CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type:	Regular Meeting
Meeting Location:	Council Conference Room – City Hall, Dover NH
Meeting Date:	**Thursday, January 14, 2021**
Meeting Time:	**10:30 AM**

1. 10:30 AM – 11:15 AM: Site Review using Transfer of Development Rights for 54 BRR, LLC, Assessor's Map I, Lot 6, zoned R-12, located at 54 Back River Road. (Proposal is to develop an affordable housing community with 44 detached 384 s.f. one-bedroom units). A related CUP application will also appear before the Planning Board. [*This item was previously heard on October 8, 2020*] (P20-60)

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL

5 Railroad Street • P.O. Box 359
Newmarket, NH 03857
Phone: (603) 659-4979
Email: mjs@mjs-engineering.com

January 4, 2021

Dover Planning Department
Central Ave.
Dover, NH 03820

Re: Site plan review P20-60 54 Back River Rd, LLC, Map I Lot 6
Technical Review Committee response

Dear Donna,
Please find enclosed 8 full size copies of revised plans for the above-mentioned project. This submission is in response to the plan comments from the October 8, 2020 TRC meeting. I have copied the plan review comments from that meeting and included them herewith in italics. Our response follows each of the comments and identifies the plans that include the comments.

Planning Comments:

- *Water/ sewer investment fees will be assessed.*
- *Impact fees*
  - This has been revised and discussed with the owner relative to affordable housing small units.
- *Any steep slopes? CUP needed?*
  - Yes, a conditional use is required for impact to steep slopes and has been included herewith.
- *Will the open space be deed restricted to prevent further development?*
  - Yes, in addition the slopes are too steep to develop.
- *Provide*
  - *Will the units be sold or rented?* Rented, and a lease agreement will be provided.
  - *Traffic impact analysis?* The traffic impact analysis is included with this resubmission.
  - *Lighting plan?* A lighting plan is being prepared.
  - *Landscape plan and operation and maintenance?* This is being prepared.
- *Please revise plan to:*
  - *Add owners signature.* Included on site plan note 2.
  - *Add professional signature and stamp.* Added to plans
  - *Correct Map from I-2 to I.* Not sure where this reference is located but we have reviewed the plans and do not see a reference to I-2.
  - *Relocate the middle two units between the northern two units to create one larger common with homes along it.* These have been revised accordingly.
  - *Provide road name that ends in Drive.* We have provided a name.
  - *Add distance between units.* This has been added to the plan.
  - *Consider relocating the attached sheds to the rear of the units.* This cannot be done due to grades.
  - *Change note 31 from required parking to allowed.* This has been completed.
  - *Stripe spaces next to crosswalk to allow for site distance.* This has been completed.
  - *Move sidewalk to parking lot side.* We have shifted the sidewalk to the other side.

- *Widen and pave sidewalk and walkways.* All are 5' wide and paved.
- *Add proposed plan to neighborhood plan.* This has been completed.
- *Add plan #P20-60 to plans on all title blocks.* The plan number has been added to the plans.
- *Address active and passive recreation requirements.* Active a passive recreation has been addressed in the revised letter of intent.
- *Add notes about 30' no cut, no disturb buffers remaining.* A note regarding the buffers has been added to site plan.
- *Revise so driveway to existing house comes off new road.* This cannot be done due to grades and the existing access is shared with the house to the east.
- *Relocate the walking paths off the accessory driveway to be opposite each other.* This has been incorporated into the design.
- *Add common site plan notes 9, 17 and 20.* We have added note 9 & 20 but note 17 is stating what erosion control notes need to be on the plan which we have on the detail sheet, so this note doesn't make sense to be on the site plan, unless I am missing something.
- *Add accessible parking spaces.* Two ADA spaces have been added.
- *Add note regarding the use of the existing home.* A note stating the existing home will be used as a community space.
- *ID correction for pool which straddles the lot line Map I, Lot 6-I-1.* This has been corrected.

Engineering Comments:

- *Consider wider paths.* Everything is 5' wide.
- *Relocate two middle houses…..* This has been incorporated into the design.
- *Move sidewalk along parking side:* Done

Police Department Comments:

- *Correct note 22 on sheet C-101.* This have been corrected to exclude Sunday as a work day.
- *Traffic assessment memorandum?.* This is submitted herewith and addresses three intersections.
- *Means and methods for waste disposal.* A fenced dumpster and recycling area has been incorporated into the design. A private hauler will be used.
- *None of the units appear to be assessible. No ADA parking provided.* Some of the units will be set up for ADA, and parking spaces have been added.
- *Lack of sufficient guest/overflow parking is a concern.* Based on the traffic and parking analysis, the 58 spaces appear to be adequate for the proposed use.
- *Snow storage?* Space for snow storage has been incorporated into the design.
- *How will the existing home be used?* Community space.
- *How will residents access openspace. Any steps or pathway proposed?* The access to the open space via a trail has been added to the plan. The connection is between units 38 & 39 and lead down through the open space to a wooden platform for a river view.

Fire/Inspections Comments:

- *Did we look at doing attached SF units to cluster the buildings and have more space between units.* Yes, and we did combine some, but the goal is to provide individual units for people rather than multi units to give a sense of "ownership".
- *Accessible spaces will be required.* Two spaces have been provided.
- *Provide a proposed street name.* Cottage Drive.
- *Clarify distance between adjacent structures and projections.* A dimension has been added to the plan and the typical distance is 12' between units and 8' between projections.
- *Provide apparatus turnaround.* As discussed the parking area has been provided and is now allowed.

- *Several structures appear to be located beyond the permitted distance from the access road.* Setbacks have been added with the 50' and 150' distances. All units that do not meet the requirements will have sprinklers and this has been noted. An access road for emergency access has been added to the first housing cluster on the west to provide additional access.
- *Discuss the choice of the stone dust path and how this will be maintained.* All paths have been changed to pavement.

If you require additional information or have any questions or comments, please call (603) 659-4979 x302.

Sincerely,

Michael J. Sievert PE
President

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL

5 Railroad Street • P. O.Box 359
Newmarket, NH 03857
Phone: (603) 659-4979
Email: mjs@mjs-engineering.com

Letter of Intent – Site Plan Review, TDR Application and Conditional Use Application

For

54 BRR, LLC

Workforce Housing Development

Tax Map I Lot 6

January 4, 2021

The Subject Property

The subject parcel is located at 54 Back River Road within the R-12 district. The 7.36 acre parcel is bordered on the west by a residential development on Red Barn Drive, the south by Back River Road, the north by the Bellamy River and east by lots. The property is serviced by municipal water and sewer. Overhead utilities are also currently provided to the site from Back River Road. Natural gas is provided available on Back River Road.

The parcel is currently developed with one single family home. This building will be retained and remodeled and used as a community space for the development. The remainder of the parcel is mostly wooded with the exception of a small area directly behind the house. This area was previously used as a contractor storage yard and has been filled significantly to level the area. The northerly and westerly part of the parcel has steep slopes some in excess of 20% which have been identified on the existing conditions plan. The parcel is also subject to the Riverfront Overlay District and Conservation District from the Bellamy River.

54 BRR, LLC Workforce Housing Cottage Development Proposal

The proposal by 54 BRR, LLC is to develop the existing property into a workforce housing development. The style of the development will be small single family detached "Cottages" in clusters. Each cluster will have a central green space for community use. There is a main access road with parking situated along the road and in a small parking lot between two of the northerly clusters. The developed area encompasses approximately 3.4 acres of the subject parcel with the remaining 4.0 acres to remain as open space. The units are 384sf, with kitchen/living, bedroom and bath. There is a small front porch and attached storage shed.

The development is in accordance with the City of Dover Zoning Ordinance Section 170-27.2 Transfer of Development Rights. This project specifically falls under section G(3)(a). The

submission includes a Yield plan prepared by Tritech Engineering. This yield plan meets the minimum requirements for develop in the R-12 District and establishes the base number of units. The transfer meets the requirements of section ii.1 because of the size of the units. These units will be rental units and will meet the HUD Fair Market Rent rates for Dover, NH.

In accordance with the City of Dover Zoning Ordinance Section 170-15, it appears the required usable recreation space for this development would be 4400 SF. Incorporated into the proposed site plan are active recreation areas within the "pods" that total approximately 12,650 SF. This area is intended to be green space for recreation including sports, outdoor grilling, sitting areas and the walkways are also included. In addition to this area, there is approximately 4 acres of open space, that will be restricted from future development with a 600 – 700 LF walking trail and platform overlooking the river.

In accordance with the City of Dover Zoning Ordinance Section 170-27 B.4, a condition use permit is required for construction activities within the Conservation District where areas in excess of 20% slope exists. The impacts for this proposed project include filling for road and utility construction, structures including 6 units, retaining wall and a wooden platform and filling to construct the stormwater treatment pond. The total area impacted within the Conservation District is 0.40 acres. All of the impacted areas are located at the upper limits of the slopes greater than 200' from the river. Proper erosion controls will be used and the fills for development are being minimized by using retaining walls to minimize fill slopes and tree removal. The grading, drainage and erosion control plan and detail sheet C501 & 502 address the construction management, soil stabilization, drainage design, inlet and outlet protection and perimeter controls for erosion control in accordance with best management practices. In addition, a shoreland permit is required for construction within the 250 shoreland setback and an Alteration of Terrain AOT permit is required for construction activities over 100,000 Sf of disturbance.

A. *Request for Technical Review Committee and Site Plan Approval*

In accordance with the Dover Code chapter 149, Site Review Regulations, this revised submission package includes the Application for Conditional Use, Fees, and the following plans and supporting documentation are included:

1. Cover Sheet
2. Existing Conditions Plan
3. Yield Plan
4. Site Plan
5. Grading, Drainage, & Erosion Control Plan
6. Utility Plan
7. Road Plan and Profile
8. Neighborhood Plan
9. Construction Details
10. Proposed Building Floor Plans and Elevations

11. Site Perspectives
12. Street Perspectives
13. Drainage Report
14. Traffic Report

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely;

Michael J. Sievert PE
MJS Engineering

Drawing Name: P:\20pro\20-011\internal\Drawing Files\Cover Sheet 3_MOS.dwg
Mon, 04 Jan 2021 - 6:55pm

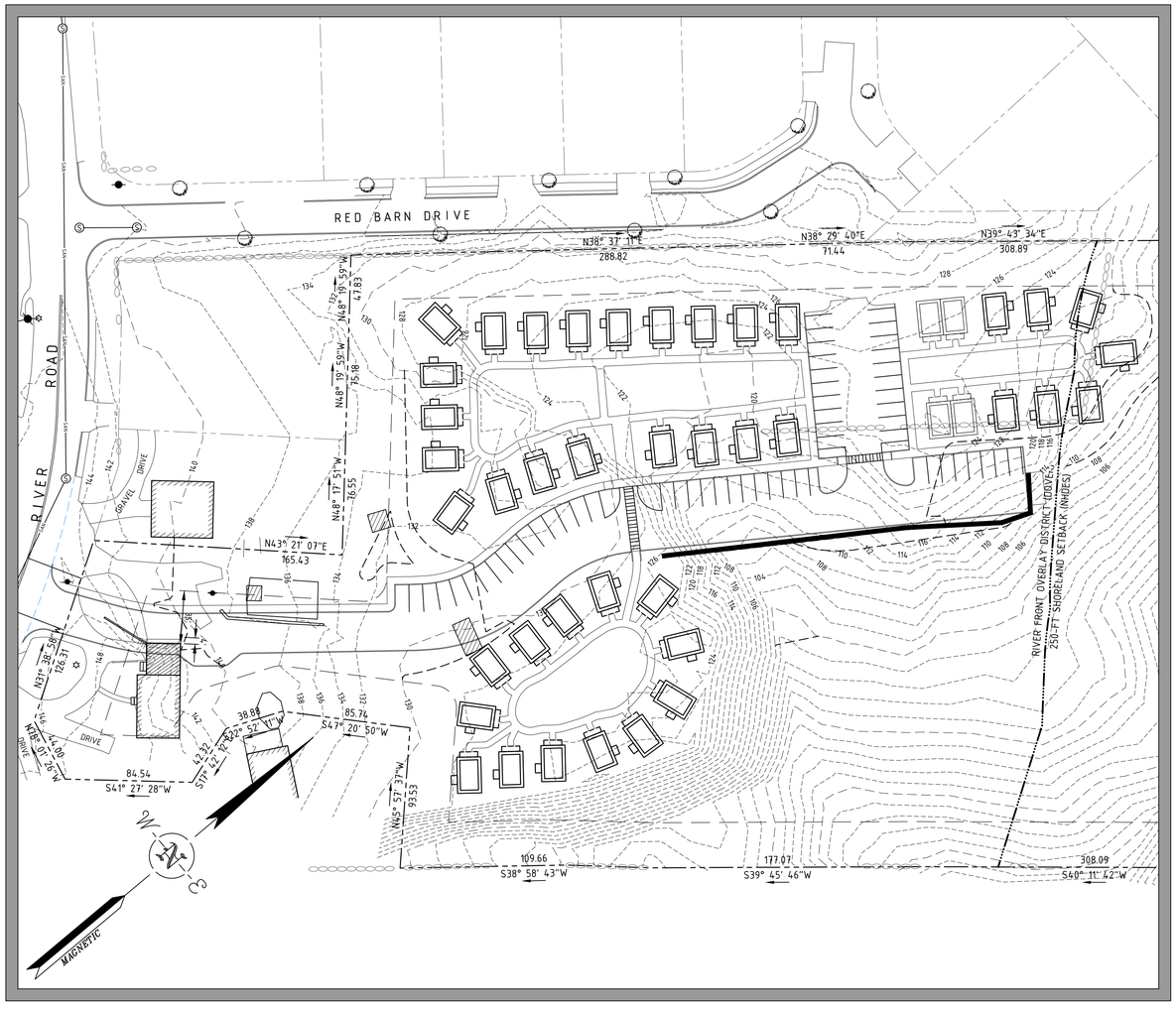
SITE PLAN

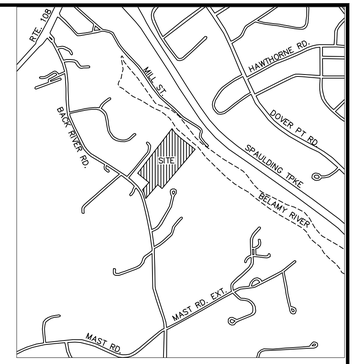
for

54 BRR, LLC

COTTAGES AT BACK RIVER ROAD

54 BACK RIVER ROAD
DOVER, NH
SEPTEMBER 17, 2020
REV. JANUARY 1, 2021





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TITLE	SHEET
EXISTING CONDITIONS PLAN	EX-1
YIELD PLAN	Y-1
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GRADING AND EROSION CONTROL PLAN	C102
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ROAD PLAN AND PROFILE	C104
NEIGHBORHOOD PLAN	C301
CONSTRUCTION DETAILS	C501-507
LIGHTING PLAN	LT101
LANDSCAPING PLAN	LA101

OWNER

54 BRR, LLC
1 STAGECOACH RD
DURHAM, NH 03824

CIVIL ENGINEER

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Railroad St., P.O. Box 359
Newmarket, NH 03857
Phone: (603) 659-4979, Fax: (603) 659-4627
E-mail: mjs@mjs-engineering.com

SURVEYOR

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3830

LANDSCAPE ARCHITECT

woodburn &company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

SOIL SCIENTIST

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, ME 03908

NO.	REVISIONS	DATE	INT.
1.	REVISIONS PER TRC #1	1/4/21	MJS
0.	INITIAL SUBMISSION TO DOVER	09/17/20	MJS

(P20-60)

NOTES

1.) INTENT: TO SHOW THE EXISTING CONDITIONS OF DOVER TAX MAP I LOT 6.

2.) CURRENT OWNER OF RECORD: 54 BRR, LLC
1 STAGECOACH ROAD
DURHAM, N.H.

3.) SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.

4.) TOTAL LOT AREA: 311,970 SQ.FT. – 7.162 ACRES

5.) TAX MAP I LOTS 6

6.) PROJECT DEED REFERENCE: BOOK 4764 PAGE 977

7.) ZONING: R–12

MIN. LOT SIZE: 12,000 SQ. FT.	OPEN SPACE REQUIREMENTS
MIN. FRONTAGE: 100 FT	MIN. LOT SIZE: 8,000 SQ.FT.
MIN. SETBACKS:	MIN. FRONTAGE: 20 FT
FRONT: 30 FT	MIN. SETBACKS:
SIDE: 15 FT	FRONT: 10 FT
REAR: 15 FT	SIDE: 10 FT
MAX BUILDING HEIGHT: 35 FT	REAR: 10 FT
LOT COVERAGE: 30 %	EXTERIOR BOUNDARY: 30 FT
	EXISTING STRUCTURES: 50 FT
	FRONTAGE BUFFER:100 FT

8.) THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL

9.) THE RAW UNADJUSTED CLOSURE OF OUR RANDOM POINT TRAVERSE WAS 1 PART IN 35,000, AND WAS ACCOMPLISHED USING A TOPCON 500 GT TOTAL STATION, DURING THE MONTH OF SEPTEMBER, 2018.

10.) IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED

11.) AN ON–SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170–27.1) AND ON STATE & FEDERAL CRITERIA OUTLINED IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY, 1987) ON THIS SITE, WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.

PROJECT PLAN REFERENCE:

OPEN SPACE SUBDIVISION PLAN BELLAMY RIDGE 46 BACK RIVER ROAD DOVER, NEW HAMPSHIRE TRITECH ENGINEERING CORPORATION DECEMBER 24, 2014 SCRD 110–35	PLAN OF LAND OF ROBERT & MURIEL NESMAN BACK RIVER ROAD DOVER, N.H. McENEANEY & O'NEIL SURVEY ASSOCIATES MAY 6, 1988 SCRD 34–66
PLAN OF LAND OF BRUCE G. & OLIVE E. STAPLES BACK RIVER ROAD DOVER, NEW HAMPSHIRE K.E. MOORE & B.G. STAPLES JAN. 1985 SCRD 25–65	PLAN OF LAND FOR EDWARDS REALTY INC SAWYERS LOWER MILL DOVER, NEW HAMPSHIRE GRANT L. DAVIS APRIL 1954 SCRD Po 2 Fo 21 PLAN #26
BOUNDARY LINE ADJUSTMENT FOR LOUISE SWEATT DOVER, NEW HAMPSHIRE EMERY ENGINEERING SEPTEMBER 26, 1991 SCRD 39–79	SUBDIVISION PLAN FOR LOUISE M. SWEATT DOVER, NEW HAMPSHIRE EMERY ENGINEERING JUNE 6, 1991 SCRD 39–24

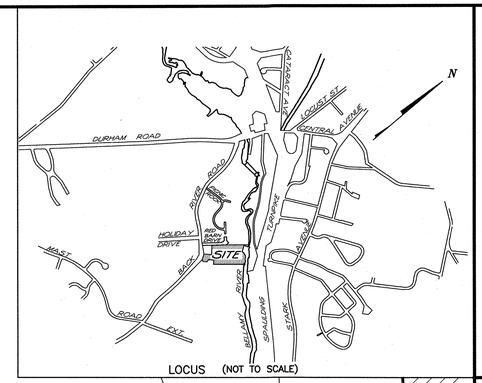
12.) BASIS OF BEARING: BEARING SYSTEM BASED ON GPS FIELD OBSERVATIONS ON AUGUST 21, 2018 USING TOPCON HIPER SR RECEIVERS AND OPUS CORRECTED ON AUGUST 24, 2018. DATUM BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH), (VERTICAL DATUM: NAVD 88). (DOVER GIS)

13.) A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD HAZARD ZONE A – PANEL 0340E, MAP No. 33017C0340E, DATE: 9–30–2015).

14.) MAP I LOT 6C MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.

15.) LOTS ARE SERVICED BY CITY WATER AND MUNICIPAL SEWER.

16.) A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO A PORTION OF THE SUBJECT PARCEL.



TRITECH
ENGINEERING CORPORATION
765 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3830

REVISIONS
DATE: DESCRIPTION:

LICENSED LAND SURVEYOR NO. 884 ROBERT J. MCKINNEY STATE OF NEW HAMPSHIRE

EXISTING CONDITIONS PLAN
54, BRR, LLC
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY
SEPTEMBER 17, 2020 JOB No. 18129
SCALE: 1" = 40'

SHEET No. EX-1

(P20-00)

NOTES

1.) INTENT: TO SHOW THE CONVENTIONAL SUBDIVISION OF DOVER TAX MAP I LOT 6.

2.) CURRENT OWNER OF RECORD: 54 BRR, LLC
1 STAGECOACH ROAD
DURHAM, N.H.

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FRONT: 30 FT	MIN. SETBACKS:
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REAR: 15 FT	SIDE: 10 FT
MAX BUILDING HEIGHT: 35 FT	REAR: 10 FT
LOT COVERAGE: 30 %	EXTERIOR BOUNDARY: 30 FT
	EXISTING STRUCTURES: 50 FT
	FRONTAGE BUFFER:100 FT

8.) THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL

9.) THE RAW UNADJUSTED CLOSURE OF OUR RANDOM POINT TRAVERSE WAS 1 PART IN 35,000, AND WAS ACCOMPLISHED USING A TOPCON 500 GT TOTAL STATION, DURING THE MONTH OF SEPTEMBER, 2018.

10.) IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON–SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170–27.1) AND ON STATE & FEDERAL CRITERIA OUTLINED IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY, 1987) ON THIS SITE, WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.

11.) PROJECT PLAN REFERENCE:

OPEN SPACE SUBDIVISION PLAN BELLAMY RIDGE 46 BACK RIVER ROAD DOVER, NEW HAMPSHIRE TRITECH ENGINEERING CORPORATION DECEMBER 24, 2014 SCRD 110–35	PLAN OF LAND OF ROBERT & MURIEL NESMAN BACK RIVER ROAD DOVER, N.H. McENEANEY & O'NEIL SURVEY ASSOCIATES MAY 6, 1988 SCRD 34–66
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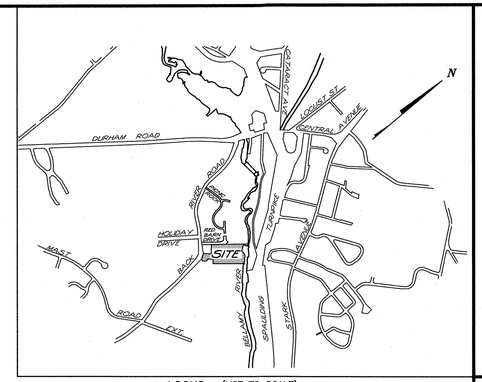
13.) A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD HAZARD ZONE A – PANEL 0340E, MAP No. 33017C0340E, DATE: 9–30–2015).

14.) THE LOTS TO BE SERVED BY MUNICIPAL WATER AND SEWER.

15.) ALL PROPOSED LOTS CONTAIN A MINIMUM OF 12,000 SQ.FT. OF CONTIGUOUS UPLAND, AND MORE THAN 8,000 SQ.FT. OF CONTIGUOUS NON–BUFFER UPLAND.

16.) MAP I LOT 6 MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.

17.) A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO A PORTION OF THE SUBJECT PARCEL.



