14.2]	C [20.2]	B [13.9]	C [19.5]	B [14.2]	C [20.3]
		HWY 89	NTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		HWY 89	SBL	B [14.9]	D [28.1]	C [15.4]	D [30.2]	C [15.1]	D [29.4]	C [15.6]	D [31.8]
			SBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
5 500 N/Site Entrance	STOP	500 N	EBLT	n/a	n/a	n/a	n/a	A [7.3]	A [7.2]	A [7.3]	A [7.2]
		500 N	WBTR	n/a	n/a	n/a	n/a	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Site Entrance	SBL	n/a	n/a	n/a	n/a	A [8.9]	A [8.8]	A [8.9]	A [8.8]
			SBR	n/a	n/a	n/a	n/a	A [8.5]	A [8.4]	A [8.5]	A [8.4]

Notes : (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(2) Numbers in parenthesis () represent delay at signalized intersections in seconds per vehicle.

Table 6-2
Lindon Townhomes
Total Future Intersection Queueing Summary

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Background 2022 AM Peak Hour	Background 2022 PM Peak Hour	Background 2026 AM Peak Hour	Background 2026 PM Peak Hour	Total Future 2022 AM Peak Hour	Total Future 2022 PM Peak Hour	Total Future 2026 AM Peak Hour	Total Future 2026 PM Peak Hour
1 600 N/HW 89	Signal		EBL	200	16	49	16	49	16	49	16	49
		600 N	EBT	-	5	23	5	23	5	23	5	23
			EBR	-	0	34	0	34	0	34	0	34
		600 N	WBL	-	16	26	16	26	17	27	17	27
			WBTR	-	19	28	19	28	19	28	19	28
			NBL	-	10	50	10	50	10	50	10	50
		HWY 89	NBT	-	84	188	88	199	86	192	90	203
			NBR	-	0	0	0	0	0	0	0	0
			SBL	-	9	17	9	17	9	17	9	17
		HWY 89	SBT	-	93	206	97	219	95	209	100	222
			SBR	-	0	11	0	11	0	11	0	11
2 550 N/HWY 89	STOP		EBL	-	2.5	32.5	2.5	35	2.5	32.5	2.5	37.5
		550 N	EBR	50	5	20	5	20	5	20	5	20
			NBL	-	7.5	32.5	10	37.5	7.5	35	10	37.5
		HWY 89	NBT	-	0	0	0	0	0	0	0	0
		HWY 89	SBTR	-	0	0	0	0	0	0	0	0
3 Site Entrance/HWY 89	STOP	Site Entrance	WBL	-	n/a	n/a	n/a	n/a	2.5	20	2.5	20
		Site Entrance	WBR	50	n/a	n/a	n/a	n/a	2.5	10	2.5	12.5
		HWY 89	NTR	-	n/a	n/a	n/a	n/a	0	0	0	0
		HWY 89	SBL	-	n/a	n/a	n/a	n/a	2.5	10	5	12.5
			SBT	-	n/a	n/a	n/a	n/a	0	0	0	0
4 500 N/HWY 89	STOP	500 N	WBL	-	2.5	0	2.5	0	5	5	5	5
		500 N	WBR	50	5	2.5	5	2.5	5	2.5	5	2.5
		HWY 89	NTR	-	0	0	0	0	0	0	0	0
		HWY 89	SBL	-	2.5	7.5	2.5	10	2.5	12.5	5	12.5
			SBT	-	0	0	0	0	0	0	0	0
5 500 N/Site Entrance	STOP	500 N	EBLT	-	n/a	n/a	n/a	n/a	0	0	0	0
		500 N	WBTR	-	n/a	n/a	n/a	n/a	0	0	0	0
			SBL	-	n/a	n/a	n/a	n/a	0	0	0	0
		Site Entrance	SBR	50	n/a	n/a	n/a	n/a	0	0	0	0

Notes : (1) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.

VII. Streets Master Plan

Overview

As mentioned previously and shown in Figure 1-4, an extension of 570 N is currently shown on the City of Lindon's Street Master Plan. The extension is proposed from the current western terminus of 570 N to connect to Hwy 89. The intent of such a connection is to further the grid of streets in the area and provide the proposed development better access to Locust Avenue.

It was requested during initial conversations for the subject project that the planned connection not be provided. Feedback from area residents requested that the subject proposed project not be given access to 570 N and keep the commercial and higher density residential oriented to Hwy 89.

Existing Grid

In the existing condition, 600 N and 500 N provide an east-west connection from Locust Avenue to Hwy 89. Additional connections are available at 1000S/700 N to the north and 400 N to the south which, similarly to 600 N provides signalized access to these east-west connections. These connections are spaced approximately a quarter mile apart from each other.

Potential Impact

Due to the existing grid connections being spaced every quarter mile an additional grid connection would serve very few users. Opportunities to make the east-west connection between Hwy 89 and Locust Avenue are frequent (every quarter mile) and often provide signalized access.

The planned grid connection would not primarily serve as an east-west grid connection but instead would provide additional opportunity for residents to the east of the proposed site to access the rear of the site. The proposed configuration would help maintain that the commercial traffic be oriented to Hwy 89 which is appropriate.

Concerns were raised that without this connection a higher concentration of proposed site traffic would be seen on 500 N east of the site. It is anticipated that the majority of commercial traffic will use the newly constructed site entrance along Hwy 89. As shown on Figure 5-2, the proposed development will add fewer than five (5) trips to 500 N during either peak hour.

The proposed development, and subsequent preclusion of a 570 N connection from Locust Avenue to Hwy 89, will have no negative impact on the surrounding network. Sufficient grid connections exist to provide circulation and access to the commercial and surrounding residential developments.

VIII. Conclusions and Recommendations

Conclusions

Based on the results of this traffic impact study, the following may be concluded:

- Under existing traffic conditions, the signalized intersections within the study area currently operate at overall acceptable levels of service (LOS) “D” or better during the weekday AM and PM peak hours.

- Under background future 2022 and 2026 traffic conditions, without the development of the subject site, delays would increase slightly at study intersections due to regional traffic growth. Intersections will continue to operate consistent with existing conditions.

- The proposed site development would generate, upon completion and full occupancy 53 net new weekday AM and 64 net new weekday PM peak hour vehicle trips as well as 951 net new weekday daily trips.

- Under total future traffic conditions with development of the site, all study intersections, including proposed site accesses would operate at overall acceptable levels of service consistent with background with improvement conditions. Unsignalized side street approaches will operate with additional capacity available and all queues will be contained within the effective storage. Thus, no additional roadway improvements as part of the site development are required.

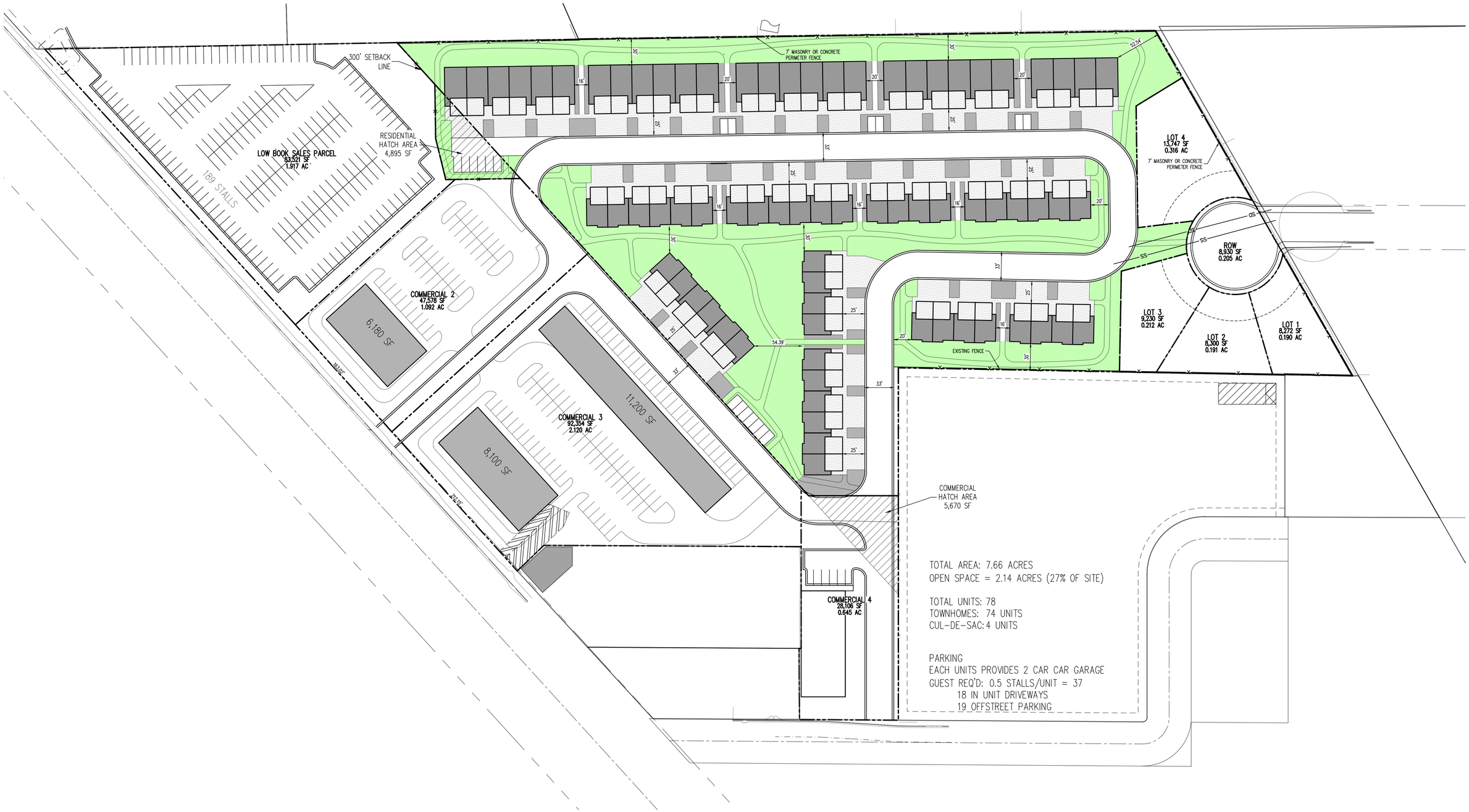
- The proposed development will preclude a future connection of 570 N to connect with Hwy 89. This connection is not necessary for the already established grid of streets. Precluding this connection will maintain that the proposed commercial development be oriented to Hwy 89.

Recommendations

- It is recommended that the proposed development provide access consistent with the attached plan.

- It is recommended that the Applicant preclude the connection of 570 N shown on the City of Lindon’s Street Master Plan consistent with the attached plan.

APPENDIX A – Full Sized Plan



TOTAL AREA: 7.66 ACRES
OPEN SPACE = 2.14 ACRES (27% OF SITE)

TOTAL UNITS: 78
TOWNHOMES: 74 UNITS
CUL-DE-SAC: 4 UNITS

PARKING
EACH UNITS PROVIDES 2 CAR CAR GARAGE
GUEST REQ'D: 0.5 STALLS/UNIT = 37
18 IN UNIT DRIVEWAYS
19 OFFSTREET PARKING

Galloway

LINDON TOWNHOMES

INFINITE REALTY

CONCEPTUAL SITE PLAN

12.23.2020

N

0 10 20 50

SCALE: 1"=50'

APPENDIX B – Scope of Work

Brian Horan

From: Brian Horan
Sent: Monday, December 14, 2020 1:02 PM
To: Michael Florence; Noah Gordon
Cc: Boyd Preece; Trent Andrus
Subject: RE: Lindon Townhomes TIS
Attachments: Lindon Townhome TIS Scope 12-14-20 update.pdf

All,

Please find attached the updated scoping form per this mornings conversation. I appreciate everyone's time and feedback on this.

Brian

Galloway

Brian
Horan, PE

TRANSPORTATION TEAM MANAGER

6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
O 303.770.8884 **C** 203.641.6879
BrianHoran@GallowayUS.com
GallowayUS.com

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From: Brian Horan <BrianHoran@GallowayUS.com>
Sent: Monday, December 14, 2020 9:30 AM
To: Michael Florence <mflorence@lindoncity.org>; Noah Gordon <ngordon@lindoncity.org>
Cc: Boyd Preece <BoydPreece@GallowayUS.com>; Trent Andrus <tandrus@lindoncity.org>
Subject: RE: Lindon Townhomes TIS

All,

Attached is a TIS Scoping form to allow us to talk from. I'll take notes on this as we go and update for after the meeting.

Brian

Galloway

Brian
Horan, PE

TRANSPORTATION TEAM MANAGER

6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
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BrianHoran@GallowayUS.com
GallowayUS.com

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From: Michael Florence <mflorence@lindoncity.org>
Sent: Friday, December 11, 2020 9:23 AM
To: Brian Horan <BrianHoran@GallowayUS.com>; Noah Gordon <ngordon@lindoncity.org>
Cc: Boyd Preece <BoydPreece@GallowayUS.com>; Trent Andrus <tandrus@lindoncity.org>
Subject: RE: Lindon Townhomes TIS

I just sent a zoom link to everyone for 10:00 am on Monday

From: Brian Horan <BrianHoran@GallowayUS.com>
Sent: Friday, December 11, 2020 8:38 AM
To: Noah Gordon <ngordon@lindoncity.org>
Cc: Boyd Preece <BoydPreece@GallowayUS.com>; Trent Andrus <tandrus@lindoncity.org>; Michael Florence <mflorence@lindoncity.org>
Subject: Re: Lindon Townhomes TIS

Noah,

I think it can be helpful to have everyone on the same page. That Monday time will work great.

Thanks so much!
Brian

Galloway

Brian
Horan, PE

TRANSPORTATION TEAM MANAGER

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BrianHoran@GallowayUS.com
GallowayUS.com

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From: Noah Gordon <ngordon@lindoncity.org>
Sent: Friday, December 11, 2020 8:35:36 AM
To: Brian Horan <BrianHoran@GallowayUS.com>
Cc: Boyd Preece <BoydPreece@GallowayUS.com>; Trent Andrus <tandrus@lindoncity.org>; Michael Florence

<mflorence@lindoncity.org>
Subject: RE: Lindon Townhomes TIS

My schedule looks pretty open next week. If you would like to involve someone from community development, in addition to engineering, we may want to meet Monday morning between 10am – noon since we have that time blocked out each week for things like this. Let us know when you'd like to meet.

Noah D. Gordon, P.E.
City Engineer, Lindon City
ngordon@lindoncity.org

From: Brian Horan <BrianHoran@GallowayUS.com>
Sent: Thursday, December 10, 2020 5:36 PM
To: Noah Gordon <ngordon@lindoncity.org>
Cc: Boyd Preece <BoydPreece@GallowayUS.com>
Subject: Lindon Townhomes TIS

Good Afternoon,

I'm looking to scope the TIS for the Lindon Townhomes project. Would there be a time next week that we could virtually meet to discuss? I'll send a scope of work form ahead of the meeting to allow us to speak from.

Much appreciated,
Brian

Galloway

Brian
Horan, PE

TRANSPORTATION TEAM MANAGER

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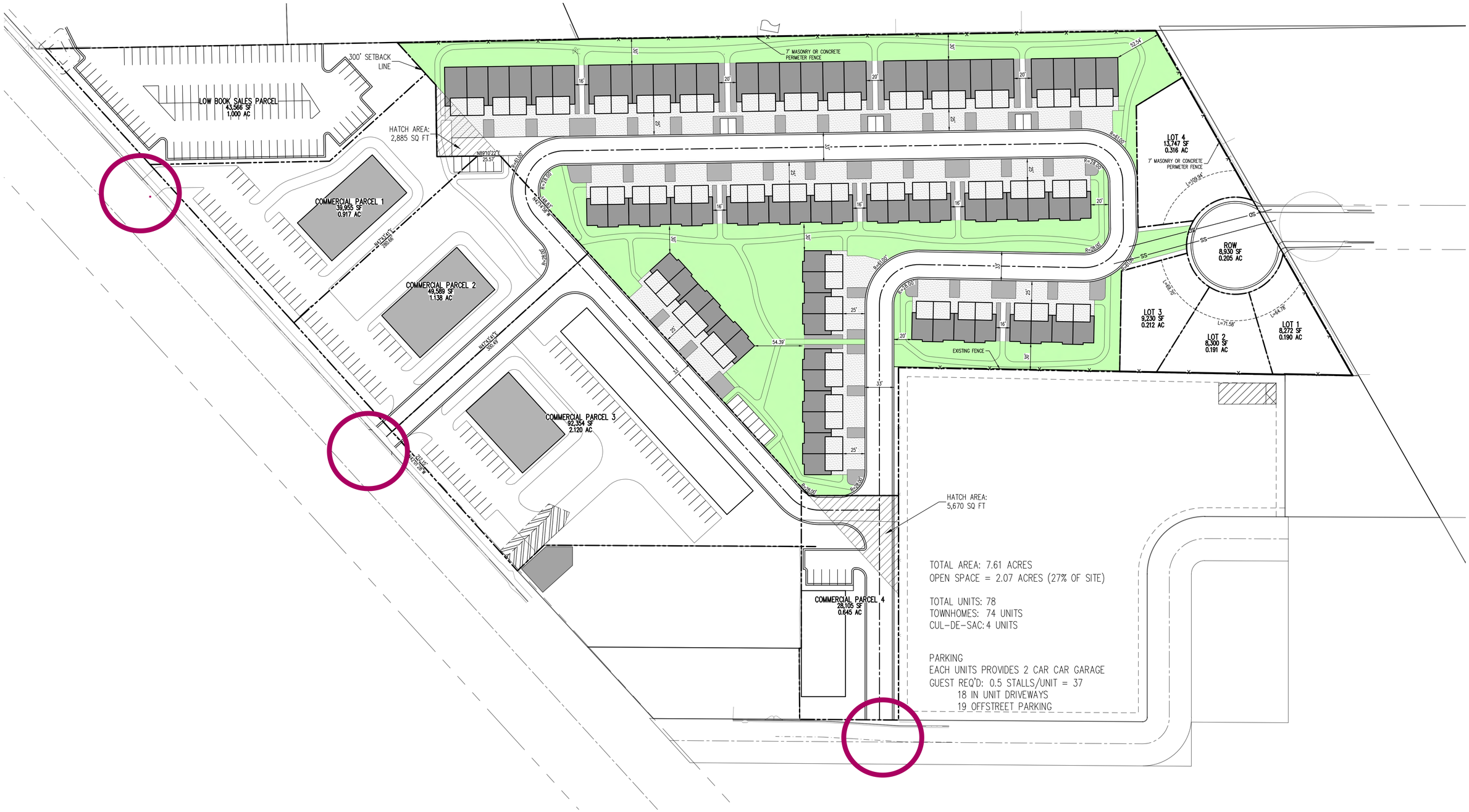
TRAFFIC IMPACT STUDY BASE ASSUMPTIONS WORKSHEET

Project Name	Lindon Townhomes			
Project Location	City of Lindon, Utah			
Project Size	74 Townhomes, 4 Single Family Homes, 30k SF Retail, 15k medical office			
Study Area Boundaries	North: 600 North		South: 500 N	
	East: 570 N Cul-de-sac		West: US HWY 89	
Study Years	2021 (Opening Day), 2026 (5 Years after)			
Future Traffic Growth Rate	1%/year Along Hwy 89			
Study Intersections (see attached)	1. Hwy 89/Site Entrances		2. 500 North/Site Entrance	
	3. HWY 89/600 North		4. HWY 89/500 North	
	5.		6.	
	7.		8.	
Time Period For Study	AM: ☒	PM: ☒	Sat. Noon: ☐	
Trip Generation Rates (Latest ITE *Trip Generation Manual* rates/equations will be utilized unless otherwise recommended or approved.)				
Trip Adjustment Factors (Subject to approval.)	Pass by: 34% (PM - ITE)		Internal Capture: NCHRP 684 Methodology	
Overall Trip Distribution	North: 60%	South: 30%	East: 0%	West: 10%
Mode Split Assumptions	n/a			
Committed Roadway Improvements	Potential for Centerline Running BRT			
Other Traffic Studies	n/a			
Areas Requiring Special Study (i.e. Signal progression, passenger car equivalents, accident analyses, etc.)	Lindon Transportation Master Plan indicates 570 North would extend to connect to HWY 89. A discussion will be provided on precluding this extension			
DATE: 12/14/20 TRANSPORTATION ENGINEER: Brian Horan (Galloway)				

Table 1
Lindon Townhomes
Trip Generation

Land Use	Land Use Code	Amount	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Average Daily Trips
PROPOSED (1)										
Townhomes (Mid-rise)	221	74	DU	7	18	25	20	13	33	402
Single Family Detached	210	4	DU	2	6	8	3	2	5	54
Retail	820	30,000	SF	17	11	28	55	59	114	1,133
Medical Office	720	15,000	SF	32	9	41	15	38	53	522
Total				**58**	**44**	**102**	**93**	**112**	**205**	**2,111**

Note(s):
(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation Manual, 10th Edition



Galloway

LINDON TOWNHOMES

INFINITE REALTY

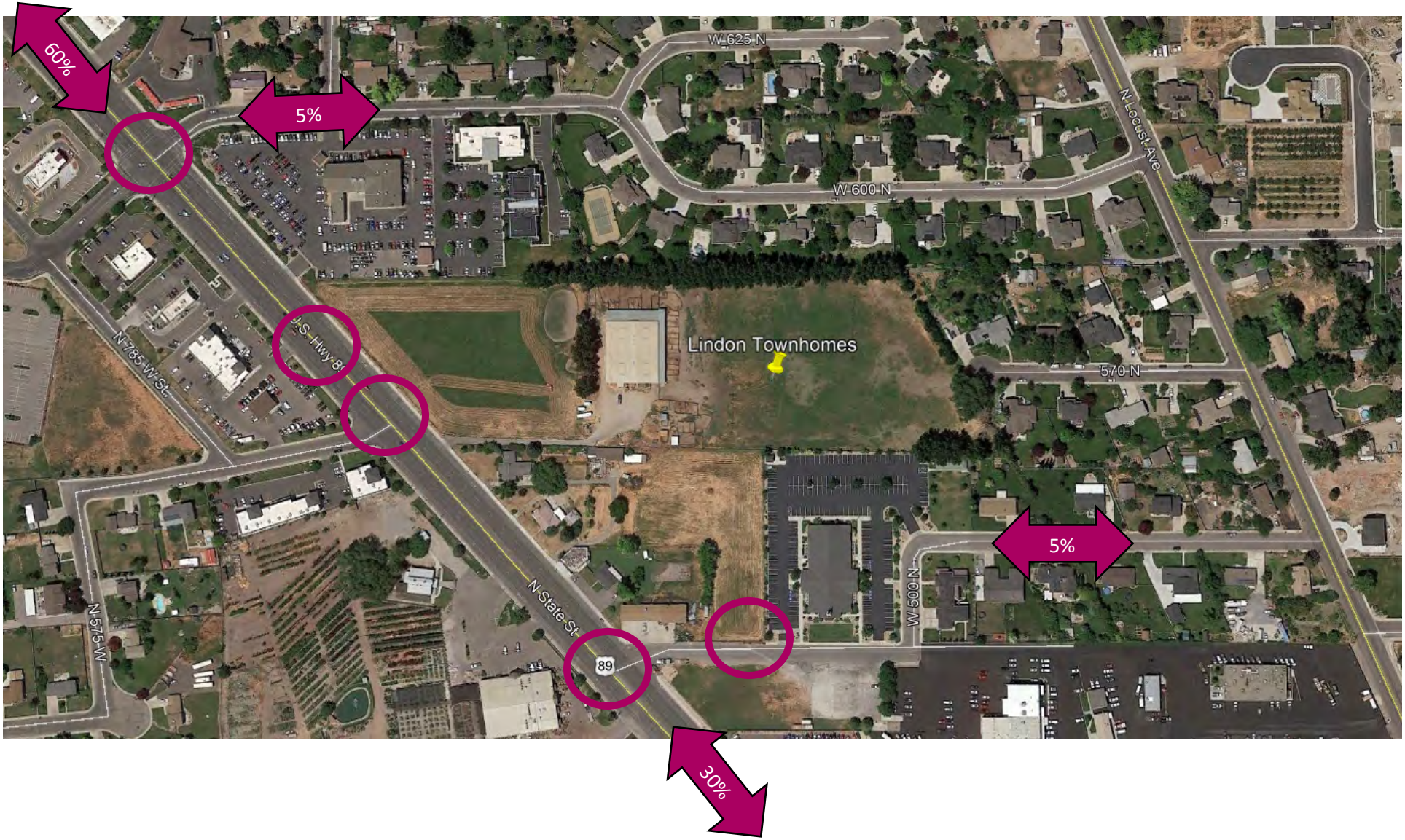
CONCEPTUAL SITE PLAN

12.10.2020

N

0 10 20 50

SCALE: 1"=50'