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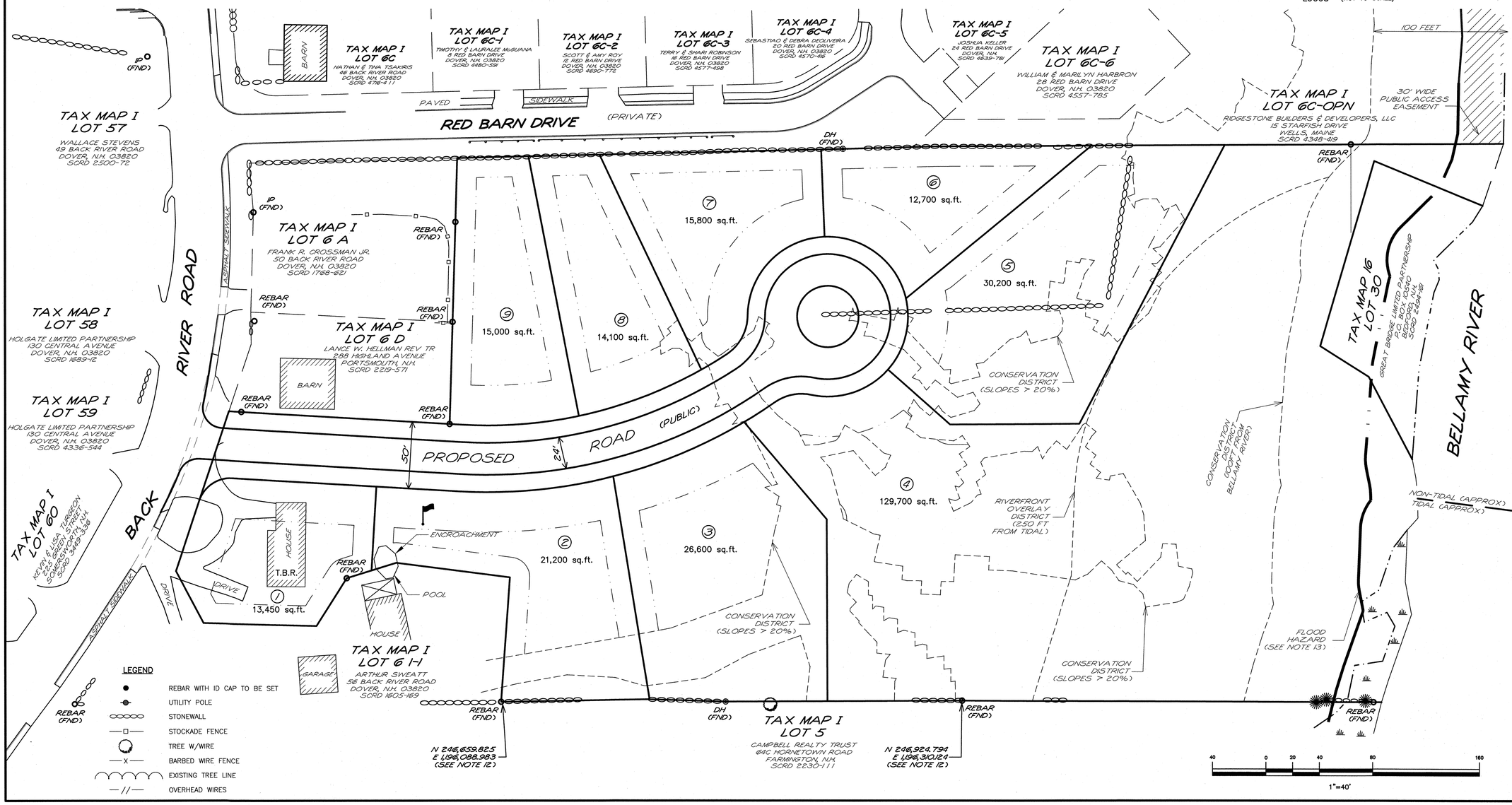

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3630

REVISIONS
DATE: DESCRIPTION:

YIELD PLAN
54 BRR, LLC
"COTTAGES"
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY
SEPTEMBER 17, 2020 JOB No. 18129
SCALE: 1" = 40'

SHEET NO. Y-1

(P20-00)

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2021-Sep-04 T 19:50

NOTES:

1. INTENT: TO SHOW THE PROPOSED CONDITIONS OF TAX MAP I, LOT 6.
2. CURRENT OWNER OF RECORD: 54 BRR, LLC
   1 STAGECOACH RD
   DURHAM, NH 03824
   OWNER SIGNATURE: _____
3. SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.
4. TOTAL LOT AREA: 320,602 SQ. FT ± 7.36 ACRES
5. TAX MAP I, LOT 6 OF THE CITY OF DOVER TAX ASSESSOR'S MAPS.
6. PROJECT DEED REFERENCE: STRAFFORD COUNTY REGISTRY OF DEEDS BOOK NO. 1605, PAGE NO. 169
7. ZONING: R-12

MIN. LOT SIZE: 12,000 SQ. FT	OPEN SPACE REQUIREMENTS
MIN. FRONTAGE: 100 FT	MIN. LOT SIZE: 8,000 SQ. FT
MIN. SETBACKS:	MIN. SETBACKS:
FRONT: 30 FT	FRONT: 10 FT
SIDE: 15 FT	SIDE: 10 FT
REAR: 15 FT	REAR: 10 FT
MAX. BUILDING HEIGHT: 35 FT	EXTERIOR BOUNDARY: 30 FT
MAX. LOT COVERAGE: 30%	EXISTING STRUCTURES: 50 FT
	FRONTAGE BUFFER: 100 FT

8. THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL.
9. IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON-SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170-27.1) AND ON STATE AND FEDERAL CRITERIA OUTLINES IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY 1987) ON THIS SITE. WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.
10. ON JUNE 22, 2020 JOSEPH W. NOEL, CERTIFIED SOIL SCIENTIST COMPLETED A SITE SPECIFIC SOIL MAP IN ACCORDANCE WITH "SITE SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT" (SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND, VERSION 5.0, DECEMBER 2017).
11. A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD ZONE A - PANEL 0340E. MAP NO. 33017C0340E, DATE 9-30-2015)
12. MAP I, LOT 6C MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.
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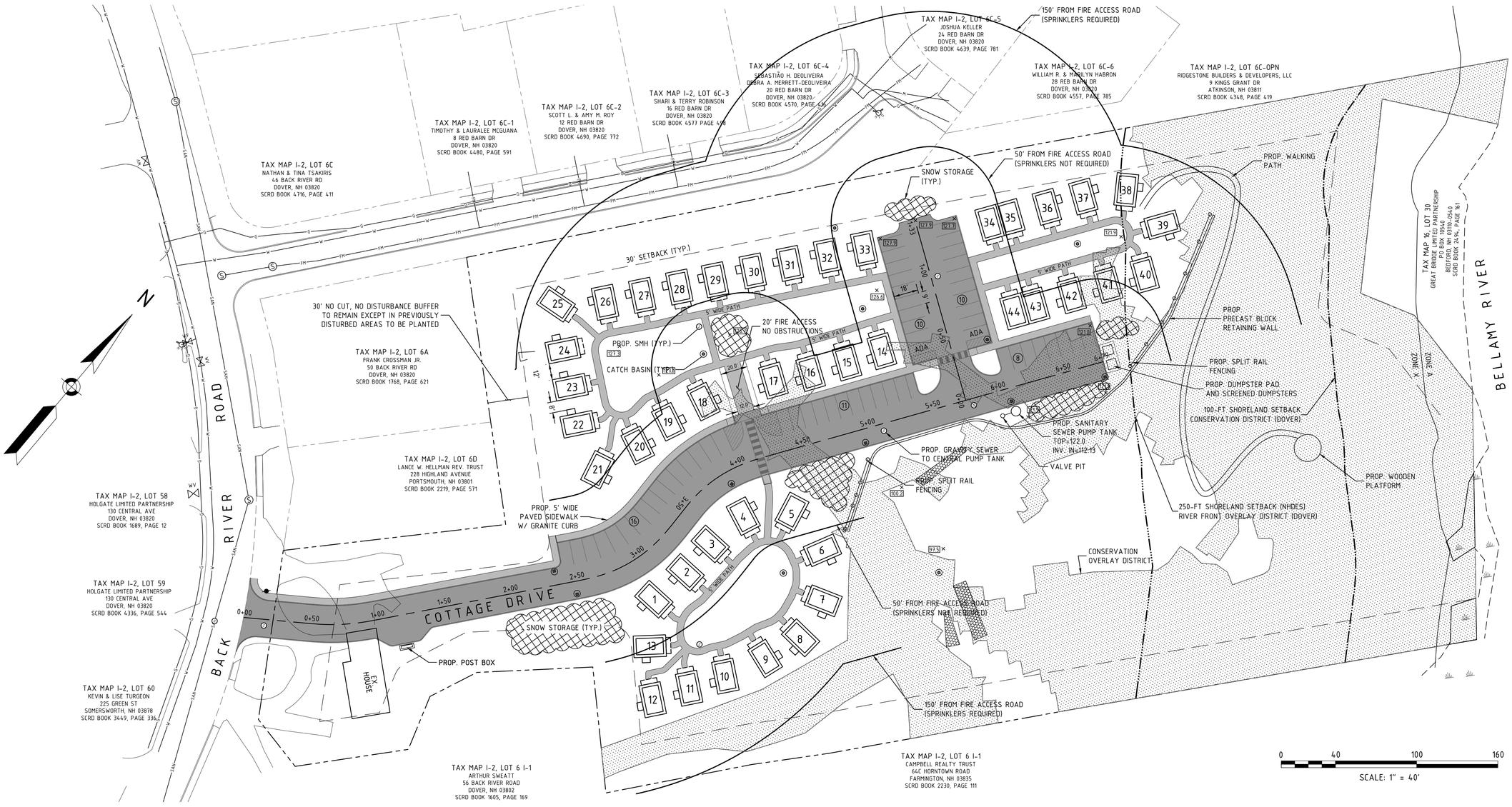
14. A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO A PORTION OF THE SUBJECT PARCEL.
15. AS-BUILT PLANS OF THE SUBDIVISION SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT AUTOCAD DWG, AUTOCAD DXF OR ESRI FORMAT TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF PROJECT IF A STREET IS PROPOSED FOR CITY ACCEPTANCE. AS-BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A L.L.S. OR P.E. DIGITAL FILES SHALL BE GEO-REFERENCED TO NEW HAMPSHIRE STATE PLANE COORDINATES NAD83 AND SHALL BE EXPRESSED IN FEET.
16. THE INSTALLATION OF THE ELECTRICAL POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.
17. ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.
18. THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
19. ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.
20. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY.
21. A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE CITY ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.
22. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY 7 AM-6 PM AND SATURDAY 9 AM-4 PM. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR. SAID SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR ASSISTANT CITY MANAGER.
23. BUILDING ADDRESSES (INCLUDING APT/UNIT NUMBERS IF APPLICABLE) SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.
24. THE PROPOSED USE FOR THE SITE IS SINGLE FAMILY COTTAGES FOR WORK FORCE HOUSING. 44 TOTAL 1 BEDROOM UNITS.
25. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:
   A. ALTERATION OF TERRAIN
   B. NHDES SEWER DISCHARGE
   C. NHDES SHORELAND
26. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
27. ANY RETAINING WALL OVER FOUR FEET (4') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
28. AND FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
29. THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS/ENTITIES THAT MAY ACQUIRE ANY PROPERTY SUBJECT TO THE REQUIREMENTS AND RESPONSIBILITIES DESCRIBED IN THE APPROVED STORMWATER MANAGEMENT PLAN. THE NOTICE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR RECORDING CONTAINED IN RSA 477 AND 478. THE NOTICE NEED NOT SET FORTH THE REQUIREMENTS AT LENGTH, SO LONG AS SUFFICIENT TO PROVIDE NOTICE TO ALL PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.
30. FIRE DEPARTMENT ACCESS ROADS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.
31. MAXIMUM ALLOWED PARKING SPACE CALCULATION:

USE	UNITS	STANDARD	ALLOWED	PROVIDED
RESIDENTIAL	43	1.4 SPACES/ UNIT + 0.5 GUEST SPACES/UNIT	82	55

32. EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.
33. TOPOGRAPHIC SURVEY PERFORMED BY TRITECH ENGINEERING IN AUGUST, 2018.
34. ELEVATIONS ARE BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH). (VERTICAL DATUM: NAVD 88). (DOVER GIS)
35. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER.
36. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
37. EXISTING BUILDING ON BACK RIVER ROAD TO BE USED AS COMMUNITY CENTER.
38. PROPOSED COTTAGES HAVE APPROXIMATELY 12' OF SPACE BETWEEN THEM.



NO.	DATE	INT.
0.	PRELIMINARY SUBMISSION	MCS
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	MCS
	11/25/20	
	1/4/21	

REVISIONS

SEAL

DATE ISSUED: 11/25/20
SCALE: 1"=40'
DESIGNED BY: MJS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 20011 Civil_.dwg

SITE PLAN
prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6
54 BACK RIVER ROAD, DOVER, NH

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JOB: 20-011

C-101

(P20-60)

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TAX MAP I-2, LOT 6C
NATHAN & TINA TSAKIRIS
46 BACK RIVER RD
DOVER, NH 03820
SCRD BOOK 4716, PAGE 411

TAX MAP I-2, LOT 6C-1
TIMOTHY & LAURALEE MCGUANA
8 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4480, PAGE 591

TAX MAP I-2, LOT 6C-2
SCOTT L. & AMY M. ROY
12 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4690, PAGE 772

TAX MAP I-2, LOT 6C-3
SHARI & TERRY ROBINSON
16 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4577 PAGE 498

TAX MAP I-2, LOT 6C-4
SEBASTIÃO H. DEOLIVEIRA
DEBRA A. MERRETT-DEOLIVEIRA
20 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4570, PAGE 416

TAX MAP I-2, LOT 6C-5
JOSHUA KELLER
24 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4639, PAGE 781

TAX MAP I-2, LOT 6C-6
WILLIAM R. & MARILYN HABRON
28 REB BARN DR
DOVER, NH 03820
SCRD BOOK 4557, PAGE 785

TAX MAP I-2, LOT 6C-OPN
RIDGESTONE BUILDERS & DEVELOPERS, LLC
9 KINGS GRANT DR
ATKINSON, NH 03811
SCRD BOOK 4348, PAGE 419

TAX MAP I-2, LOT 6A
FRANK CROSSMAN JR.
50 BACK RIVER RD
DOVER, NH 03820
SCRD BOOK 1768, PAGE 621

TAX MAP I-2, LOT 6D
LANCE W. HELLMAN REV. TRUST
228 HIGHLAND AVENUE
PORTSMOUTH, NH 03801
SCRD BOOK 2219, PAGE 571

BACK RIVER ROAD

COTTAGE DRIVE

EX. HOUSE

5' WIDE PATH

WALKING PATH

P.CB1 — 12" HDPE L=122', S= 1.6%
P.CB2 — 12" HDPE L=63', S= 12.7%
P.CB3
P.CB4 — 12" HDPE L=23', S=4.7%
P.CB5 — 12" HDPE L=125', S= 1.5%
P.CB6 — 15" HDPE L=104', S=3.0%; 18" HDPE L=111', S=1.3%
P.CB7 — 12" HDPE L=12', S=1.0%
P.CB8 — 12" HDPE L=49', S=2.3%
P.CB9 — 12" HDPE L=100', S=0.9%
P.CB10 — 12" HDPE L=74', S= 2.0%
P.CB11 — 15" HDPE L=99', S= 1.1%
P.CB12

PUMP STATION
VALVE PIT
PROP. RET. WALL WITH GUARDRAIL
RIPRAP WITH GEOTEXTILE
PROP. SED. FOREBAY
PROP. SILT SOCK OR SILT FENCE
PROP. BIORETENTION BASIN
6" UNDERDRAIN INV. = 96.3
OUTLET CONTROL DEVICE
BEEHIVE INV. (TOP) = 100.2
6" UNDERDRAIN INV. IN = 96.3
6" INV. OUT = 96.0
8" HDPE L=32', S=1.9%
INV. = 95.5
RIPRAP SPILLWAY WITH GEOTEXTILE

STRUCTURE	RIM	INVERT	
P.CB1	126.1	12"	(N) 119.0
		12"	(W) 119.1
		15"	(S) 118.3
P.CB2	126.5	12"	(E) 121.1
P.CB3	127.0	12"	(S) 120.7
P.CB4	132.3	12"	(N) 125.8
		12"	(E) 125.6
P.CB5	127.5	12"	(W) 123.0
		15"	(E) 120.9
P.CB6	124.5	15"	(N) 117.2
		15"	(W) 117.7
		18"	(E) 117.0
		12"	(S) 117.7
P.CB7	121.2	12"	(N) 115.9
		18"	(W) 115.5
		12"	(E) 115.0
		24"	(S) 112.0
P.CB8	120.2	12"	115.7
P.CB9	122.7	12"	(S) 117.0
P.CB10	133.4	12"	126.9
P.CB11	125.5	12"	120.0
P.CB12	121.7	12"	116.7

0 30 60 100
SCALE: 1" = 30'

NO.	DATE	INT.
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	1/4/21	MCS
0.	PRELIMINARY SUBMISSION	11/25/20	MCS

REVISIONS

SEAL

MICHAEL C. SIEVERT No. 9699 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

DATE ISSUED: 11/25/20
SCALE: 1"=40'
DESIGNED BY: MJS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 20011 Civil_1.dwg

GRADING, DRAINAGE, & EROSION CONTROL PLAN
prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6
54 BACK RIVER ROAD, DOVER, NH

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JOB: 20-011

C-102

(P20-60)

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TAX MAP I-2, LOT 6C
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TAX MAP I-2, LOT 6D
LANCE W. HELLMAN REV. TRUST
228 HIGHLAND AVENUE
PORTSMOUTH, NH 03801
SCRD BOOK 2219, PAGE 571

TAX MAP I-2, LOT 6 I-1

TAX MAP I-2, LOT 6 I-1
CAMPBELL REALTY TRUST
6/C HORNTOWN ROAD

BACK RIVER ROAD

COTTAGE DRIVE

SMH
RIM=145.0
INV. IN=137.95

PROP. SMH

SMH
RIM=127.0
INV. IN=120.58
INV. OUT=120.48

SMH
RIM=127.9
INV. OUT=120.0

SMH1
RIM=126.1
INV. IN(W)=118.78
INV. IN(E)=113.5
INV. OUT=113.4

SMH2
RIM=124.0
INV. IN=118.0
INV. OUT=117.9

SMH3
RIM=121.7
INV. IN(W)=117.13
INV. IN(N)=112.48
INV. OUT=112.38

SEWER SERVICE (TYP.)
4" SDR 35
MIN. S=0.01

SEWER SERVICE (TYP.)
4" SDR 35
MIN. S=0.01
SEE TYP. BUILDING SEWER CONNECTION FOR DETAILS

WATER SERVICE (TYP.)
2" PVC

6" PVC WATER MAIN

6" SDR 35 S=0.01

SEWER CLEANOUT (TYP.)
INV. OUT=121.5

CLEANOUT
INV. OUT=115.0

5' WIDE PATH

PROP. DUMPSTER PAD
AND SCREENED DUMPSTERS

PROP. SANITARY
SEWER PUMP TANK
TOP=122.0
INV. IN=112.13

PROP. GRAVITY SEWER
TO CENTRAL PUMP TAN

EX. HOUSE

HYD

WV

HP

IP

0 30 60 100
SCALE: 1" = 30'

NO.	DATE	INT.
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	1/4/21	MCS
0.	PRELIMINARY SUBMISSION	11/25/20	MCS

REVISIONS

SEAL

MICHAEL J. SEVERT NO. 9869 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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DESIGNED BY: MJS
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APPROVED BY: MJS
DWG FILE: 20011 Civil_1.dwg

UTILITIES PLAN
prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6
54 BACK RIVER ROAD, DOVER, NH

MJS ENGINEERING, P.C.
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(P20-60)

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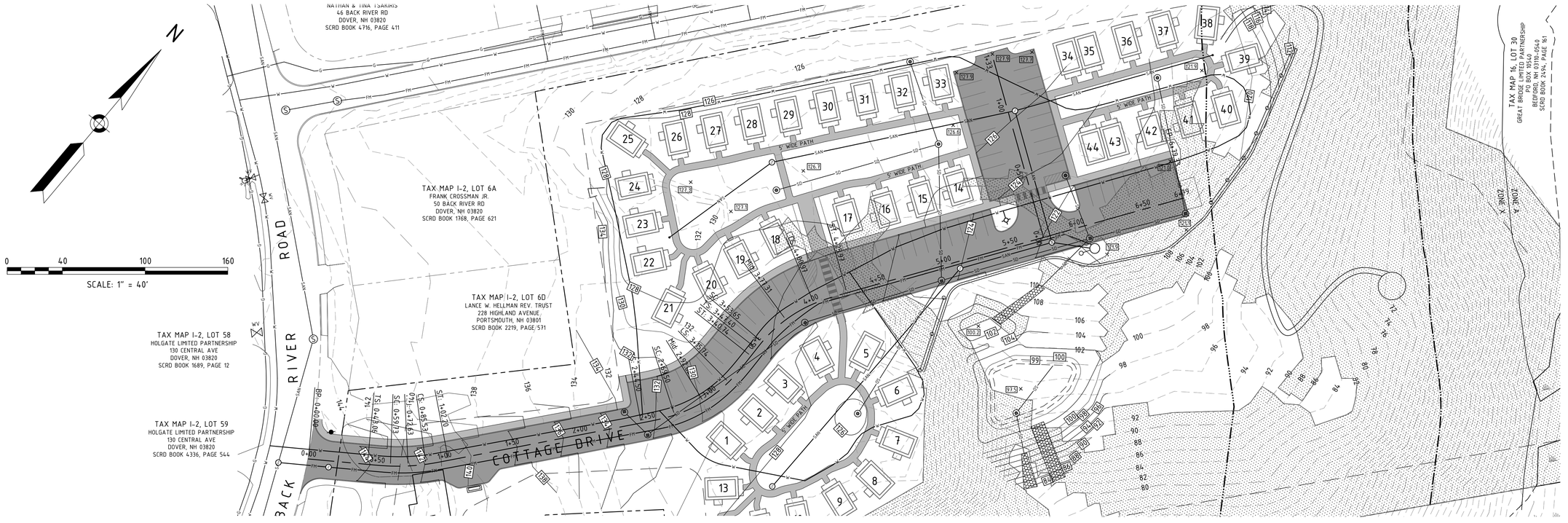
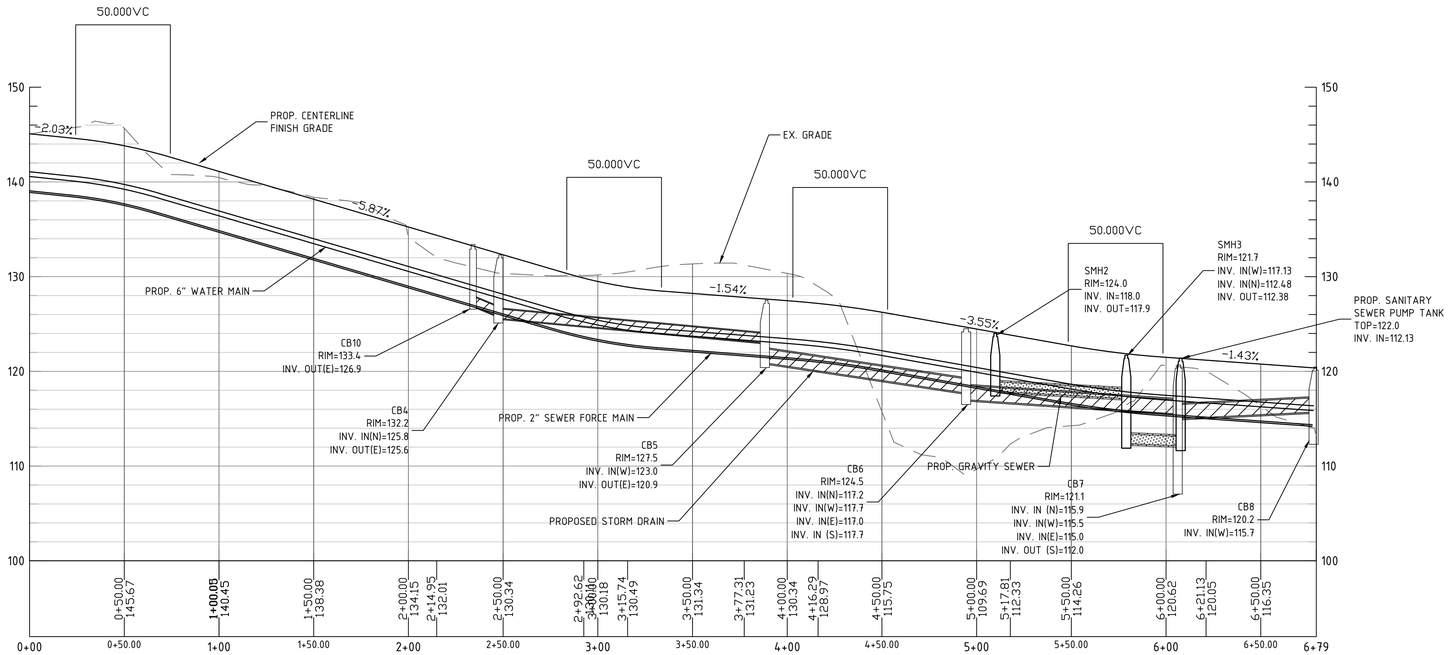
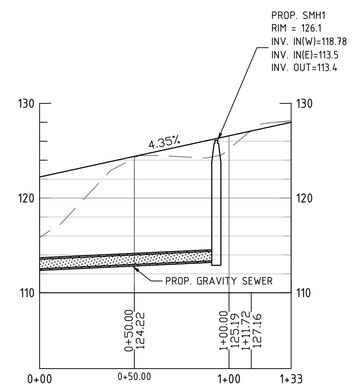




COTTAGE DRIVE PROFILE



COTTAGE DR. EXTENSION PROFILE

NO.	DATE	INT.
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	12/29/20	MCS
0.	PRELIMINARY SUBMISSION	11/25/20	MCS

REVISIONS

SEAL

MICHAEL J. METERT NO. 6809 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

DATE ISSUED: 11/25/20
SCALE: 1"=40'
DESIGNED BY: MJS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 20011 Civil_1.dwg

ROAD PLAN AND PROFILE
prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6
54 BACK RIVER ROAD, DOVER, NH

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JOB: 20-011

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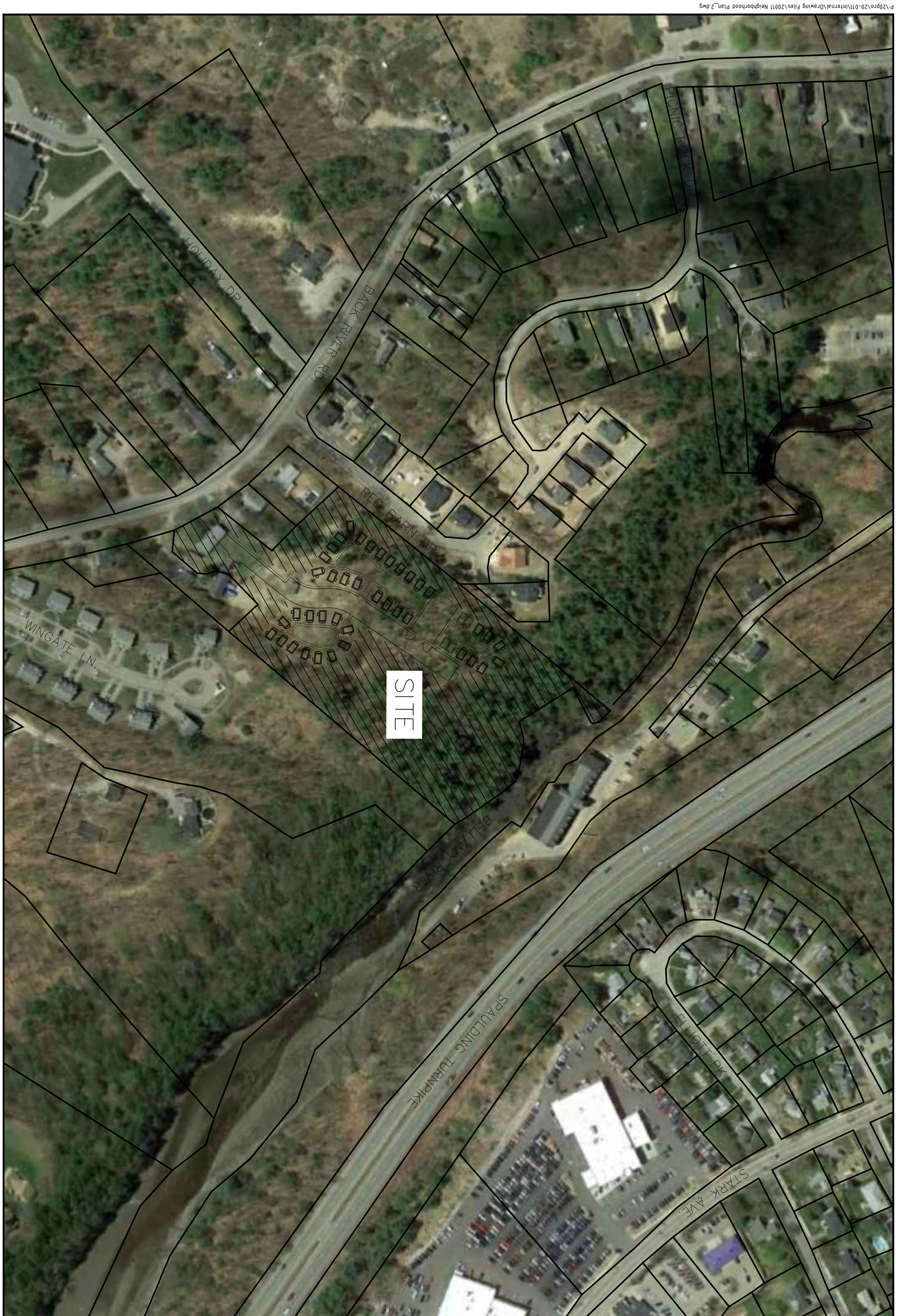
(P20-60)



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MJS ENGINEERING, P.C.
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Phone: (603) 659-4979, Fax: (603) 659-4627
E-mail: mjs@mjs-engineering.com

NEIGHBORHOOD PLAN

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6

DATE ISSUED:	12/29/20
SCALE:	1"=100'
DESIGNED BY:	MJS
DRAWN BY:	AWS
APPROVED BY:	MJS
DWG FILE:	20011 Neighborhood Plan_2.dwg

SEAL

STATE OF NEW HAMPSHIRE
MICHAEL J. SIEVERT
No. 8307
LICENSED PROFESSIONAL ENGINEER

NO.	REVISIONS	DATE	INT.
1.	REVISIONS PER TRC #1	12/29/20	MJS
0.	INITIAL SUBMISSION TO DOVER	9/17/20	MJS

(P20-60)

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CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES:

AREA OF DISTURBANCE/STABILIZATION
A. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL THE AREA OF UNSTABILIZED SOIL EXCEED 5 ACRES AT ANY ONE TIME BEFORE THE AREA IS STABILIZED.
B. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
1. IN AREAS TO BE PAVED, BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2006, ITEM NO. 304.1 OR 304.2 HAVE BEEN INSTALLED;
2. IN AREAS NOT TO BE PAVED
2.A. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
2.B. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
2.C. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.
C. DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITHIN 45 DAYS AND PERMANENTLY STABILIZED NO LATER THAN 3 DAYS AFTER FINAL GRADING.

EROSION CONTROL PRACTICES:
A. INSTALLATION:
1. INSTALL ALL EROSION CONTROLS AS SHOWN ON THE GRADING PLAN, TYPICAL DETAILS, AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE. MANUFACTURER'S SPECIFICATIONS SHALL BE FOLLOWED.
B. INSPECTION:
1. INSPECT ALL EROSION CONTROLS WEEKLY AND AFTER EVERY RAIN EVENT OF 0.5 INCHES OR GREATER UNLESS OTHERWISE NOTED.
2. TEMPORARY STABILIZATION PRACTICES SHALL BE INSPECTED ONCE PER WEEK DURING CONSTRUCTION UNTIL EXPOSED SURFACES ARE STABILIZED.
3. ANY SIGNS OF RILL OR GULLY EROSION SHALL BE IMMEDIATELY REPAIRED.
C. MAINTENANCE:
1. MAINTAIN EROSION CONTROLS PER THE TYPICAL DETAILS AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE.
D. REMOVAL
1. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE 85% VEGETATIVE COVER HAS BEEN ESTABLISHED.
2. AFTER REMOVAL, ALL DISTURBED AREAS SHALL BE REGRADED, FERTILIZED, AND RESEEDED. MONITOR TO ENSURE VEGETATIVE GROWTH IS ESTABLISHED AND REPAIR AS NEEDED UNTIL MINIMUM OF 85% VEGETATIVE COVER IS ESTABLISHED.

PROTECTED SHORELAND REQUIREMENTS

A. ALL WORK SHALL CONFORM TO THE COMPREHENSIVE SHORELAND PROTECTION ACT AND CITY OF DOVER SHORELAND PROTECTION OVERLAY DISTRICT.
B. WITHIN 3 DAYS OF FINAL GRADING OR TEMPORARY SUSPENSION OF WORK IN AN AREA THAT IS IN THE PROTECTED SHORELAND, ALL EXPOSED SOIL AREAS SHALL BE STABILIZED BY:
1. SEEDING AND MULCHING, IF DURING THE GROWING SEASON
2. MULCHING WITH TACK OR NETTING IF NOT WITHIN THE GROWING SEASON
3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
4. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.
C. FERTILIZER
1. LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER (NOT MORE THAN 2% PHOSPHORUS AND A NITROGEN COMPONENT WHICH IS AT LEAST 50% SLOW RELEASE NITROGEN COMPONENTS) SHALL BE USED BEYOND 25 FEET FROM THE REFERENCE LINE.
2. APPLY 10-0-10 LOW PHOSPHATE FERTILIZER AT A RATE OF 600 lb./Ac.
3. APPLY LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS/ACRE.

COLD WEATHER SITE STABILIZATION

A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY NOVEMBER 30TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
C. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

TEMPORARY VEGETATION
(REFER TO PROTECTED SHORELAND REQUIREMENTS FOR WORK WITHIN THE PROTECTED SHORELAND)

A. SITE PREPARATION
1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED ABOVE.
2. ENSURE RUNOFF IS DIVERTED FROM SEEDED AREA.
3. ON SLOPES OF 4:1 OR STEEPER, CREATE HORIZONTAL GROOVES PERPENDICULAR TO THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.
B. SEED BED PREPARATION
1. REMOVE STONES AND TRASH FROM AREA TO BE SEEDED.
2. COMPACTED SOIL SHALL BE LOOSENED TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME, AND SEED.
3. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
C. SEEDING
1. SEED PER THE FOLLOWING RECOMMENDATIONS

SEASON	APPLICATION DATE	MIXTURE TYPE	QUANTITY (lb./Ac.)
EARLY SPRING	NO LATER THAN 5/15	OATS	80
LATE SPRING/ FALL	4/1 TO 6/1 & 8/15 TO 9/15	PERENNIAL RYE	30
EARLY SPRING/ FALL	4/1 TO 5/15 & 8/15 TO 9/15	ANNUAL RYE	40
FALL	8/15 TO 9/15	WINTER RYE	112

2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM ¼ TO ½ INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
3. TEMPORARY SEEDING SHOULD TYPICALLY OCCUR PRIOR TO SEPTEMBER 15TH.
4. AREAS SEEDED BETWEEN MAY 15TH AND AUGUST 15TH SHOULD BE COVERED WITH HAY OR STRAW MULCH.
5. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15TH. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.
D. MAINTENANCE
1. TEMPORARY SEEDING SHOULD BE INSPECTED WEEKLY AND AFTER ANY RAINFALL EXCEEDING ½ INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHOULD ALSO BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
2. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHOULD BE IMPLEMENTED.
3. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.
4. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (E.G., MULCH) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION
(REFER TO PROTECTED SHORELAND REQUIREMENTS FOR WORK WITHIN THE PROTECTED SHORELAND)

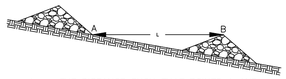
A. SITE PREPARATION
1. REFER TO SITE PREPARATION FOR TEMPORARY SEEDING.
B. SEED BED PREPARATION
1. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
2. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
3. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
4. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
5. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
C. SEEDING
1. UNLESS OTHERWISE NOTED, GRASS SEED MIXTURE 'C' SHALL BE APPLIED AT THE SPECIFIED RATE AS NOTED IN THE 'SEED MIXTURES FOR PERMANENT VEGETATION' TABLE.
2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM ¼ TO ½ INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING OPERATIONS SHOULD BE ON THE CONTOUR.
3. WHERE FEASIBLE, EXCEPT WHERE EITHER A CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
4. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND TO REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
5. SLOPES MUST BE NO STEEPER THAN 2 TO 1.
6. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
7. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
D. MAINTENANCE
1. PERMANENTLY SEEDED AREAS SHOULD BE INSPECTED MONTHLY.
2. MOW SEEDED AREAS AS NECESSARY.
3. BASED ON INSPECTION, AREAS SHOULD BE REPAIRED AND/OR RESEEDED TO ENSURE 85% OF THE SOIL SURFACE IS COVERED BY VEGETATION.

MULCHING & EROSION CONTROL MATTING
A. GENERAL
1. APPLY PRIOR TO A STORM EVENT. CLOSELY MONITOR THE WEATHER TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.
2. MULCHING WITHIN A SPECIFIED TIME PERIOD FROM ORIGINAL SOIL EXPOSURE
2.A. WITHIN 100 FEET OF WETLANDS THE TIME PERIOD SHOULD BE NO GREATER THAN 7 DAYS.
2.B. IN OTHER AREAS IT SHALL BE NO GREATER THAN 14 DAYS.
B. TEMPORARY MULCHING
1. HAY OR STRAW MULCHES
1.A. ORGANIC MULCHES INCLUDING HAY AND STRAW SHALL BE AIR-DRIED, FREE FROM UNDESIRABLE SEEDS AND COARSE MATERIALS.
1.B. APPLICATION RATE SHALL BE 2 BALES/1,000 SF (70-90 POUNDS) OR 1.5-2.0 TONS/ACRE TO COVER 75-90% OF THE GROUND.
1.C. ANCHORING
1.C.1. EROSION CONTROL BLANKETS SHALL BE OF A WOVEN ORGANIC MATERIAL SUCH AS COCO MATTING. IT SHALL NOT CONSIST OF WELDED PLASTIC OR BIODEGRADABLE NETTING. INSTALL PER MANUFACTURERS SPECIFICATIONS.
1.C.2. TACKIFIER: APPLY POLYMER OR ORGANIC TACKIFIER TO ANCHOR HAY OR STRAW MULCH. APPLY PER MANUFACTURER'S SPECIFICATIONS. TYPICAL APPLICATION RATES ARE 40-60 LBS/ACRE FOR POLYMER MATERIAL AND 80-120 LBS/ACRE FOR ORGANIC LIQUID.
1.D. WINTER APPLICATION: APPLY TO A DEPTH OF 4 INCHES OR DOUBLE THE ABOVE LISTED APPLICATION RATE. NOTE THAT IF SEEDING IS NECESSARY, MULCH WILL NEED TO BE REMOVED AND THE AREA SEEDED AND MULCHED IN THE SPRING.
1.E. MAINTENANCE
1.E.1. INSPECT PERIODICALLY AND AFTER RAIN STORMS FOR RILLS OR DISPLACEMENT OF MULCH. REPAIR AS NECESSARY. CONTINUE INSPECTIONS UNTIL 85% VEGETATIVE COVER IS ESTABLISHED.
2. EROSION CONTROL BLANKET OR MATTING
2.A. EROSION CONTROL BLANKETS SHALL BE OF A WOVEN ORGANIC MATERIAL SUCH AS COCO MATTING. IT SHALL NOT CONSIST OF WELDED PLASTIC OR BIODEGRADABLE NETTING.
2.B. REFER TO PLANS FOR TYPICAL EROSION CONTROL MATTING DETAIL. INSTALL PER MANUFACTURERS SPECIFICATIONS.
2.C. APPLICATION AND TIMING
2.C.1. DURING THE GROWING SEASON (APRIL 15 – SEPTEMBER 15) USE ON THE BASE OF GRASSED WATERWAYS, STEEP SLOPES (15% OR GREATER), ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS, AND WETLANDS.
2.C.2. DURING THE LATE FALL AND WINTER (SEPTEMBER 15 – APRIL 15) IN ADDITION TO THOSE LISTED ABOVE USE ON SIDE SLOPES OF GRASSED WATERWAYS AND MODERATE SLOPES (GREATER THAN 8%).
3. MAINTENANCE
3.A. INSPECT PERIODICALLY AND BEFORE AND AFTER STORM EVENTS TO ENSURE CONTACT WITH THE SOIL UNTIL 85% VEGETATIVE COVER IS ESTABLISHED. REPAIR AND RESTAPLE AS NECESSARY.
C. PERMANENT MULCHING
1. WOOD CHIPS OR GROUND BARK
1.A. APPLY TO A THICKNESS OF 2 TO 6 INCHES. TYPICAL APPLICATION RATES ARE 10-20 TONS/ACRE OR 460-920 POUNDS/1,000 SF.
1.B. MAINTENANCE: INSPECT ANNUALLY AND AFTER RAIN EVENTS OF 2.5 INCHES OR MORE IN A 24 HOUR PERIOD. REPAIR/REPLACE AS NECESSARY.
2. EROSION CONTROL MIX
2.A. COMPOSITION OF THE MIX SHALL BE AS FOLLOWS:
2.A.1. ORGANIC MATTER CONTENT SHALL BE BETWEEN 25-65% DRY WEIGHT BASIS.
2.A.2. PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING THE 3" SCREEN, 90-100% PASSING THE 1" SCREEN, 70-100% PASSING THE 0.75 INCH SCREEN, AND 30-75% PASSING THE 0.25 INCH SCREEN.
2.A.3. THE ORGANIC PORTION SHALL BE ELONGATED AND FIBROUS. IT SHALL NOT CONTAIN WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSED WOOD PRODUCTS.
2.A.4. THE MIX SHALL NOT CONTAIN SILTS, CLAYS, OR FINE SANDS.
2.A.5. SOLUBLE SALTS CONTENT SHALL BE < 4.0MMHOS/CM AND A pH OF 5.0-8.0.
2.B. PLACEMENT OF BERM
2.B.1. PLACE BERM ALONG A LEVEL CONTOUR. BERM MUST BE A MINIMUM OF 12" HIGH ON THE UPHILL SIDE AND 2 FEET WIDE.
2.C. MAINTENANCE: INSPECT PERIODICALLY AND AUGMENT AS NEEDED TO MAINTAIN INITIAL THICKNESS. REPLACE IF NO LONGER FUNCTIONING AS INTENDED.

SOIL STOCKPILES
A. GENERAL
1. STOCKPILES MUST BE LOCATED 50 FEET FROM DITCHES AND CULVERT INLETS.
B. PROTECTION OF STOCKPILES
1. PROTECT SOIL AND AGGREGATE STOCKPILES WITH TEMPORARY PERIMETER SEDIMENT BARRIER SUCH AS SILT FENCE OR SILT SOCK.
2. COVER ACTIVE STOCKPILES WITH ANCHORED PROTECTIVE COVERING PRIOR TO EXPECTED STORM EVENTS.
3. INACTIVE STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS OR TEMPORARILY SEEDED AND MULCHED PER THE TEMPORARY VEGETATION AND MULCHING NOTES ON THIS PAGE.
4. STOCKPILES THAT ARE A SOURCE OF DUST SHALL BE COVERED.

DUST CONTROL
A. DUST SHALL BE CONTROLLED ON SITE DURING CONSTRUCTION BY IMPLEMENTING THE FOLLOWING DUST CONTROL MEASURES
1. MULCHING AND VEGETATIVE COVER TO REDUCE DUST.
2. MECHANICAL SWEEPERS AND FINE WATER SPRAYS.
3. COVER SURFACES WITH CRUSHED STONE OR COARSE GRAVEL.

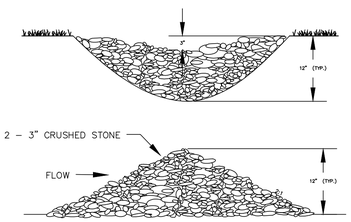
ADDITIONAL NOTES:
1. NO FUEL SHALL BE STORED ON SITE DURING CONSTRUCTION.
2. DURING CONSTRUCTION DUST SHALL BE PREVENTED FROM BECOMING A SAFETY OR HEALTH HAZARD BY THE IMPLEMENTATION OF ACCEPTED CONTROL METHODS SUCH AS WATERING.
3. ALL CONSTRUCTION MATERIALS THAT ARE SPILLED OR DEPOSITED ON THE PUBLIC ROADWAYS SHALL BE REMOVED BY THE CONTRACTOR.
4. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS AT THE SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.



L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION.

STONE CHECK DAM PROFILE VIEW

N.T.S

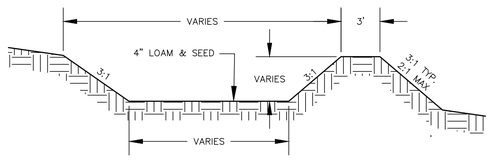


CONSTRUCTION SPECIFICATIONS:
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED.
5. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

MAINTENANCE NOTES:
1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE INSPECTED AFTER EACH STORM AND DAILY DURING PROLONGED STORM EVENTS. ANY DAMAGE TO THE STRUCTURES SHALL BE REPAIRED IMMEDIATELY.
2. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE.
3. WHEN REMOVING THE STRUCTURES, THE DISTURBED AREAS SHALL BE BROUGHT UP TO EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED.
4. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT REACHES 1/2 THE ORIGINAL HEIGHT OF THE STRUCTURE.

STONE CHECK DAM

N.T.S

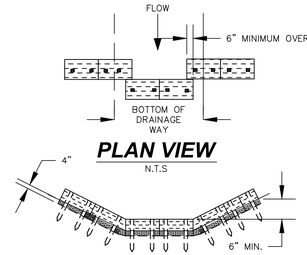


CONVEYANCE SWALE DETAIL

N.T.S

CONSTRUCTION NOTES:
1. REFER TO BERM CONSTRUCTION NOTES IN STORMWATER POND DETAIL FOR BERM CONSTRUCTION REQUIREMENTS.
2. SWALE SHALL HAVE GREATER THAN 85% VEGETATIVE GROWTH PRIOR TO RECEIVING RUNOFF.
3. REFER TO PERMANENT VEGETATION REQUIREMENTS FOR SEEDING REQUIREMENTS. SEED MIX 'C' SHALL BE APPLIED AT THE SPECIFIED RATE ON SHEET D1.

MAINTENANCE NOTES:
1. INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATION, VEGETATION LOSS, AND PRESENCE OF INVASIVE SPECIES.
2. PERFORM PERIODIC MOWING. DO NOT MOW GRASS SHORTER THAN 4 INCHES.
3. REMOVE DEBRIS AND ACCUMULATED SEDIMENT BASED ON INSPECTION.
4. REPAIR ERODED AREAS, REMOVE INVASIVE SPECIES AND DEAD VEGETATION, AND RESEED WITH APPLICABLE GRASS MIX AS WARRANTED BY INSPECTION.

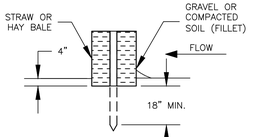


PLAN VIEW

N.T.S

DRAINAGE WAY CROSS-SECTION

N.T.S

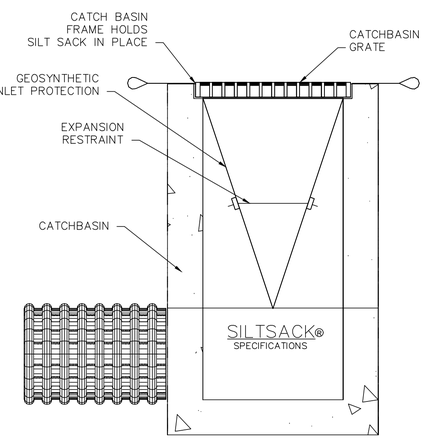


CROSS-SECTION

N.T.S

HAY BALE INLET PROTECTION DETAIL

N.T.S



CONSTRUCTION SPECIFICATIONS:
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. HAY BALES SHALL BE PLACED IN ROWS WITH ENDS TIGHTLY ABUTTING. WHEN PLACED IN CHANNELS BALES SHALL BE STAGGERED AND OVERLAPPED AS SHOWN IN THE DETAIL.
4. HAY BALES SHALL BE EMBEDDED ONTO THE SOIL AT LEAST 4 INCHES.
5. HAY BALES SHALL BE ANCHORED INTO THE SOIL USING 2" X 2" STAKES DRIVEN THROUGH THE BALES AT LEAST 18" INTO THE SOIL.
6. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

MAINTENANCE NOTES:
1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE INSPECTED AFTER EACH STORM AND DAILY DURING PROLONGED STORM EVENTS. ANY DAMAGE TO THE STRUCTURES SHALL BE REPAIRED IMMEDIATELY.
2. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE.
3. WHEN REMOVING THE STRUCTURES, THE DISTURBED AREAS SHALL BE BROUGHT UP TO EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED.
4. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT REACHES 1/2 THE ORIGINAL HEIGHT OF THE STRUCTURE.

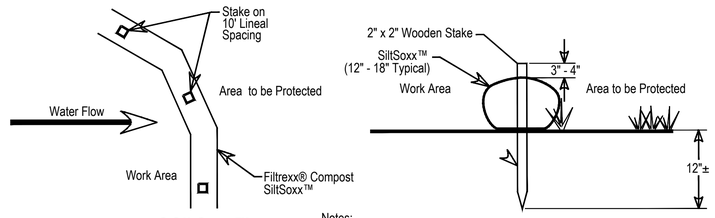
NOTES:

1. GEOSYNTHETIC SEDIMENT FILTER TRAP SHALL BE "REGULAR FLOW SILTSACK®" OR APPROVED EQUAL. SPECIFICATIONS FOR SILTSACK® ARE DETAILED.

2. FILTER TRAPS SHALL BE INSPECTED AFTER EVERY RAIN EVENT OF 0.25" OR GREATER AND SEDIMENTS SHALL BE REMOVED FROM TRAP WHEN SEDIMENT HAS REACHED TWO THIRDS OF THE DEPTH OF THE TRAP, OR IF PONDING OF WATER AT SURFACE BEGINS TO OCCUR. DO NOT PUNCTURE FILTER TRAP TO MITIGATE PONDING.

CATCH BASIN GEOSYNTHETIC SEDIMENT TRAP

N.T.S.



®SiltSoxx™ Plan View

Notes:
1. All material to meet Filtrexx® specifications .
2. Compost material to be dispersed on site up slope from protected area.

SILTSOXX DETAIL

N.T.S.

NO.	DATE	REVISIONS
0.	9/17/20	INITIAL SUBMISSION TO DOVER
1.	1/5/21	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20

INT. AWS MCS

SEAL

DATE ISSUED: 6/12/20
SCALE: 1"=40'
DESIGNED BY: XXX
DRAWN BY: XXX
APPROVED BY: MJS
DWG FILE: Civil Details B.dwg

CONSTRUCTION DETAILS

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6

MJS ENGINEERING, P.C.
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JOB: 20-011

C-501

(P20-60)

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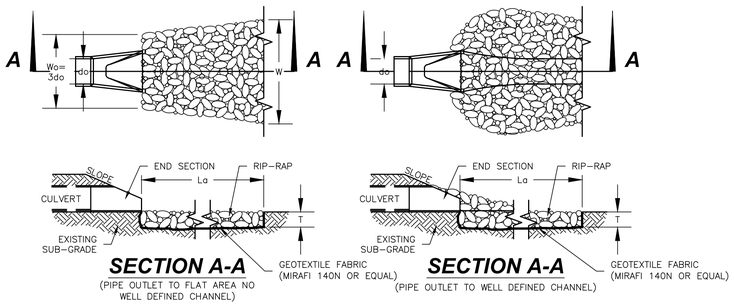
SEED MIXTURE SELECTION BASED ON SOIL TYPE				
	SOIL DRAINAGE			
USE	SEEDING MIXTURE	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A B C D	FAIR POOR POOR FAIR	GOOD GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT EXCELLENT
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A C	GOOD GOOD	GOOD EXCELLENT	GOOD EXCELLENT
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A B C	GOOD GOOD GOOD	GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E F	FAIR FAIR	EXCELLENT EXCELLENT	EXCELLENT EXCELLENT
NOTE: POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREAS AND ATHLETIC FIELDS.				