Updated study intersection locations

APPENDIX C – LOS Descriptions

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	$\leq$10.0
B	> 10.0 and $\leq$20.0
C	> 20.0 and $\leq$ 35.0
D	> 35.0 and $\leq$ 55.0
E	> 55.0 and $\leq$ 80.0
F	>80.0

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Table 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

APPENDIX D – Traffic Counts

L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 1

Groups Printed- General Traffic - Turns

	SH-89 (State Street) From Northwest					600 North From East					SH-89 (State Street) From Southeast					600 North From Southwest					
Start Time	Right	Thru	Bear Left	Peds	App. Total	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Thru	Left	Peds	App. Total	Right	Bear Right	Left	Peds	App. Total	Int. Total
07:00 AM	3	126	1	0	130	3	0	1	0	4	1	114	6	0	121	4	0	2	0	6	261
07:15 AM	1	180	6	0	187	0	0	4	0	4	2	166	2	0	170	4	3	3	0	10	371
07:30 AM	1	229	5	0	235	4	1	3	1	9	5	164	6	0	175	1	1	6	0	8	427
07:45 AM	2	272	10	0	284	5	2	3	0	10	5	269	13	0	287	6	0	4	0	10	591
Total	7	807	22	0	836	12	3	11	1	27	13	713	27	0	753	15	4	15	0	34	1650
08:00 AM	8	259	14	1	282	4	2	3	0	9	8	220	14	0	242	7	0	1	1	9	542
08:15 AM	4	196	7	0	207	3	2	4	0	9	4	200	9	0	213	9	0	4	0	13	442
08:30 AM	5	236	4	0	245	4	2	4	0	10	8	194	9	0	211	4	2	5	1	12	478
08:45 AM	7	309	9	0	325	3	1	5	0	9	2	223	9	0	234	10	0	2	0	12	580
Total	24	1000	34	1	1059	14	7	16	0	37	22	837	41	0	900	30	2	12	2	46	2042

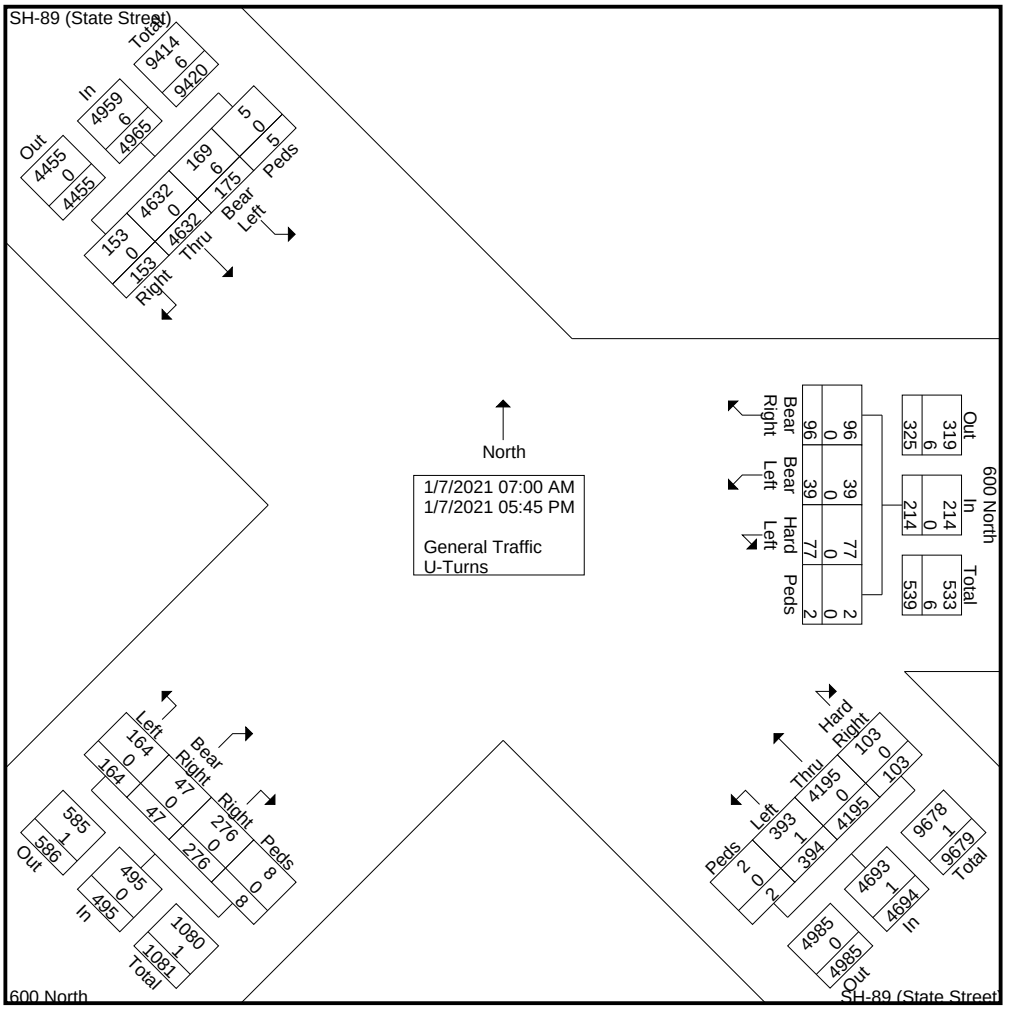
04:00 PM	16	333	15	1	365	3	1	6	0	10	8	273	40	0	321	25	6	12	0	43	739
04:15 PM	13	316	23	2	354	9	3	2	0	14	11	337	37	1	386	26	1	15	2	44	798
04:30 PM	13	326	20	1	360	10	4	8	1	23	13	298	46	1	358	27	6	20	2	55	796
04:45 PM	15	387	16	0	418	15	6	6	0	27	8	352	34	0	394	32	8	10	0	50	889
Total	57	1362	74	4	1497	37	14	22	1	74	40	1260	157	2	1459	110	21	57	4	192	3222
05:00 PM	19	377	18	0	414	15	2	12	0	29	9	362	43	0	414	37	7	12	0	56	913
05:15 PM	19	425	13	0	457	8	3	5	0	16	7	341	48	0	396	22	4	26	1	53	922
05:30 PM	14	320	6	0	340	6	4	6	0	16	7	361	28	0	396	29	7	20	0	56	808
05:45 PM	13	341	8	0	362	4	6	5	0	15	5	321	50	0	376	33	2	22	1	58	811
Total	65	1463	45	0	1573	33	15	28	0	76	28	1385	169	0	1582	121	20	80	2	223	3454
Grand Total	153	4632	175	5	4965	96	39	77	2	214	103	4195	394	2	4694	276	47	164	8	495	10368
Apprch %	3.1	93.3	3.5	0.1		44.9	18.2	36	0.9		2.2	89.4	8.4	0		55.8	9.5	33.1	1.6		
Total %	1.5	44.7	1.7	0	47.9	0.9	0.4	0.7	0	2.1	1	40.5	3.8	0	45.3	2.7	0.5	1.6	0.1	4.8	
General Traffic	153	4632	169	5	4959	96	39	77	2	214	103	4195	393	2	4693	276	47	164	8	495	10361
% General Traffic	100	100	96.6	100	99.9	100	100	100	100	100	100	100	99.7	100	100	100	100	100	100	100	99.9
U-Turns	0	0	6	0	6	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	7
% U-Turns	0	0	3.4	0	0.1	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0.1

L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 2



L2 Data Collection

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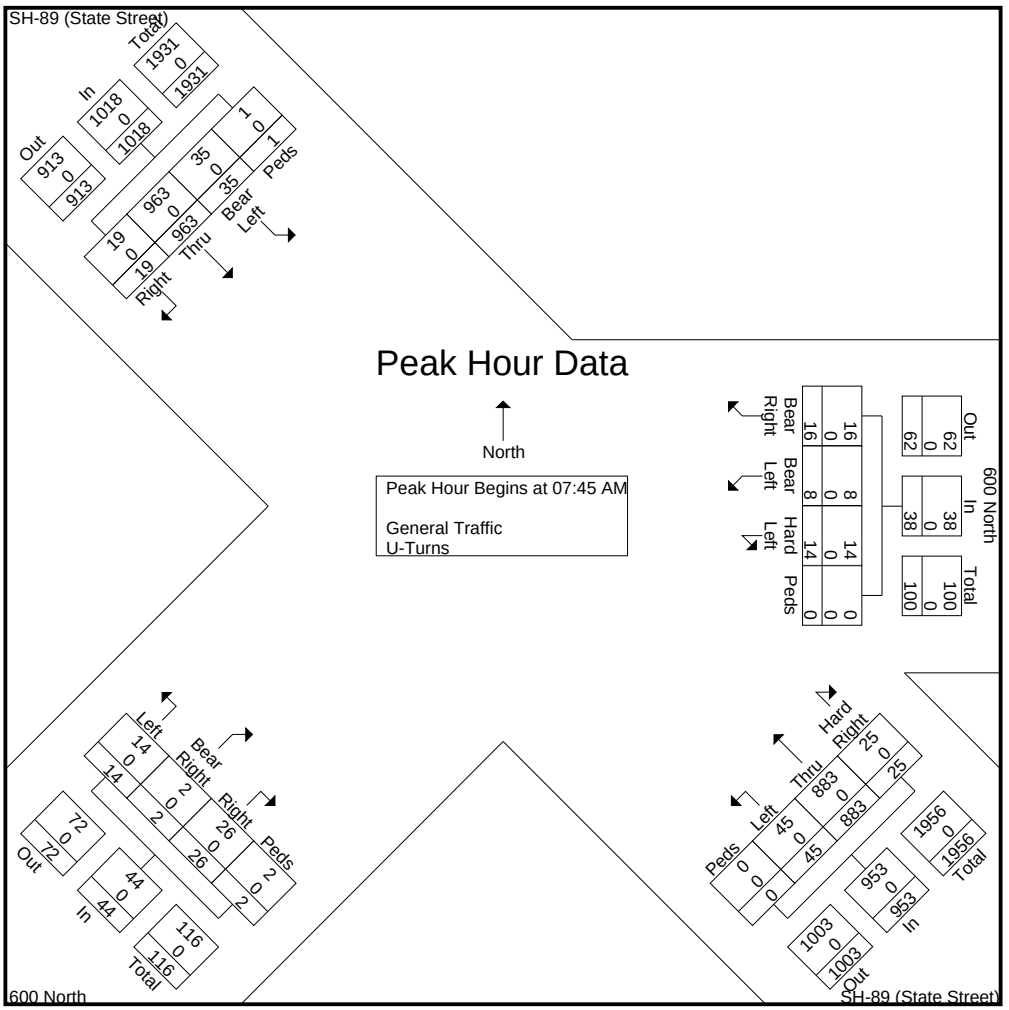
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 3

	SH-89 (State Street) From Northwest					600 North From East					SH-89 (State Street) From Southeast					600 North From Southwest					
Start Time	Right	Thru	Bear Left	Peds	App. Total	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Thru	Left	Peds	App. Total	Right	Bear Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	**272**	10	0	**284**	**5**	**2**	3	0	**10**	5	**269**	13	0	**287**	6	0	4	0	10	**591**
08:00 AM	**8**	259	**14**	**1**	282	4	2	3	0	9	**8**	220	**14**	0	242	7	0	1	**1**	9	542
08:15 AM	4	196	7	0	207	3	2	**4**	0	9	4	200	9	0	213	**9**	0	4	0	**13**	442
08:30 AM	5	236	4	0	245	4	2	4	0	10	8	194	9	0	211	4	**2**	**5**	1	12	478
Total Volume	19	963	35	1	1018	16	8	14	0	38	25	883	45	0	953	26	2	14	2	44	2053
% App. Total	1.9	94.6	3.4	0.1		42.1	21.1	36.8	0		2.6	92.7	4.7	0		59.1	4.5	31.8	4.5		
PHF	.594	.885	.625	.250	.896	.800	1.00	.875	.000	.950	.781	.821	.804	.000	.830	.722	.250	.700	.500	.846	.868
General Traffic	19	963	35	1	1018	16	8	14	0	38	25	883	45	0	953	26	2	14	2	44	2053
% General Traffic	100	100	100	100	100	100	100	100	0	100	100	100	100	0	100	100	100	100	100	100	100
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



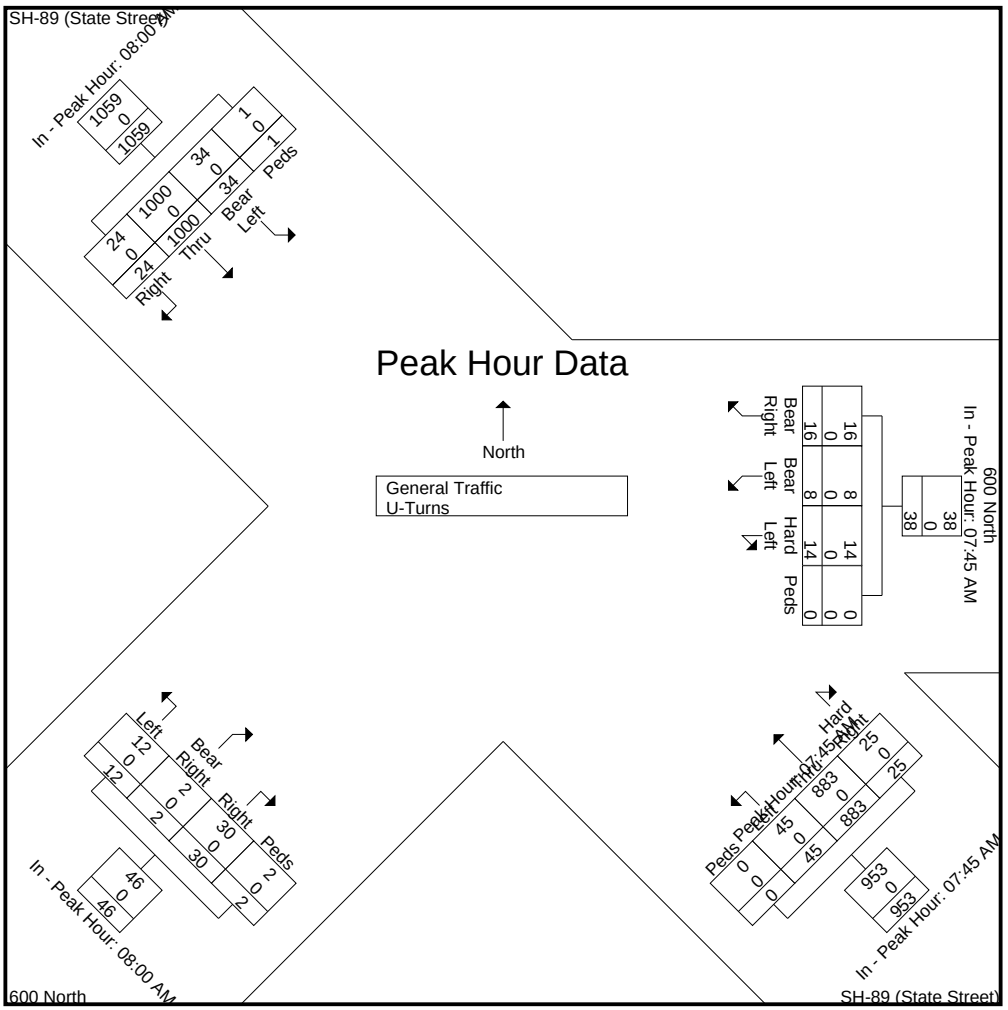
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 4

	SH-89 (State Street) From Northwest					600 North From East					SH-89 (State Street) From Southeast					600 North From Southwest					
Start Time	Right	Thru	Bear Left	Peds	App. Total	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Thru	Left	Peds	App. Total	Right	Bear Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	08:00 AM					07:45 AM					07:45 AM					08:00 AM					
+0 mins.	**8**	259	**14**	**1**	282	**5**	**2**	3	0	**10**	5	**269**	13	0	**287**	7	0	1	**1**	9	
+15 mins.	4	196	7	0	207	4	2	3	0	9	**8**	220	**14**	0	242	9	0	4	0	**13**	
+30 mins.	5	236	4	0	245	3	2	**4**	0	9	4	200	9	0	213	4	**2**	**5**	1	12	
+45 mins.	7	**309**	9	0	**325**	4	2	4	0	10	8	194	9	0	211	**10**	0	2	0	12	
Total Volume	24	1000	34	1	1059	16	8	14	0	38	25	883	45	0	953	30	2	12	2	46	
% App. Total	2.3	94.4	3.2	0.1		42.1	21.1	36.8	0		2.6	92.7	4.7	0		65.2	4.3	26.1	4.3		
PHF	.750	.809	.607	.250	.815	.800	1.000	.875	.000	.950	.781	.821	.804	.000	.830	.750	.250	.600	.500	.885	
General Traffic	24	1000	34	1	1059	16	8	14	0	38	25	883	45	0	953	30	2	12	2	46	
% General Traffic	100	100	100	100	100	100	100	100	0	100	100	100	100	0	100	100	100	100	100	100	
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



L2 Data Collection

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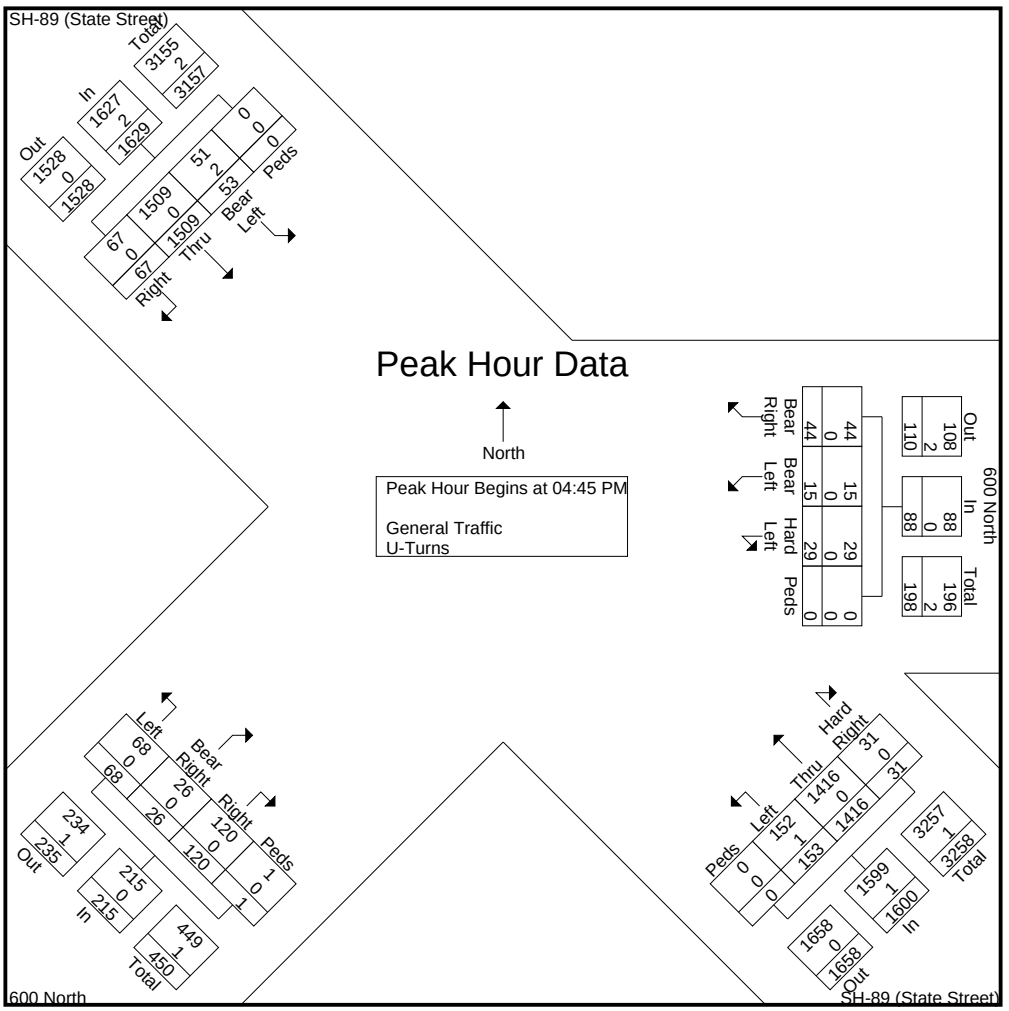
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 5

	SH-89 (State Street) From Northwest					600 North From East					SH-89 (State Street) From Southeast					600 North From Southwest					
Start Time	Right	Thru	Bear Left	Peds	App. Total	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Thru	Left	Peds	App. Total	Right	Bear Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	15	387	16	0	418	**15**	**6**	6	0	27	8	352	34	0	394	32	**8**	10	0	50	889
05:00 PM	**19**	377	**18**	0	414	15	2	**12**	0	**29**	**9**	**362**	43	0	**414**	**37**	7	12	0	**56**	913
05:15 PM	19	**425**	13	0	**457**	8	3	5	0	16	7	341	**48**	0	396	22	4	**26**	**1**	53	**922**
05:30 PM	14	320	6	0	340	6	4	6	0	16	7	361	28	0	396	29	7	20	0	56	808
Total Volume	67	1509	53	0	1629	44	15	29	0	88	31	1416	153	0	1600	120	26	68	1	215	3532
% App. Total	4.1	92.6	3.3	0		50	17	33	0		1.9	88.5	9.6	0		55.8	12.1	31.6	0.5		
PHF	.882	.888	.736	.000	.891	.733	.625	.604	.000	.759	.861	.978	.797	.000	.966	.811	.813	.654	.250	.960	.958
General Traffic	67	1509	51	0	1627	44	15	29	0	88	31	1416	152	0	1599	120	26	68	1	215	3529
% General Traffic	100	100	96.2	0	99.9	100	100	100	0	100	100	100	99.3	0	99.9	100	100	100	100	100	99.9
U-Turns	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
% U-Turns	0	0	3.8	0	0.1	0	0	0	0	0	0	0	0.7	0	0.1	0	0	0	0	0	0.1