SEED MIXTURES FOR PERMANENT VEGETATION			
MIXTURE	SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SF
A	TALL FESCUE CREEPING RED FESCUE REDTOP *TOTAL*	20 20 2 *42*	0.45 0.45 0.05 *0.95*
B	TALL FESCUE CREEPING RED FESCUE CROWN VETCH OR FLATPEA *TOTAL*	15 10 15 – 30 *40 OR 55*	0.35 0.25 0.35 – 0.75 *0.95 OR 1.35*
C	TALL FESCUE CREEPING RED FESCUE BIRDSFOOT TREFOIL *TOTAL*	20 20 8 *48*	0.45 0.45 0.20 *1.10*
D	TALL FESCUE FLATPEA *TOTAL*	20 30 *50*	0.45 0.75 *1.20*
E	CREPPING RED FESCUE KENTUCKY BLUEGRASS *TOTAL*	50 50 *100*	1.15 1.15 *2.30*
F	TALL FESCUE	*150*	*3.60*

CONSTRUCTION SEQUENCING:

THE ESTIMATED START OF CONSTRUCTION IS SUMMER 2021 AND THE ESTIMATED END OF CONSTRUCTION IS SUMMER 2022. THE FOLLOWING CONSTRUCTION SEQUENCING SHALL BE FOLLOWED;

1. SCHEDULE A PRE–CONSTRUCTION MEETING WITH CITY OFFICIALS, OWNER, AND CONTRACTORS IF REQUIRED BY THE CONDITIONS OF APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
2. CONTACT DIG–SAFE, INDIVIDUAL UTILITIES, AND CITY DEPARTMENTS TO GET ALL UTILITIES MARKED PRIOR TO START OF CONSTRUCTION.
3. THE OWNER OR SITE GENERAL CONTRACTOR SHALL FILE A NOTICE OF INTENT (NOI) FOR COVERAGE UNDER THE EPA'S CONSTRUCTION GENERAL PERMIT (CGP). A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE AVAILABLE ON SITE.
4. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES IN ACCORDANCE WITH THE STABILIZED CONSTRUCTION ENTRANCE DETAIL. A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT THE BACK ROAD AND MCKONE LANE ACCESS POINTS.
5. CONSTRUCT AND STABILIZE ALL TEMPORARY AND PERMANENT SEDIMENT AND EROSION CONTROLS INCLUDING SWALES AND SEDIMENT TRAPS.
   5.1. SEDIMENT AND EROSION PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS AND SHALL FULLY ENCOMPASS ALL WORK COMPLETED DURING EACH PHASE.
   5.2. INSTALL SWALES AND TEMPORARY SEDIMENT TRAPS PRIOR TO ROUGH GRADING. THE LOCATION OF THE SEDIMENT TRAPS ARE SHOWN ON THE GRADING PLANS. A SEDIMENT TRAP DETAIL, INCLUDING SIZING INFORMATION, IS SHOWN ON SHEET D2.
   5.3. CONSTRUCTION OF THE STORMWATER PONDS AND TREATMENT SWALES SHALL BEGIN AFTER ALL CONTRIBUTING DISTURBED AREAS HAVE BEEN STABILIZED.
6. THIS PROJECT SHALL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 450:53 AND CHAPTER Agr 3800 RELATIVE TO INVASIVE SPECIES.
7. INSTALL TEMPORARY CONSTRUCTION GATE AT NEW ENTRANCE ROAD FOR SAFETY PURPOSES.
8. CLEAR AND GRUB THE ROADWAY AND PARKING AREAS, AND THE HOUSING AREA TO THE SOUTHWEST. REMOVE ORGANICS ONLY FROM THOSE AREAS THAT CAN BE WORKED AND STABILIZED WITHIN 45 DAYS OF REMOVAL. LOAM STOCKPILES SHALL BE STORED ON THE EXISTING CLEARED AREA TO THE SOUTHEAST OF THE ROADWAY. STOCKPILES SHALL BE TEMPORARILY STABILIZED WITH MULCH. STUMPS MAY BE DISPOSED OF ON OR OFFSITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
9. MINIMIZE DISTURBANCE OF PREVIOUSLY STABILIZED SOILS ON SITE, THAT ARE OUTSIDE OF THE ROADWAY AND STORMWATER CONTROL AREAS.
10. TOTAL SITE DISTURBANCE DEPICTED ON THESE PLANS IS APPROXIMATELY 197,000 SF (4.5 AC.).
    10.1. REFER TO VEGETATION AND EROSION CONTROL NOTES ON THIS PLAN DURING CONSTRUCTION.
    10.2. THE ROAD CONSTRUCTION FOR THIS PROJECT WILL BE CONSTRUCTED IN ONE PHASE.
    10.3. ALL CONSTRUCTION SHALL FOLLOW EROSION CONTROL REQUIREMENTS AND CONSTRUCTION SEQUENCE AND SHALL BE STABILIZED WITHIN 45 DAYS OF COMPLETION.
11. ROAD CONSTRUCTION
    11.1 PROCEED WITH ROAD CONSTRUCTION IN THE LOCATION AND TO GRADES AS SHOWN ON THE PLANS. EXCAVATE ROADWAY TO SUBGRADE.
    11.2 PLACE SELECT FILLS IN LOCATIONS AND TO THE GRADES SHOWN ON PLANS PER THE APPLICABLE DETAILS AND THE FOLLOWING:
    11.2.1. PLACE FILL MATERIAL MEETING THE SPECIFICATION OF NHDOT 304.1 IN MAXIMUM 12" LIFTS AND COMPACT TO 95% MAXIMUM DRY DENSITY.
    11.2.2. ALL MATERIAL SHALL BE FREE OF DELETERIOUS MATERIALS SUCH AS LOAM, STUMPS, BRUSH, AND ROCKS LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING PLACED.
    11.2.3 LOAM AND SEED SLOPES WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
    11.3 BASE MATERIALS:
    11.3.1. BANK RUN AND CRUSHED GRAVEL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO 95% MAXIMUM DRY DENSITY TO THE DEPTHS SPECIFIED IN THE ROAD CROSS–SECTION DETAILS.
    11.4 PAVEMENT:
    11.4.1. PLACE AS SOON AS POSSIBLE AFTER THE SELECT MATERIALS ARE INSTALLED AND ACCEPTED TO ELIMINATE SOIL EROSION.
    11.4.2. STABILIZE ALL ROADWAYS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
    11.4.3. DRIVEWAY APRONS SHALL BE INCLUDED IF BASE GRAVELS HAVE BEEN PLACED.
12. UNDERGROUND UTILITIES SHALL BE INSTALLED WITH THE PROGRESS OF THE ROAD CONSTRUCTION. ELECTRICAL AND COMMUNICATION CONDUITS SHALL BE INSTALLED BY LICENSED PROFESSIONALS AND IN ACCORDANCE WITH THE SPECIFIC STANDARDS. THE SEWER FORCEMAIN AND WATER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS HEREIN.
13. INSPECT, MAINTAIN, AND IF NECESSARY REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS STATED IN THE EROSION CONTROL NOTES ON THIS SHEET. PROVIDE AN EROSION CONTROL LOG INDICATING THE DATE INSPECTED, WHO INSPECTED, WHAT WAS FOUND, AND WHAT WAS DONE (IF ANYTHING).
14. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AFTER SITE IS STABILIZED AND RESEED ANY AREAS DISTURBED BY REMOVAL. THE APPROXIMATE DATE FOR REMOVAL OF EROSION CONTROLS IS AUGUST 2018.
15. IF NECESSARY, ALL DRAINAGE STRUCTURES AND PIPES SHALL BE FLUSHED/PUMPED FREE OF SEDIMENT AFTER STABILIZATION IS COMPLETE.
16. LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.
17. UNIT CONSTRUCTION
    16.1 UNITS WILL BE CONSTRUCTED IN GROUPS OF 10–15.
    16.2 CONSTRUCTION OF UNITS WILL BEGIN ON THE GROUP ON THE EAST SIDE AND PROCEED TO THE WEST SIDE, FROM SOUTH TO NORTH.
    16.3 UTILITY CONNECTIONS SHALL BE COORDINATED WITH FOUNDATION CONSTRUCTION



SECTION A-A
(PIPE OUTLET TO FLAT AREA NO WELL DEFINED CHANNEL)

SECTION A-A
(PIPE OUTLET TO WELL DEFINED CHANNEL)

RIP-RAP GRADATION

d50=6"	% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
	100	9	TO	12
	85	7.8	TO	10.8
	50	6	TO	9
	15	1.8	TO	3

d50=8"	% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
	100	12	TO	16
	85	10.4	TO	14.4
	50	8	TO	12
	15	2.4	TO	4

RIP RAP APRON DIMENSION TABLE

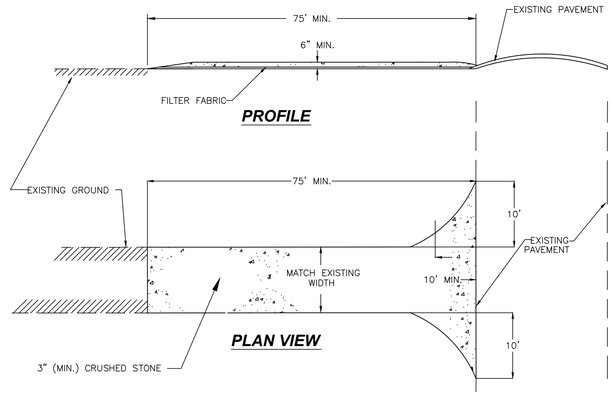
LOCATION	Wo	W	La	T	d50
RIP RAP #1 – SWP #1 OUTLET	3.75'	19'	16'	24"	8"
RIP RAP #2 – SWP #2 OUTLET	4.5'	23'	19'	24"	8"
RIP RAP #3 – 15" HDPE CULVERT AT STA 20+34	VARIES SEE PLAN			18"	6"
RIP RAP #4 – 18" HDPE CULVERT AT STA 33+47	VARIES SEE PLAN			24"	8"

CONSTRUCTION SPECIFICATIONS:
1. PREPARE THE SUB–GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP–RAP TO THE GRADES SHOWN ON THE PLANS.
2. MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC (MIRAFI 140N OR EQUAL) REQUIRED UNDER ALL ROCK RIP–RAP.
3. THE ROCK OR GRAVEL USED FOR FILTER OR RIP–RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF ROCK RIP–RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
5. STONE FOR THE RIP–RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

MAINTENANCE NOTES:
1. OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP–RAP SHALL BE REPAIRED IMMEDIATELY.
2. THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS OCCURRING.
3. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

PIPE OUTLET PROTECTION DETAIL

NOT TO SCALE



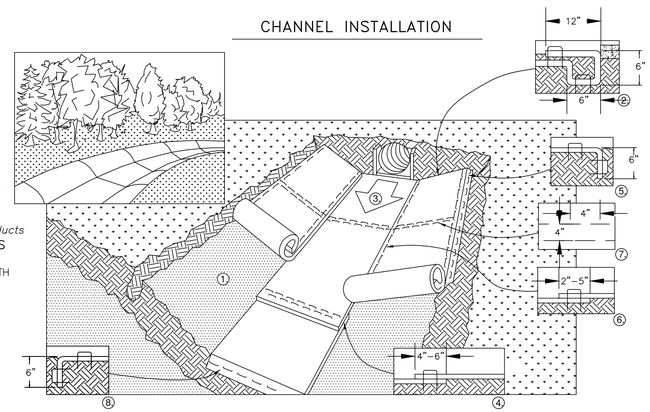
STABILIZED CONSTRUCTION ENTRANCE DETAIL

N.T.S

STABILIZED CONSTRUCTION ENTRANCE NOTES:
1. GRADE AND COMPACT ACCESS ROAD ENTRANCE AS NECESSARY. PLACE FILTER FABRIC (MIRAFI OR EQUAL) AND PLACE 6" OF 3" CRUSHED STONE TO MATCH SLOPE OF EXISTING ROAD.
2. PROVIDE NECESSARY SWALES OR DIVERSIONS TO MINIMIZE DIRECT FLOW OF WATER ONTO STONE AREA.
3. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED AS NECESSARY TO REMOVE SILT FROM TIRES PRIOR TO ENTERING PUBLIC ROADS. A SMALL SWALE SHALL BE CONSTRUCTED ON THE DOWN GRADIENT SIDE TO TRAP ANY SILT WASHED FROM THE STONE ENTRANCE.

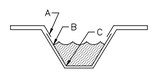
NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS
14649 HIGHWAY 41 NORTH
EVANSVILLE, IN 47725
800–772–2040
www.nagreen.com

CHANNEL INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL–O–SEED DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP'S IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECP's EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE RECP's.
3. ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" – 6" (10 CM –15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE RECP's.
5. FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" – 5" (5 CM –12.5 CM) (DEPENDING ON RECP's TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M – 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE REQUIRED.

TYPICAL TURF REINFORCEMENT MATTING DETAIL

N.T.S

NOTES:
1. ALL SEDIMENT FOREBAY SPILLWAYS FOR TREATMENT SWALES AND ALL 2:1 SLOPES SHALL BE LINED WITH NORTH AMERICAN GREEN SC150BN EROSION CONTROL BLANKET OR APPROVED EQUAL.
2. FOR SALES CONTACT:
   EJ PRESCOTT, INC.
   210 SHEEP DAVIS RD.
   CONCORD, NH
   603–224–9545

NO.	DATE	INT.
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	1/5/21 MCS
0.	INITIAL SUBMISSION TO DOVER	9/17/20 AWS

REVISIONS

SEAL

MICHAEL W. SIEVERT No. 9809 PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

DATE ISSUED: 6/12/20
SCALE: 1"=40'
DESIGNED BY: XXX
DRAWN BY: XXX
APPROVED BY: MJS
DWG FILE: Civil Details B.dwg

CONSTRUCTION DETAILS

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Railroad St. P.O. Box 359
Newmarket, NH 03857
Phone: (603) 659-2560 Fax: (603) 659-4627
E-mail: mjs@mjs-engineering.com

JOB: 20-011

C-502

(P20-60)

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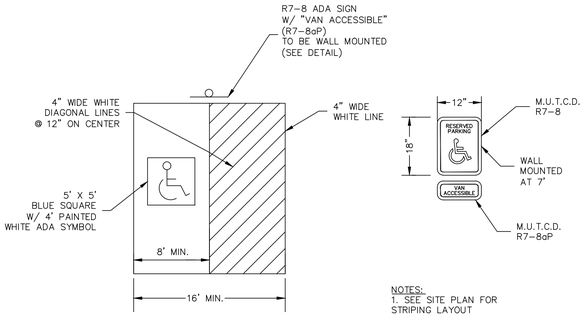
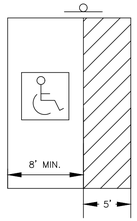
2021-01-04 05:40 pm



NOTES:
1. SEE SITE PLAN FOR STRIPING LAYOUT

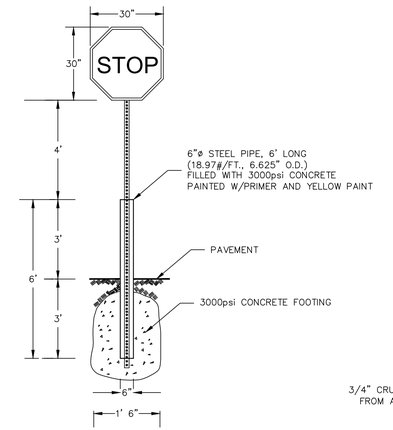


ADA STRIPING AND SIGN DETAIL

N.T.S

PAVEMENT MARKING NOTES:

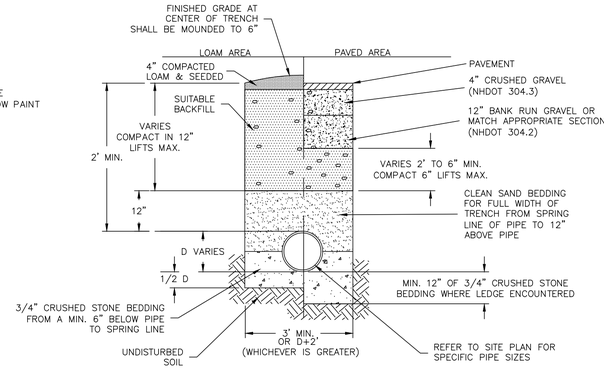
1. STRIPE PARKING AREAS AND DRIVES AS SHOWN, INCLUDING PARKING SPACES, HANDICAP SYMBOLS, AND PAINTED ISLANDS. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) AND AASHTO M248 TYPE "F". MEDIAN ISLANDS AND CENTERLINES TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT.
2. ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE "STANDARD ALPHABETS FOR HIGHWAY SIGN AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS.
3. PAINTED ISLANDS SHALL BE 4 INCH WIDE DIAGONAL LINES SPACED AT 3 FT. O.C. BORDERED BY 4 INCH WIDE LINES.
4. ALL CROSSWALKS SHALL MATCH THE CITY OF DOVER STANDARD AND SHALL BE PAINTED WITH THERMOPLASTIC PAINT.



TYPICAL SIGN DETAIL

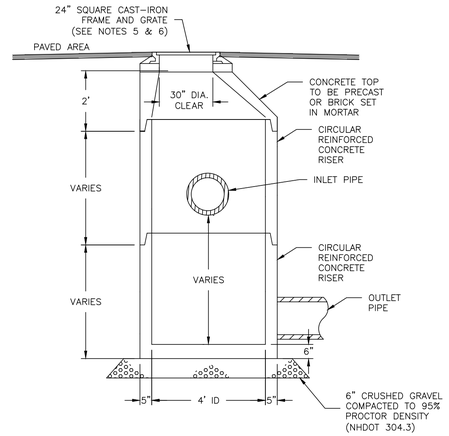
N.T.S.

NOTES:
1. SEE PLANS FOR SIGN PLACEMENT.



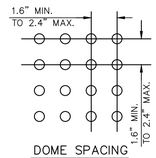
STANDARD DRAINAGE PIPE TRENCH

N.T.S

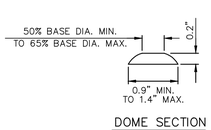


TYPICAL DRAIN MANHOLE

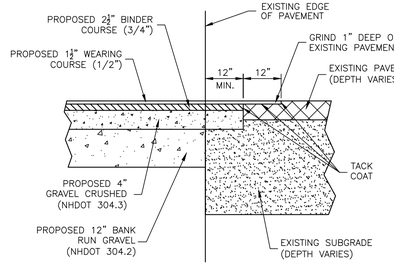
N.T.S



DOME SPACING



DOME SECTION

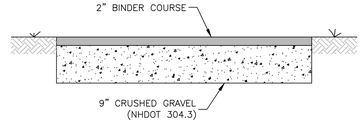


PAVEMENT SAWCUT NOTES

1. SAWCUT THROUGH DEPTH OF PAVEMENT AT LEAST 1 FT. FROM EDGE OR GREATER IF REQUIRED.
2. INSTALL AND COMPACT CRUSHED GRAVEL TO GRADE.
3. PLACE BINDER COURSE.
4. GRIND OR SAWCUT EXISTING PAVEMENT 1 FT. WIDE TO A DEPTH NECESSARY TO PROPERLY MATCH NEW WEARING COURSE PAVEMENT.
5. TACK COAT ALL EXISTING PAVEMENT SURFACES WITH EMULSIFIED ASPHALT (MS-1) PRIOR TO PLACING NEW PAVEMENT.

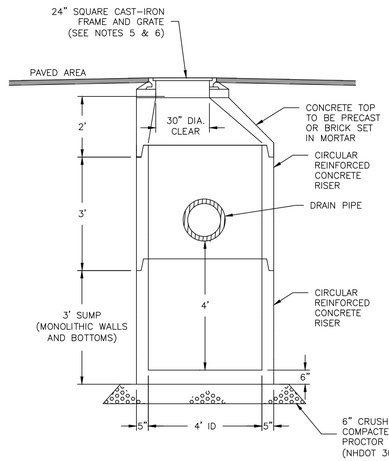
TYPICAL PAVEMENT SAWCUT DETAIL

SCALE: N.T.S.



TYPICAL WALKING PATH DETAIL

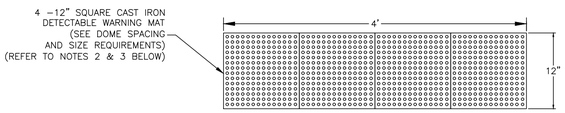
N.T.S

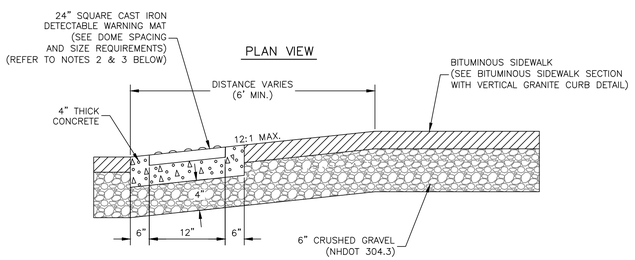


TYPICAL CATCH BASIN DETAIL

N.T.S

DRAINAGE STRUCTURE NOTES:
1. DRAINAGE STRUCTURE MATERIALS SHALL COMPLY WITH NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, DIVISION 600, SECTION 604.
2. SITE CONTRACTOR SHALL BACKFILL AROUND DRAINAGE STRUCTURES IN 6 TO 8 INCH LIFTS, ATTAINING 95% MAXIMUM PROCTOR DENSITY FOR EACH LIFT.
3. PIPE OPENINGS SHALL BE FULLY MORTARED ON OUTSIDE PRIOR TO BACK FILLING. INSIDE OF PIPE OPENINGS SHALL BE MORTARED AND ALLOWED TO CURE PER MANUFACTURERS REQUIREMENTS PRIOR TO RECEIVING RUNOFF.
4. JOINTS BETWEEN ADJACENT RISERS SHALL BE FULLY SEALED WITH ELASTOMERIC SEALANT PER MANUFACTURERS REQUIREMENTS.
5. WHEN FRAME/GRATE ARE LOCATED IN A PAVED AREA, THEY SHALL BE BROUGHT TO FINISH GRADE AFTER BINDER COURSE PAVEMENT IS PLACED. THE EXCAVATION REQUIRED AROUND THE GRATE AND FRAME SHALL BE BACKFILLED FLUSH WITH THE TOP OF BINDER COURSE WITH NHDOT CLASS B CONCRETE.
6. FRAME AND GRATE:
   CATCH BASINS:
   NEENAH LIFTMATE OR PAMREX

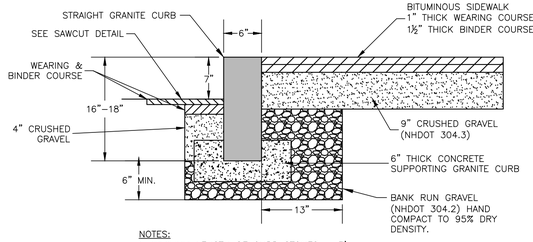




DETECTABLE WARNING MAT DETAIL

N.T.S

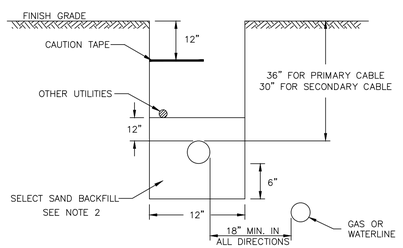
NOTES:
1. MAXIMUM CROSS SLOPE OF SIDEWALK TO BE 2%.
2. CONCRETE TO BE 4,000 PSF.
3. REFER TO MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION OF DETECTABLE WARNING MATS.



NOTES:
1. MINIMUM LENGTH OF CURB STONES = 3'
2. MAXIMUM LENGTH OF CURB STONES = 10'
3. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.

TYPICAL BITUMINOUS SIDEWALK SECTION WITH VERTICAL GRANITE CURB

N.T.S



TELEPHONE & ELECTRIC TRENCH

N.T.S

NOTES:
1. CONSTRUCTION TO BE IN ACCORDANCE WITH PSNH CONSTRUCTION STANDARDS FOR NEW ELECTRICAL SERVICE WORK BY CONTRACTORS, MOST RECENT EDITION.
2. SELECT SAND BACKFILL SHALL CONSIST OF A FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE. EXCEPT NATURALLY OCCURING SMOOTH ROUND PEBBLES NO GREATER THAN 3/8" IN DIAMETER ARE PERMITTED AS LONG AS THEIR TOTAL VOLUME PER CUBIC FOOT OF SAND DOES NOT EXCEED 1%. THE SAND SHALL BE COMPLETELY FREE OF FROZEN LUMPS, ROCKS, STONES, DEBRIS AND RUBBISH. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6" LIFTS.
3. CONDUIT SIZES TO BE 5" 3-PHASE PRIMARY AND 4" 3-PHASE SECONDARY. ALL CONDUIT SIZES TO BE VERIFIED BY PSNH.
4. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE THE NATIONAL ELECTRIC CODE.

NO.	REVISIONS	DATE	INT.
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	1/5/21	MCS
0.	INITIAL SUBMISSION TO DOVER	9/17/20	AWS

SEAL

MICHAEL J. SEVERY No. 9809 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

DATE ISSUED: 6/12/20
SCALE: AS SHOWN
DESIGNED BY: MJS
DRAWN BY: JLG
APPROVED BY: MJS
DWG FILE: Civil Details B.dwg

CONSTRUCTION DETAILS

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP 1, LOT 6

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JOB: 20-011

C-503

(P20-60)

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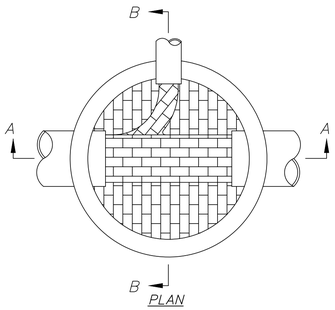
MANHOLE CONSTRUCTION MATERIAL REQUIREMENTS (PER Env-Wq 704.10 NUMERATION)

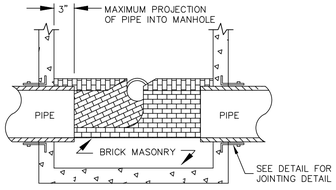
(A) ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE, AND SPACE NECESSARY FOR THE INTENDED SERVICE.
(B) MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY IN EXCESS OF 25 YEARS.
(C) MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 LOADING AND SHALL NOT LEAK IN EXCESS OF 1 GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
(D) BARRELS AND CONE SECTIONS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
(E) BASE SECTIONS SHALL BE MONOLITHIC CONSTRUCTION TO A POINT AT LEAST SIX INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
(F) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
(G) PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
  (1) ELASTOMERIC, RUBBER SLEEVE WITH WATER TIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
  (2) CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
  (3) ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
  (4) NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
(H) MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
(I) ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OF THE TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE OF THE WALL.
(J) MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL.
  UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
(K) MATERIALS FOR CONSTRUCTION FOR MANHOLES SHALL BE AS FOLLOWS:
  (1) CONCRETE FOR CAST-IN-PLACE OR COMPLETE MANHOLES SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NH DOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION."
  (2) REINFORCING FOR CAST-IN-PLACE CONCRETE SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE REQUIREMENTS OF THE NH DOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION."
  (3) PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478-06;
  (4) THE MANHOLE FRAME AND COVER SHALL PROVIDE A 30-INCH DIAMETER CLEAR OPENING;
  (5) THE MANHOLE COVER SHALL HAVE THE WORD "SEWER" IN 3-INCH LETTERS CAST INTO THE TOP SURFACE;
  (6) THE CASTINGS SHALL BE OF EVEN-GRAINED CAST IRON, SMOOTH, AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS;
  (7) CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION;
  (8) CASTINGS SHALL BE EQUAL TO CLASS 30, CONFORMING TO ASTM A48/48M-03;
  (9) BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32-05, CLAY OR SHALE, FOR GRADE SS HARD BRICK;
  (10) MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
  (11) PROPORTIONS IN MORTAR OF PARTS BY VOLUME SHALL BE:
    (a) 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
    (b) 4.5 PARTS SAND, 1.0 PART CEMENT AND 0.5 PART HYDRATED LIME;
  (12) CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
  (13) HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES";
  (14) SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES";
(N) THE MINIMUM INTERNAL DIAMETER OF MANHOLE SHALL BE 48 INCHES.
(S) IN THE FLOW CHANNEL A DROP OF AT LEAST 0.1 FEET SHALL BE PROVIDED BETWEEN THE INGOING AND OUTGOING SEWERS ON ALL MANHOLES.

MANHOLE TESTING REQUIREMENTS (Env-Wq 704.10)

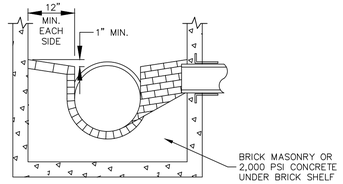
(X) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.*
(Y) THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
  (1) THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg: AND
  (2) THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 9 INCHES Hg SHALL BE:
    (A) NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP;
    (B) NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP
(Z) THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (Y) ABOVE.
*MANHOLE TESTING MUST BE CONDUCTED PRIOR TO INVERT AND SHELF PLACEMENT.



PLAN



SECTION A-A

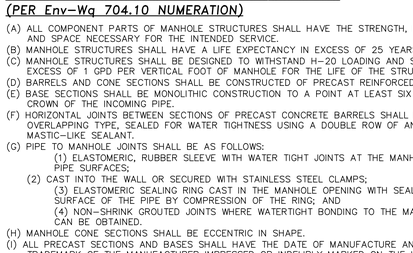


SECTION B-B

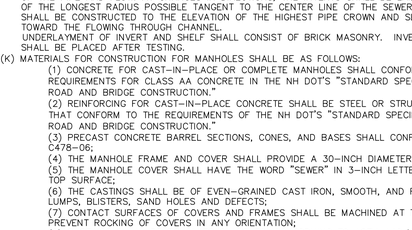
NOTE:
1. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
2. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
3. ALTERNATE INVERT DETAILS: REPLACE BRICK INVERT W/ CAST-IN-PLACE CONCRETE.

TYPICAL SEWER MANHOLE INVERT

N.T.S.



LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(OR ACCEPTABLE SUBSTITUTE)

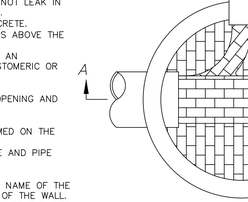


KOR-N-SEAL JOINT SLEEVE
(OR ACCEPTABLE SUBSTITUTE)

DETAIL "A" - PIPE TO MANHOLE JOINTS

N.T.S

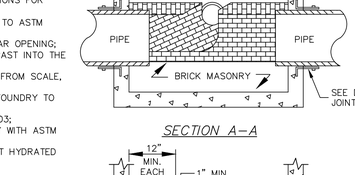
NOTES:
1. USE LOCK-JOINT FLEXIBLE MANHOLE SLEEVE FOR FACTORY INSTALLED APPLICATIONS AND KOR-N-SEAL SLEEVE FOR IN FIELD INSTALLATIONS.
2. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE W/ MANUFACTURERS' WRITTEN INSTRUCTIONS.



ELASTOMERIC SEALANT

NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS

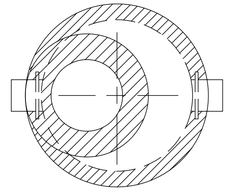
DETAIL "B" - HORIZONTAL JOINTS
N.T.S

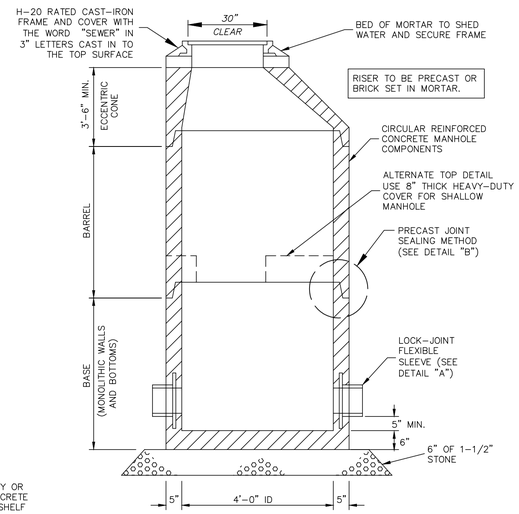


NOTE: ENCASE SEWER LINE IF WATER LINE IS BELOW OR WITHIN 18" OF SEWER LINE. (SEE DETAIL)

WATER/SEWER CROSSING

N.T.S.


PLAN VIEW

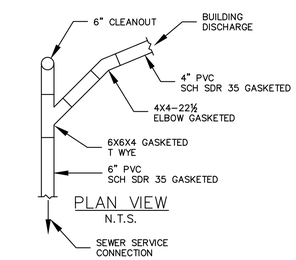


SECTION VIEW

NOTES:
1. SMH #1 IS A STANDARD MANHOLE WITH ECCENTRIC CONE TOP.
2. THERE SHALL BE NO STEPS INSTALLED WITHIN THE MANHOLE.

STANDARD MANHOLE

N.T.S.



PLAN VIEW
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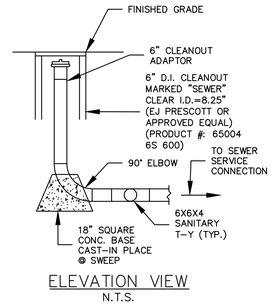
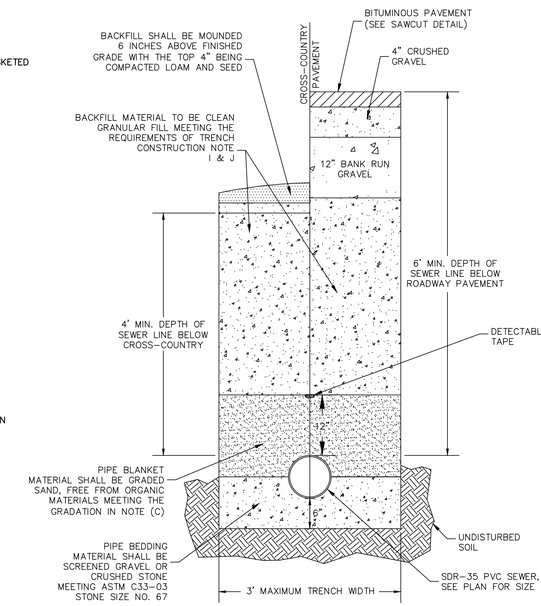


ELEVATION VIEW
N.T.S.

CLEANOUT DETAIL



STANDARD SEWER PIPE TRENCH

SEWER NOTES:

PER THE REQUIREMENTS OF "STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWERAGE AND WASTEWATER TREATMENT FACILITIES."

GRAVITY SEWER CONSTRUCTION MATERIALS (Env-Wq 704.05)

(A) PLASTIC GRAVITY SEWER PIPE AND FITTINGS SHALL BE 8 INCH PVC SDR 35 SEWER PIPE (EXCEPT SEWER SERVICE SHALL BE 6" SRD 35 PVC) AND SHALL COMPLY WITH ASTM D3034-04a.
(B) PLASTIC SEWER PIPE SHALL HAVE A PIPE STIFFNESS RATING OF AT LEAST 46 PSI AT 5 PERCENT PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2412-02 DURING MANUFACTURE.
(C) JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212-96(a)(2003)e1 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.

GRAVITY SEWER PIPE TESTING REQUIREMENTS (Env-Wq 704.07)

(A) ALL NEW SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE AIR TESTS.
(B) LOW-PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:
  (1) ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW-PRESSURE AIR"; OR
  (2) UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE" (1998).
(C) ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
(D) ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS FOLLOWING INSTALLATION.
(E) THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 7½ PERCENT OF AVERAGE INSIDE DIAMETER.

PROTECTION OF WATER SUPPLIES (Env-Wq 704.12)

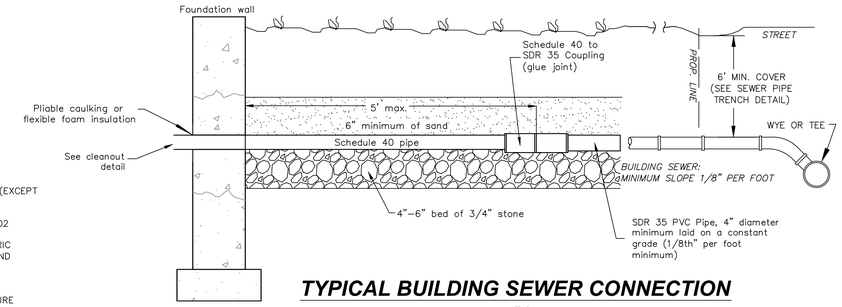
(A) SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
(B) A DEVIATION FROM THE SEPARATION REQUIREMENTS OF (A) ABOVE SHALL BE ALLOWED WHERE NECESSARY TO AVOID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENTS SPECIFIED IN Env-Wq 704.06.
(C) WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
  (1) VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER; AND
  (2) SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

FORCE MAIN AND LOW PRESSURE SEWER CONSTRUCTION MATERIALS (PER Env-Wq 704.06 NUMERATION)

THIS SECTION REQUIRED TO MEET REQUIREMENTS OF Env-Wq 704.12 (d):
(A) FORCE MAINS SHALL BE CONSTRUCTED OF SDR 21 PVC MATERIAL.
(B) FORCE MAINS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFILL REQUIREMENTS.
(C) PVC PIPE USED FOR FORCE MAINS SHALL CONFORM TO ASTM D2241-05 OR ASTM D1785-05.

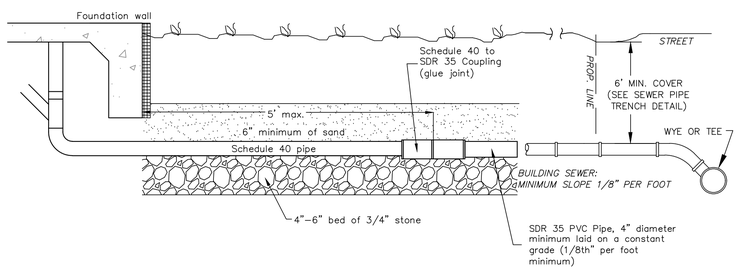
FORCE MAIN AND LOW PRESSURE SEWER TESTING (PER Env-Wq 704.08 NUMERATION)

FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH SECTION 4 OF AWWA C600-05 "INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES", AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING TOTAL DYNAMIC HEAD OR AT LEAST 100 PSI.



TYPICAL BUILDING SEWER CONNECTION

N.T.S



TYPICAL BUILDING SEWER CONNECTION

N.T.S

NO.	DATE	INT.
1.	1/5/21	MCS
0.	9/17/20	AWS
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1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	
0.	INITIAL SUBMISSION TO DOVER	

SEAL
MICHAEL J. SWEET No. 6809 Licensed Professional Engineer STATE OF NEW HAMPSHIRE

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CONSTRUCTION DETAILS
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54 BRR, LLC
JOHN RANDOLPH
TAX MAP 1, LOT 6

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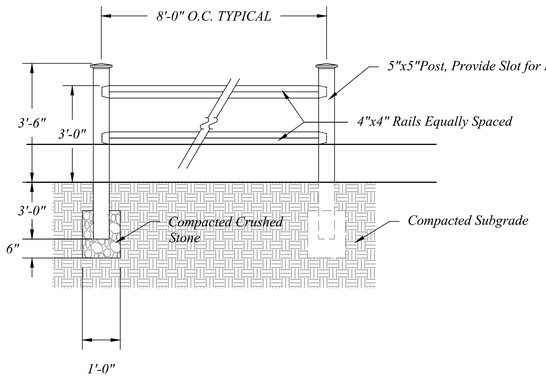
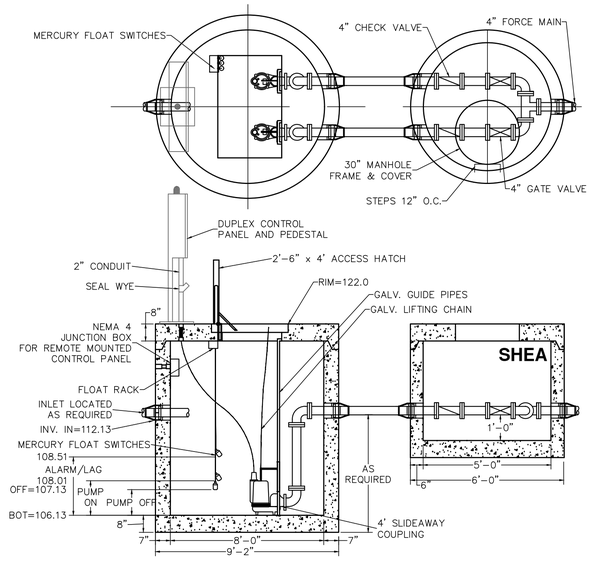


2 RAIL DIAMOND RAIL CEDAR FENCE



PROPOSED PUMP STATION & VALVE PIT DETAIL

NOT TO SCALE

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM C990 SPEC
4. PUMP MODEL – MYERS 3RH 3" SOLIDS HANDLING

TRENCH CONSTRUCTION (PER Env-Wq 704.09 NUMERATION)

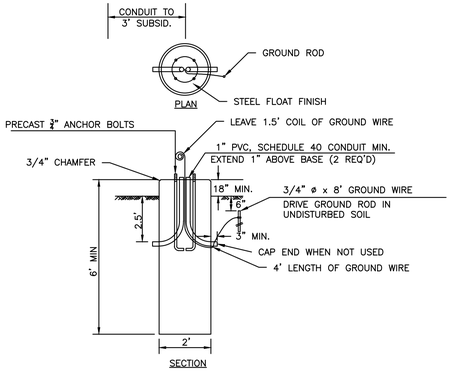
(A) TRENCH DIMENSIONS SHALL BE AS FOLLOWS:
(1) FOR SEWER PIPE LESS THAN 15" IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 36".
(B) PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33-03 STONE SIZE NO. 67.
(C) THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES THROUGH A 1/2 INCH SIEVE AND A MAXIMUM OF 15% PASSES THROUGH A #200 SIEVE.
(E) PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6 INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.
(F) PIPE SAND MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.
(G) COMPACTION SHALL BE IN 12 INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.
(H) BACKFILL MATERIALS SHALL BE COMPACTED IN 3-FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION (OR OTHER PAVED AREAS) WHERE THE FINAL 3 FEET SHALL BE COMPACTED IN 12-INCH LAYERS TO THE ROAD BASE SURFACE.
(I) TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING: DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
(J) TRENCH BACKFILL AT CROSS-COUNTRY LOCATIONS SHALL BE AS DESCRIBED IN (I) ABOVE, EXCEPT THAT TOP SOIL, LOAM, MUCK OR PEAT, MAY BE USED PROVIDED THE COMPLETED CONSTRUCTION WILL BE STABLE, AND PROVIDED THAT ACCESS TO THE SEWER FOR MAINTENANCE AND RECONSTRUCTION IS PRESERVED.
(K) BACKFILL SHALL BE MOUNDED 6 INCHES ABOVE ORIGINAL GROUND AT CROSS-COUNTRY LOCATIONS.
(L) BASE COURSE FOR TRENCH REPAIR SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NH DOT.
(O) PRECAUTIONS SHALL BE TAKEN TO AVOID GROUNDWATER POOLING AT THE SURFACE BY PROVIDING DRAINAGE TO A SUITABLE OUTLET AT CATCH BASINS OR RUNOFF SWALES.

FORCE MAIN AND LOW PRESSURE SEWER CONSTRUCTION MATERIALS (PER Env-Wq 704.06 NUMERATION)

THIS SECTION REQUIRED TO MEET REQUIREMENTS OF Env-Wq 704.12 (d):
(A) FORCE MAINS SHALL BE CONSTRUCTED OF SDR 21 PVC MATERIAL.
(B) FORCE MAINS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFILL REQUIREMENTS.
(C) PVC PIPE USED FOR FORCE MAINS SHALL CONFORM TO ASTM D2241-05 OR ASTM D1785-05.

FORCE MAIN AND LOW PRESSURE SEWER TESTING (PER Env-Wq 704.08 NUMERATION)

FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH SECTION 4 OF AWWA C600-05 "INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES", AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING TOTAL DYNAMIC HEAD OR AT LEAST 100 PSI.



CONCRETE LIGHT POLE BASE

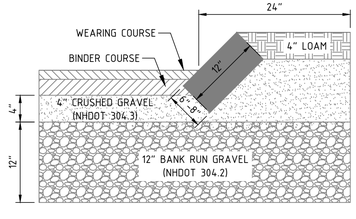
N.T.S

POLE MOUNTED LIGHTING SPECIFICATIONS:

1. ALL SITE WORK SHALL CONFORM TO TOWN OF DURHAM STANDARDS AND LOCAL AUTHORITIES HAVING JURISDICTION.
2. ALL MATERIAL WORKMANSHIP SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING STANDARDS, NEW HAMPSHIRE ELECTRIC CODE, FIRE PROTECTION ASSOCIATION, NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION.
3. ALL EXTERIOR CONDUITS FOR LIGHTING SHALL BE 1" MIN. DIAMETER PVC SCHEDULE 40. ALL ELBOWS SHALL BE SCHEDULE 40. ALL CONDUITS UNDER ROADWAYS AND PARKING AREAS SHALL HAVE MINIMUM COVER OF THREE (3) FEET.
4. ALL UNDERGROUND CONDUITS WILL HAVE NYLON PULL ROPE TO FACILITATE PULLING IN CABLES.
5. ALL EQUIPMENT TO BE LITHONIA LIGHTING – MR2-LED SERIES.
6. LUMINARIES SHALL BE LITHONIA LIGHTING – MR2-LED SERIES,
7. ALL EXTERIOR CONDUITS SHALL BE PROVIDED WITH 6" WIDE, METALIZED CONTINUOUS WARNING TAPE.
8. POLES SHALL BE LITHONIA LIGHTIN OR EQUAL.
9. PROVIDE FUSING ON ALL LUMINARIES. FUSES TO BE LOCATED AT POLE HANDHOLE. ALL LUMINARIES 277 VOLT.
10. GROUND ALL POLES. PROVIDE 3/4" X 8'-0" GROUND ROD AT EACH POLE WITH #6 AWG COPPER GROUND CONNECTION.
11. PROVIDE SHIMS AS REQUIRED AND SET ALL POLES PLUMB. PROVIDE FULL ANCHOR BOLT COVERS.
12. ALL NO. 6 WIRE AND LARGER SHALL BE TYPE THHN COPPER. NO. 8 WIRE AND SMALLER SHALL BE THWN COPPER.
13. MOUNTING HEIGHT SHALL BE 17'±.
14. USE MR2 LED 60C LEDS, WITH DRIVE CURRENT OF 700 mA DISTANCE TYPE T3M.

GENERAL LIGHTING NOTES:

1. LIGHTING SUPPLIER: VISIBLE LIGHT, INC. (603) 926-6049.
2. OWNER MAY ELECT TO USE ALTERNATIVE LIGHT FIXTURES IF FIRST APPROVED BY DESIGNER AND TOWN.
3. SITE LIGHTING WILL BE LOCATED AS SHOWN ON THE SITE PLAN.
4. ALL NON-ESSENTIAL LIGHTING WILL BE REQUIRED TO BE TURNED OFF AFTER BUSINESS HOURS, LEAVING ONLY THE NECESSARY LIGHTING FOR SECURITY.
5. ALL LIGHTING FOR SECURITY OR AESTHETICS WILL BE FULL CUT-OFF OR A SHIELDED TYPE, NOT ALLOWING ANY UPWARD DISTRIBUTION OF LIGHT.
6. PRECAST CONCRETE POLE BASE SHEA CONCRETE OR EQUAL.

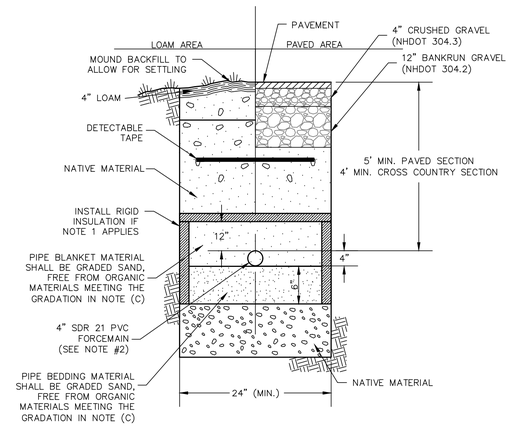


NOTES:

1. REMOVE LOAM TO A MINIMUM DEPTH OF 8" BELOW SELECT MATERIALS.
2. COMPACT BASE, SUBBASE, AND SUBGRADE TO 95% OF STANDARD PROCTOR.
3. SEE PLAN FOR LOCATION

TYPICAL SLOPED GRANITE CURB

NTS



SEWER FORCEMAIN TRENCH

N.T.S

NOTES

1. USE RIGID INSULATION AS SHOWN IF PIPE COVER IS LESS THAN 4' UNDER PAVED SECTION OR 5' UNDER CROSS COUNTRY SECTION.
2. THERE SHALL BE NO GLUE JOINTS ON THE FORCEMAIN.