L2 Data Collection

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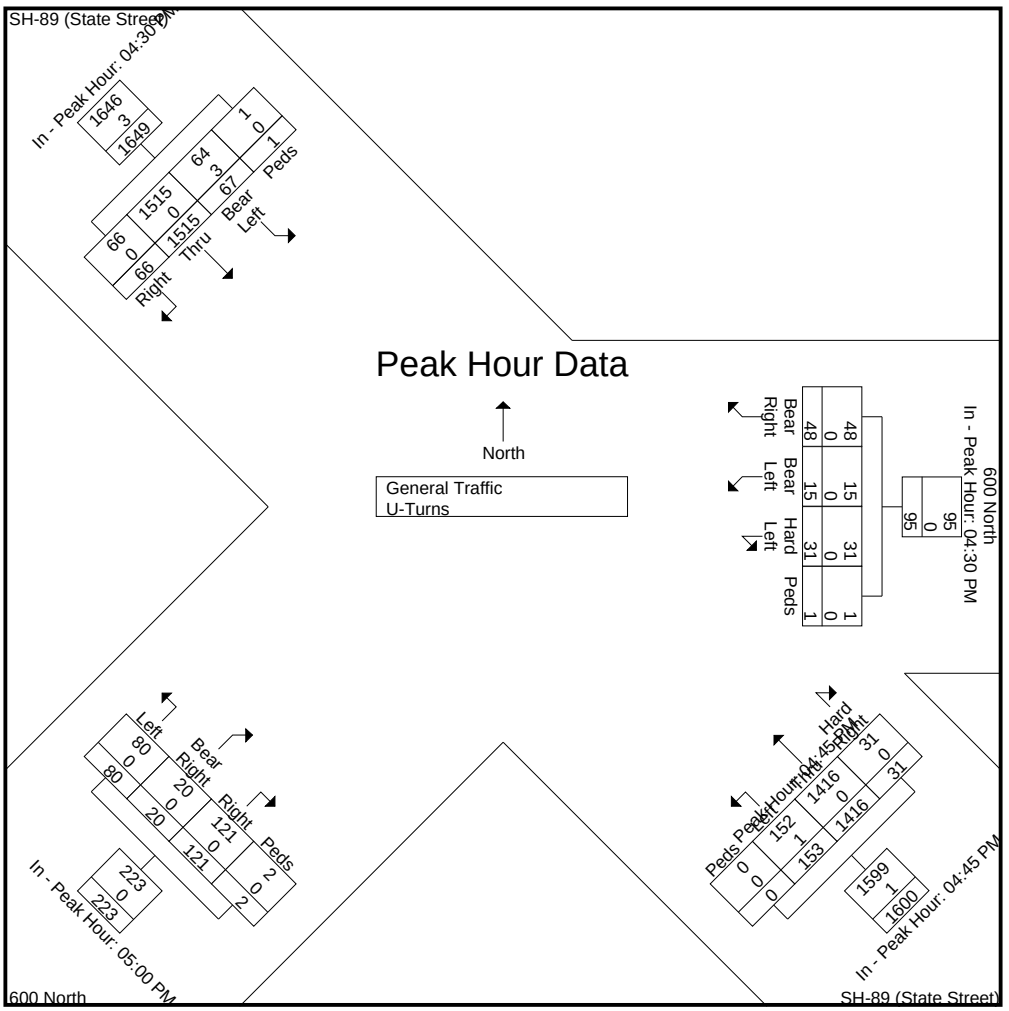
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 6

	SH-89 (State Street) From Northwest					600 North From East					SH-89 (State Street) From Southeast					600 North From Southwest					
Start Time	Right	Thru	Bear Left	Peds	App. Total	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Thru	Left	Peds	App. Total	Right	Bear Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:30 PM					04:30 PM					04:45 PM					05:00 PM					
+0 mins.	13	326	**20**	**1**	360	10	4	8	**1**	23	8	352	34	0	394	**37**	**7**	12	0	56	
+15 mins.	15	387	16	0	418	**15**	**6**	6	0	27	**9**	**362**	43	0	**414**	22	4	**26**	**1**	53	
+30 mins.	**19**	377	18	0	414	15	2	**12**	0	**29**	7	341	**48**	0	396	29	7	20	0	56	
+45 mins.	19	**425**	13	0	**457**	8	3	5	0	16	7	361	28	0	396	33	2	22	1	**58**	
Total Volume	66	1515	67	1	1649	48	15	31	1	95	31	1416	153	0	1600	121	20	80	2	223	
% App. Total	4	91.9	4.1	0.1		50.5	15.8	32.6	1.1		1.9	88.5	9.6	0		54.3	9	35.9	0.9		
PHF	.868	.891	.838	.250	.902	.800	.625	.646	.250	.819	.861	.978	.797	.000	.966	.818	.714	.769	.500	.961	
General Traffic	66	1515	64	1	1646	48	15	31	1	95	31	1416	152	0	1599	121	20	80	2	223	
% General Traffic	100	100	95.5	100	99.8	100	100	100	100	100	100	100	99.3	0	99.9	100	100	100	100	100	
U-Turns	0	0	3	0	3	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	
% U-Turns	0	0	4.5	0	0.2	0	0	0	0	0	0	0	0.7	0	0.1	0	0	0	0	0	



L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 600 North
City, State: Lindon, Utah
Control: Signalized

File Name : SH-89 (State St) & 600 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 7

Image 1

L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 1

Groups Printed- General Traffic - Turns

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				575 North From West				
Start Time	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
07:00 AM	0	130	0	130	118	0	0	118	2	6	0	8	256
07:15 AM	1	188	0	189	159	2	0	161	6	8	0	14	364
07:30 AM	4	223	0	227	171	4	0	175	9	5	0	14	416
07:45 AM	5	283	0	288	300	9	0	309	11	0	1	12	609
Total	10	824	0	834	748	15	0	763	28	19	1	48	1645
08:00 AM	5	260	0	265	228	16	0	244	2	1	0	3	512
08:15 AM	3	210	0	213	215	3	0	218	4	3	0	7	438
08:30 AM	7	239	0	246	211	4	0	215	8	2	1	11	472
08:45 AM	4	322	0	326	238	4	0	242	5	1	0	6	574
Total	19	1031	0	1050	892	27	0	919	19	7	1	27	1996

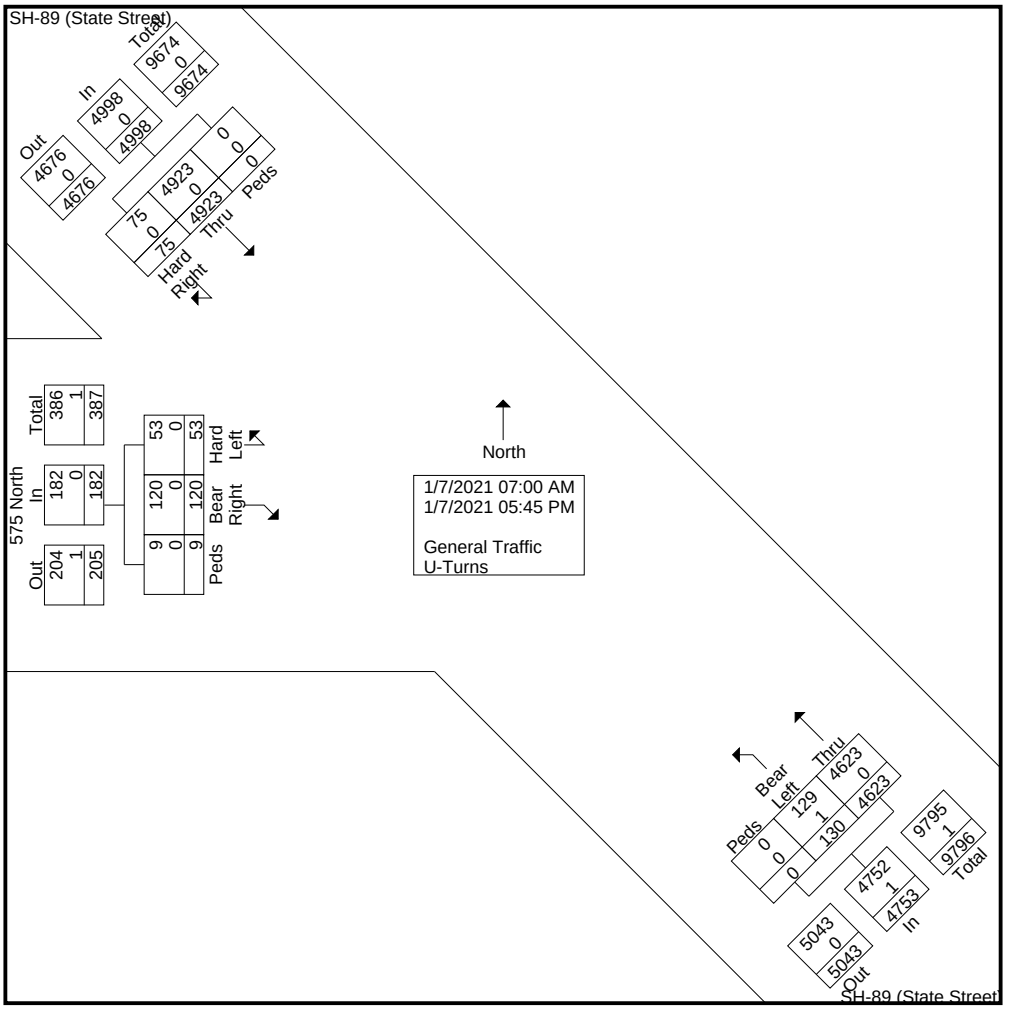
04:00 PM	7	346	0	353	311	13	0	324	10	4	0	14	691
04:15 PM	7	356	0	363	388	11	0	399	7	1	2	10	772
04:30 PM	4	359	0	363	352	11	0	363	9	5	1	15	741
04:45 PM	7	425	0	432	376	14	0	390	5	3	2	10	832
Total	25	1486	0	1511	1427	49	0	1476	31	13	5	49	3036
05:00 PM	10	411	0	421	397	13	0	410	15	1	2	18	849
05:15 PM	2	434	0	436	386	9	0	395	18	5	0	23	854
05:30 PM	6	360	0	366	398	11	0	409	8	6	0	14	789
05:45 PM	3	377	0	380	375	6	0	381	1	2	0	3	764
Total	21	1582	0	1603	1556	39	0	1595	42	14	2	58	3256
Grand Total	75	4923	0	4998	4623	130	0	4753	120	53	9	182	9933
Apprch %	1.5	98.5	0		97.3	2.7	0		65.9	29.1	4.9		
Total %	0.8	49.6	0	50.3	46.5	1.3	0	47.9	1.2	0.5	0.1	1.8	
General Traffic	75	4923	0	4998	4623	129	0	4752	120	53	9	182	9932
% General Traffic	100	100	0	100	100	99.2	0	100	100	100	100	100	100
U-Turns	0	0	0	0	0	1	0	1	0	0	0	0	1
% U-Turns	0	0	0	0	0	0.8	0	0	0	0	0	0	0

L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 2



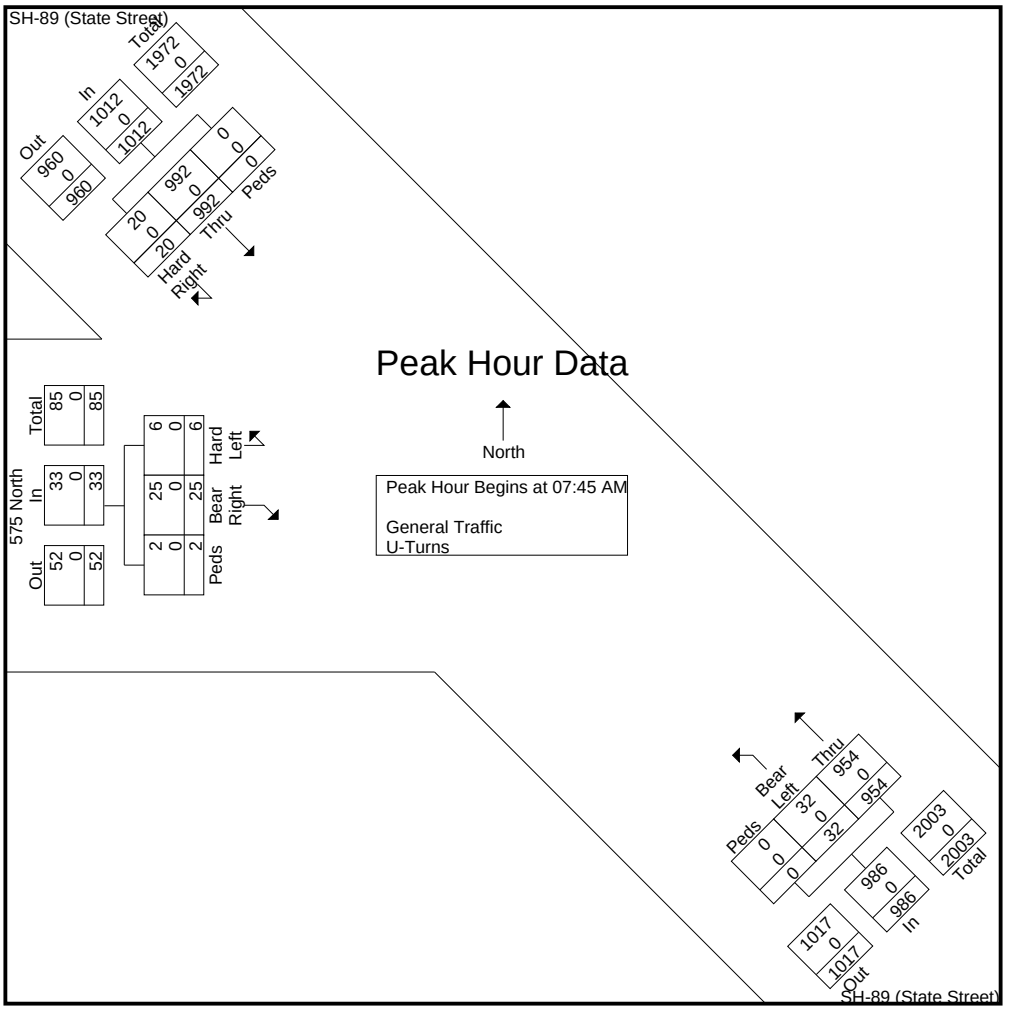
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 3

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				575 North From West				
Start Time	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	5	**283**	0	**288**	**300**	9	0	**309**	**11**	0	**1**	**12**	**609**
08:00 AM	5	260	0	265	228	**16**	0	244	2	1	0	3	512
08:15 AM	3	210	0	213	215	3	0	218	4	**3**	0	7	438
08:30 AM	**7**	239	0	246	211	4	0	215	8	2	1	11	472
Total Volume	20	992	0	1012	954	32	0	986	25	6	2	33	2031
% App. Total	2	98	0		96.8	3.2	0		75.8	18.2	6.1		
PHF	.714	.876	.000	.878	.795	.500	.000	.798	.568	.500	.500	.688	.834
General Traffic	20	992	0	1012	954	32	0	986	25	6	2	33	2031
% General Traffic	100	100	0	100	100	100	0	100	100	100	100	100	100
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0



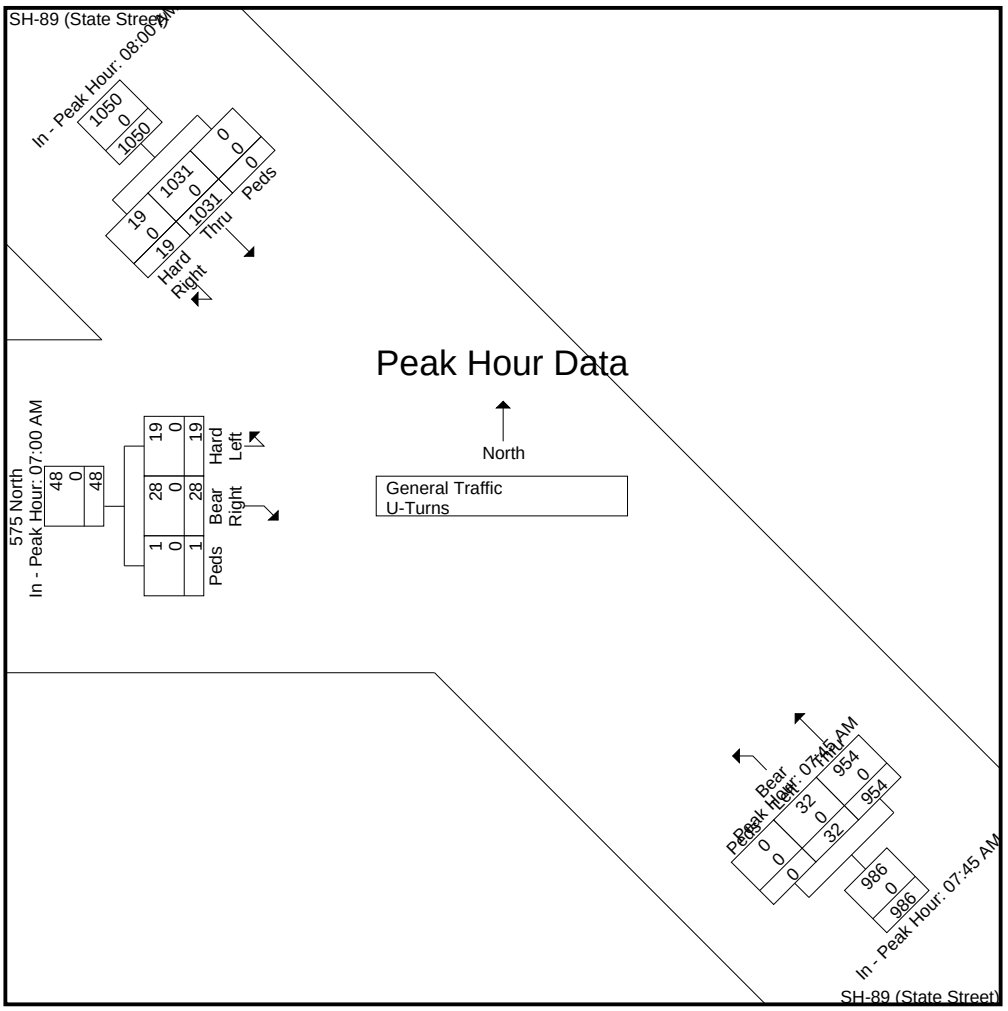
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 4

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				575 North From West				
Start Time	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	08:00 AM				07:45 AM				07:00 AM				
+0 mins.	5	260	0	265	**300**	9	0	**309**	2	6	0	8	
+15 mins.	3	210	0	213	228	**16**	0	244	6	**8**	0	**14**	
+30 mins.	**7**	239	0	246	215	3	0	218	9	5	0	14	
+45 mins.	4	**322**	0	**326**	211	4	0	215	**11**	0	**1**	12	
Total Volume	19	1031	0	1050	954	32	0	986	28	19	1	48	
% App. Total	1.8	98.2	0		96.8	3.2	0		58.3	39.6	2.1		
PHF	.679	.800	.000	.805	.795	.500	.000	.798	.636	.594	.250	.857	
General Traffic	19	1031	0	1050	954	32	0	986	28	19	1	48	
% General Traffic	100	100	0	100	100	100	0	100	100	100	100	100	
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	



L2 Data Collection

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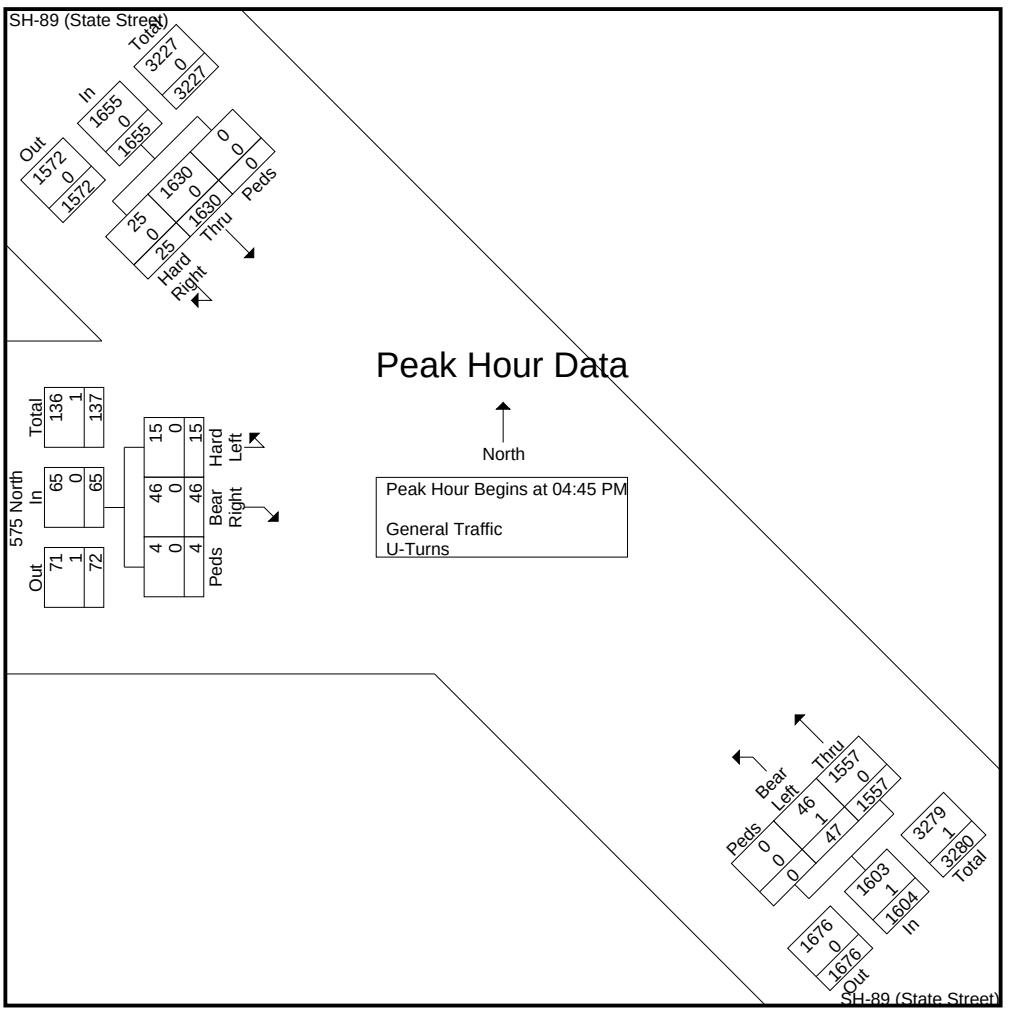
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 5

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				575 North From West				
Start Time	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	7	425	0	432	376	**14**	0	390	5	3	**2**	10	832
05:00 PM	**10**	411	0	421	397	13	0	**410**	15	1	2	18	849
05:15 PM	2	**434**	0	**436**	386	9	0	395	**18**	5	0	**23**	**854**
05:30 PM	6	360	0	366	**398**	11	0	409	8	**6**	0	14	789
Total Volume	25	1630	0	1655	1557	47	0	1604	46	15	4	65	3324
% App. Total	1.5	98.5	0		97.1	2.9	0		70.8	23.1	6.2		
PHF	.625	.939	.000	.949	.978	.839	.000	.978	.639	.625	.500	.707	.973
General Traffic	25	1630	0	1655	1557	46	0	1603	46	15	4	65	3323
% General Traffic	100	100	0	100	100	97.9	0	99.9	100	100	100	100	100.0
U-Turns	0	0	0	0	0	1	0	1	0	0	0	0	1
% U-Turns	0	0	0	0	0	2.1	0	0.1	0	0	0	0	0.0