NO.	DATE	INT.
1.	1/5/21	MCS
0.	9/17/20	AWS

REVISIONS

1. REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20
0. INITIAL SUBMISSION TO DOVER

SEAL

MICHAEL J. METERT No. 9697 Engineer
STATE OF NEW HAMPSHIRE • PROFESSIONAL ENGINEER

DATE ISSUED: 6/12/20
SCALE: AS SHOWN
DESIGNED BY: MJS
DRAWN BY: JLG
APPROVED BY: MJS
DWG FILE: Civil Details B.dwg

CONSTRUCTION DETAILS

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Railroad St., P.O. Box 359
Newmarket, NH 03857 603-659-4427
Phone (603) 659-4427
e-mail: mjs@mjs-engineering.com

JOB: 20-011

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(P20-60)

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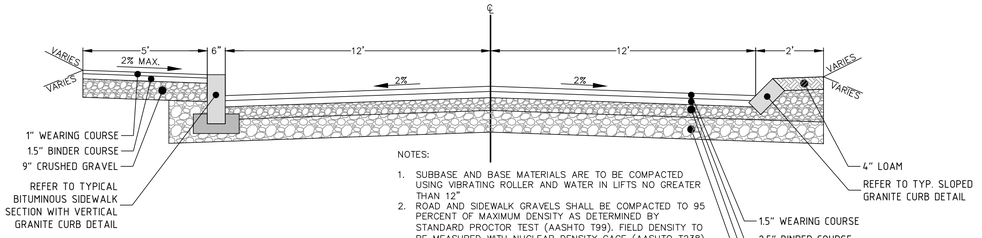

NOTES:

1. SUBBASE AND BASE MATERIALS ARE TO BE COMPACTED USING VIBRATING ROLLER AND WATER IN LIFTS NO GREATER THAN 12"
2. ROAD AND SIDEWALK GRAVELS SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY STANDARD PROCTOR TEST (AASHTO T99). FIELD DENSITY TO BE MEASURED WITH NUCLEAR DENSITY GAGE (AASHTO T238).
3. SIDEWALK MATERIALS:
   WEARING COURSE: 1"
   BINDER COURSE: 1.5"
   CRUSHED GRAVEL (NHDOT 304.3): 9"
4. ROAD MATERIALS:
   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

PRIVATE ROAD STA 0+00 TO STA 2+37 TRAVEL WAY AND SIDEWALK CROSS-SECTION

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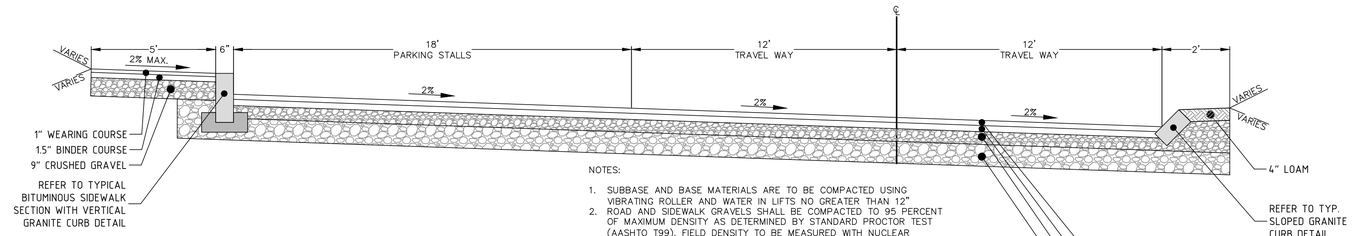

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   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

PRIVATE ROAD STA 2+37 TO STA 5+00 TRAVEL WAY. PARKING, AND SIDEWALK CROSS-SECTION

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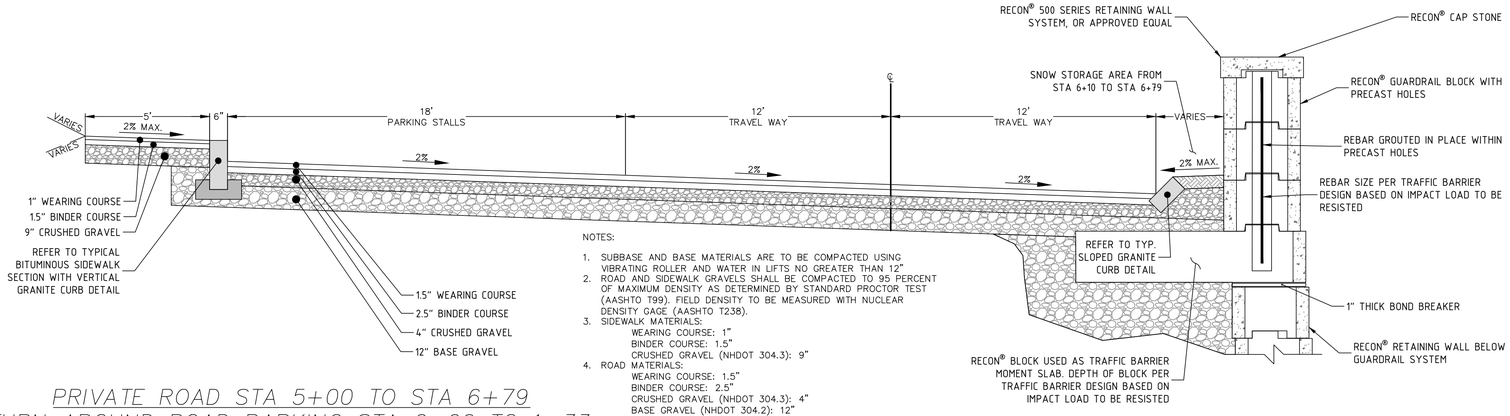

NOTES:

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4. ROAD MATERIALS:
   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

PRIVATE ROAD STA 5+00 TO STA 6+79 TURN AROUND ROAD PARKING STA 0+00 TO 1+33 TRAVEL WAY. PARKING, AND SIDEWALK CROSS-SECTION

NTS

NO.	DATE	REVISIONS
0.	9/17/20	INITIAL SUBMISSION TO DOVER
1.	1/5/21	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20

INT. AWS MCS

SEAL

STATE OF NEW HAMPSHIRE · PROFESSIONAL ENGINEER · MICHAEL J. METERT No. 9809 · CERTIFICATE

DATE ISSUED: 6/12/20
SCALE: AS SHOWN
DESIGNED BY: MJS
DRAWN BY: JLG
APPROVED BY: MJS
DWG FILE: Civil Details B.dwg

CONSTRUCTION DETAILS

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6

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JOB: 20-011

C-506

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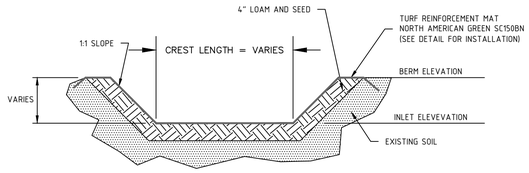

NOTES: CREST BREADTH IS WIDTH OF BERM AT SPILLWAY.

NOTE: SPILLWAY TO BE CONSTRUCTED TO THE DIMENSIONS AND SPECIFICATIONS SHOWN.

SPILLWAY DIMENSION TABLE

LOCATION	CREST ELEV.	BERM ELEV.	LENGTH*	WIDTH*
SPILLWAY #1 - SEDIMENT FOREBAY	101.2	102.1	6'	6'

*REFER TO DETAIL ABOVE FOR LOCATION OF WIDTH AND LENGTH

BIORETENTION SYSTEM SPILLWAY CROSS SECTION

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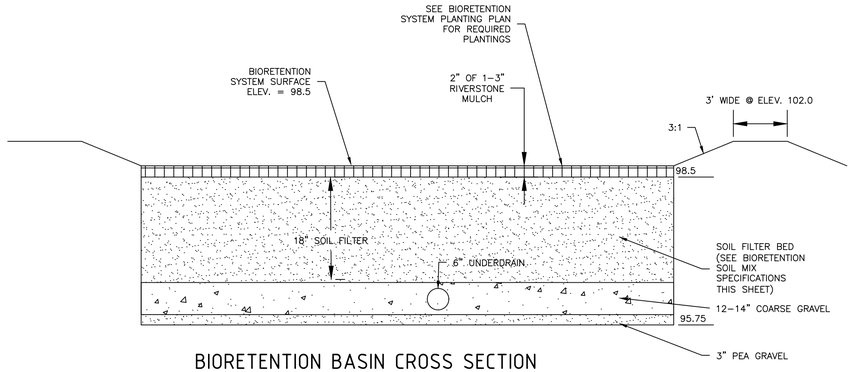


BIORETENTION BASIN CROSS SECTION

CONSTRUCTION NOTES:

1. DO NOT PLACE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. TO PREVENT DEGRADATION OF INFILTRATION FUNCTION: DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION SYSTEM DURING ANY STAGE OF CONSTRUCTION. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
3. CLEAR AND GRUB THE AREA WHERE THE BIORETENTION SYSTEM IS TO BE LOCATED. STOCKPILE LOAM FOR REUSE LATER.
4. THE FOUNDATION AREA SHALL BE SCARIFIED PRIOR TO PLACING FILL. ALL UNSUITABLE MATERIAL UNDER THE BERM SHALL BE REMOVED AND REPLACED WITH SUITABLE FOUNDATION MATERIAL.
5. THE BERM SHALL BE CONSTRUCTED BEGINNING FROM THE LOWEST POINT UNIFORMLY ALONG ITS ENTIRE LENGTH; PLACE MATERIALS IN MAXIMUM 12" LOOSE LIFTS COMPACTED TO 95% MAXIMUM MODIFIED PROCTOR DENSITY. EMBANKMENT SOIL SHALL HAVE NO ORGANIC MATTER OR FROZEN MATERIAL AND NO STONES LARGER THAN 2/3 OF THE MAXIMUM LOOSE LIFT THICKNESS. STONES AROUND ANY STRUCTURES AND/OR CONDUITS SHALL NOT EXCEED 3 INCHES. EMBANKMENT FILL MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

SIEVE SIZE:	% PASSING:
#4	80-90
#40	50-80
#100	30-45
#200	15-30

6. ALL PIPE TO PIPE CONNECTIONS SHALL BE WATER-TIGHT.
7. ALL DISTURBED AREAS NOT OTHERWISE LANDSCAPED SHALL RECEIVE FOUR INCHES OF LOAM AND SEED.

GENERAL MAINTENANCE:

1. THE BIORETENTION BASIN SHALL BE INSPECTED TWICE EACH YEAR WITH PREVENTATIVE MAINTENANCE PROVIDED.
2. SYSTEMS SHALL BE INSPECTED ANNUALLY AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
3. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
4. AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
5. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

PLANTING REQUIREMENTS

1. THE BIORETENTION BASIN AND SEDIMENT FOREBAY BERM, BOTTOM AND INTERIOR SIDE SLOPES SHALL BE PLANTED WITH A 50:50 MIX OF NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES AND NEW ENGLAND CONSERVATION/WILDLIFE MIX AT 1,500 SF/LB AVAILABLE FROM:

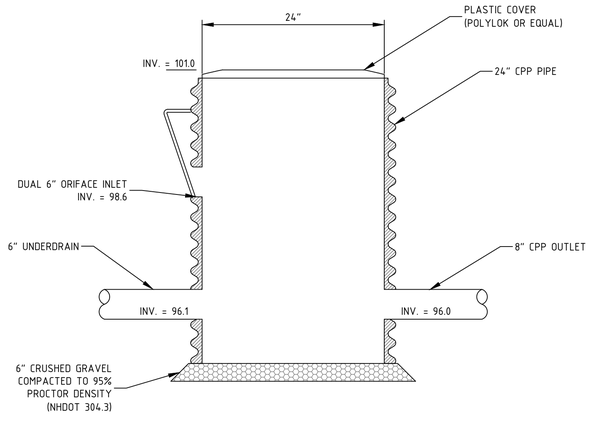
   NEW ENGLAND WETLAND PLANTS. INC.
   820 WEST AMHERST STREET
   AMHERST, MA 01002

BIORETENTION SYSTEM GENERAL NOTES:

1. BIORETENTION SYSTEM FILTER SOIL MIX SHALL MEET THE FOLLOWING REQUIREMENTS OF FILTER MEDIA OPTION A OR OPTION B.

BIORETENTION SYSTEM SOIL MIX SPECIFICATIONS

		GRADATION OF MATERIAL	
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	SIEVE NO.	% BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C-33 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
LOAMY COARSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		60	15 TO 40
		200	8 TO 15



OUTLET CONTROL STRUCTURE DETAIL

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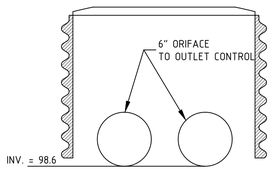


ORIFACE DIMENSIONS

NO.	REVISIONS	DATE	INT.
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	12/29/20	MCS

SEAL

MICHAEL C. SIEVERT NO. 6809 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

DATE ISSUED: 1/5/20
SCALE: AS SHOWN
DESIGNED BY: MJS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE:

CONSTRUCTION DETAILS
prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP 1, LOT 6
54 BACK RIVER ROAD, DOVER, NH

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Railroad Sr., P.O. Box 359
Newmarket, NH 03857 (603) 659-4427
Phone (603) 659-4427 Fax (603) 659-4427
e-mail: mjs@mjs-engineering.com

JOB: 20-011

C-507

(P20-60)

Landscape Operation & Maintenance Plan For 54 Back River Road

Weekly Tasks

1. Mow and edge lawns if needed. Lawns to be cut to 3.5" height.
2. Prune back any shrubs overhanging curbs or sidewalks.
3. Prune back any groundcover overhanging curbs or sidewalks.
4. Remove litter and leaves from plants, planters, and parking lots.
5. Remove any broken or fallen branches from trees. Remove sucker growth from tree trunks.
6. Remove any weeds larger than 2 inches (5 cm) high or wide from planters. Weeds 2 inches (5 cm) and larger must be removed, not just killed.
7. Replace bark mulch which has been knocked or washed out of planters. Smooth mulch layer if it has been disturbed.
8. Replace decorative rock which has been knocked or washed out of drip strips. Smooth decorative rock surface if it has been disturbed.
9. Check plants for signs of stress, pests or disease. Request authorization to replace other dead or missing plants. Note: Maintenance contractor must request authorization to make replacements within one week of the damage becoming evident.
10. Sweep or blow clean all walkways, curbs, and gutters.
11. Treat for any signs of disease or pest infestation.
12. Complete any items required on the Monthly Checklist.
13. Hand water any plants that are dry and stressed.
14. Check the irrigation system (if there is a system). Make emergency repairs as needed or request authorization to make major repairs. Note: Maintenance contractor must request authorization for repairs within one week of the damage becoming evident.
15. Adjust the irrigation controllers for current water needs of plants.
16. **Gently prune shrubs at appropriate time of year based on species, for shape and form. DO NOT shear.**

Yearly Tasks

Early Spring

1. Prune any tree branches that interfere with public safety. Prune all parking lot and street trees yearly to encourage strong growth.
2. Apply granular fertilizer to shrubs beds and lawns. Be sure to make application prior to a moderate rainfall in drip-irrigated planters so the rain will wash the fertilizer in.
3. Submit receipts to owner's authorized representative as proof of fertilizer purchase.
4. Trim any perennial foliage left in the fall for winter interest to within six inches of the ground.
5. Add new mulch to planters where the mulch depth has been reduced to less than 2 inches (5 cm) thick. Mulch depth shall not exceed 2". Additional mulch not required where shrubs or groundcover completely hide the soil surface from view.

6. Where there is irrigation and after threat of frost is gone, flush out irrigation systems as needed and check for proper operation of each valve zone.
7. Clean or replace plugged sprinkler nozzles. Replace plugged drip emitters.
8. Replace irrigation controller program back-up batteries.

June:

No additional items

July:

No additional items

August:

No additional items

September:

1. Inventory all plant materials. Inventory shall include an exact count of all shrubs and trees, itemized by planter. Replace any dead or missing plants.

October:

1. Prepare irrigation system for winter. Make sure backflow preventer is well insulated or drained prior to first freeze. Blow out pipes using compressed air in areas where freezing could result in breakage.
2. Mow field areas.

November:

1. “WILT-PRUF” broadleaf evergreens when temperature permits.

December:

1. Prune any tree branches that interfere with public safety. Prune all parking lot and street trees yearly to encourage strong growth.

TAX MAP I-2, LOT 6C-3
SHARI & TERRY ROBINSON
16 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4577 PAGE 498

TAX MAP I-2, LOT 6C-2
SCOTT L. & AMY M. ROY
12 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4690, PAGE 772

TAX MAP I-2, LOT 6C-1
TIMOTHY & LAURALEE MCGUANA
8 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4480, PAGE 591

TAX MAP I-2, LOT 6C
NATHAN & TINA TSAKIRIS
46 BACK RIVER RD
DOVER, NH 03820
SCRD BOOK 4716, PAGE 411

TAX MAP I-2, LOT 8A
FRANK CROSSMAN JR.
50 BACK RIVER RD
DOVER, NH 03820
SCRD BOOK 1768, PAGE 621

TAX MAP I-2, LOT 6D
LANCE W. HELLMAN REV. TRUST
228 HIGHLAND AVENUE
PORTSMOUTH, NH 03801
SCRD BOOK 2219, PAGE 571

TAX MAP I-2, LOT 58
GATE LIMITED PARTNERSHIP
130 CENTRAL AVE
DOVER, NH 03820
SCRD BOOK 1689, PAGE 12

TAX MAP I-2, LOT 59
ATE LIMITED PARTNERSHIP
30 CENTRAL AVE
OVER, NH 03820
CRD BOOK 4336, PAGE 544

X MAP I-2, LOT 60
VIN & LISE TURGEON
22 GREEN ST
RSWORTH, NH 03878
BOOK 449, PAGE 336

TAX MAP I-2, LOT 8 I-1
ARTHUR SWEATT
56 BACK RIVER ROAD
DOVER, NH 03802
SCRD BOOK 1806, PAGE 169

DEBRA A. MERRETT-DESOUVEIRA
20 RED BARN DR
DOVER, NH 03820
SCRD BOOK 4570, PAGE 416

DOVER, NH 03820
SCRD BOOK 4557, PAGE 766

DEVELOPERS, LLC
9 KINGS GRANT DR
ATKINSON, NH 03811
SCRD BOOK 4548, PAGE 419

BACK RIVER ROAD

COTTAGE DRIVE

R-ASY
R-P

Schedule													
Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens per Lamp	Lumen Multiplier	LLF	Wattage	Efficiency	Distribution	Notes
	B	20	Lithonia Lighting	RADB LED P2 30K SYM MVOLT BTS BCC DDBXD	RADB LED P2 30K SYM DDBXD; mounted at 3.5ft	LED	1	RADB_LED_P2_30K_SYM_DDBXD.ies	589	1	0.9	8	100%	TYPE VS, BUG RATING: B0 - U1 - G0	
	D	44	Lithonia Lighting	WF6 LL LED 27K MVOLT	LED Ultra Thin Wafer Low Lumen 2700K, 120 - 277V; mounted at 9ft	LED	1	WF6_LL_LED_27K_MVOLT.ies	819	1	0.9	12.7	100%	DIRECT, SC-0=1.24, SC-90=1.24	
	R-ASY	11	Lithonia Lighting	RADPT LED P2 30K ASY MVOLT RADPT20 HS DDBXD with RSS 16 4B T20 DDBXD	RADEAN Post-Top with P2 3000K Asymmetric distribution with house-side shield; mounted at 16ft	LED	1	RADPT_P2_30K_ASY_HS.ies	4205	1	0.9	38.0107	100%	TYPE IV, VERY SHORT, BUG RATING: B1 - U2 - G2	
	R-P	2	Lithonia Lighting	RADPT LED P2 30K PATH MVOLT RADPT20 HS DDBXD with RSS 16 4B T20 DDBXD	RADEAN Post-Top with P2 3000K Pathway distribution with house-side shield; mounted at 16ft	LED	1	RADPT_P2_30K_PATH_HS.ies	3509	1	0.9	38.0107	100%	TYPE IV, SHORT, BUG RATING: B1 - U2 - G2	

Plan View
Scale - 1" = 30ft

VISUAL

54 BACK RIVER ROAD
DOVER, NH
Site Lighting Layout

Designer
Heidi G. Connors
Visible Light, Inc.
24 Stickney Terrace
Suite 6
Hampton, NH 03842

Date
01/05/2021

Scale
1"=30'

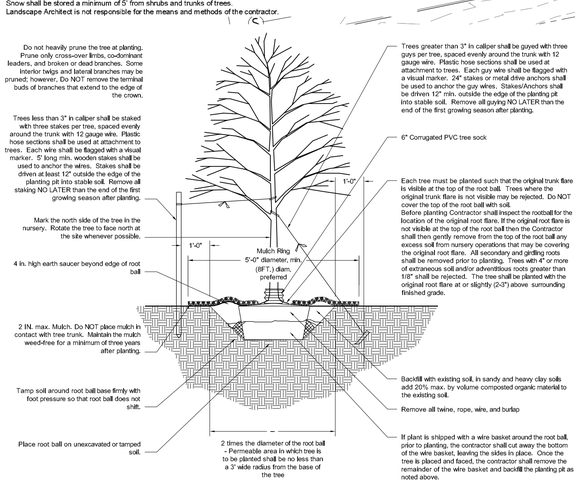
Drawing No.

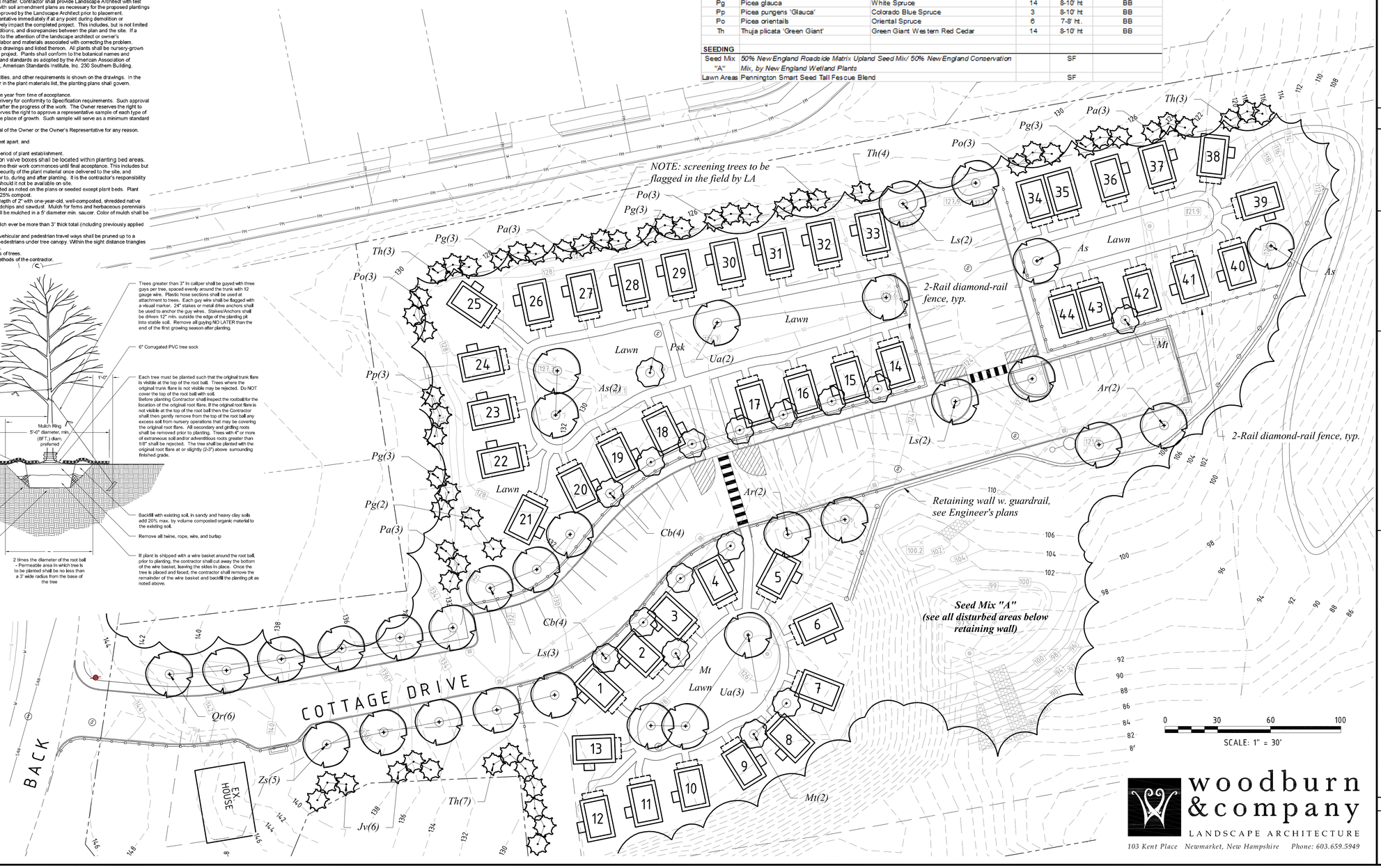
Summary

1. Design is based on drawings by MJS Engineering, P.C. dated 01/06/21 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control shall be staked in place between the work and Water bodies, Wetlands and/or drainage ways prior to any construction.
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
9. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 1-888-344-7233.
10. The Contractor shall procure any required permits prior to construction.
11. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
12. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
13. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
14. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
15. All plants shall be legibly tagged with proper botanical name.
16. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
17. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
18. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
19. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
20. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
21. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
22. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
23. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
24. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
25. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
26. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
27. Landscape Architect is not responsible for the means and methods of the contractor.

Plant List

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
TREES					
Ar	*Acer rubrum 'Red Sunset'*	Red Sunset Red Maple	4	2.5-3" cal.	BB
As	*Acer saccharum 'Green Mountain'*	Gree Mountain Sugar Maple	4	2.5-3" cal.	BB
Cb	*Carpinus betulus 'Frans Fontaine'*	Frans Fontaine Hornbeam	11	2.5-3" cal.	BB
Ls	*Liquidambar sytraciflua*	Sweetgum	7	2.5-3" cal.	BB
Mt	*Malus 'Tina'*	Tina Crabapple	4	2.5-3" cal.	BB
Psk	*Prunus serrulata 'Kwanzan'*	Kwanzan Cherry	1	2.5-3" cal.	BB
Qr	*Quercus rubra*	Red Oak	6	2.5-3" cal.	BB
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	5	2.5-3" cal.	BB
Zs	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	5	2.5-3" cal.	BB
EVERGREEN TREES FOR SCREENING					
Jv	*Juniperus virginiana 'Emerald Sentinel'*	Emerald Sentinel Eastern Red Cedar	6	7-8' ht.	BB
Pa	Picea abies	Norway Spruce	9	8-10' ht	BB
Pg	Picea glauca	White Spruce	14	8-10' ht	BB
Pp	Picea pungens 'Glauca'	Colorado Blue Spruce	3	8-10' ht	BB
Po	Picea orientalis	Oriental Spruce	6	7-8' ht.	BB
Th	Thuja plicata 'Green Giant'	Green Giant Western Red Cedar	14	8-10' ht	BB
SEEDING					
Seed Mix "A"	*50% New England Roadside Matrix Upland Seed Mix/ 50% New England Conservation Mix, by New England Wetland Plants*			SF	
Lawn Areas	Pennington Smart Seed Tall Fescue Blend			SF	





woodburn &company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

NO.	DATE	INT.
REVISIONS		
1.	REVISED SUBMISSION TO DOVER PER TECHNICAL REVIEW 10/8/20	01/07/21	VM
0.	INITIAL SUBMISSION	10/02/20	RW

SEAL

DATE ISSUED: 01/07/21
SCALE: 1"=30'
DESIGNED BY: RW
DRAWN BY: VM
APPROVED BY: RW
DWG FILE:

LANDSCAPE PLAN

prepared for
54 BRR, LLC
JOHN RANDOLPH
TAX MAP I, LOT 6
54 BACK RIVER ROAD, DOVER, NH

MJS ENGINEERING, P.C.
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JOB: 20-011

LA101

(P20-60)

TRAFFIC IMPACT ASSESSMENT

PROPOSED AFFORDABLE HOUSING DEVELOPMENT

Dover, New Hampshire

December 2020

Prepared for

MJS Engineering, P.C.

Stephen G. Pernaw
& Company, Inc.

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Transportation: Engineering • Planning • Design

TRAFFIC IMPACT ASSESSMENT
PROPOSED AFFORDABLE HOUSING DEVELOPMENT
DOVER, NEW HAMPSHIRE
December 23, 2020

INTRODUCTION

This study has been prepared for MJS Engineering, P.C. on behalf of their client John Randolph to assess the traffic impacts associated with a proposed affordable housing development project located on the east side Back River Road in Dover, New Hampshire. The purpose of this report is to summarize the traffic count data collected, the trip generation characteristics of the proposed residential development, the future traffic projections, the technical analyses, and our findings relative to traffic operations, capacity, and safety.

Based on input from the City of Dover, the study area includes the Back River Road/Proposed Site Access Road intersection, as well as the Back River Road and Mast Road intersections on NH Route 108 (NH108) and the Back River Road/Mast Road/Leathers Lane intersection. The analysis periods include the typical weekday morning and evening commuter periods, and the analysis years were set at 2022 and 2032.

PROPOSAL

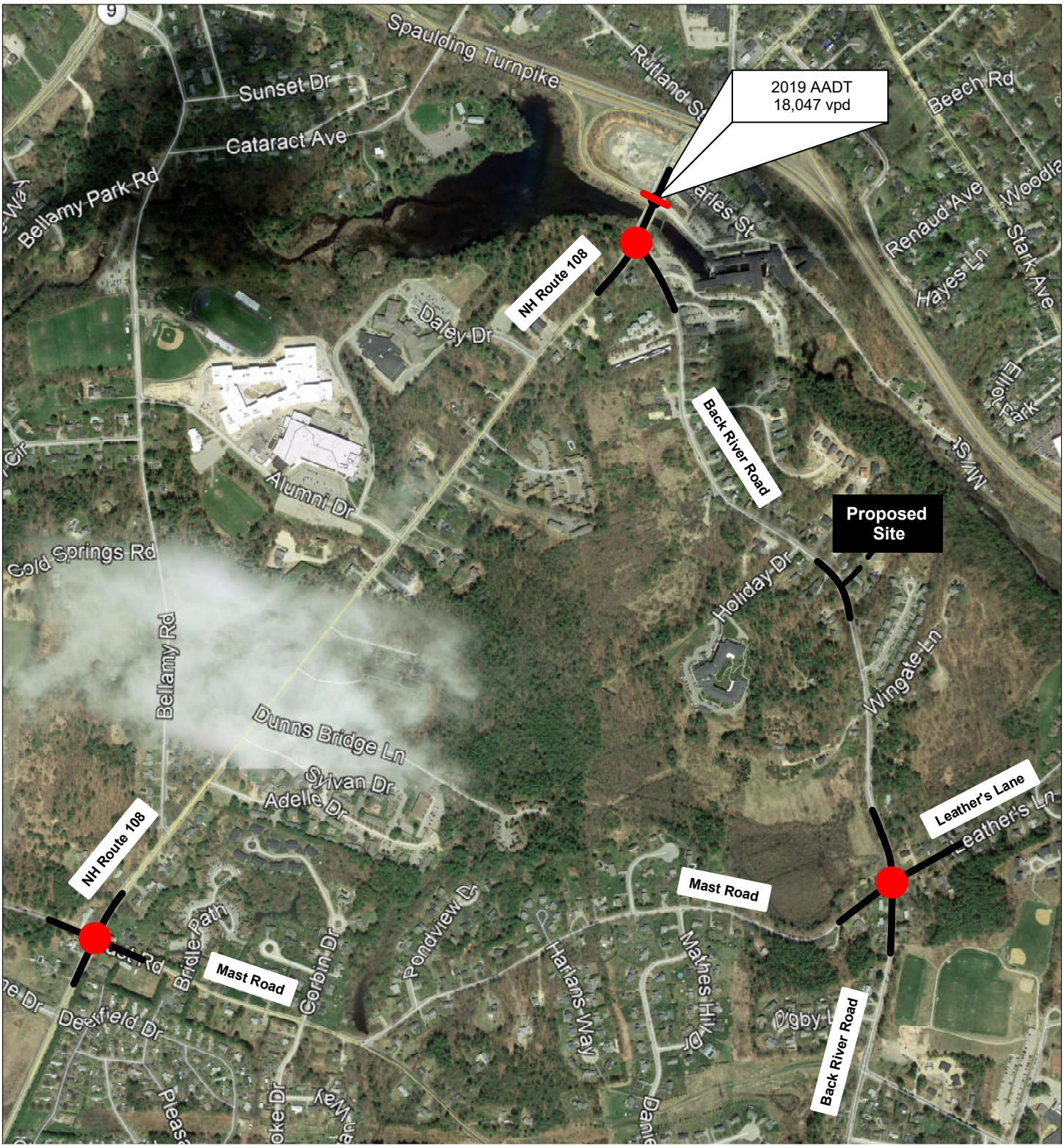
The development proposal involves the construction of 44 workforce housing "cottages," each with a gross floor area of approximately 384 square feet, along a Proposed Site Access Road that will create a new three-leg T-intersection on Back River Road, located approximately 250-feet south of the Red Barn Drive intersection. The location of the subject site with respect to the area roadway system, along with the study area intersections, are shown on Figure 1. The plan entitled: "*Grading Plan,"* Sheet C-102, prepared by MJS Engineering, P.C., dated 6/12/20 shows the layout of the proposed dwelling units and is found in Appendix A.

EXISTING CONDITIONS

ROADWAYS

Back River Road functions as a rural two-lane collector roadway that extends in a general northwest-southeast direction between NH108 and the Piscataqua Road/Drew Road intersection. In addition to providing access to NH108 for through traffic, this roadway also provides direct access to several intersecting streets and numerous residences. The horizontal alignment is curvilinear and the vertical profile follows a rolling terrain. The pavement is delineated with a four-inch double yellow centerline (passing maneuvers prohibited) and four-inch white edge lines.

In the vicinity of the subject site, the pavement width measures approximately 35-feet and is delineated with two 11' travel lanes and 6'-7' foot paved shoulders. The speed limit is posted at 30 mph on Back River Road.



= AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)

= INTERSECTION TURNING MOVEMENT COUNT LOCATION

NORTH

2037A

Figure 1

Site Location

Traffic Impact Assessment, Proposed Affordable Housing Development, Dover, New Hampshire

INTERSECTIONS

The **NH108/Back River Road** intersection functions as a signalized high-type "T" intersection with raised median islands on each leg of the intersection. The existing travel lane configuration at this intersection is as follows:

NH108 (SB) Approach: One exclusive left-turn lane and one exclusive through lane
NH108 (NB) Approach: One exclusive through lane and one exclusive right-turn lane
Back River Road (WB) Approach: One exclusive left-turn lane and one exclusive right-turn lane

The signal controller operates with three basic signal phases: 1) northbound and southbound movements (with permitted left-turns), 2) westbound left and right turns (with a northbound right-turn overlap) and 3) a pedestrian actuated pedestrian phase. The pedestrian phase was not heavily used; it was actuated twice during the AM peak hour, and three times during the PM peak hour.

The **NH108/Mast Road** intersection functions as a standard four-leg intersection that operates under traffic signal control. The existing travel lane configuration at this intersection is as follows:

Mast Road (EB) Approach: One exclusive left-turn lane and one shared through-right lane
Mast Road (WB) Approach: One exclusive left-turn lane and one shared through-right lane
NH108 (NB) Approach: One shared left-through lane and one exclusive right-turn lane
NH108 (SB) Approach: One exclusive left-turn lane and one shared through-right lane

This signal controller operates with four basic signal phases: 1) southbound lead phase, 2) northbound and southbound movements, 3) eastbound and westbound movements, and 4) a pedestrian actuated pedestrian phase. The pedestrian phase was not utilized during the AM peak hour and only in two instances during the PM peak hour.

The **Back River Road/Mast Road-Leathers Lane** intersection functions as a standard four-leg intersection that operates under STOP sign control on the minor approaches. The existing travel lane configuration at this intersection is as follows:

Mast Road (EB) Approach: One shared left-through-right lane
Leathers Lane (WB) Approach: One shared left-through-right lane
Back River Road (NB) Approach: One shared left-through-right lane
Back River Road (SB) Approach: One shared left-through-right lane

TRAFFIC VOLUMES

Research at the New Hampshire Department of Transportation (NHDOT) revealed that a short-term automatic traffic recorder (ATR) count was conducted on NH108 (North of Back River Road) in September 2019. This count station is located approximately 0.5 miles northwest of the subject site and the data confirmed that the rate of traffic flow typically reached peak levels during the typical weekday AM and PM commuter periods. The daily and hourly variations in traffic demand at this location are summarized graphically on Page 5. Appendix B contains the summary and detail sheets pertaining to this count station.

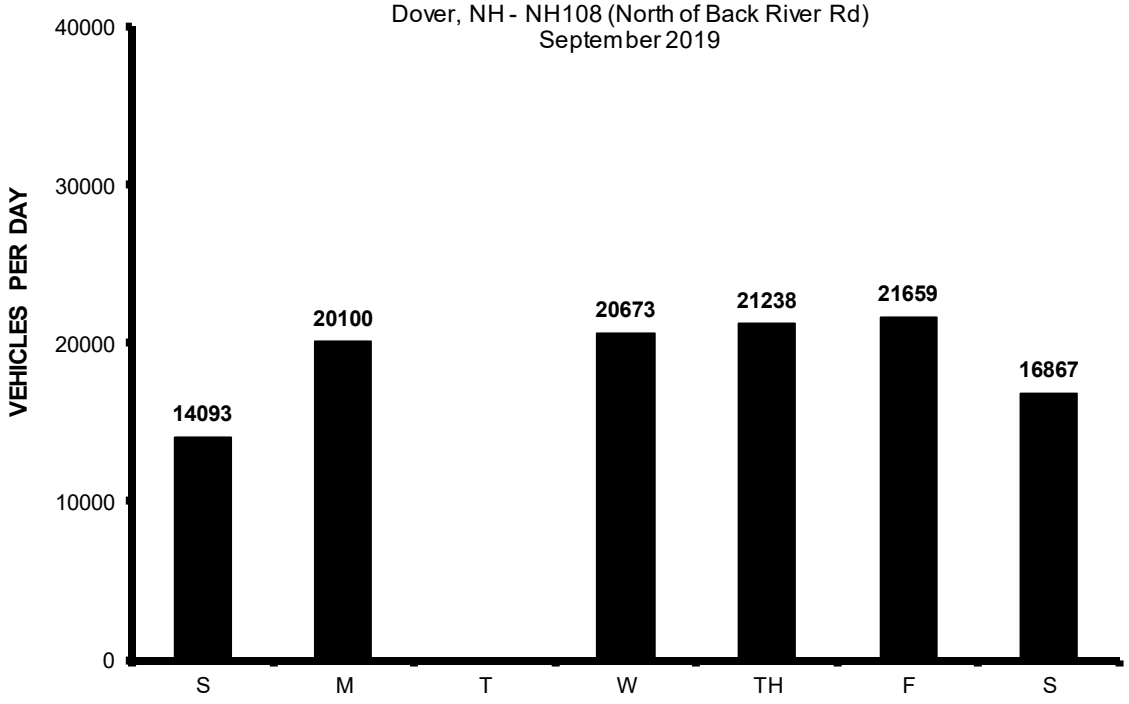
To supplement this data, Pernaw & Company, Inc. conducted intersection turning movement and vehicle classification counts at the NH108/Back River Road, NH108/Mast Road signalized intersections and the Back River Road/Mast Road-Leathers Lane unsignalized intersection on two separate weekdays in October 2020. These counts were conducted on Wednesday, October 7, 2020 and Thursday, October 8, 2020 from 7:00 to 9:00 AM and from 3:00 to 6:00 PM. The new 2020 count data for the study area is summarized on Figure 2. Several facts and conclusions are evident from this data.

- The Wednesday AM peak hour and Thursday PM peak hour traffic volumes represented the higher of the two count days, and were therefore selected for analysis purposes.
- The highest hourly traffic volumes in the study area occurred from 7:15 to 8:15 or 7:30 to 8:30 AM and from 3:30 to 4:30 or 4:30 to 5:30 PM. The traffic volumes during the PM peak hour were generally higher than those that occurred during the AM peak hour on NH108. Traffic volumes on Back River Road at the subject site were slightly higher during the AM peak hour, presumably due to the nearby school.
- NH108 traffic volumes, north of Back River Road, totaled 1,438 (AM) and 1,655 (PM) during the peak hour periods. The higher directional flow was southbound during both the AM peak hour (54% - from downtown Dover) and the PM peak hour (52% - from downtown Dover).
- The traffic volume on Back River Road (east of NH108) totaled 707 (AM) and 675 (PM) vehicles during the peak hour periods. The directional flow on Back River Road is relatively even during the both AM and PM peak hour periods.
- The traffic flow on Back River Road passing the subject site totaled 583 vehicles (AM) and 572 vehicles (PM) during the peak hour periods. The higher directional flow was eastbound during the AM peak hour (52%) and eastbound during the PM peak hour (52%) periods.

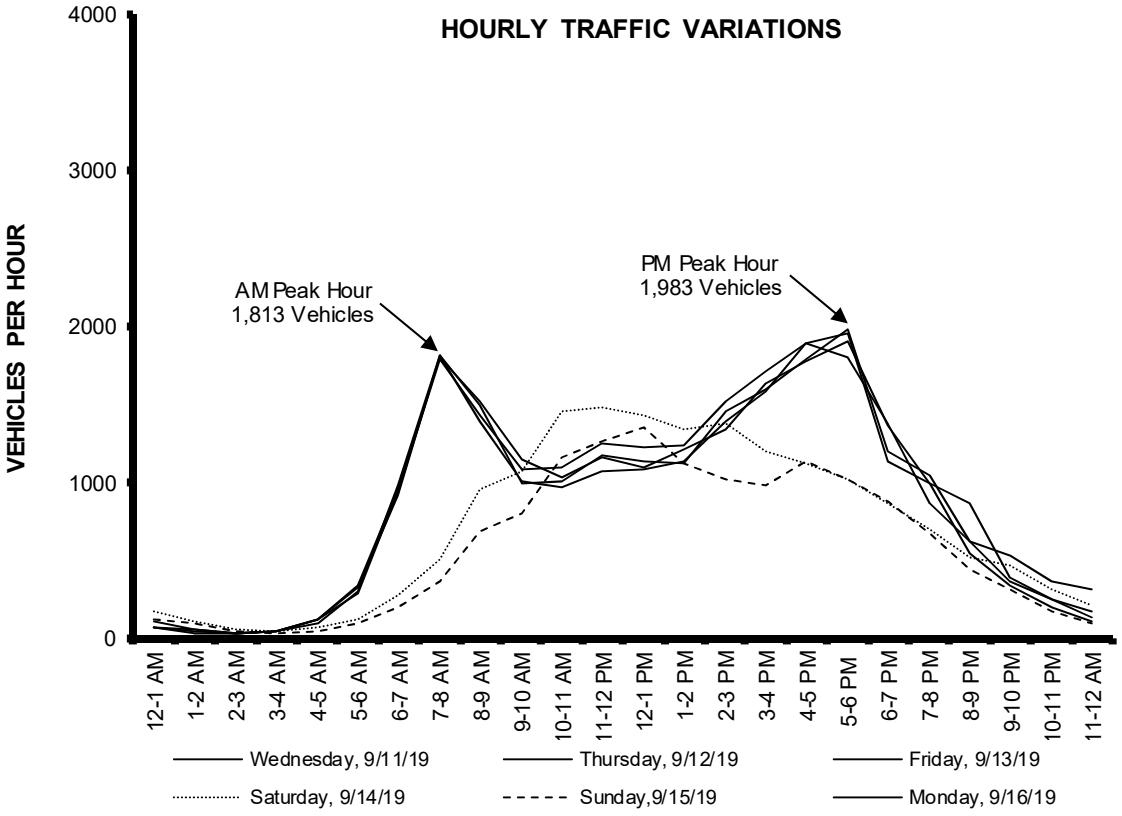
Appendix C contains detail sheets pertaining to all of the raw turning movement count data.

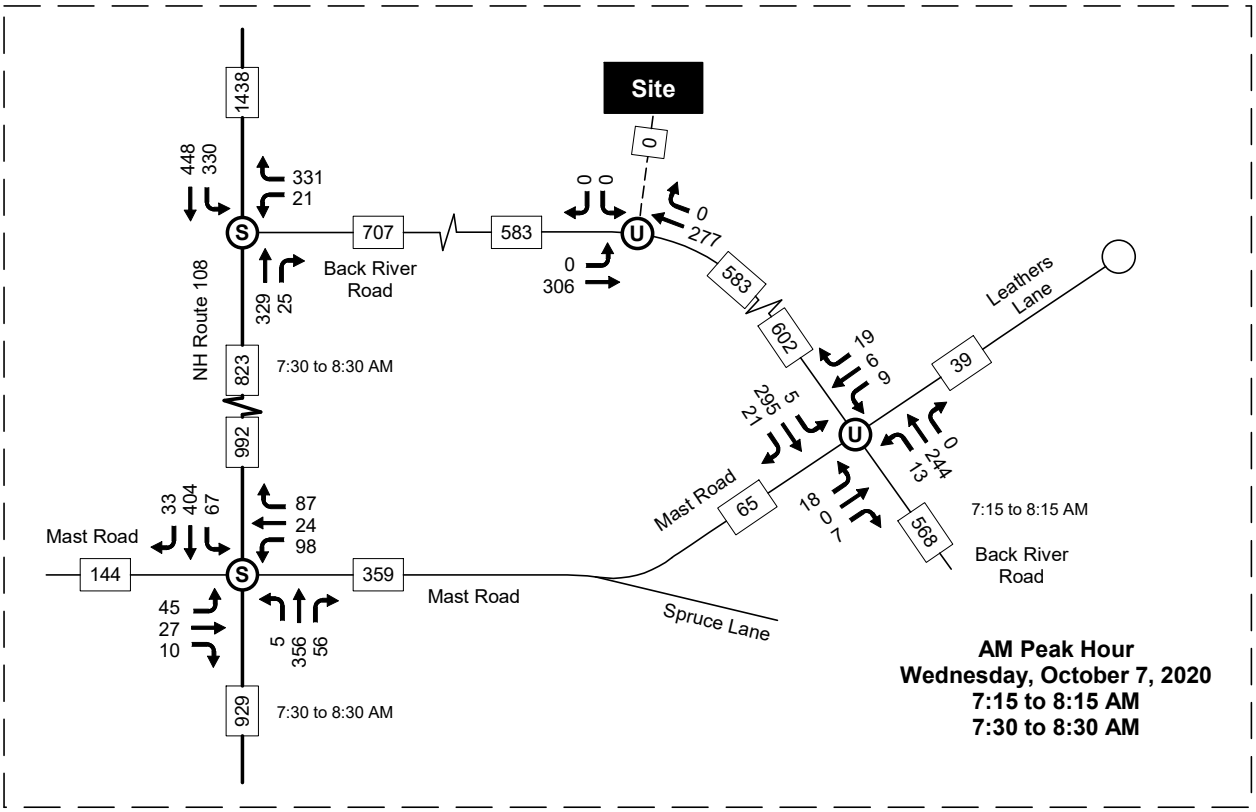
DAILY TRAFFIC VARIATIONS

Dover, NH - NH108 (North of Back River Rd)
September 2019



HOURLY TRAFFIC VARIATIONS





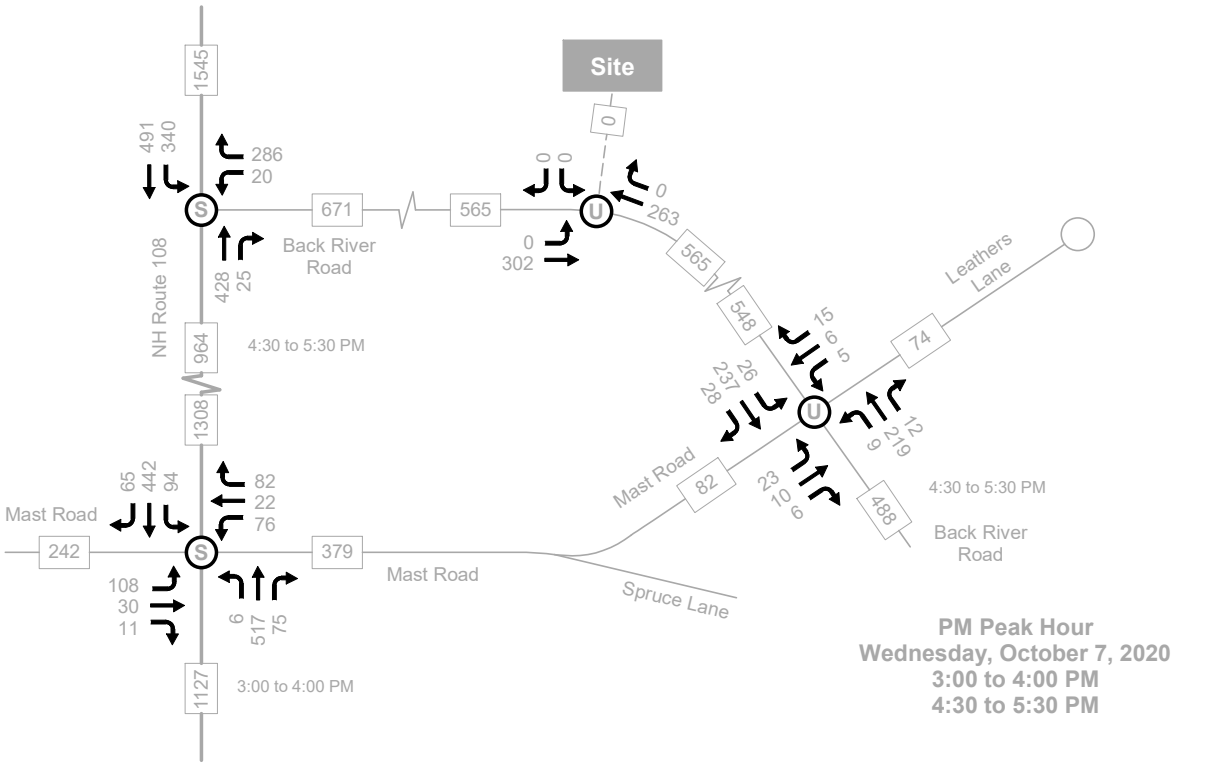


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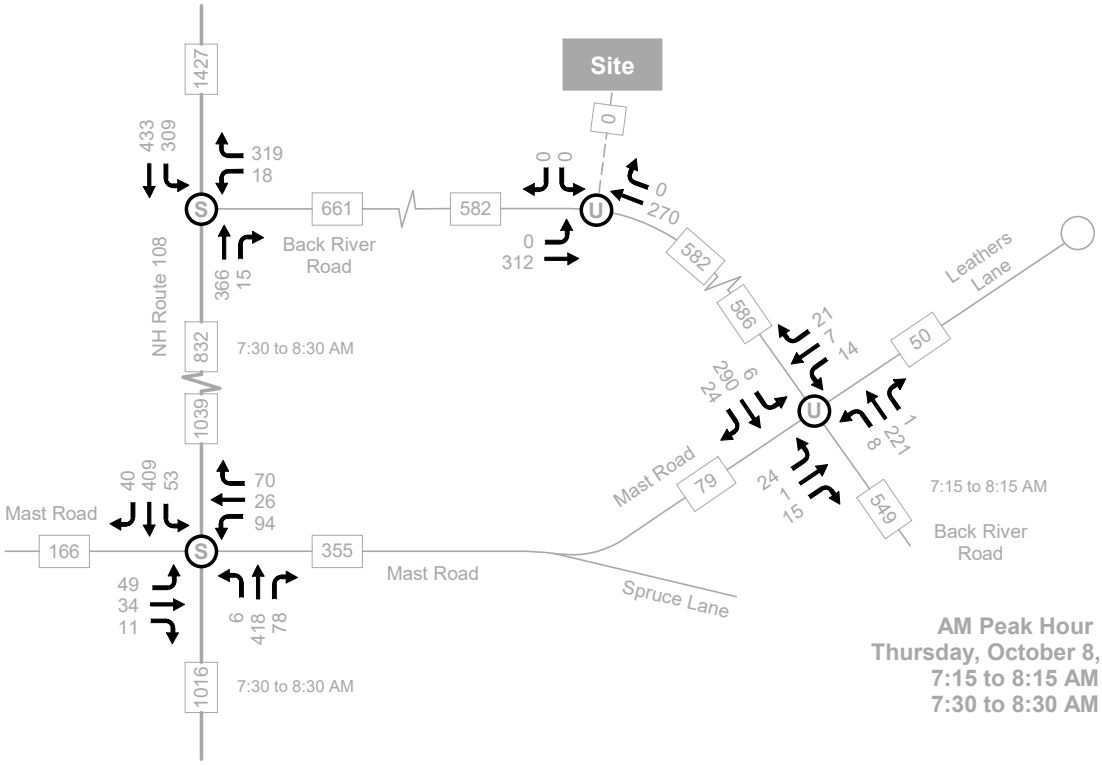
Figure 2A