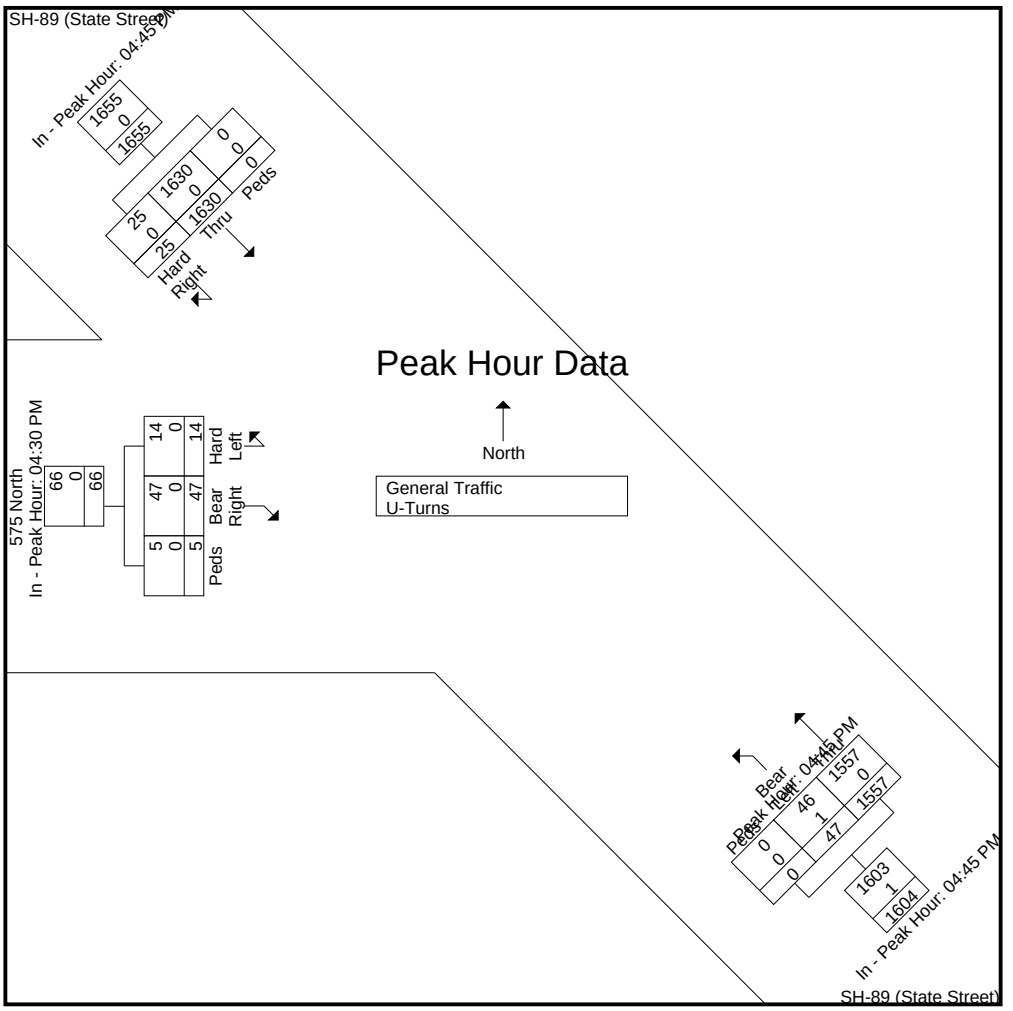
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 6

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				575 North From West				
Start Time	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	04:45 PM				04:45 PM				04:30 PM				
+0 mins.	7	425	0	432	376	**14**	0	390	9	**5**	1	15	
+15 mins.	**10**	411	0	421	397	13	0	**410**	5	3	**2**	10	
+30 mins.	2	**434**	0	**436**	386	9	0	395	15	1	2	18	
+45 mins.	6	360	0	366	**398**	11	0	409	**18**	5	0	**23**	
Total Volume	25	1630	0	1655	1557	47	0	1604	47	14	5	66	
% App. Total	1.5	98.5	0		97.1	2.9	0		71.2	21.2	7.6		
PHF	.625	.939	.000	.949	.978	.839	.000	.978	.653	.700	.625	.717	
General Traffic	25	1630	0	1655	1557	46	0	1603	47	14	5	66	
% General Traffic	100	100	0	100	100	97.9	0	99.9	100	100	100	100	
U-Turns	0	0	0	0	0	1	0	1	0	0	0	0	
% U-Turns	0	0	0	0	0	2.1	0	0.1	0	0	0	0	



L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 575 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 575 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 7

Image 1

L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 1

Groups Printed- General Traffic - Turns

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				500 North From East				
Start Time	Thru	Bear Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Bear Right	Hard Left	Peds	App. Total	Int. Total
07:00 AM	124	4	0	128	1	115	0	116	1	0	0	1	245
07:15 AM	179	2	0	181	3	150	0	153	11	2	1	14	348
07:30 AM	228	6	0	234	0	171	0	171	3	1	0	4	409
07:45 AM	284	6	0	290	3	287	0	290	8	2	0	10	590
Total	815	18	0	833	7	723	0	730	23	5	1	29	1592
08:00 AM	256	4	0	260	2	235	0	237	4	2	0	6	503
08:15 AM	222	1	0	223	1	204	0	205	7	1	0	8	436
08:30 AM	232	1	0	233	1	209	0	210	4	3	0	7	450
08:45 AM	331	3	0	334	1	244	0	245	5	0	0	5	584
Total	1041	9	0	1050	5	892	0	897	20	6	0	26	1973

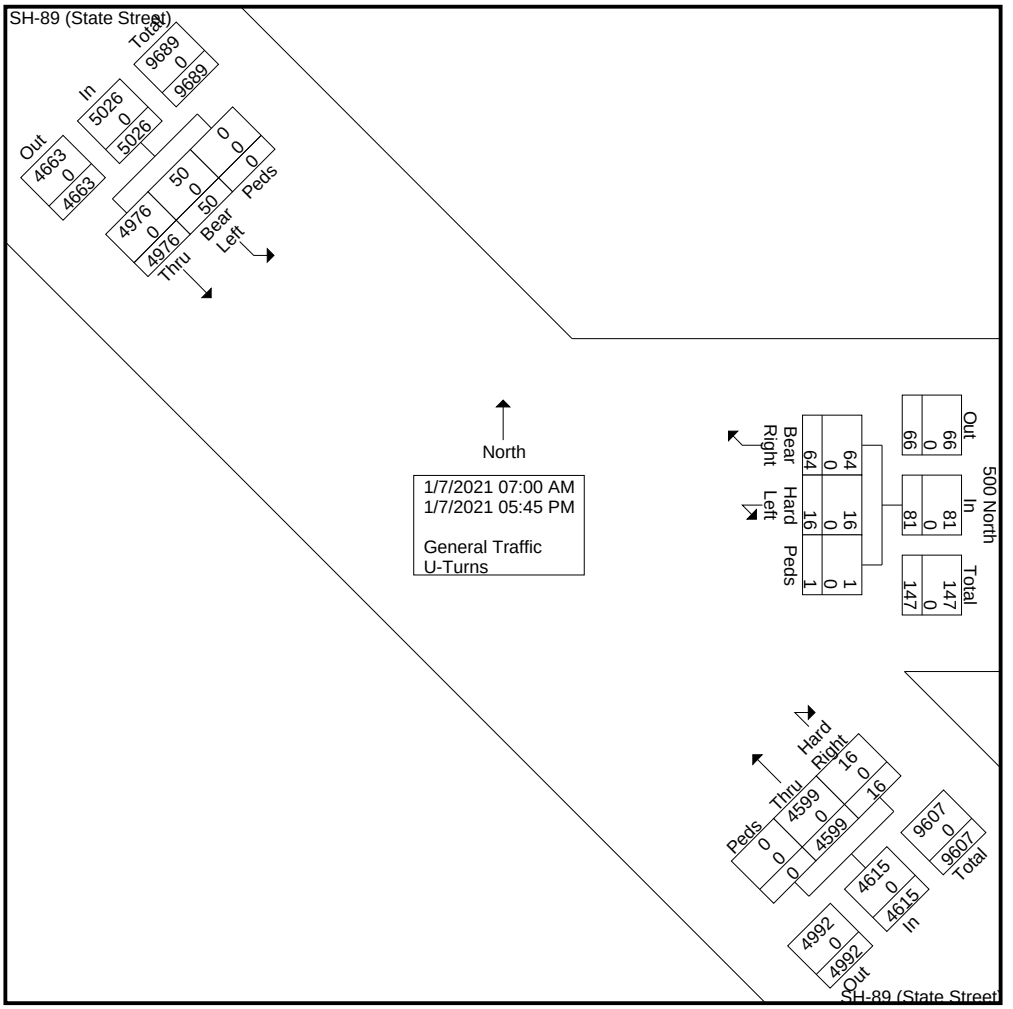
04:00 PM	357	2	0	359	2	298	0	300	6	3	0	9	668
04:15 PM	360	1	0	361	0	380	0	380	4	0	0	4	745
04:30 PM	378	3	0	381	0	368	0	368	3	2	0	5	754
04:45 PM	421	2	0	423	0	385	0	385	3	0	0	3	811
Total	1516	8	0	1524	2	1431	0	1433	16	5	0	21	2978
05:00 PM	432	4	0	436	0	397	0	397	0	0	0	0	833
05:15 PM	433	6	0	439	1	398	0	399	1	0	0	1	839
05:30 PM	370	4	0	374	0	386	0	386	2	0	0	2	762
05:45 PM	369	1	0	370	1	372	0	373	2	0	0	2	745
Total	1604	15	0	1619	2	1553	0	1555	5	0	0	5	3179
Grand Total	4976	50	0	5026	16	4599	0	4615	64	16	1	81	9722
Apprch %	99	1	0		0.3	99.7	0		79	19.8	1.2		
Total %	51.2	0.5	0	51.7	0.2	47.3	0	47.5	0.7	0.2	0	0.8	
General Traffic	4976	50	0	5026	16	4599	0	4615	64	16	1	81	9722
% General Traffic	100	100	0	100	100	100	0	100	100	100	100	100	100
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0

L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 2



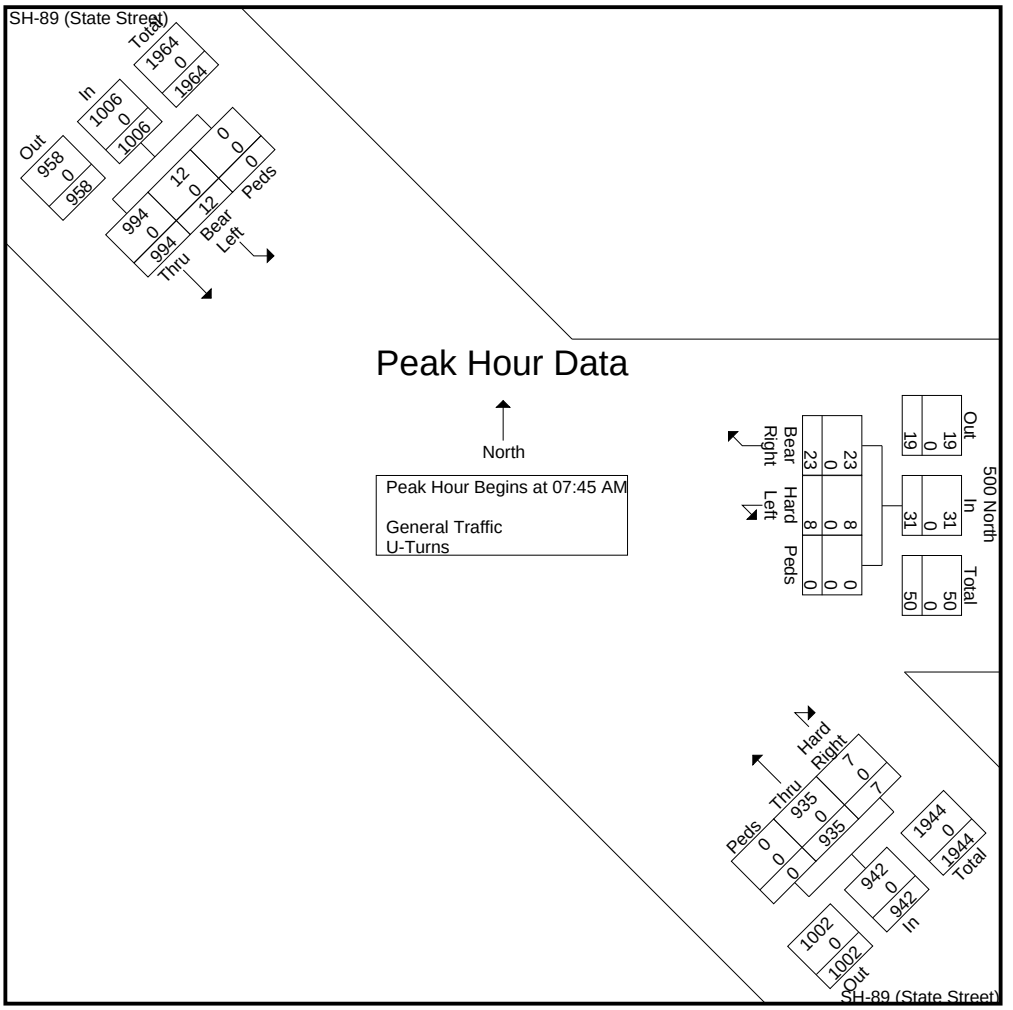
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 3

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				500 North From East				
Start Time	Thru	Bear Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Bear Right	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	**284**	**6**	0	**290**	**3**	**287**	0	**290**	**8**	2	0	**10**	**590**
08:00 AM	256	4	0	260	2	235	0	237	4	2	0	6	503
08:15 AM	222	1	0	223	1	204	0	205	7	1	0	8	436
08:30 AM	232	1	0	233	1	209	0	210	4	**3**	0	7	450
Total Volume	994	12	0	1006	7	935	0	942	23	8	0	31	1979
% App. Total	98.8	1.2	0		0.7	99.3	0		74.2	25.8	0		
PHF	.875	.500	.000	.867	.583	.814	.000	.812	.719	.667	.000	.775	.839
General Traffic	994	12	0	1006	7	935	0	942	23	8	0	31	1979
% General Traffic	100	100	0	100	100	100	0	100	100	100	0	100	100
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0



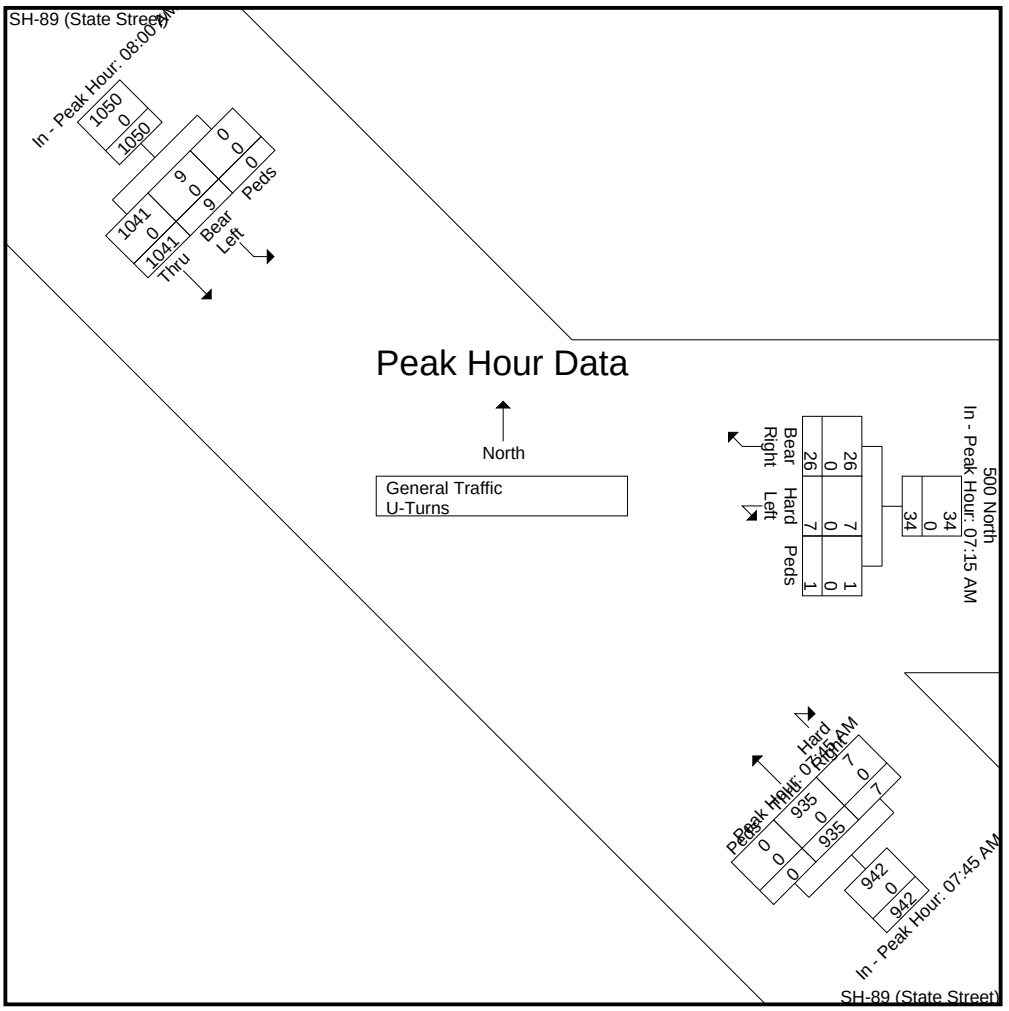
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 4

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				500 North From East				
Start Time	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	08:00 AM				07:45 AM				07:15 AM				
+0 mins.	256	**4**	0	260	**3**	**287**	0	**290**	**11**	**2**	**1**	**14**	
+15 mins.	222	1	0	223	2	235	0	237	3	1	0	4	
+30 mins.	232	1	0	233	1	204	0	205	8	2	0	10	
+45 mins.	**331**	3	0	**334**	1	209	0	210	4	2	0	6	
Total Volume	1041	9	0	1050	7	935	0	942	26	7	1	34	
% App. Total	99.1	0.9	0		0.7	99.3	0		76.5	20.6	2.9		
PHF	.786	.563	.000	.786	.583	.814	.000	.812	.591	.875	.250	.607	
General Traffic	1041	9	0	1050	7	935	0	942	26	7	1	34	
% General Traffic	100	100	0	100	100	100	0	100	100	100	100	100	
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	



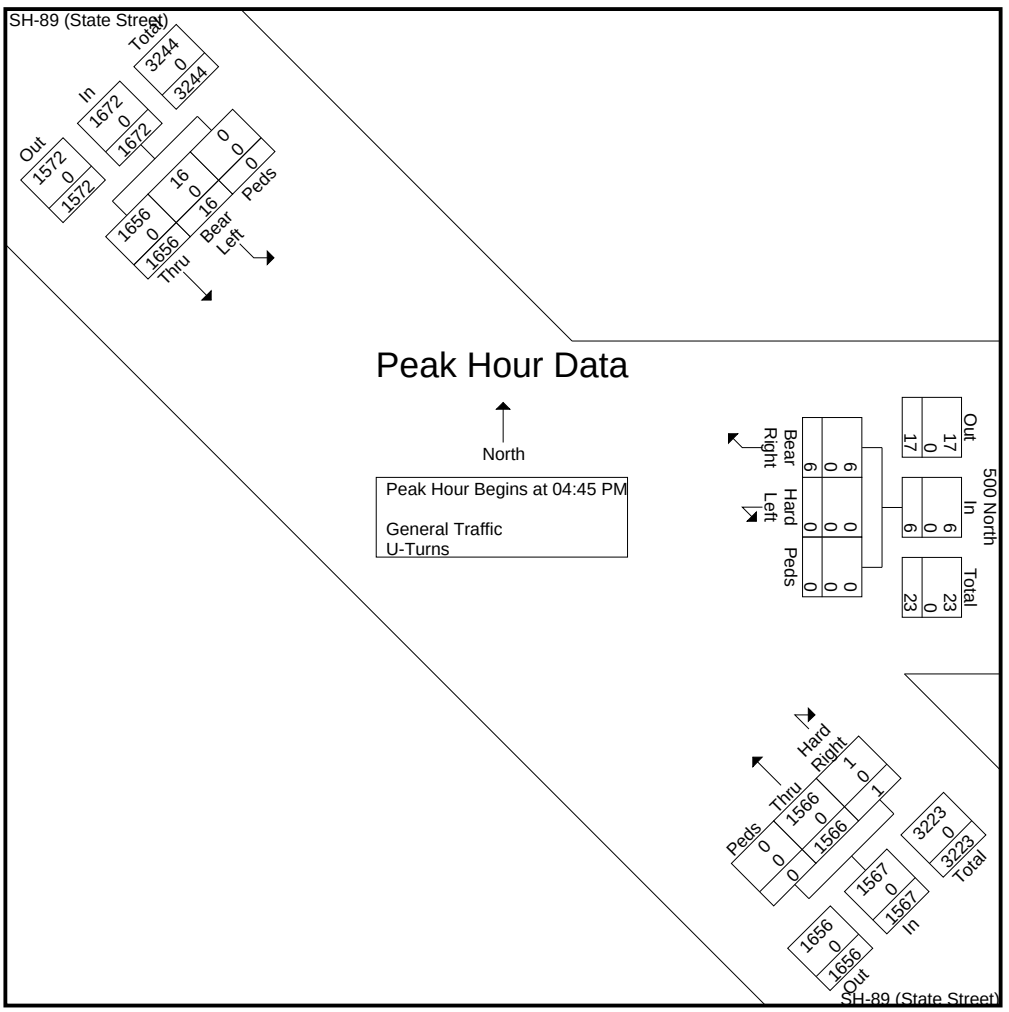
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 5

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				500 North From East				
Start Time	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	421	2	0	423	0	385	0	385	**3**	0	0	**3**	811
05:00 PM	432	4	0	436	0	397	0	397	0	0	0	0	833
05:15 PM	**433**	**6**	0	**439**	**1**	**398**	0	**399**	1	0	0	1	**839**
05:30 PM	370	4	0	374	0	386	0	386	2	0	0	2	762
Total Volume	1656	16	0	1672	1	1566	0	1567	6	0	0	6	3245
% App. Total	99	1	0		0.1	99.9	0		100	0	0		
PHF	.956	.667	.000	.952	.250	.984	.000	.982	.500	.000	.000	.500	.967
General Traffic	1656	16	0	1672	1	1566	0	1567	6	0	0	6	3245
% General Traffic	100	100	0	100	100	100	0	100	100	0	0	100	100
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	0



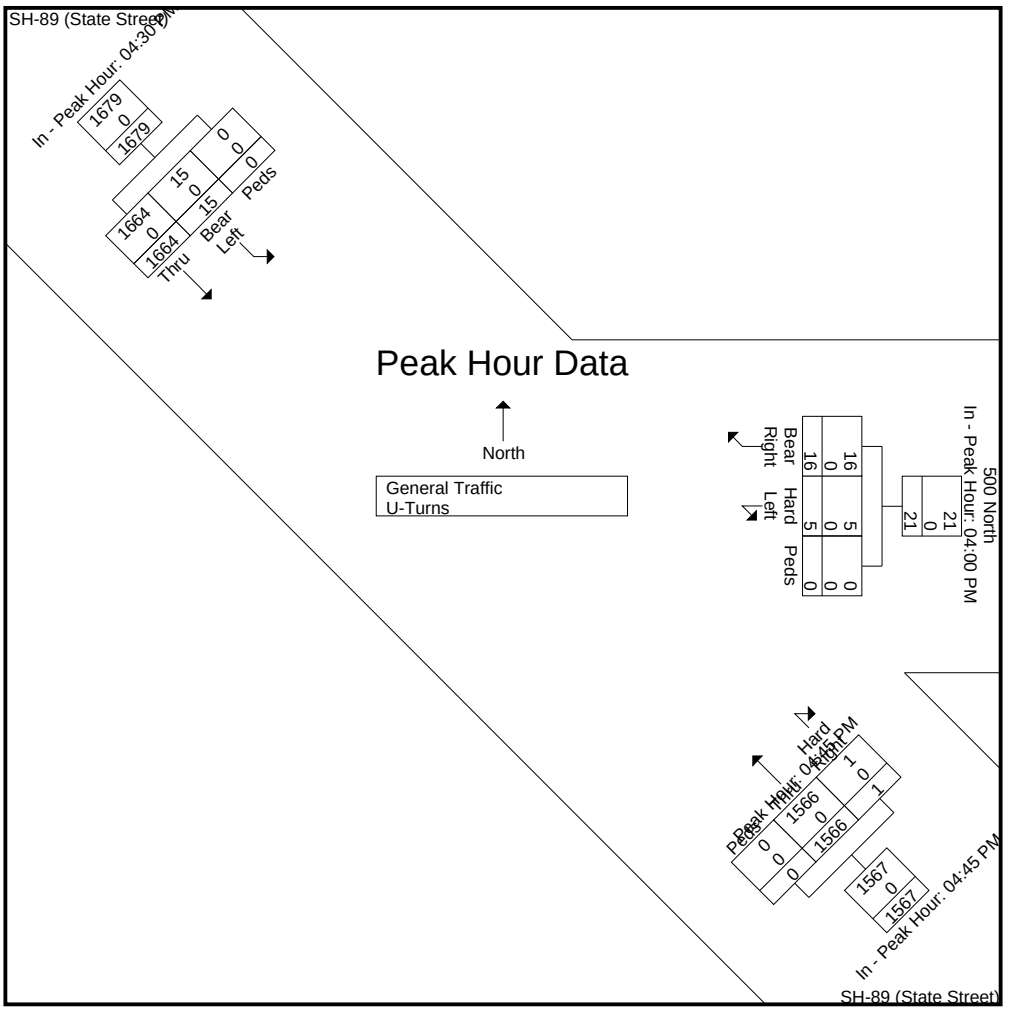
L2 Data Collection

L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 6

	SH-89 (State Street) From Northwest				SH-89 (State Street) From Southeast				500 North From East				
Start Time	**Thru**	**Bear Left**	**Peds**	**App. Total**	**Hard Right**	**Thru**	**Peds**	**App. Total**	**Bear Right**	**Hard Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	04:30 PM				04:45 PM				04:00 PM				
+0 mins.	378	3	0	381	0	385	0	385	**6**	**3**	0	**9**	
+15 mins.	421	2	0	423	0	397	0	397	4	0	0	4	
+30 mins.	432	4	0	436	**1**	**398**	0	**399**	3	2	0	5	
+45 mins.	**433**	**6**	0	**439**	0	386	0	386	3	0	0	3	
Total Volume	1664	15	0	1679	1	1566	0	1567	16	5	0	21	
% App. Total	99.1	0.9	0		0.1	99.9	0		76.2	23.8	0		
PHF	.961	.625	.000	.956	.250	.984	.000	.982	.667	.417	.000	.583	
General Traffic	1664	15	0	1679	1	1566	0	1567	16	5	0	21	
% General Traffic	100	100	0	100	100	100	0	100	100	100	0	100	
U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	
% U-Turns	0	0	0	0	0	0	0	0	0	0	0	0	



L2 Data Collection

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Idaho (208) 860-7554 Utah (801) 413-2993

Study: GALL0001
Intersection: SH-89 / 500 North
City, State: Lindon, Utah
Control: Stop Sign

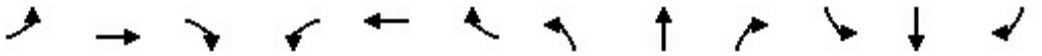
File Name : SH-89 (State St) & 500 N
Site Code : 00000000
Start Date : 1/7/2021
Page No : 7

Image 1

APPENDIX E – Existing Synchro Outputs

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	2	28	15	26	49	960	27	38	1047	21
v/c Ratio	0.06	0.01	0.09	0.06	0.10	0.10	0.33	0.03	0.07	0.36	0.02
Control Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.2	0.0	2.8	6.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.2	0.0	2.8	6.4	0.1
Queue Length 50th (ft)	3	0	0	3	2	0	24	0	1	27	0
Queue Length 95th (ft)	16	5	0	16	19	10	83	0	9	92	0
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	811	811	750	811	741	476	2890	946	509	2890	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.04	0.02	0.04	0.10	0.33	0.03	0.07	0.36	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	2	26	14	8	16	45	883	25	35	963	19
Future Volume (veh/h)	14	2	26	14	8	16	45	883	25	35	963	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	2	28	15	9	17	49	960	27	38	1047	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	136	116	258	42	80	564	2649	822	588	2649	822
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.11	0.52	0.52	0.11	0.52	0.52
Sat Flow, veh/h	1385	1870	1585	1380	579	1094	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	15	2	28	15	0	26	49	960	27	38	1047	21
Grp Sat Flow(s),veh/h/ln	1385	1870	1585	1380	0	1673	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	0.5	0.0	0.8	0.5	0.0	0.7	0.5	5.0	0.4	0.4	5.6	0.3
Cycle Q Clear(g_c), s	1.1	0.0	0.8	0.5	0.0	0.7	0.5	5.0	0.4	0.4	5.6	0.3
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	136	116	258	0	122	564	2649	822	588	2649	822
V/C Ratio(X)	0.06	0.01	0.24	0.06	0.00	0.21	0.09	0.36	0.03	0.06	0.40	0.03
Avail Cap(c_a), veh/h	689	743	630	706	0	665	564	2649	822	588	2649	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	19.5	19.8	19.7	0.0	19.8	3.6	6.5	5.3	3.5	6.6	5.3
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.1	0.0	0.9	0.3	0.4	0.1	0.2	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.3	0.1	0.0	0.3	0.1	1.3	0.1	0.1	1.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	19.5	20.9	19.8	0.0	20.6	3.9	6.8	5.4	3.7	7.0	5.4
LnGrp LOS	C	B	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		45			41			1036			1106	
Approach Delay, s/veh		20.7			20.3			6.7			6.9	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		7.8	9.5	28.0		7.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.4	7.0		3.1	2.5	7.6		2.7				
Green Ext Time (p_c), s	0.0	6.3		0.1	0.0	6.8		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		7.3	
HCM 6th LOS		A	

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	32	954	992	20
Future Vol, veh/h	6	25	32	954	992	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	27	35	1037	1078	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1574	550	1100	0	-	0
Stage 1	1089	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	158	410	350	-	-	-
Stage 1	213	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	142	410	350	-	-	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	192	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	350	-	170	410	-	-
HCM Lane V/C Ratio	0.099	-	0.038	0.066	-	-
HCM Control Delay (s)	16.4	-	27	14.4	-	-
HCM Lane LOS	C	-	D	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	986	0	0	1017
Future Vol, veh/h	0	0	986	0	0	1017
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1072	0	0	1105

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1514	536	0	-	1072	0
Stage 1	1072	-	-	-	-	-
Stage 2	442	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	169	419	-	0	361	-
Stage 1	218	-	-	0	-	-
Stage 2	562	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	169	419	-	-	361	-
Mov Cap-2 Maneuver	194	-	-	-	-	-
Stage 1	218	-	-	-	-	-
Stage 2	562	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	361	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	0	0	0	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	23	935	7	12	994
Future Vol, veh/h	8	23	935	7	12	994
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	25	1016	8	13	1080

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1478	512	0	0	1024	0
Stage 1	1020	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	177	434	-	-	381	-
Stage 1	235	-	-	-	-	-
Stage 2	552	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	171	434	-	-	381	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	533	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	206	434	381	-
HCM Lane V/C Ratio	-	-	0.042	0.058	0.034	-
HCM Control Delay (s)	-	-	23.2	13.8	14.8	-
HCM Lane LOS	-	-	C	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	19	31	0	0	0
Future Vol, veh/h	0	19	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	34	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	34	0	-	0	55	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1578	-	-	-	953	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1578	-	-	-	953	1039
Mov Cap-2 Maneuver	-	-	-	-	953	-
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	1002	-

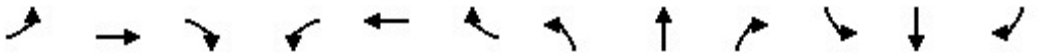
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1578	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	28	130	32	64	166	1539	34	58	1640	73
v/c Ratio	0.32	0.09	0.34	0.14	0.20	0.49	0.61	0.04	0.17	0.65	0.09
Control Delay	22.3	17.8	7.1	18.8	9.9	10.8	11.4	0.1	5.2	12.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	17.8	7.1	18.8	9.9	10.8	11.4	0.1	5.2	12.0	1.5
Queue Length 50th (ft)	20	7	0	8	4	14	115	0	5	127	0
Queue Length 95th (ft)	49	23	34	26	28	#50	186	0	17	203	11
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	503	703	678	519	653	339	2507	835	339	2507	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.19	0.06	0.10	0.49	0.61	0.04	0.17	0.65	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	26	120	29	15	44	153	1416	31	53	1509	67
Future Volume (veh/h)	68	26	120	29	15	44	153	1416	31	53	1509	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	28	130	32	16	48	166	1539	34	58	1640	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	259	220	302	57	171	398	2461	764	415	2461	764
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.48	0.48	0.10	0.48	0.48
Sat Flow, veh/h	1338	1870	1585	1228	412	1236	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	74	28	130	32	0	64	166	1539	34	58	1640	73
Grp Sat Flow(s),veh/h/ln	1338	1870	1585	1228	0	1648	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	2.6	0.6	3.8	1.1	0.0	1.7	2.1	10.9	0.6	0.7	12.0	1.2
Cycle Q Clear(g_c), s	4.3	0.6	3.8	1.8	0.0	1.7	2.1	10.9	0.6	0.7	12.0	1.2
Prop In Lane	1.00		1.00	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	259	220	302	0	228	398	2461	764	415	2461	764
V/C Ratio(X)	0.26	0.11	0.59	0.11	0.00	0.28	0.42	0.63	0.04	0.14	0.67	0.10
Avail Cap(c_a), veh/h	595	690	585	585	0	608	398	2461	764	415	2461	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	18.4	19.7	19.1	0.0	18.8	8.0	9.4	6.7	5.8	9.6	6.9
Incr Delay (d2), s/veh	0.5	0.2	2.5	0.2	0.0	0.7	3.2	1.2	0.1	0.7	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	1.4	0.3	0.0	0.6	0.9	3.3	0.2	0.2	3.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	18.5	22.2	19.3	0.0	19.5	11.2	10.6	6.8	6.5	11.1	7.1
LnGrp LOS	C	B	C	B	A	B	B	B	A	A	B	A
Approach Vol, veh/h		232			96			1739			1771	
Approach Delay, s/veh		21.5			19.4			10.6			10.8	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		11.3	9.5	28.0		11.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.7	12.9		6.3	4.1	14.0		3.8				
Green Ext Time (p_c), s	0.0	7.4		0.6	0.0	7.1		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		11.5	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	46	47	1557	1630	25
Future Vol, veh/h	15	46	47	1557	1630	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	50	51	1692	1772	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2565	900	1799	0	-	0
Stage 1	1786	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	46	242	158	-	-	-
Stage 1	78	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	31	242	158	-	-	-
Mov Cap-2 Maneuver	47	-	-	-	-	-
Stage 1	53	-	-	-	-	-
Stage 2	375	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	46.8	1.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	158	-	47	242	-	-
HCM Lane V/C Ratio	0.323	-	0.347	0.207	-	-
HCM Control Delay (s)	38.3	-	117.8	23.7	-	-
HCM Lane LOS	E	-	F	C	-	-
HCM 95th %tile Q(veh)	1.3	-	1.2	0.8	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1604	0	0	1676
Future Vol, veh/h	0	0	1604	0	0	1676
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1743	0	0	1822

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2472	872	0	-	1743	0
Stage 1	1743	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	52	252	-	0	169	-
Stage 1	83	-	-	0	-	-
Stage 2	398	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	52	252	-	-	169	-
Mov Cap-2 Maneuver	73	-	-	-	-	-
Stage 1	83	-	-	-	-	-
Stage 2	398	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	169	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	0	0	0	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	1566	1	16	1656
Future Vol, veh/h	0	6	1566	1	16	1656
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	1702	1	17	1800

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2457	852	0	0	1703	0
Stage 1	1703	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	53	260	-	-	177	-
Stage 1	88	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	48	260	-	-	177	-
Mov Cap-2 Maneuver	76	-	-	-	-	-
Stage 1	88	-	-	-	-	-
Stage 2	349	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.2	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	260	177	-
HCM Lane V/C Ratio	-	-	-	0.025	0.098	-
HCM Control Delay (s)	-	-	0	19.2	27.5	-
HCM Lane LOS	-	-	A	C	D	-
HCM 95th %tile Q(veh)	-	-	-	0.1	0.3	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	6	0	0	0
Future Vol, veh/h	0	17	6	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	7	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	7	0	-	0	25	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1614	-	-	-	991	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1614	-	-	-	991	1075
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1005	-

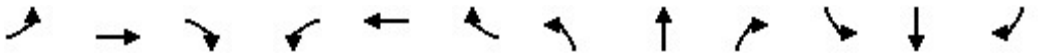
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1614	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

APPENDIX F - Background (without site development) Synchro Outputs

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	2	28	15	26	49	970	27	38	1058	21
v/c Ratio	0.06	0.01	0.09	0.06	0.10	0.10	0.34	0.03	0.08	0.37	0.02
Control Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.2	0.0	2.8	6.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.2	0.0	2.8	6.4	0.1
Queue Length 50th (ft)	3	0	0	3	2	0	24	0	1	27	0
Queue Length 95th (ft)	16	5	0	16	19	10	84	0	9	93	0
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	811	811	750	811	741	473	2890	946	504	2890	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.04	0.02	0.04	0.10	0.34	0.03	0.08	0.37	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	2	26	14	8	16	45	892	25	35	973	19
Future Volume (veh/h)	14	2	26	14	8	16	45	892	25	35	973	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	2	28	15	9	17	49	970	27	38	1058	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	136	116	258	42	80	561	2649	822	585	2649	822
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.11	0.52	0.52	0.11	0.52	0.52
Sat Flow, veh/h	1385	1870	1585	1380	579	1094	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	15	2	28	15	0	26	49	970	27	38	1058	21
Grp Sat Flow(s),veh/h/ln	1385	1870	1585	1380	0	1673	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	0.5	0.0	0.8	0.5	0.0	0.7	0.5	5.1	0.4	0.4	5.7	0.3
Cycle Q Clear(g_c), s	1.1	0.0	0.8	0.5	0.0	0.7	0.5	5.1	0.4	0.4	5.7	0.3
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	136	116	258	0	122	561	2649	822	585	2649	822
V/C Ratio(X)	0.06	0.01	0.24	0.06	0.00	0.21	0.09	0.37	0.03	0.06	0.40	0.03
Avail Cap(c_a), veh/h	689	743	630	706	0	665	561	2649	822	585	2649	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	19.5	19.8	19.7	0.0	19.8	3.6	6.5	5.3	3.5	6.6	5.3
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.1	0.0	0.9	0.3	0.4	0.1	0.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.3	0.1	0.0	0.3	0.1	1.4	0.1	0.1	1.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	19.5	20.9	19.8	0.0	20.6	3.9	6.9	5.4	3.7	7.1	5.4
LnGrp LOS	C	B	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		45			41			1046			1117	
Approach Delay, s/veh		20.7			20.3			6.7			6.9	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		7.8	9.5	28.0		7.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.4	7.1		3.1	2.5	7.7		2.7				
Green Ext Time (p_c), s	0.0	6.4		0.1	0.0	6.8		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		7.3	
HCM 6th LOS		A	

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	32	964	1002	20
Future Vol, veh/h	6	25	32	964	1002	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	27	35	1048	1089	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1589	556	1111	0	-	0
Stage 1	1100	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	155	406	346	-	-	-
Stage 1	210	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	139	406	346	-	-	-
Mov Cap-2 Maneuver	167	-	-	-	-	-
Stage 1	189	-	-	-	-	-
Stage 2	532	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	346	-	167	406	-	-
HCM Lane V/C Ratio	0.101	-	0.039	0.067	-	-
HCM Control Delay (s)	16.6	-	27.4	14.5	-	-
HCM Lane LOS	C	-	D	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	996	0	0	1027
Future Vol, veh/h	0	0	996	0	0	1027
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1083	0	0	1116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1529	542	0	-	1083	0
Stage 1	1083	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	166	415	-	0	357	-
Stage 1	215	-	-	0	-	-
Stage 2	560	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	166	415	-	-	357	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	215	-	-	-	-	-
Stage 2	560	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	357	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	0	0	0	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	23	944	7	12	1004
Future Vol, veh/h	8	23	944	7	12	1004
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	25	1026	8	13	1091

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1492	517	0	0	1034	0
Stage 1	1030	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	174	431	-	-	377	-
Stage 1	232	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	168	431	-	-	377	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	232	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	203	431	377	-
HCM Lane V/C Ratio	-	-	0.043	0.058	0.035	-
HCM Control Delay (s)	-	-	23.5	13.9	14.9	-
HCM Lane LOS	-	-	C	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	19	31	0	0	0
Future Vol, veh/h	0	19	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	34	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	34	0	-	0	55	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1578	-	-	-	953	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1578	-	-	-	953	1039
Mov Cap-2 Maneuver	-	-	-	-	953	-
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	1002	-

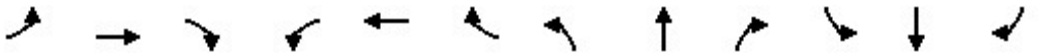
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1578	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	28	130	32	64	166	1554	34	58	1657	73
v/c Ratio	0.32	0.09	0.34	0.14	0.20	0.49	0.62	0.04	0.17	0.66	0.09
Control Delay	22.3	17.8	7.1	18.8	9.9	10.8	11.5	0.1	5.2	12.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	17.8	7.1	18.8	9.9	10.8	11.5	0.1	5.2	12.1	1.5
Queue Length 50th (ft)	20	7	0	8	4	14	117	0	5	128	0
Queue Length 95th (ft)	49	23	34	26	28	#50	188	0	17	206	11
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	503	703	678	519	653	339	2507	835	339	2507	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.19	0.06	0.10	0.49	0.62	0.04	0.17	0.66	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	26	120	29	15	44	153	1430	31	53	1524	67
Future Volume (veh/h)	68	26	120	29	15	44	153	1430	31	53	1524	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	28	130	32	16	48	166	1554	34	58	1657	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	259	220	302	57	171	396	2461	764	412	2461	764
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.48	0.48	0.10	0.48	0.48
Sat Flow, veh/h	1338	1870	1585	1228	412	1236	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	74	28	130	32	0	64	166	1554	34	58	1657	73
Grp Sat Flow(s),veh/h/ln	1338	1870	1585	1228	0	1648	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	2.6	0.6	3.8	1.1	0.0	1.7	2.1	11.1	0.6	0.7	12.1	1.2
Cycle Q Clear(g_c), s	4.3	0.6	3.8	1.8	0.0	1.7	2.1	11.1	0.6	0.7	12.1	1.2
Prop In Lane	1.00		1.00	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	259	220	302	0	228	396	2461	764	412	2461	764
V/C Ratio(X)	0.26	0.11	0.59	0.11	0.00	0.28	0.42	0.63	0.04	0.14	0.67	0.10
Avail Cap(c_a), veh/h	595	690	585	585	0	608	396	2461	764	412	2461	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	18.4	19.7	19.1	0.0	18.8	8.1	9.4	6.7	5.9	9.7	6.9
Incr Delay (d2), s/veh	0.5	0.2	2.5	0.2	0.0	0.7	3.2	1.2	0.1	0.7	1.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	1.4	0.3	0.0	0.6	0.9	3.4	0.2	0.2	3.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	18.5	22.2	19.3	0.0	19.5	11.3	10.6	6.8	6.6	11.2	7.1
LnGrp LOS	C	B	C	B	A	B	B	B	A	A	B	A
Approach Vol, veh/h		232			96			1754			1788	
Approach Delay, s/veh		21.5			19.4			10.6			10.9	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		11.3	9.5	28.0		11.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.7	13.1		6.3	4.1	14.1		3.8				
Green Ext Time (p_c), s	0.0	7.3		0.6	0.0	7.1		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		11.6	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	46	47	1573	1646	25
Future Vol, veh/h	15	46	47	1573	1646	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	50	51	1710	1789	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2589	908	1816	0	-	0
Stage 1	1803	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	45	239	155	-	-	-
Stage 1	76	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	30	239	155	-	-	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	51	-	-	-	-	-
Stage 2	372	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.8	1.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	155	-	45	239	-	-
HCM Lane V/C Ratio	0.33	-	0.362	0.209	-	-
HCM Control Delay (s)	39.2	-	124.9	24	-	-
HCM Lane LOS	E	-	F	C	-	-
HCM 95th %tile Q(veh)	1.3	-	1.3	0.8	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1620	0	0	1693
Future Vol, veh/h	0	0	1620	0	0	1693
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1761	0	0	1840

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2497	881	0	-	1761	0
Stage 1	1761	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	50	249	-	0	165	-
Stage 1	81	-	-	0	-	-
Stage 2	395	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	50	249	-	-	165	-
Mov Cap-2 Maneuver	72	-	-	-	-	-
Stage 1	81	-	-	-	-	-
Stage 2	395	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	165	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	0	0	0	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	1582	1	16	1673
Future Vol, veh/h	0	6	1582	1	16	1673
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	1720	1	17	1818

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2482	861	0	0	1721	0
Stage 1	1721	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	51	257	-	-	173	-
Stage 1	86	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	46	257	-	-	173	-
Mov Cap-2 Maneuver	74	-	-	-	-	-
Stage 1	86	-	-	-	-	-
Stage 2	345	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	257	173	-
HCM Lane V/C Ratio	-	-	-	0.025	0.101	-
HCM Control Delay (s)	-	-	0	19.4	28.1	-
HCM Lane LOS	-	-	A	C	D	-
HCM 95th %tile Q(veh)	-	-	-	0.1	0.3	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	6	0	0	0
Future Vol, veh/h	0	17	6	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	7	0	0	0

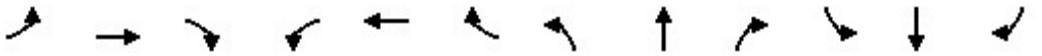
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	7	0	-	0	25	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1614	-	-	-	991	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1614	-	-	-	991	1075
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1614	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	2	28	15	26	49	1009	27	38	1100	21
v/c Ratio	0.06	0.01	0.09	0.06	0.10	0.11	0.35	0.03	0.08	0.38	0.02
Control Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.3	0.0	2.8	6.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.3	0.0	2.8	6.5	0.1
Queue Length 50th (ft)	3	0	0	3	2	0	25	0	1	28	0
Queue Length 95th (ft)	16	5	0	16	19	10	88	0	9	97	0
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	811	811	750	811	741	458	2890	946	490	2890	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.04	0.02	0.04	0.11	0.35	0.03	0.08	0.38	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	2	26	14	8	16	45	928	25	35	1012	19
Future Volume (veh/h)	14	2	26	14	8	16	45	928	25	35	1012	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	2	28	15	9	17	49	1009	27	38	1100	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	136	116	258	42	80	550	2649	822	573	2649	822
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.11	0.52	0.52	0.11	0.52	0.52
Sat Flow, veh/h	1385	1870	1585	1380	579	1094	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	15	2	28	15	0	26	49	1009	27	38	1100	21
Grp Sat Flow(s),veh/h/ln	1385	1870	1585	1380	0	1673	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	0.5	0.0	0.8	0.5	0.0	0.7	0.5	5.4	0.4	0.4	6.0	0.3
Cycle Q Clear(g_c), s	1.1	0.0	0.8	0.5	0.0	0.7	0.5	5.4	0.4	0.4	6.0	0.3
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	136	116	258	0	122	550	2649	822	573	2649	822
V/C Ratio(X)	0.06	0.01	0.24	0.06	0.00	0.21	0.09	0.38	0.03	0.07	0.42	0.03
Avail Cap(c_a), veh/h	689	743	630	706	0	665	550	2649	822	573	2649	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	19.5	19.8	19.7	0.0	19.8	3.6	6.5	5.3	3.5	6.7	5.3
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.1	0.0	0.9	0.3	0.4	0.1	0.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.3	0.1	0.0	0.3	0.1	1.4	0.1	0.1	1.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	19.5	20.9	19.8	0.0	20.6	4.0	7.0	5.4	3.7	7.2	5.4
LnGrp LOS	C	B	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		45			41			1085			1159	
Approach Delay, s/veh		20.7			20.3			6.8			7.0	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		7.8	9.5	28.0		7.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.4	7.4		3.1	2.5	8.0		2.7				
Green Ext Time (p_c), s	0.0	6.6		0.1	0.0	7.1		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		7.4	
HCM 6th LOS		A	

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	32	1003	1043	20
Future Vol, veh/h	6	25	32	1003	1043	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	27	35	1090	1134	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1651	578	1156	0	-	0
Stage 1	1145	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	144	393	329	-	-	-
Stage 1	197	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	129	393	329	-	-	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	176	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.6	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	329	-	156	393	-	-
HCM Lane V/C Ratio	0.106	-	0.042	0.069	-	-
HCM Control Delay (s)	17.2	-	29.1	14.8	-	-
HCM Lane LOS	C	-	D	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1036	0	0	1069
Future Vol, veh/h	0	0	1036	0	0	1069
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1126	0	0	1162

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1591	563	0	-	1126	0
Stage 1	1126	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	154	402	-	0	340	-
Stage 1	202	-	-	0	-	-
Stage 2	547	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	154	402	-	-	340	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	547	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	340	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	0	0	0	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	23	983	7	12	1045
Future Vol, veh/h	8	23	983	7	12	1045
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	25	1068	8	13	1136

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1552	538	0	0	1076	0
Stage 1	1072	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	162	417	-	-	360	-
Stage 1	218	-	-	-	-	-
Stage 2	538	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	156	417	-	-	360	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	218	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	191	417	360	-
HCM Lane V/C Ratio	-	-	0.046	0.06	0.036	-
HCM Control Delay (s)	-	-	24.7	14.2	15.4	-
HCM Lane LOS	-	-	C	B	C	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	19	31	0	0	0
Future Vol, veh/h	0	19	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	34	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	34	0	-	0	55	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1578	-	-	-	953	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1578	-	-	-	953	1039
Mov Cap-2 Maneuver	-	-	-	-	953	-
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	1002	-

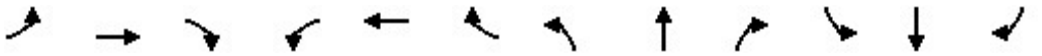
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1578	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	28	130	32	64	166	1617	34	58	1724	73
v/c Ratio	0.32	0.09	0.34	0.14	0.20	0.49	0.64	0.04	0.17	0.69	0.09
Control Delay	22.3	17.8	7.1	18.8	9.9	10.8	11.8	0.1	5.2	12.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	17.8	7.1	18.8	9.9	10.8	11.8	0.1	5.2	12.5	1.5
Queue Length 50th (ft)	20	7	0	8	4	14	124	0	5	136	0
Queue Length 95th (ft)	49	23	34	26	28	#50	199	0	17	219	11
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	503	703	678	519	653	339	2507	835	339	2507	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.19	0.06	0.10	0.49	0.64	0.04	0.17	0.69	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	26	120	29	15	44	153	1488	31	53	1586	67
Future Volume (veh/h)	68	26	120	29	15	44	153	1488	31	53	1586	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	28	130	32	16	48	166	1617	34	58	1724	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	259	220	302	57	171	388	2461	764	404	2461	764
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.48	0.48	0.10	0.48	0.48
Sat Flow, veh/h	1338	1870	1585	1228	412	1236	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	74	28	130	32	0	64	166	1617	34	58	1724	73
Grp Sat Flow(s),veh/h/ln	1338	1870	1585	1228	0	1648	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	2.6	0.6	3.8	1.1	0.0	1.7	2.1	11.7	0.6	0.7	12.9	1.2
Cycle Q Clear(g_c), s	4.3	0.6	3.8	1.8	0.0	1.7	2.1	11.7	0.6	0.7	12.9	1.2
Prop In Lane	1.00		1.00	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	259	220	302	0	228	388	2461	764	404	2461	764
V/C Ratio(X)	0.26	0.11	0.59	0.11	0.00	0.28	0.43	0.66	0.04	0.14	0.70	0.10
Avail Cap(c_a), veh/h	595	690	585	585	0	608	388	2461	764	404	2461	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	18.4	19.7	19.1	0.0	18.8	8.5	9.6	6.7	6.1	9.9	6.9
Incr Delay (d2), s/veh	0.5	0.2	2.5	0.2	0.0	0.7	3.4	1.4	0.1	0.7	1.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	1.4	0.3	0.0	0.6	0.9	3.6	0.2	0.2	4.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	18.5	22.2	19.3	0.0	19.5	11.9	11.0	6.8	6.8	11.6	7.1
LnGrp LOS	C	B	C	B	A	B	B	B	A	A	B	A
Approach Vol, veh/h		232			96			1817			1855	
Approach Delay, s/veh		21.5			19.4			11.0			11.2	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		11.3	9.5	28.0		11.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.7	13.7		6.3	4.1	14.9		3.8				
Green Ext Time (p_c), s	0.0	7.2		0.6	0.0	6.8		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			11.9									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	46	47	1636	1713	25
Future Vol, veh/h	15	46	47	1636	1713	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	50	51	1778	1862	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2689	945	1889	0	-	0
Stage 1	1876	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	39	226	142	-	-	-
Stage 1	68	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	25	226	142	-	-	-
Mov Cap-2 Maneuver	39	-	-	-	-	-
Stage 1	44	-	-	-	-	-
Stage 2	360	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	56.6	1.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	142	-	39	226	-	-
HCM Lane V/C Ratio	0.36	-	0.418	0.221	-	-
HCM Control Delay (s)	44	-	152.1	25.4	-	-
HCM Lane LOS	E	-	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	1.4	0.8	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1686	0	0	1761
Future Vol, veh/h	0	0	1686	0	0	1761
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1833	0	0	1914

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2599	917	0	-	1833	0
Stage 1	1833	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	44	236	-	0	152	-
Stage 1	73	-	-	0	-	-
Stage 2	381	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	44	236	-	-	152	-
Mov Cap-2 Maneuver	65	-	-	-	-	-
Stage 1	73	-	-	-	-	-
Stage 2	381	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	152	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	0	0	0	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	1646	1	16	1740
Future Vol, veh/h	0	6	1646	1	16	1740
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	1789	1	17	1891

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2580	895	0	0	1790	0
Stage 1	1790	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	45	244	-	-	160	-
Stage 1	78	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	40	244	-	-	160	-
Mov Cap-2 Maneuver	67	-	-	-	-	-
Stage 1	78	-	-	-	-	-
Stage 2	331	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.2	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	244	160	-
HCM Lane V/C Ratio	-	-	-	0.027	0.109	-
HCM Control Delay (s)	-	-	0	20.2	30.2	-
HCM Lane LOS	-	-	A	C	D	-
HCM 95th %tile Q(veh)	-	-	-	0.1	0.4	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	6	0	0	0
Future Vol, veh/h	0	17	6	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	7	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	7	0	-	0	25	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1614	-	-	-	991	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1614	-	-	-	991	1075
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1614	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

APPENDIX G – Pass-by and Internal Capture Information

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Lindon Townhome	**Organization:**	Galloway
Project Location:	Lindon, Utah	**Performed By:**	
Scenario Description:	Total Future	**Date:**	
Analysis Year:	2022	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				19	15	4
Retail				18	11	7
Restaurant				0		
Cinema/Entertainment				0		
Residential				33	9	24
Hotel				0	0	0
All Other Land Uses[2]				0		
Total				70	35	35

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	1		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	70	35	35
Internal Capture Percentage	6%	6%	6%
External Vehicle-Trips[3]	66	33	33
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	7%	25%
Retail	9%	14%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	0%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Lindon Townhome
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	15	15	1.00	4	4
Retail	1.00	11	11	1.00	7	7
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	9	9	1.00	24	24
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	3	0	0	0
Retail	2		1	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	5	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4	0	0	0	0
Retail	1		0	0	0	0
Restaurant	2	1		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	1	14	15	14	0	0
Retail	1	10	11	10	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	9	9	9	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	1	3	4	3	0	0
Retail	1	6	7	6	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	24	24	24	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Lindon Townhome	**Organization:**	Galloway
Project Location:	Lindon, Utah	**Performed By:**	
Scenario Description:	Total Future	**Date:**	
Analysis Year:	2022	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				23	6	17
Retail				74	36	38
Restaurant				0		
Cinema/Entertainment				0		
Residential				38	23	15
Hotel				0	0	0
All Other Land Uses[2]				0		
Total				135	65	70

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	0	0	0	0
Retail	1		0	0	10	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	4	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	135	65	70
Internal Capture Percentage	28%	29%	27%
External Vehicle-Trips[3]	97	46	51
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	33%	18%
Retail	19%	29%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	43%	33%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Lindon Townhome
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	6	6	1.00	17	17
Retail	1.00	36	36	1.00	38	38
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	23	23	1.00	15	15
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	1	0	0	0
Retail	1		11	2	10	2
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	6	3	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	0	0	1	0
Retail	2		0	0	11	0
Restaurant	2	18		0	4	0
Cinema/Entertainment	0	1	0		1	0
Residential	3	4	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	2	4	6	4	0	0
Retail	7	29	36	29	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	10	13	23	13	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	3	14	17	14	0	0
Retail	11	27	38	27	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	10	15	10	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Table E.9 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period
Land Use Code 820—Shopping Center

SIZE (1,000 SQ. FT GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
53	Port Orange, FL	1993	162	2:00–6:00 p.m.	59	—	—	41	—	—	TPD Inc.
9	Kissimmee, FL	1994	107	2:00–6:00 p.m.	66	20	14	34	—	—	TPD Inc.
77	Edgewater, FL	1992	365	2:00–6:00 p.m.	46	—	—	54	—	—	TPD Inc.
82	Deltona, FL	1992	336	2:00–6:00 p.m.	34	—	—	66	—	—	TPD Inc.
78	Orlando, FL	1991	702	2:00–6:00 p.m.	55	23	22	45	—	—	TPD Inc.
45	Orlando, FL	1992	844	2:00–6:00 p.m.	56	24	20	44	—	—	TPD Inc.
50	Orlando, FL	1992	555	2:00–6:00 p.m.	41	41	18	59	—	—	TPD Inc.
52	Orlando, FL	1995	665	2:00–6:00 p.m.	42	33	25	58	—	—	TPD Inc.
17	Orlando, FL	1994	196	2:00–6:00 p.m.	66	—	—	34	—	—	TPD Inc.
60	Orlando, FL	1995	1,583	3:00–7:00 p.m.	40	38	22	60	—	—	TPD Inc.
158	Crestwood, KY	June 1993	129	4:00–6:00 p.m.	36	39	25	64	759	—	Barton-Aschman Assoc.
118	Louisville area, KY	June 1993	133	4:00–6:00 p.m.	22	51	27	78	3,555	—	Barton-Aschman Assoc.
74	Louisville, KY	June 1993	187	4:00–6:00 p.m.	30	43	27	70	922	—	Barton-Aschman Assoc.
59	Louisville area, KY	June 1993	247	4:00–6:00 p.m.	31	52	17	69	2,659	—	Barton-Aschman Assoc.
145	Louisville area, KY	June 1993	210	4:00–6:00 p.m.	53	30	17	47	2,636	—	Barton-Aschman Assoc.
104	Louisville area, KY	June 1993	261	4:00–6:00 p.m.	28	50	22	72	2,111	—	Barton-Aschman Assoc.
235	Louisville, KY	June 1993	211	4:00–6:00 p.m.	35	29	36	65	2,593	—	Barton-Aschman Assoc.
71	Louisville, KY	June 1993	109	4:00–6:00 p.m.	25	42	33	75	1,559	—	Barton-Aschman Assoc.
350	Worcester, MA	Apr. 1994	224	4:00–6:00 p.m.	18	45	37	82	2,112	—	ICSC
738	East Brunswick, NJ	Apr. 1994	283	4:00–6:00 p.m.	14	79	7	86	8,059	—	ICSC
294	Philadelphia, PA	Apr. 1994	213	4:00–6:00 p.m.	25	51	24	75	4,055	—	ICSC
256	Hamden, CT	Apr. 1994	208	4:00–6:00 p.m.	27	51	22	73	3,422	—	ICSC
418	Glen Burnie, MD	Apr. 1994	281	4:00–6:00 p.m.	20	51	29	80	5,610	—	ICSC
560	Harrisonburg, VA	Apr. 1994	437	4:00–6:00 p.m.	19	49	32	81	3,051	—	ICSC

Table E.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
361	Glen Allen, VA	Apr. 1994	315	4:00–6:00 p.m.	17	54	29	83	2,034	—	ICSC
375	Shelby, NC	May 1994	214	4:00–6:00 p.m.	30	48	22	70	3,053	—	ICSC
413	Texas City, TX	May 1994	228	4:00–6:00 p.m.	28	52	20	72	589	—	ICSC
488	Texas City, TX	May 1994	257	4:00–6:00 p.m.	12	75	13	88	1,094	—	ICSC
293	Berwyn, IL	May 1994	282	4:00–6:00 p.m.	24	70	6	76	4,806	—	ICSC
667	Bourbonais, IL	May 1994	200	4:00–6:00 p.m.	16	53	31	84	2,770	—	ICSC
225	Bellevue, IL	May 1994	284	4:00–6:00 p.m.	35	32	33	65	1,970	—	ICSC
255	Bettendorf, IA	May 1994	222	4:00–6:00 p.m.	24	37	39	76	3,706	—	ICSC
808	Laguna Hills, CA	June 1994	240	4:00–6:00 p.m.	13	73	14	87	4,035	—	ICSC
450	Hanford, CA	May 1994	321	4:00–6:00 p.m.	23	49	28	77	2,767	—	ICSC
800	San Jose, CA	May 1994	205	4:00–6:00 p.m.	21	51	28	79	7,474	—	ICSC
598	Greeley, CO	May 1994	205	4:00–6:00 p.m.	17	55	28	83	3,840	—	ICSC
581	Pueblo, CO	May 1994	296	4:00–6:00 p.m.	18	53	29	82	2,938	—	ICSC
476	Bellevue, WA	May 1994	234	4:00–6:00 p.m.	26	54	20	74	3,427	—	ICSC
720	Framingham, MA	Dec. 1982	92	3:30–7:00 p.m.	23	39	38	77	—	73,628	Raymond Keyes Assoc.
890	Newark, DE	July 1984	179	3:00–8:00 p.m.	12	49	39	88	—	—	Raymond Keyes Assoc.
402	Manassas, VA	June 1984	87	4:00–6:00 p.m.	48	25	27	52	—	—	Raymond Keyes Assoc.
462	Ross, PA	June 1980	175	5:30–7:00 p.m.	36	—	—	64	—	27,200	Raymond Keyes Assoc.
234	Huntington Lt. NY	Nov. 1985	181	4:00–7:00 p.m.	46	21	33	54	—	34,630	Raymond Keyes Assoc.
658	Wayne, NJ	Sept. 1984	243	3:00–6:00 p.m.	27	61	12	73	—	85,600	Raymond Keyes Assoc.
1,200	Washington, DC	1980	364	4:00–6:00 p.m.	25	35	40	75	—	—	Gorove-Slade
800	Southern CA	—	1,000	4:00–6:00 p.m.	12	45	43	88	—	—	Fischer
451	Portland, OR	—	—	5:00–6:00 p.m.	25	—	—	75	—	—	Buttke
113	Portland, OR	—	—	5:00–6:00 p.m.	17	—	—	83	—	—	Buttke

Table E.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
622	Ramsey, MN	Nov. 1985	46	4:00–9:00 p.m.	44	26	30	56	—	36,370	Raymond Keyes Assoc.
736	Pensacola, FL	Oct. 1985	383	3:00–7:00 p.m.	26	35	39	74	—	—	Raymond Keyes Assoc.
84	Dover, DE	July 1985	216	3:30–7:00 p.m.	50	6	44	50	—	—	Raymond Keyes Assoc.
500	Meriden, CT	Apr. 1985	—	4:00–6:00 p.m.	8	—	—	92	—	—	Connecticut DOT
660	Enfield, CT	Apr. 1985	—	4:00–6:00 p.m.	22	—	—	78	—	—	Connecticut DOT
845	Waterford, CT	Apr. 1985	—	4:00–6:00 p.m.	14	—	—	86	—	—	Connecticut DOT
1,060	West Hartford, CT	Apr. 1985	—	4:00–6:00 p.m.	17	—	—	83	—	—	Connecticut DOT
131	Pr. Georges Co., MD	1982/83	88	4:00–6:00 p.m.	74	—	—	26	—	—	JHK
181	Pr. Georges Co., MD	1982/83	105	4:00–6:00 p.m.	36	—	—	64	—	—	JHK
100	Pr. Georges Co., MD	1982/83	93	4:00–6:00 p.m.	36	—	—	64	—	—	JHK
475	Pr. Georges Co., MD	1982/83	130	4:00–6:00 p.m.	20	—	—	80	—	—	JHK
60	Pr. Georges Co., MD	1982/83	72	4:00–6:00 p.m.	72	—	—	28	—	—	JHK
90	Pr. Georges Co., MD	1982/83	91	4:00–6:00 p.m.	58	—	—	42	—	—	JHK
78	Pr. Georges Co., MD	1982/83	113	4:00–6:00 p.m.	59	—	—	41	—	—	JHK
44	Pr. Georges Co., MD	1982/83	97	4:00–6:00 p.m.	51	—	—	49	—	—	JHK
467	Pr. Georges Co., MD	1982/83	99	4:00–6:00 p.m.	56	—	—	44	—	—	JHK
352	W. Orange, NJ	Mar. 1986	149	4:00–6:00 p.m.	38	19	43	62	—	21,520	Raymond Keyes Assoc.
176	Tarpon Springs, FL	May 1986	124	3:00–7:00 p.m.	37	28	35	63	—	34,080	Raymond Keyes Assoc.
762	Orlando, FL	Fall 1985	182	4:00–6:00 p.m.	25	52	23	75	—	—	Kimley-Horn and Assoc. Inc.
166	Orlando, FL	Fall 1985	124	4:00–6:00 p.m.	27	48	25	73	—	—	Kimley-Horn and Assoc. Inc.
129	Orlando, FL	Fall 1985	116	4:00–6:00 p.m.	28	50	22	72	—	—	Kimley-Horn and Assoc. Inc.
71	Orlando, FL	Fall 1985	81	4:00–6:00 p.m.	50	44	6	50	—	—	Kimley-Horn and Assoc. Inc.

Table E.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
921	Albany, NY	July & Aug. 1985	196	4:00–6:00 p.m.	23	42	35	77	—	60,950	Raymond Keyes Assoc.
108	Overland Park, KS	July 1988	111	4:30–5:30 p.m.	26	61	13	74	—	34,000	—
118	Overland Park, KS	Aug. 1988	123	4:30–5:30 p.m.	25	55	20	75	—	—	—
256	Greece, NY	June 1988	120	4:00–6:00 p.m.	38	62	—	62	—	23,410	Sear Brown
160	Greece, NY	June 1988	78	4:00–6:00 p.m.	29	71	—	71	—	57,306	Sear Brown
550	Greece, NY	June 1988	117	4:00–6:00 p.m.	48	52	—	52	—	40,763	Sear Brown
51	Boca Raton, FL	Dec. 1987	110	4:00–6:00 p.m.	33	34	33	67	—	42,225	Kimley-Horn and Assoc. Inc.
1,090	Ross Twp, PA	July 1988	411	2:00–8:00 p.m.	34	56	10	66	—	51,500	Wilbur Smith and Assoc.
97	Upper Dublin Twp, PA	Winter 1988/89	—	4:00–6:00 p.m.	41	—	—	59	—	34,000	McMahon Associates
118	Tredyffrin Twp, PA	Winter 1988/89	—	4:00–6:00 p.m.	24	—	—	76	—	10,000	Booz Allen & Hamilton
122	Lawnside, NJ	Winter 1988/89	—	4:00–6:00 p.m.	37	—	—	63	—	20,000	Pennoni Associates
126	Boca Raton, FL	Winter 1988/89	—	4:00–6:00 p.m.	43	—	—	57	—	40,000	McMahon Associates
150	Willow Grove, PA	Winter 1988/89	—	4:00–6:00 p.m.	39	—	—	61	—	26,000	Booz Allen & Hamilton
153	Broward Cnty., FL	Winter 1988/89	—	4:00–6:00 p.m.	50	—	—	50	—	85,000	McMahon Associates
153	Arden, DE	Winter 1988/89	—	4:00–6:00 p.m.	30	—	—	70	—	26,000	Orth-Rodgers & Assoc. Inc.
154	Doylestown, PA	Winter 1988/89	—	4:00–6:00 p.m.	32	—	—	68	—	29,000	Orth-Rodgers & Assoc. Inc.
164	Middletown Twp, PA	Winter 1988/89	—	4:00–6:00 p.m.	33	—	—	67	—	25,000	Booz Allen & Hamilton
166	Haddon Twp, NJ	Winter 1988/89	—	4:00–6:00 p.m.	20	—	—	80	—	6,000	Pennoni Associates
205	Broward Cnty., FL	Winter 1988/89	—	4:00–6:00 p.m.	55	—	—	45	—	62,000	McMahon Associates

Table E.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
237	W. Windsor Twp, NJ	Winter 1988/89	—	4:00–6:00 p.m.	48	—	—	52	—	46,000	Booz Allen & Hamilton
242	Willow Grove, PA	Winter 1988/89	—	4:00–6:00 p.m.	37	—	—	63	—	26,000	McMahon Associates
297	Whitehall, PA	Winter 1988/89	—	4:00–6:00 p.m.	33	—	—	67	—	26,000	Orth-Rodgers & Assoc. Inc.
360	Broward Cnty., FL	Winter 1988/89	—	4:00–6:00 p.m.	44	—	—	56	—	73,000	McMahon Associates
370	Pittsburgh, PA	Winter 1988/89	—	4:00–6:00 p.m.	19	—	—	81	—	33,000	Wilbur Smith
150	Portland, OR	—	519	4:00–6:00 p.m.	68	6	26	32	—	25,000	Kittelson and Associates
150	Portland, OR	—	655	4:00–6:00 p.m.	65	7	28	35	—	30,000	Kittelson and Associates
760	Calgary, Alberta	Oct.-Dec. 1987	15,436	4:00–6:00 p.m.	20	39	41	80	—	—	City of Calgary DOT
178	Bordentown, NJ	Apr. 1989	154	2:00–6:00 p.m.	35	—	—	65	—	37,980	Raymond Keyes Assoc.
144	Manalapan, NJ	July 1990	176	3:30–6:15 p.m.	32	44	24	68	—	69,347	Raymond Keyes Assoc.
549	Natick, MA	Feb. 1989	—	4:45–5:45 p.m.	33	26	41	67	—	48,782	Raymond Keyes Assoc.

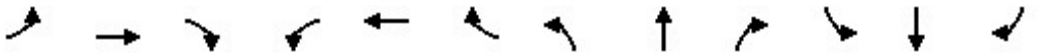
Average Pass-By Trip Percentage: 34

"—" means no data were provided

APPENDIX H – Future (with site development) Synchro Outputs

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	2	28	16	26	49	982	28	38	1072	21
v/c Ratio	0.06	0.01	0.09	0.06	0.10	0.10	0.34	0.03	0.08	0.37	0.02
Control Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.3	0.1	2.8	6.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	18.0	0.5	18.1	13.0	2.9	6.3	0.1	2.8	6.4	0.1
Queue Length 50th (ft)	3	0	0	3	2	0	24	0	1	27	0
Queue Length 95th (ft)	16	5	0	17	19	10	86	0	9	95	0
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	811	811	750	811	741	468	2889	946	501	2889	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.04	0.02	0.04	0.10	0.34	0.03	0.08	0.37	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	2	26	15	8	16	45	903	26	35	986	19
Future Volume (veh/h)	14	2	26	15	8	16	45	903	26	35	986	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	2	28	16	9	17	49	982	28	38	1072	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	137	116	259	43	80	557	2647	822	581	2647	822
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.11	0.52	0.52	0.11	0.52	0.52
Sat Flow, veh/h	1385	1870	1585	1380	579	1094	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	15	2	28	16	0	26	49	982	28	38	1072	21
Grp Sat Flow(s),veh/h/ln	1385	1870	1585	1380	0	1673	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	0.5	0.0	0.8	0.5	0.0	0.7	0.5	5.2	0.4	0.4	5.8	0.3
Cycle Q Clear(g_c), s	1.1	0.0	0.8	0.5	0.0	0.7	0.5	5.2	0.4	0.4	5.8	0.3
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	137	116	259	0	123	557	2647	822	581	2647	822
V/C Ratio(X)	0.06	0.01	0.24	0.06	0.00	0.21	0.09	0.37	0.03	0.07	0.40	0.03
Avail Cap(c_a), veh/h	688	743	629	705	0	665	557	2647	822	581	2647	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	19.5	19.8	19.7	0.0	19.8	3.6	6.5	5.4	3.5	6.7	5.3
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.1	0.0	0.8	0.3	0.4	0.1	0.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.3	0.1	0.0	0.3	0.1	1.4	0.1	0.1	1.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	19.5	20.9	19.8	0.0	20.6	3.9	6.9	5.4	3.7	7.1	5.4
LnGrp LOS	C	B	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		45			42			1059			1131	
Approach Delay, s/veh		20.7			20.3			6.7			7.0	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		7.8	9.5	28.0		7.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.4	7.2		3.1	2.5	7.8		2.7				
Green Ext Time (p_c), s	0.0	6.5		0.1	0.0	6.9		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		7.4	
HCM 6th LOS		A	

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	32	976	1016	20
Future Vol, veh/h	6	25	32	976	1016	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	27	35	1061	1104	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1609	563	1126	0	-	0
Stage 1	1115	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	151	402	340	-	-	-
Stage 1	206	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	135	402	340	-	-	-
Mov Cap-2 Maneuver	164	-	-	-	-	-
Stage 1	185	-	-	-	-	-
Stage 2	529	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.2	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	340	-	164	402	-	-
HCM Lane V/C Ratio	0.102	-	0.04	0.068	-	-
HCM Control Delay (s)	16.8	-	27.9	14.6	-	-
HCM Lane LOS	C	-	D	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	17	991	8	15	1026
Future Vol, veh/h	5	17	991	8	15	1026
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	18	1077	9	16	1115

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1560	543	0	0	1086	0
Stage 1	1082	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	160	414	-	-	356	-
Stage 1	215	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	153	414	-	-	356	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	215	-	-	-	-	-
Stage 2	515	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	188	414	356	-
HCM Lane V/C Ratio	-	-	0.029	0.045	0.046	-
HCM Control Delay (s)	-	-	24.7	14.1	15.6	-
HCM Lane LOS	-	-	C	B	C	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	23	947	10	16	1004
Future Vol, veh/h	11	23	947	10	16	1004
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	25	1029	11	17	1091

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1505	520	0	0	1040	0
Stage 1	1035	-	-	-	-	-
Stage 2	470	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	171	429	-	-	374	-
Stage 1	230	-	-	-	-	-
Stage 2	544	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	163	429	-	-	374	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	230	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	200	429	374	-
HCM Lane V/C Ratio	-	-	0.06	0.058	0.047	-
HCM Control Delay (s)	-	-	24.1	13.9	15.1	-
HCM Lane LOS	-	-	C	B	C	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	19	31	1	1	3
Future Vol, veh/h	8	19	31	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	21	34	1	1	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	35	0	-	0	74	35
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	39	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1576	-	-	-	930	1038
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	983	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1576	-	-	-	924	1038
Mov Cap-2 Maneuver	-	-	-	-	924	-
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	983	-

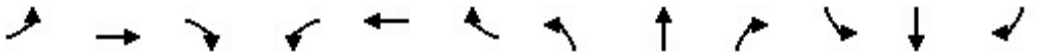
Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1576	-	-	-	924	1038
HCM Lane V/C Ratio	0.006	-	-	-	0.001	0.003
HCM Control Delay (s)	7.3	0	-	-	8.9	8.5
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	28	130	33	64	166	1577	35	58	1676	73
v/c Ratio	0.32	0.09	0.34	0.14	0.20	0.49	0.63	0.04	0.17	0.67	0.09
Control Delay	22.3	17.8	7.1	18.9	9.9	10.8	11.6	0.1	5.2	12.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	17.8	7.1	18.9	9.9	10.8	11.6	0.1	5.2	12.2	1.5
Queue Length 50th (ft)	20	7	0	9	4	14	119	0	5	131	0
Queue Length 95th (ft)	49	23	34	27	28	#50	192	0	17	209	11
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	503	703	678	519	653	339	2507	835	339	2507	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.19	0.06	0.10	0.49	0.63	0.04	0.17	0.67	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	26	120	30	15	44	153	1451	32	53	1542	67
Future Volume (veh/h)	68	26	120	30	15	44	153	1451	32	53	1542	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	28	130	33	16	48	166	1577	35	58	1676	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	259	220	302	57	171	393	2461	764	409	2461	764
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.48	0.48	0.10	0.48	0.48
Sat Flow, veh/h	1338	1870	1585	1228	412	1236	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	74	28	130	33	0	64	166	1577	35	58	1676	73
Grp Sat Flow(s),veh/h/ln	1338	1870	1585	1228	0	1648	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	2.6	0.6	3.8	1.2	0.0	1.7	2.1	11.3	0.6	0.7	12.3	1.2
Cycle Q Clear(g_c), s	4.3	0.6	3.8	1.8	0.0	1.7	2.1	11.3	0.6	0.7	12.3	1.2
Prop In Lane	1.00		1.00	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	259	220	302	0	228	393	2461	764	409	2461	764
V/C Ratio(X)	0.26	0.11	0.59	0.11	0.00	0.28	0.42	0.64	0.05	0.14	0.68	0.10
Avail Cap(c_a), veh/h	595	690	585	585	0	608	393	2461	764	409	2461	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	18.4	19.7	19.2	0.0	18.8	8.2	9.5	6.7	6.0	9.7	6.9
Incr Delay (d2), s/veh	0.5	0.2	2.5	0.2	0.0	0.7	3.3	1.3	0.1	0.7	1.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	1.4	0.3	0.0	0.6	0.9	3.4	0.2	0.2	3.8	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	18.5	22.2	19.3	0.0	19.5	11.5	10.8	6.8	6.7	11.3	7.1
LnGrp LOS	C	B	C	B	A	B	B	B	A	A	B	A
Approach Vol, veh/h		232			97			1778			1807	
Approach Delay, s/veh		21.5			19.4			10.8			11.0	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		11.3	9.5	28.0		11.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.7	13.3		6.3	4.1	14.3		3.8				
Green Ext Time (p_c), s	0.0	7.3		0.6	0.0	7.0		0.3				

Intersection Summary	
HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	46	47	1595	1665	25
Future Vol, veh/h	15	46	47	1595	1665	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	50	51	1734	1810	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2620	919	1837	0	-	0
Stage 1	1824	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	43	235	151	-	-	-
Stage 1	74	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	28	235	151	-	-	-
Mov Cap-2 Maneuver	44	-	-	-	-	-
Stage 1	49	-	-	-	-	-
Stage 2	367	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	50.1	1.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	151	-	44	235	-	-
HCM Lane V/C Ratio	0.338	-	0.371	0.213	-	-
HCM Control Delay (s)	40.6	-	128.8	24.4	-	-
HCM Lane LOS	E	-	F	C	-	-
HCM 95th %tile Q(veh)	1.4	-	1.3	0.8	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	29	1613	11	20	1692
Future Vol, veh/h	14	29	1613	11	20	1692
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	32	1753	12	22	1839

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2539	883	0	0	1765	0
Stage 1	1759	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	48	248	-	-	164	-
Stage 1	81	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	248	-	-	164	-
Mov Cap-2 Maneuver	70	-	-	-	-	-
Stage 1	81	-	-	-	-	-
Stage 2	324	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.4	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	70	248	164	-
HCM Lane V/C Ratio	-	-	0.217	0.127	0.133	-
HCM Control Delay (s)	-	-	70.2	21.6	30.3	-
HCM Lane LOS	-	-	F	C	D	-
HCM 95th %tile Q(veh)	-	-	0.8	0.4	0.4	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	6	1586	5	22	1680
Future Vol, veh/h	4	6	1586	5	22	1680
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	7	1724	5	24	1826

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2505	865	0	0	1729	0
Stage 1	1727	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	50	255	-	-	171	-
Stage 1	85	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	43	255	-	-	171	-
Mov Cap-2 Maneuver	73	-	-	-	-	-
Stage 1	85	-	-	-	-	-
Stage 2	323	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	34.7	0	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	73	255	171	-
HCM Lane V/C Ratio	-	-	0.06	0.026	0.14	-
HCM Control Delay (s)	-	-	57.4	19.5	29.4	-
HCM Lane LOS	-	-	F	C	D	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.5	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	17	6	1	1	4
Future Vol, veh/h	10	17	6	1	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	18	7	1	1	4

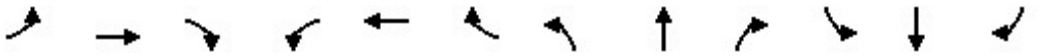
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	8	0	-	0	48	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1612	-	-	-	962	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1612	-	-	-	955	1074
Mov Cap-2 Maneuver	-	-	-	-	955	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	982	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1612	-	-	-	955	1074
HCM Lane V/C Ratio	0.007	-	-	-	0.001	0.004
HCM Control Delay (s)	7.2	0	-	-	8.8	8.4
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	2	28	16	26	49	1021	28	38	1114	21
v/c Ratio	0.06	0.01	0.09	0.06	0.10	0.11	0.35	0.03	0.08	0.39	0.02
Control Delay	18.1	18.0	0.5	18.1	13.0	3.0	6.3	0.1	2.8	6.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	18.0	0.5	18.1	13.0	3.0	6.3	0.1	2.8	6.5	0.1
Queue Length 50th (ft)	3	0	0	3	2	0	26	0	1	28	0
Queue Length 95th (ft)	16	5	0	17	19	10	90	0	9	100	0
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	811	811	750	811	741	454	2889	946	486	2889	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.04	0.02	0.04	0.11	0.35	0.03	0.08	0.39	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	2	26	15	8	16	45	939	26	35	1025	19
Future Volume (veh/h)	14	2	26	15	8	16	45	939	26	35	1025	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	2	28	16	9	17	49	1021	28	38	1114	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	137	116	259	43	80	546	2647	822	569	2647	822
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.11	0.52	0.52	0.11	0.52	0.52
Sat Flow, veh/h	1385	1870	1585	1380	579	1094	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	15	2	28	16	0	26	49	1021	28	38	1114	21
Grp Sat Flow(s),veh/h/ln	1385	1870	1585	1380	0	1673	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	0.5	0.0	0.8	0.5	0.0	0.7	0.5	5.5	0.4	0.4	6.1	0.3
Cycle Q Clear(g_c), s	1.1	0.0	0.8	0.5	0.0	0.7	0.5	5.5	0.4	0.4	6.1	0.3
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	137	116	259	0	123	546	2647	822	569	2647	822
V/C Ratio(X)	0.06	0.01	0.24	0.06	0.00	0.21	0.09	0.39	0.03	0.07	0.42	0.03
Avail Cap(c_a), veh/h	688	743	629	705	0	665	546	2647	822	569	2647	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	19.5	19.8	19.7	0.0	19.8	3.7	6.6	5.4	3.5	6.7	5.3
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.1	0.0	0.8	0.3	0.4	0.1	0.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.3	0.1	0.0	0.3	0.1	1.5	0.1	0.1	1.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	19.5	20.9	19.8	0.0	20.6	4.0	7.0	5.4	3.8	7.2	5.4
LnGrp LOS	C	B	C	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		45			42			1098			1173	
Approach Delay, s/veh		20.7			20.3			6.8			7.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		7.8	9.5	28.0		7.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.4	7.5		3.1	2.5	8.1		2.7				
Green Ext Time (p_c), s	0.0	6.7		0.1	0.0	7.1		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		7.4	
HCM 6th LOS		A	

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	32	1015	1057	20
Future Vol, veh/h	6	25	32	1015	1057	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	27	35	1103	1149	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1671	586	1171	0	-	0
Stage 1	1160	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	140	389	323	-	-	-
Stage 1	193	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	125	389	323	-	-	-
Mov Cap-2 Maneuver	152	-	-	-	-	-
Stage 1	172	-	-	-	-	-
Stage 2	518	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	323	-	152	389	-	-
HCM Lane V/C Ratio	0.108	-	0.043	0.07	-	-
HCM Control Delay (s)	17.5	-	29.7	14.9	-	-
HCM Lane LOS	C	-	D	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	17	1031	8	15	1068
Future Vol, veh/h	5	17	1031	8	15	1068
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	18	1121	9	16	1161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1622	565	0	0	1130	0
Stage 1	1126	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	149	401	-	-	339	-
Stage 1	202	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	142	401	-	-	339	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	502	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	177	401	339	-
HCM Lane V/C Ratio	-	-	0.031	0.046	0.048	-
HCM Control Delay (s)	-	-	26	14.4	16.2	-
HCM Lane LOS	-	-	D	B	C	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.2	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	23	986	10	16	1045
Future Vol, veh/h	11	23	986	10	16	1045
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	25	1072	11	17	1136

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1566	542	0	0	1083	0
Stage 1	1078	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	159	415	-	-	357	-
Stage 1	217	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	151	415	-	-	357	-
Mov Cap-2 Maneuver	189	-	-	-	-	-
Stage 1	217	-	-	-	-	-
Stage 2	506	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	189	415	357	-
HCM Lane V/C Ratio	-	-	0.063	0.06	0.049	-
HCM Control Delay (s)	-	-	25.3	14.2	15.6	-
HCM Lane LOS	-	-	D	B	C	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	0.2	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	19	31	1	1	3
Future Vol, veh/h	8	19	31	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	21	34	1	1	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	35	0	-	0	74	35
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	39	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1576	-	-	-	930	1038
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	983	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1576	-	-	-	924	1038
Mov Cap-2 Maneuver	-	-	-	-	924	-
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	983	-

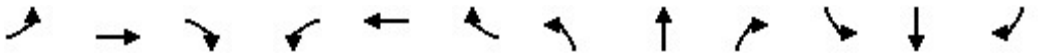
Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1576	-	-	-	924	1038
HCM Lane V/C Ratio	0.006	-	-	-	0.001	0.003
HCM Control Delay (s)	7.3	0	-	-	8.9	8.5
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	28	130	33	64	166	1640	35	58	1743	73
v/c Ratio	0.32	0.09	0.34	0.14	0.20	0.49	0.65	0.04	0.17	0.70	0.09
Control Delay	22.3	17.8	7.1	18.9	9.9	10.8	12.0	0.1	5.2	12.6	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	17.8	7.1	18.9	9.9	10.8	12.0	0.1	5.2	12.6	1.5
Queue Length 50th (ft)	20	7	0	9	4	14	127	0	5	138	0
Queue Length 95th (ft)	49	23	34	27	28	#50	203	0	17	222	11
Internal Link Dist (ft)		182			349		696			553	
Turn Bay Length (ft)				200				520	420		
Base Capacity (vph)	503	703	678	519	653	339	2507	835	339	2507	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.19	0.06	0.10	0.49	0.65	0.04	0.17	0.70	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	26	120	30	15	44	153	1509	32	53	1604	67
Future Volume (veh/h)	68	26	120	30	15	44	153	1509	32	53	1604	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	28	130	33	16	48	166	1640	35	58	1743	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	259	220	302	57	171	385	2461	764	400	2461	764
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.48	0.48	0.10	0.48	0.48
Sat Flow, veh/h	1338	1870	1585	1228	412	1236	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	74	28	130	33	0	64	166	1640	35	58	1743	73
Grp Sat Flow(s),veh/h/ln	1338	1870	1585	1228	0	1648	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	2.6	0.6	3.8	1.2	0.0	1.7	2.1	12.0	0.6	0.7	13.1	1.2
Cycle Q Clear(g_c), s	4.3	0.6	3.8	1.8	0.0	1.7	2.1	12.0	0.6	0.7	13.1	1.2
Prop In Lane	1.00		1.00	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	259	220	302	0	228	385	2461	764	400	2461	764
V/C Ratio(X)	0.26	0.11	0.59	0.11	0.00	0.28	0.43	0.67	0.05	0.14	0.71	0.10
Avail Cap(c_a), veh/h	595	690	585	585	0	608	385	2461	764	400	2461	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	18.4	19.7	19.2	0.0	18.8	8.6	9.6	6.7	6.2	9.9	6.9
Incr Delay (d2), s/veh	0.5	0.2	2.5	0.2	0.0	0.7	3.5	1.4	0.1	0.8	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	1.4	0.3	0.0	0.6	0.9	3.7	0.2	0.2	4.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	18.5	22.2	19.3	0.0	19.5	12.1	11.1	6.8	6.9	11.7	7.1
LnGrp LOS	C	B	C	B	A	B	B	B	A	A	B	A
Approach Vol, veh/h		232			97			1841			1874	
Approach Delay, s/veh		21.5			19.4			11.1			11.4	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	28.0		11.3	9.5	28.0		11.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	5.0	23.5		18.0				
Max Q Clear Time (g_c+I1), s	2.7	14.0		6.3	4.1	15.1		3.8				
Green Ext Time (p_c), s	0.0	7.1		0.6	0.0	6.7		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		12.0	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	46	47	1658	1732	25
Future Vol, veh/h	15	46	47	1658	1732	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	50	51	1802	1883	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2720	955	1910	0	-	0
Stage 1	1897	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	38	222	139	-	-	-
Stage 1	66	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	24	222	139	-	-	-
Mov Cap-2 Maneuver	37	-	-	-	-	-
Stage 1	42	-	-	-	-	-
Stage 2	355	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	59.8	1.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	139	-	37	222	-	-
HCM Lane V/C Ratio	0.368	-	0.441	0.225	-	-
HCM Control Delay (s)	45.2	-	163.9	25.9	-	-
HCM Lane LOS	E	-	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	1.5	0.8	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	29	1679	11	20	1760
Future Vol, veh/h	14	29	1679	11	20	1760
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	32	1825	12	22	1913

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2640	919	0	0	1837	0
Stage 1	1831	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	42	235	-	-	151	-
Stage 1	73	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	36	235	-	-	151	-
Mov Cap-2 Maneuver	63	-	-	-	-	-
Stage 1	73	-	-	-	-	-
Stage 2	308	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.2	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	63	235	151	-
HCM Lane V/C Ratio	-	-	0.242	0.134	0.144	-
HCM Control Delay (s)	-	-	79.5	22.7	32.8	-
HCM Lane LOS	-	-	F	C	D	-
HCM 95th %tile Q(veh)	-	-	0.8	0.5	0.5	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	6	1650	5	22	1747
Future Vol, veh/h	4	6	1650	5	22	1747
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	7	1793	5	24	1899

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2604	899	0	0	1798	0
Stage 1	1796	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	44	242	-	-	158	-
Stage 1	77	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	37	242	-	-	158	-
Mov Cap-2 Maneuver	66	-	-	-	-	-
Stage 1	77	-	-	-	-	-
Stage 2	307	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.5	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	66	242	158	-
HCM Lane V/C Ratio	-	-	0.066	0.027	0.151	-
HCM Control Delay (s)	-	-	63.4	20.3	31.8	-
HCM Lane LOS	-	-	F	C	D	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.5	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	17	6	1	1	4
Future Vol, veh/h	10	17	6	1	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	18	7	1	1	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	8	0	-	0	48	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1612	-	-	-	962	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1612	-	-	-	955	1074
Mov Cap-2 Maneuver	-	-	-	-	955	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	982	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1612	-	-	-	955	1074
HCM Lane V/C Ratio	0.007	-	-	-	0.001	0.004
HCM Control Delay (s)	7.2	0	-	-	8.8	8.4
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0

Table
Lindon Townhomes
Total Futre Intersection Level of Service and Queue Summary

Intersection		Operating Condition	Street Name	Approach/ Movement	Total Future 2022						Total Future 2026					
					LOS	AM Peak Hour v/c	Queue	LOS	PM Peak Hour v/c	Queue	LOS	AM Peak Hour v/c	Queue	LOS	PM Peak Hour v/c	Queue
3	Site Entrance/HWY 89	STOP	Site Entrance	WBL	C [24.7]	0.029	2.5	F [70.2]	0.217	20	D [26.0]	0.031	2.5	F [79.5]	20	0.242
			Site Entrance	WBR	B [14.1]	0.045	2.5	C [21.6]	0.127	10	B [14.4]	0.046	2.5	C [22.7]	12.5	0.134
			HWY 89	NTR	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0
			HWY 89	SBL	C [15.6]	0.046	2.5	D [30.3]	0.133	10	C [16.2]	0.048	5	D [32.8]	12.5	0.144
				SBT	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0
4	500 N/HWY 89	STOP	500 N	WBL	C [24.1]	0.06	5	F [57.4]	0.06	5	D [25.3]	0.063	5	F [63.4]	5	0.066
			500 N	WBR	B [13.9]	0.058	5	C [19.5]	0.026	2.5	B [14.2]	0.06	5	C [20.3]	2.5	0.027
			HWY 89	NTR	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0
			HWY 89	SBL	C [15.1]	0.047	2.5	D [29.4]	0.14	12.5	C [15.6]	0.049	5	D [31.8]	12.5	0.151
				SBT	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0	A [0.0]	0	0

Notes : (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(2) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.

ORDINANCE NO. 2020-8-O

AN ORDINANCE OF THE CITY COUNCIL OF LINDON CITY, UTAH COUNTY, UTAH, AMENDING TITLE 17.76 PLANNED RESDIENTIAL DEVELOPMENT OVERLAY (PRD OVERLAY) ZONE AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City Council is authorized by state law to enact and amend ordinances establishing land use regulations; and

WHEREAS, the proposed amendment is consistent with the goal of the General Plan that a variety of housing types should be provided where appropriate, and innovative development patterns and building methods that will result in more affordable housing should be encouraged; and

WHEREAS, the proposed amendment is consistent with the goal of the General Plan that the relationship of planned land uses should reflect consideration of existing development, environmental conditions, service and transportation needs, and fiscal impacts; and

WHEREAS, the proposed amendment is consistent with the goal of the General Plan that transitions between different land uses and intensities should be made gradually with compatible uses, particularly where natural or man-made buffers are not available; and

WHEREAS, the proposed amendment is consistent with the goal of the General Plan that growth should be guided to locations contiguous to existing development to provide city services and transportation in a cost-effective and efficient manner; and

WHEREAS, the proposed amendment is consistent with the goal of the General Plan that density increases should be considered only upon demonstration of adequate infrastructure and resource availability; and

WHEREAS, on April 28, 2020 and June 9, 2020 the Planning Commission held properly noticed public hearings to hear testimony regarding the ordinance amendment; and

WHEREAS, after the June 9, 2020 public hearing, the Planning Commission further considered the proposed ordinance amendment and recommended that the City Council adopted the attached ordinance; and

WHEREAS, the City Council held a public hearing on July 20, 2020, to consider the recommendation and the City Council received and considered all public comments that were made therein.

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Lindon, Utah County, State of Utah, as follows:

Section I: Amendment. Amend Lindon City Code Section 17.76 as follows:

Chapter 17.76

PLANNED RESIDENTIAL DEVELOPMENT OVERLAY (PRD OVERLAY) ZONE

Sections:

17.76.010 Purpose.

1. The Planned Residential Development Overlay Zone promotes the following purposes:
    a. Create diverse and quality housing options in Lindon City.
    b. Effectively develop unique commercial lots and parcels that do not naturally accommodate traditional commercial development patterns;
    c. Allow for appropriate housing transitions from commercial properties to low density single family residential;
    d. Improve the design and livability of residential buildings in the Planned Residential Development Overlay Zone.
    e. To preserve the commercial tax base and intent of the General Commercial zone.
2. The purposes of the Planned Residential Development Overlay are accomplished by:
    a. Allowing densities higher than a typical low-density residential development, as identified in the Lindon City Land Use Map;
    b. Establishing standards for landscaping, building and site design, public safety, parking, aesthetics, traffic circulation, fencing, lighting, and other similar site improvements; and
    c. Requiring standards that enable Planned Residential Developments to fit into the surrounding development.

17.76.020 Applicability.

1. The Planned Residential Development Overlay Zone may be applied to ~~any~~ lots or parcels only in the General Commercial (CG) Zone after application and approval of a zone map amendment by the City Council after a recommendation from the Planning Commission.

17.76.030 Permitted Uses and Building Types

1. *Permitted Uses.* In addition to uses permitted or conditionally permitted in the underlying General Commercial (GC) zone, a Planned Residential Development is a conditionally permitted use in the Planned Residential Development Overlay Zone and is not permitted in any other zone.
2. Planned Residential Development's may include the following building types: detached single family, twin homes, tri-plex, multi-unit buildings and townhouses. All Individual residential units shall be subdivided into separate lots or condominium units;

a. The minimum lot size for detached single family shall be five thousand (5,000) square feet with fifty (50) feet of frontage.
b. Multi-unit buildings shall be limited to a maximum of four (4) units per building.
c. Townhomes building types shall be limited to a maximum of six (6) units in a single row within a single building.

3. In order to preserve the intent of the General Commercial zone, building permits from Lindon City shall be obtained and construction commenced for at least twenty-five (25) percent of the approved commercial square footages prior to releasing building permits for residential construction.
4. Accessory apartments are not permitted in the Planned Residential Development Overlay Zone

17.76.040 Zone Map Amendment, Site Plan and Conditional Use Permit Approval.

1. Zone Map Amendment. An application to apply the Planned Residential Development Overlay Zone shall include a concept site plan, building elevations, and renderings showing the proposed project for the subject site. Any concept plan presented to the Planning Commission and City Council for approval shall first be reviewed by the Development Review Committee to ensure the proposal is technically feasible.
2. *Site Plan.*
    a. Proposed development in the Planned Residential Development Overlay Zone shall first submit a Land Use Application for site plan approval. The applicant shall provide all requirements of the site plan to the City before the City considers the application submitted and before action is taken. The application for a site plan shall include all necessary fees and documentation required by this Chapter.
    b. The applicant shall submit the site plan for a Planned Residential Development according to site plan submittal requirements outlined in the Lindon City Land Development Policies, Standard Specifications and Drawings Manual (Development Manual). In addition to the items required in the Development Manual, a complete application shall include building elevations and renderings, open space percentages and landscape plan, site circulation, and project size and density. At that time the applicant shall pay a fee in an amount established in the most recently adopted Lindon City Consolidated Fee Schedule. No development, construction, revisions, or additions shall take place on the site until the Planning Commission has approved the site plan, the site plan is considered finalized by the City, and the developer has obtained the appropriate permits. Applicants for amended site plans for Planned Residential Developments shall follow the same procedures, pay the same fees, and be bound by the same development standards and requirements as applicants for site plans for Planned Residential Developments. The Planning Director or designee has the authority to make minor amendments to the site plan where such amendments are in compliance with the ordinance and the site plan is not materially altered.
    c. The procedure for site plan approval shall be as follows:
        i. Development Review Committee. The Planning Department shall forward the proposed site plan to the Development Review Committee for initial review. The Development Review Committee shall review the site plan, civil engineering, and architectural designs while considering whether it complies with the Lindon General Plan and all City ordinances, resolutions, and policies. The site plan and architectural designs shall comply with the Lindon General Plan and all City

ordinances, resolutions, and policies before the Planning Commission can review the application.

ii. Planning Commission. The Planning Commission shall review the site plan and be the land use authority for all site plans for Planned Residential Developments. The Planning Commission shall consider whether the proposed site plan complies with City ordinances, resolutions, policies, development manual and the General Plan when reviewing a site plan for a Planned Residential Development.

d. The applicant shall not amend or change any approved site plan without first following the procedure for approval of site plans.

e. The Planning Commission may impose conditions or require further studies ~~on~~ of the site plan to mitigate dangerous hazards or evaluate impacts to public infrastructure or surrounding neighborhoods where there is substantiated evidence that a real safety hazard exists.

17.76.050 Final Plat and Improvement Drawings.

1. The form and contents of the final plat and improvement drawings, where applicable, shall contain all of the requirements found in Title 17.32 – Subdivisions-Special Requirements and the Lindon City Development Manual. The final plat shall also contain the following information:
    a. A designation of common areas, limited common areas, and private ownership areas.
    b. For condominiums, three dimensional drawings of buildings and building elevations. In the case where the Planned Residential Development is a condominium project, the developer shall submit a written statement by an attorney and architect who are licensed to practice in Utah. This written statement shall be the attorney's and architect's opinion that the condominium declaration, the subdivision plat and the other supporting documentation comply in all respects with the Utah Condominium Ownership Act (UCA Sec. 57-8-1, et seq.) as well as all applicable federal, state and local laws and ordinances and that when the office of the Utah County Recorder has recorded the condominium declaration and final plat, the proposed project will be a validly existing and lawful condominium project in all respects.
    c. Plat restrictions, lot restrictions, and other information required by the Planning Commission or City Council.
2. Planned Residential Development site plans may be built in phases as long as each phase of a Planned Residential Development complies with all of the requirements of this ordinance. A phase of a Planned Residential Development may not be less than twenty thousand (20,000) square feet.
3. The Planning Director shall approve the final plat of the Planned Residential Development provided he/she finds that:
    a. The applicant has redrawn the site plan to incorporate all the requirements as approved by the Planning Commission and City Council and has submitted the corrected site plan with the final plat.

b. The applicant has incorporated all of the improvements and conditions of the approved site plan into the final plat.
c. The City Engineer has marked the construction drawings of the Planned Residential Development as finalized.

4. The City shall record the final plat after it obtains all of the required signatures and after it receives all of the required bonds, fees, and documents.
5. The procedure for subdivision shall be as follows:
    a. The site plan must be approved by the Planning Commission before the final plat can be approved.
    b. Subdivision approval shall be approved by the appropriate land use authority as found in 17.09.
    c. The developer shall submit a Land Use Application for final plat approval of all or part of the Planned Residential Development together with all required fees. The final plat shall be prepared by the developer's surveyor and engineer.
    d. The Development Review Committee shall review the final plat and give their recommendations to the Planning Director.
    e. The Planning Director is the final approving authority, after receiving approval from the Planning Commission and City Council, for final plats and shall approve the application request if it meets the requirements of the approved site plan and all applicable City ordinances.
    f. All applications shall meet the expiration time lines as found in 17.12.210

17.76.060 Building Permits.

The City shall not issue a building permit for any project until the final plat has been recorded by the City.

17.76.070 Completion and Maintenance of Site**.**

Every Planned Residential Development shall conform to the approved site plan. The applicant or any other person or entity shall not add any buildings or make any improvements or changes to a Planned Residential Development that did not appear on the approved site plan. The applicant and subsequent owners and applicable associations shall maintain all improvements shown on the site plan in a neat and attractive manner. Failure to complete or maintain a Planned Residential Development in accordance with this Chapter and with the approved site plan is a violation of the terms of this Chapter. The City may initiate criminal and/or civil legal proceeding against any person, firm, entity or corporation, whether acting as principal, agent, property owner, lessee, lessor, tenant, landlord, employee, employer or otherwise, for failure to complete or maintain a Planned Residential Development in accordance with this Chapter and with the approved site plan.

17.76.080 Development Standards and Requirements.

The City requires the following development standards for all Planned Residential Developments.

1. *Compliance with Lindon City Code.* A proposed Planned Residential Development shall comply with the requirements of this Chapter, the Lindon City Development Manual, and with all applicable Lindon City Code provisions and with conditions imposed by the Land Use Authority.
2. *Density.* A Planned Residential Development shall not exceed an average density of ten (10) dwelling units per gross acre. Development phases with a density above ten (10) units to the acre shall be located adjacent to commercial uses. Densities shall be ten (10) units or less as a transition to low density single family residential.
3. *Height.* No lot or parcel of land in a Planned Residential Development approved pursuant to the Planned Residential Development Overlay Zone shall have a building or structure used for dwelling which exceeds two (2) stories with a maximum height of thirty-five (35) feet, measuring the four (4) corners of the building from finished grade to the highest point of the roof structure. The Planning Director and Chief Building Official shall be responsible for designating and identifying the four corners of a building. No dwelling shall be erected to a height less than one (1) story above grade.
4. *The Planned Residential Development ordinance allows two development options:*
    a. Option one:
        i. *Minimum Area.* The minimum area required for any Planned Residential Development shall be twenty thousand (20,000) square feet.
        ii. *Maximum Area.* The maximum allowable size shall be one (1) acre.
        iii. *Number of units.* The maximum number of units is ten (10) units per development.
        iv. *State Street Setback.* To preserve the commercial intent, use and zoning along State Street, a three hundred (300) foot setback from State Street is required.
    b. *Option two:*
        i. *Minimum Area. One (1) acre*
        ii. *Maximum Area. No maximum but must be in connection with a commercial use as found in (b)(iii).*
        iii. *Commercial Required.* Residential development shall only be allowed in connection with existing or new commercial uses. Residential uses shall be located on the rear portion of the lot and behind any commercial use.
        iv. *State Street Setback:* To preserve the commercial intent, use and zoning along State Street, a three hundred (300) foot setback shall be required and residential uses are not allowed within this setback, unless a reduction is grant as follows:
            1. The Planning Commission and City Council may consider a reduction in this depth upon evaluating the following:
                a. Viable commercial options remain for the site;
                b. A commercial lot is irregularly shaped;
                c. The reduction does not limit future redevelopment opportunities of the commercial property.

5. *Building Types and Variety.* At least two different building types shall be included in projects larger than two acres and with multiple buildings. Buildings shall be differentiated from other building types through type of building, variations to building materials, color, rooflines, and the use of architectural features such as awnings, light fixtures and eave details
6. *Setbacks.* The following building setbacks, as measured from property lines, for primary buildings shall apply in the Planned Residential Development zone:
    a. For residential developments one acre or less not including an existing or new commercial use as part of the project
        i. *Front Setback.* 25 feet
        ii. *Rear Setback.* 30 feet
        iii. *Side Setbacks.* For attached units the setback between buildings is 10 feet and 6 feet for a combined side yard setback of sixteen (16) feet. For interior units with common walls the setback is zero (0) feet. For detached buildings the side setback is six (6) feet for a combined side yard setback of twelve (12) feet.
    b. For residential developments proposed for a property with new or existing commercial uses the below setbacks are required.
        i. buildings shall be setback a minimum thirty (30) feet from the abutting property line of any single-family residential or R1-20 zone and any commercial building.
        ii. Side Setbacks: 10 feet and 6 feet for a combined side yard setback of sixteen (16) feet. For interior units with common walls the setback is zero (0) feet. When abutting the property line of any single-family residential the side yard shall be increased to thirty (30) feet.
        iii. Corner side setbacks 20 feet.
        iv. Front: 25 feet. The front setback may be modified by the land use authority where design items such as common open space, paseos or similar design feature is proposed.
        v. Rear: 30. The rear setback may be modified by the land use authority where design items such as common open space or similar design feature is proposed. Setbacks from abutting single family residential may not be reduced.

7. *Utilities.* Compliance with the Development Manual and applicable Lindon City Code provisions regarding utility connections to residential units is required. The public sewer system and the public water supply shall serve all dwellings. All utilities shall be underground. The developer shall individually meter natural gas and electricity for each individual dwelling. No water or sewer lines shall be located under covered parking areas. Wall-mounted and ground-based meters, HVAC, and utility equipment serving a building shall be located as close to each other as possible and fully screened from view. Screening shall either be incorporated aesthetically into the design of the building, fencing or screened by landscaping.
8. *Fences.*

a. *Perimeter Fences.* A minimum seven (7) foot masonry or concrete perimeter fence shall be required as a buffer when abutting single family residential or commercial uses.
b. *Patio/Limited Common Area Fences.* A patio or limited common area adjacent to the rear of a dwelling unit may be enclosed with a six-foot (6') high fence.

9. *Landscaping and Open Space.*
    a. All land within a Planned Residential Development not covered by buildings, driveways, sidewalks, structures, and patios shall be designated as common area and shall be permanently landscaped with trees, shrubs, lawn, or ground cover and maintained in accordance with good landscaping practice. All required setback areas adjacent to public streets shall be landscaped. All landscaping shall have a permanent underground sprinkling system.
    b. Development greater than one acre shall include common open space, according the following standards:
        i. At a minimum, twenty (20) percent of the development site, excluding roads or private driveways and required setback areas, shall be in common open space. Setback areas that are in usable size segments and where a common amenity is provided can be counted towards the common open space requirement. The land use authority may approve a reduction in the open space requirement by twenty-five (25) percent of the required open space square footage if the site is within one quarter mile, as measured at the closest property lines, of an existing Lindon City park or trail. Private balconies, porches, patios of a minimum sixty (60) square feet may be counted towards a maximum of ten (10) percent of the required open space percentage;
        ii. Open spaces shall include both active and passives spaces including plazas, courtyards, paseos, landscaped detention basins, playgrounds, pavilions, pools, spa, pool deck, or other areas that can be made into useable areas, and interior spaces available to residents as common area such as a clubhouse;
        iii. Open spaces shall be designed to be an integral part of any development. A majority of the required open space shall be consolidated into a primary central and common open space area. Alternative and innovative open space options may be presented to the land use authority for consideration which accomplish the similar goal of open space being integral part of any development. Buildings shall be designed around the common open space edge. Majority open spaces shall not be located in perimeter outlying areas of the development;
        iv. Where appropriate, the planning commission may approve individual private yard areas in place of common open space. However, development with private open space shall have no loss of the required open space percentage:
            1. Rear-loaded buildings shall provide private open space through porches, balconies, and small front yards;

2. Front-loaded units may provide private open space as enclosed rear yards.

v. Trees shall be planted along any property line abutting single family residential with trees planted as a buffer every thirty (30) feet. Trees shall be a minimum two (2) inch caliper, measured one (1) foot above the ground and shall be at least six (6) feet in height. Tree species shall be planted as found in the Lindon City Tree Planting Guide. An eight (8) foot landscaped area shall be provided for trees to be planted and allow for future tree growth. It shall be the responsibility of the property owner to maintain the trees in a healthy manner and to replace any trees that have died in order to maintain the buffer.

vi. Accent elements such as trellises, arches, arbors, columns, or low monument features shall be used to demarcate entrances to the development, common open spaces and paseos. Alternative accent elements may be approved by the land use authority

10. *Lighting Plan.* All Planned Residential Development's shall include a lighting plan and photometric study for parking lots, pedestrian walkways and buildings. The lighting plan shall be designed to:
    a. discourage crime;
    b. enhance the safety of the residents and guests of the Planned Residential Development;
    c. prevent glare onto adjacent properties; and enhance the appearance and design of the project.

    All Planned Residential Development homeowners' associations and housing units are required to control and meter all outside lighting shown on the lighting plan except for front and back door lighting. The lighting plan shall designate which lighting shall be commonly metered to the association or owner.
11. *Parking.* There shall be a minimum of two (2) parking spaces provided for each dwelling. At a minimum, sixty-five (65) percent of the residential units shall have a garage capable of parking two (2) vehicles. Required off-street parking spaces shall not be permitted within the street-side yard setbacks. There shall be a minimum of one half (½) parking space for each dwelling for guest parking within the development. Guest parking shall be located on the same lot or parcel of the dwellings served. With approval of the land use authority, a development may count building unit driveways up to fifty (50) percent of the required spaces toward meeting the quest parking requirement. All parking spaces shall measure at least nine (9) feet by eighteen feet (18'). Developers shall pave with asphalt and/or concrete all parking spaces, parking areas, and driveways and provide proper drainage. Drainage shall not be channeled or caused to flow across pedestrian walk ways. The architecture of all covered parking structures shall be the same as the architecture of the main buildings within the Planned Residential Development.

a. Direct access to each parking space shall be from a private driveway and not from a public street unless otherwise granted by the Planning Commission based on the following guidelines:
    i. Topography or other development constraints on the project area are such that a private drive is impractical to serve the project.
    ii. Traffic volumes, safety, and visibility on the public roadway will not create a dangerous situation for direct parking stall access.
    iii. No more than six (6) units shall directly access any public roadway.

12. *Irrigation Systems.*
    a. Where an existing irrigation system consisting of open ditches is located on or adjacent to or within one hundred (100) feet of a proposed subdivision, complete plans for relocation or covering or other safety precautions shall be submitted with an application for preliminary approval of a plat.
    b. All pressure irrigation systems in or within one hundred (100) feet of a proposed subdivision shall be identified and otherwise color-coded as to pipe and valve color to meet state standards and regulations.
13. *Solid Waste Receptacles.* All solid waste receptacles which are not located within a building, shall be enclosed on at least three sides with the similar materials as used on the exterior of the main buildings within the Planned Residential Development. Central waste receptacles shall only be permitted within a trash enclosure which meets standards found in the Development Manual. Trash enclosures shall be located in the side or rear of the dwelling units, but not the Streetside, and must be accessible for garbage trucks.
14. *Architectural and façade Designs.* The treatment of building design, materials and exteriors shall be architecturally and aesthetically pleasing and have unique individual, feel and sense of place, while still being architecturally compatible with the surrounding buildings and properties. Buildings within developments shall have a variety of building materials to architecturally set them apart and to create unique and separate buildings. Both vertical and horizontal elements shall be used, as appropriate, to give variety and architectural detail. Side facades of buildings shall typically receive equal design consideration, particularly when fronting common open spaces, public or private streets, and development entrances. The following architectural design requirements shall be applied:
    a. Buildings shall contain more than a single-color application and more than a single material application;
    b. Building Materials
        i. The following materials may be used as the primary exterior materials of a building consisting of at least sixty (60) percent: wood clapboard, cementitious fiber board, wood board and batten, wood siding, brick, stone, or similar material as approved by the land use authority. The following secondary materials may be

used: cementitious fiber board, brick, wood, stone, glass, architectural metal panel, or similar material as approved by the land use authority.

ii. EIFS or stucco may be used for up to thirty (30) percent on the front façade of a building and forty (40) percent of a side façade when facing a public or private street, development entrance or common open space. EIFS and stucco do not have a maximum percentage on the remaining side and rear facades when not fronting on a public or private street, development entrance or common open space.

c. Each building shall include varied wall plains, recesses, or similar façade design to incorporate wall variation.

d. Changes in materials and color shall correspond to variations in building mass or shall be separated by a building element.

e. Buildings shall incorporate a variety of materials and architectural elements to provide variation among the building types.

f. Eaves and rooflines are encouraged to emphasize vertical proportions. They shall be broken up with gables, building projections, and articulation to emphasize the individual quality of the units.

g. Garage doors shall be designed consistent with the overall style of the building. Material, pattern, and, color to be coordinated with the architectural style. Garages shall be recessed from wall plane. Where garage doors are flush with facades, the facade shall feature upper level building projections and decorative building elements such as trellises to provide interest and relief. For buildings with front loading garages, garage doors shall include windows to add variety to the door.

h. Stucco-textured foam trim molding shall not be used as the only application to enhance building facades

i. All windows along the front façade shall incorporate at least two of the following:

i. mullions and/or transoms;

ii. trim or molding at least four inches in width. The trim or molding shall have a different color from the buildings primary color;

iii. canopies, shutters, or awnings, proportional to window size;

iv. recessed inset from the front façade by at least two (2) inches.

j. the front façade of any residential building shall not face or front the rear yard or side yard of a single-family home

15. *Roof Pitch.* All buildings shall have a pitched roof consistent with the overall architectural style of the building.

16. *Homeowner's Association.* The applicant shall establish a home owners association for every Planned Residential Development containing common or limited common property, with more than one owner for the purpose of maintaining the Planned Residential Development. The

homeowner's association, the individual property owners, and tenants shall maintain the ~~PRD~~ Planned Residential Development in accordance with the approved site plan.

17. *Existing Homes.* No Planned Residential Development shall include an existing single-family dwelling. If a single-family dwelling exists on the property where a Planned Residential Development is proposed, the applicant shall plat separately a lot containing the home. The plat shall comply with the requirements of the Lindon City Development Manual.
18. Each attached unit must contain enhanced sound attenuation and sound mitigation construction;
19. *Pedestrian Connections.*
    a. The project site plan and development must connect each separate building with internal concrete walkways to provide safe and convenient pedestrian access to common areas and amenities. The width of internal walkways that are adjacent to parking stalls shall be no less than five feet. The width of internal walkways that are not adjacent to parking stalls shall be no less than four feet.
    b. To the extent possible, developments shall make at least one pedestrian access connections to a public street right-of-way.
20. *Frontage, Orientation and Entrances.*
    a. Building entrances shall, to the extent feasible, front onto streets, private driveways designed as streets or common open spaces. Where an end unit fronts onto a street or private driveway designed as a street, center block residences may front onto a common open space, courtyard, paseos or landscaped pedestrian way;
    b. In order to create neighborhood connections, all residential buildings shall have expansive windows, entryways, balconies, terraces or other architectural design features which are oriented to the street, pedestrian way or common open spaces.
    c. Building entrances shall be the primary feature of the front façade and identify access to individual units;
    d. Stoops or front porches, raised a minimum of one (1) foot above the adjacent grade, shall be provided at entrances that face a street, paseo, common open space area, or other public space.
21. *Access and Streets.*
    a. Development access shall be identified on the site plan and subdivision plans. New public streets shall follow the Lindon City Streets Master Plan Map. Projects may be accessed through existing or new commercial developments when appropriate easements or land is secured for access. Proposed developments shall not remove existing single-family homes for access connections to adjacent neighborhoods.
    b. The minimum width for private streets shall be twenty-four (24) feet if residential buildings are less than thirty (30) feet in height. For residential buildings thirty (30) feet or greater in height, the minimum private street width is twenty-six (26) feet. Where a street includes public utilities, the minimum street width shall be twenty-nine (29) feet, constructed to a public street standard as found in the Lindon City Development Manual,

and dedicated to Lindon City. Hard surfacing for both private and public streets shall not include the gutter when determining minimum street widths.

SECTION II: The provisions of this ordinance and the provisions adopted or incorporated by reference are severable. If any provision of this ordinance is found to be invalid, unlawful, or unconstitutional by a court of competent jurisdiction, the balance of the ordinance shall nevertheless be unaffected and continue in full force and effect.

SECTION III: Provisions of other ordinances in conflict with this ordinance and the provisions adopted or incorporated by reference are hereby repealed or amended as provided herein.

SECTION IV: This ordinance shall take effect immediately upon its passage and posting as provide by law.

PASSED and ADOPTED and made EFFECTIVE by the City Council of Lindon City, Utah, this _____day of _____, 2020.

_____

Jeff Acerson, Mayor

ATTEST:

_____

Kathryn A. Moosman,

Lindon City Recorder

SEAL