2020 Existing Traffic Volumes - Wednesday, October 7, 2020

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire



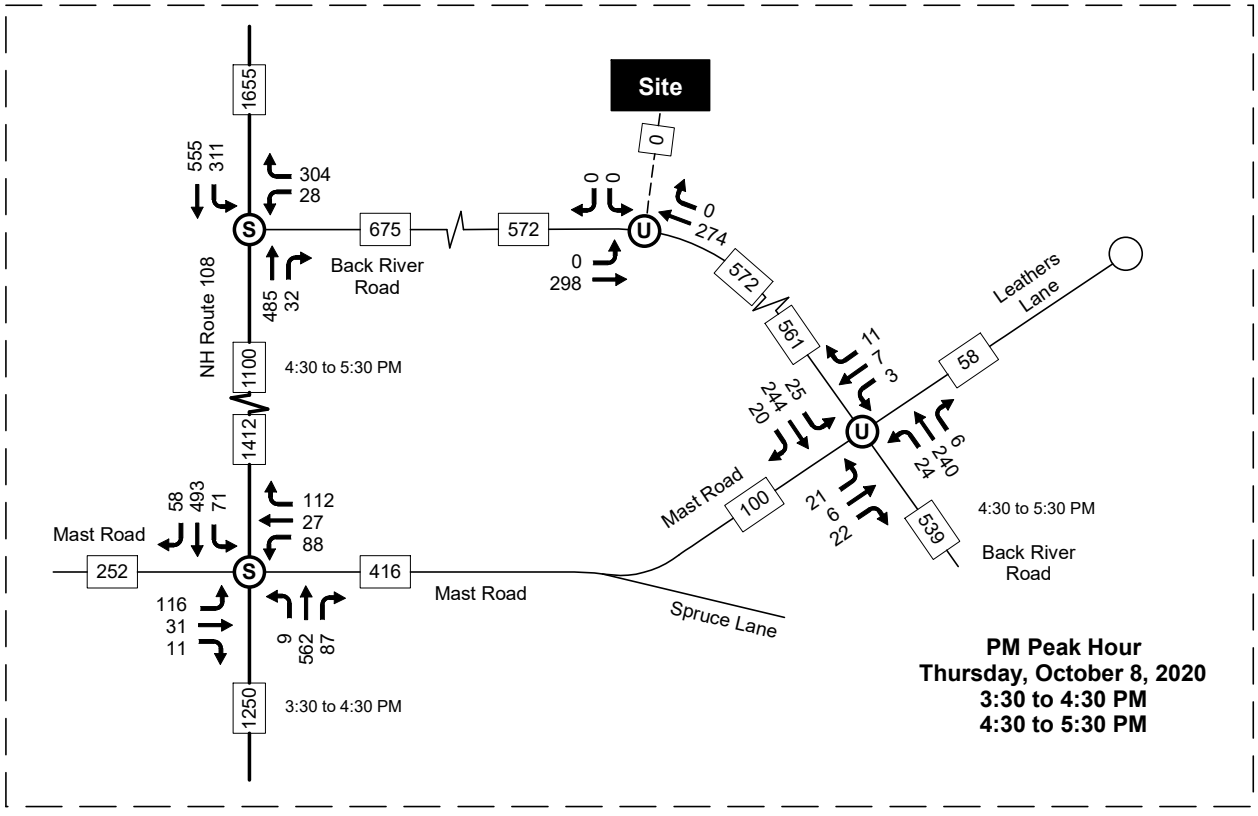


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Figure 2B

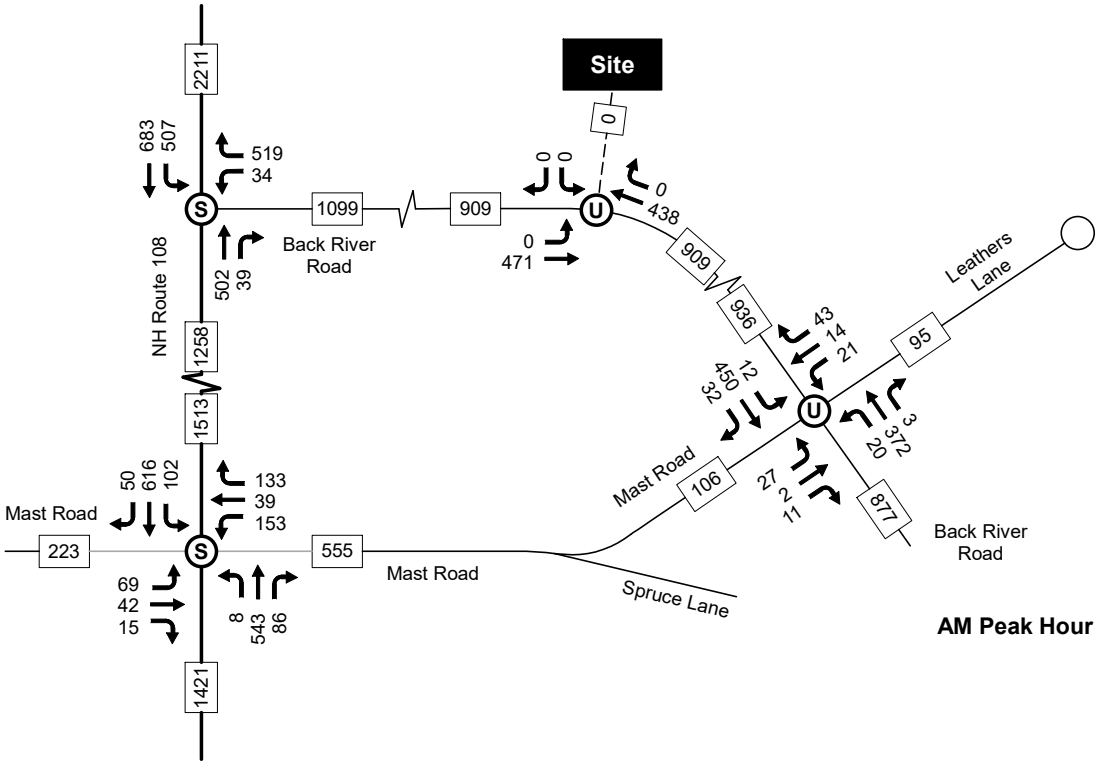
2020 Existing Traffic Volumes - Thursday, October 8, 2020

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire

NO-BUILD TRAFFIC VOLUMES

The No-Build traffic projections (without the proposed residential development) for 2022 and 2032 are summarized on Figures 3 and 4, respectively. These projections are based on the October 2020 traffic count data, a one-percent annual background traffic growth rate (compounded annually) to account for normal background traffic growth, a seasonal adjustment factor of 1.06 to reflect peak-month conditions, and a COVID-19 adjustment factor of 1.41 (AM) and 1.18 (PM) due to recent travel conditions as a result of the pandemic. The No-Build projections also account for a recently approved residential development project on Leathers Lane proposed by others. Appendix E contains a diagram that summarizes the distribution of the other development traffic volumes.

The future traffic projections contained herein are intended to reflect worst-case, peak-month, peak-hour conditions. The calculations pertaining to the derivation of the annual background traffic growth rate, the seasonal adjustment factor, and the Covid-19 factor are contained in Appendix D.



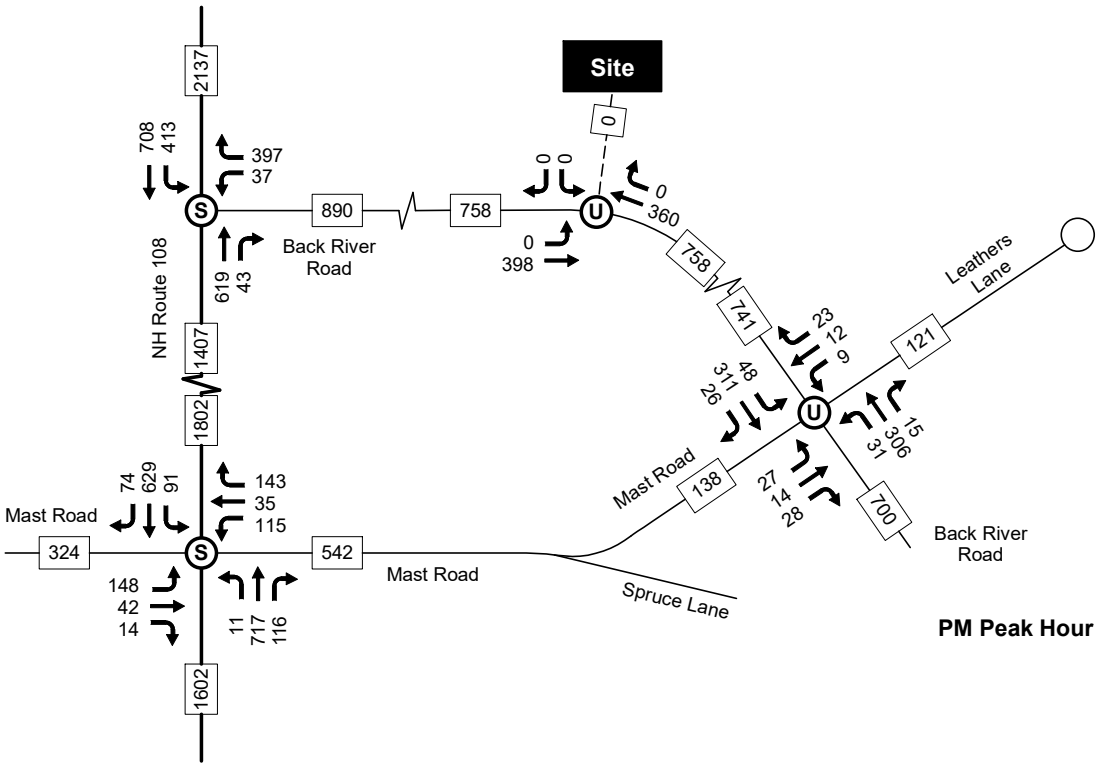


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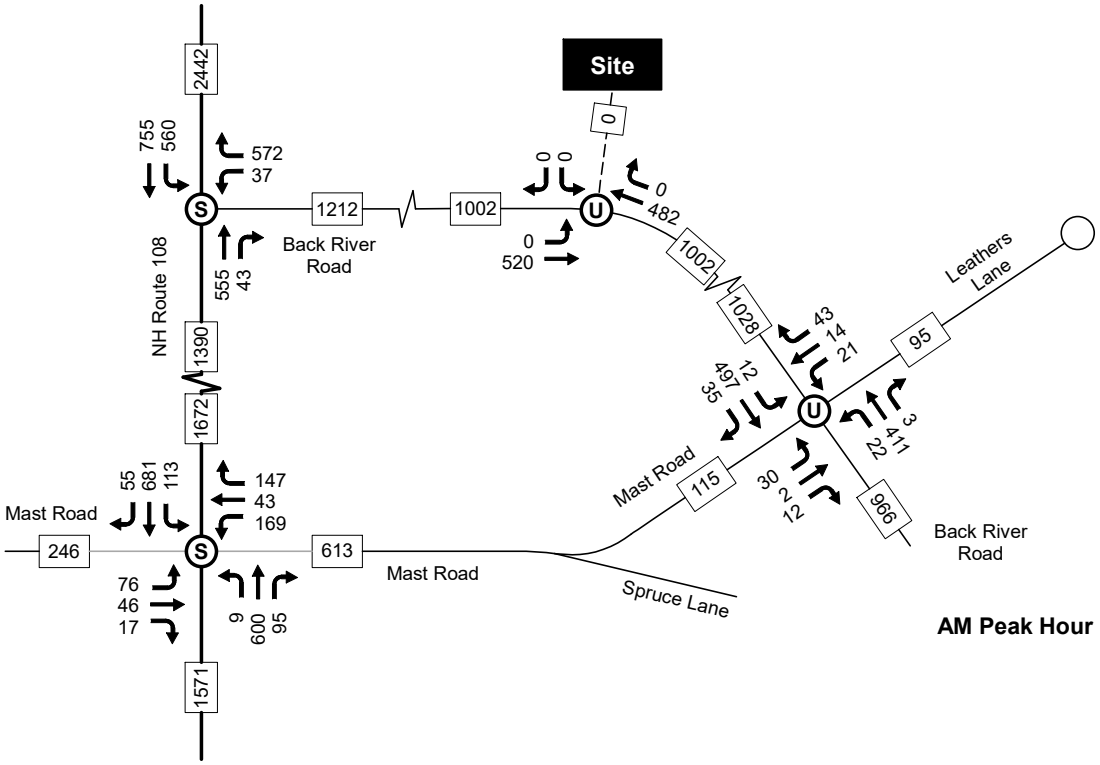
Figure 3

2022 No-Build Traffic Volumes

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire



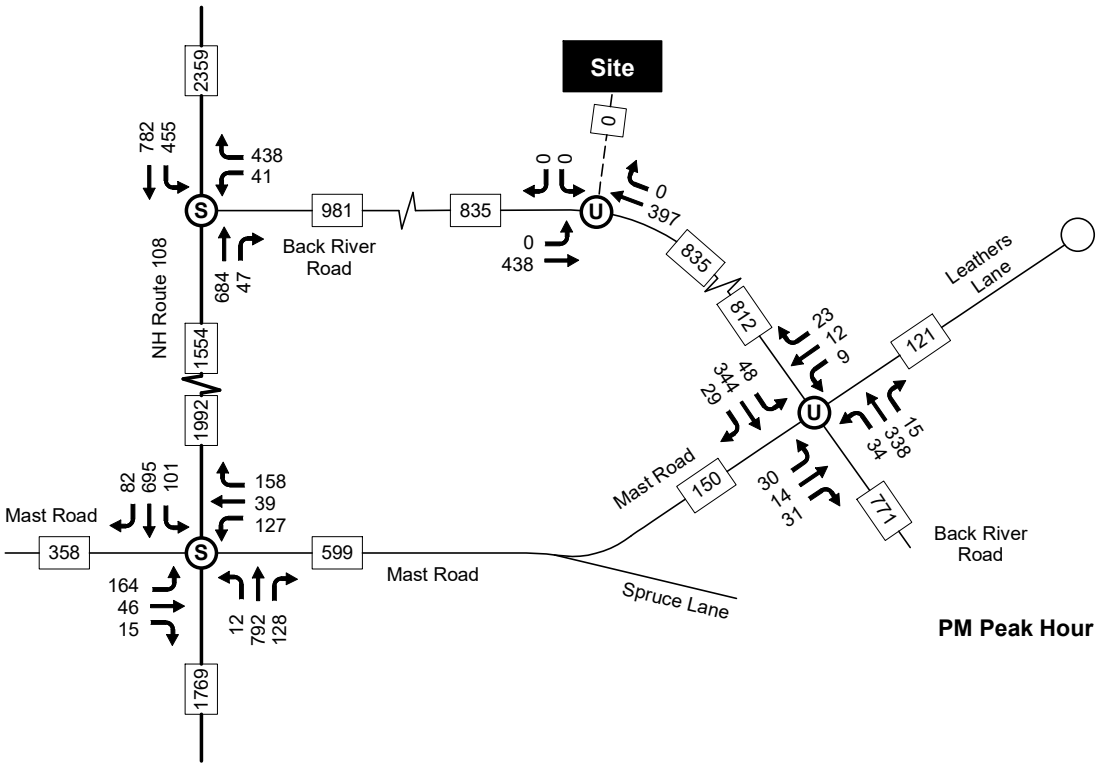


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Figure 4

2032 No-Build Traffic Volumes

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire

SITE GENERATED TRAFFIC

To estimate the quantity of vehicle-trips that will be produced by the proposed affordable housing development Pernaw & Company, Inc. considered the standardized trip-generation rates and equations published by the Institute of Transportation Engineers (ITE)[1]. To account for the unique size of each dwelling unit (384 sf), the number of residents was utilized rather than the number of dwelling units. In this case, some units will be occupied by one person; others by two persons. Utilizing a ratio of 1.5 persons per unit results in 66 residents.

According to ITE Land Use Code 210 (Single-Family Housing) trip rates per resident, the overall development is expected to generate approximately 14 vehicle-trips during the weekday AM peak hour and 27 vehicle-trips during the weekday PM peak hour, on an average weekday basis. The following table summarizes the anticipated trip-generating characteristics of the proposed affordable housing development based on the ITE "trip rate" and "trip equation" methods. The higher of the two estimates was utilized for traffic projections and analysis purposes.

Table 1 — Trip Generation Summary

	Estimate A ITE Trip Rate Method [1]	Estimate B ITE Trip Equation Method [1]
Weekday Total (24 hours)		
Entering	88 veh	116 veh
Exiting	88 veh	116 veh
Total	176 trips	232 trips
Weekday AM Peak Hour		
Entering	4 veh	4 veh
Exiting	10 veh	10 veh
Total	14 trips	14 trips
Weekday PM Peak Hour		
Entering	12 veh	18 veh
Exiting	6 veh	9 veh
Total	18 trips	27 trips

[1] ITE Land Use Code 210 - Single-Family Detached Housing - 66 Residents (44 Units X 1.5 = 66 Residents)

All vehicle-trips associated with the proposed residential development constitute "primary" trips, or new trips to the area. Appendix F contains the trip generation computations for the proposed affordable housing development, along with a diagram that summarizes the distribution of the primary trips at the various roadway segments within the study area.

[1] Institute of Transportation Engineers, *Trip Generation Manual,* tenth edition (Washington, D.C., 2017).

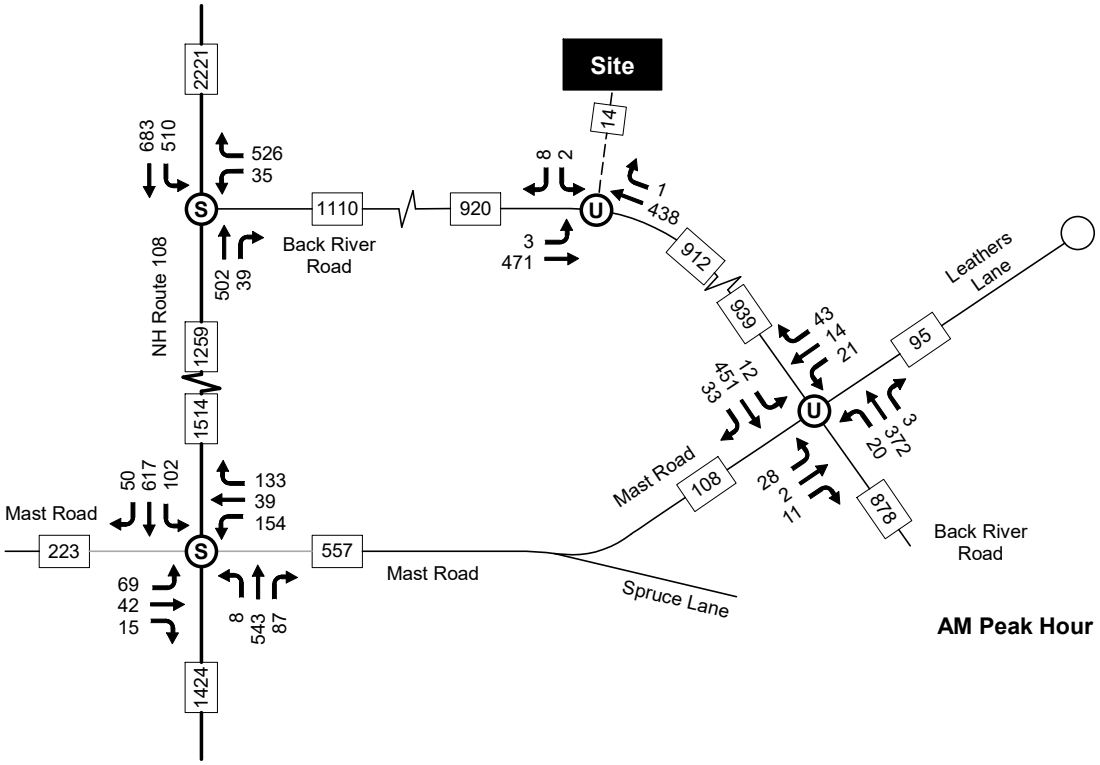
BUILD PROJECTIONS

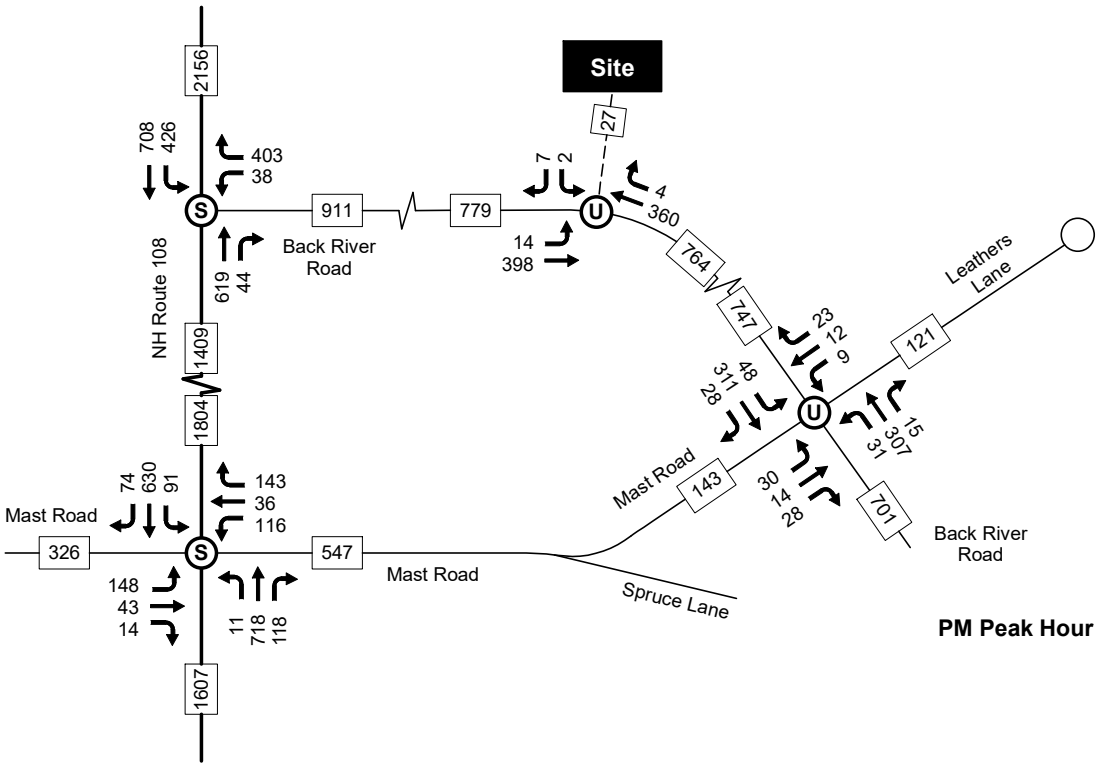
The Build traffic projections with the proposed affordable housing development fully occupied are summarized on Figures 5 and 6. These projections are based on the No-Build traffic volumes, the higher of the two trip generation estimates in Table 1, and the expectation that the primary trips will be distributed in the following manner:

Trip Distribution Patterns

Gateway	Travel Routes	Percentage
A	To / From points north on NH108	72%
B	To / From points south via Back River Road	5%
C	To / From points south via NH108	18%
D	To / From points west via Mast Road	5%
		100%

These travel patterns were based on analysis of the "journey to work" data from the latest census, the traffic patterns observed at the nearby Back River Road/Wingate Lane intersection, and our familiarity of the study area.





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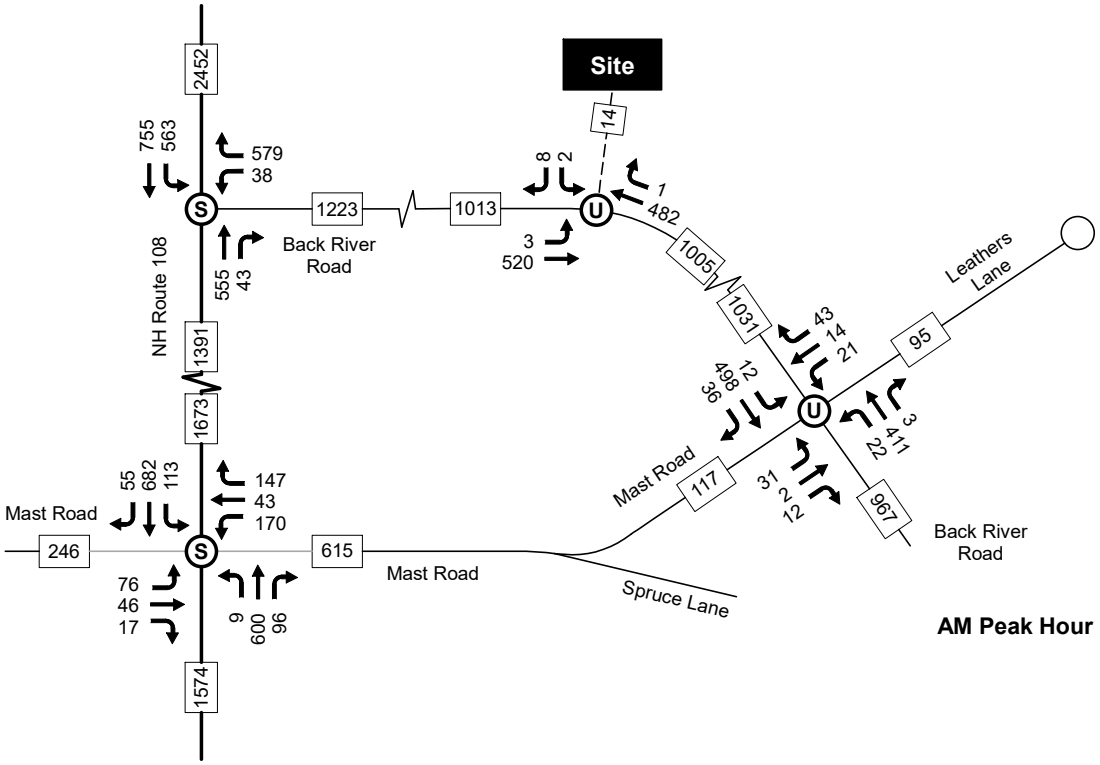
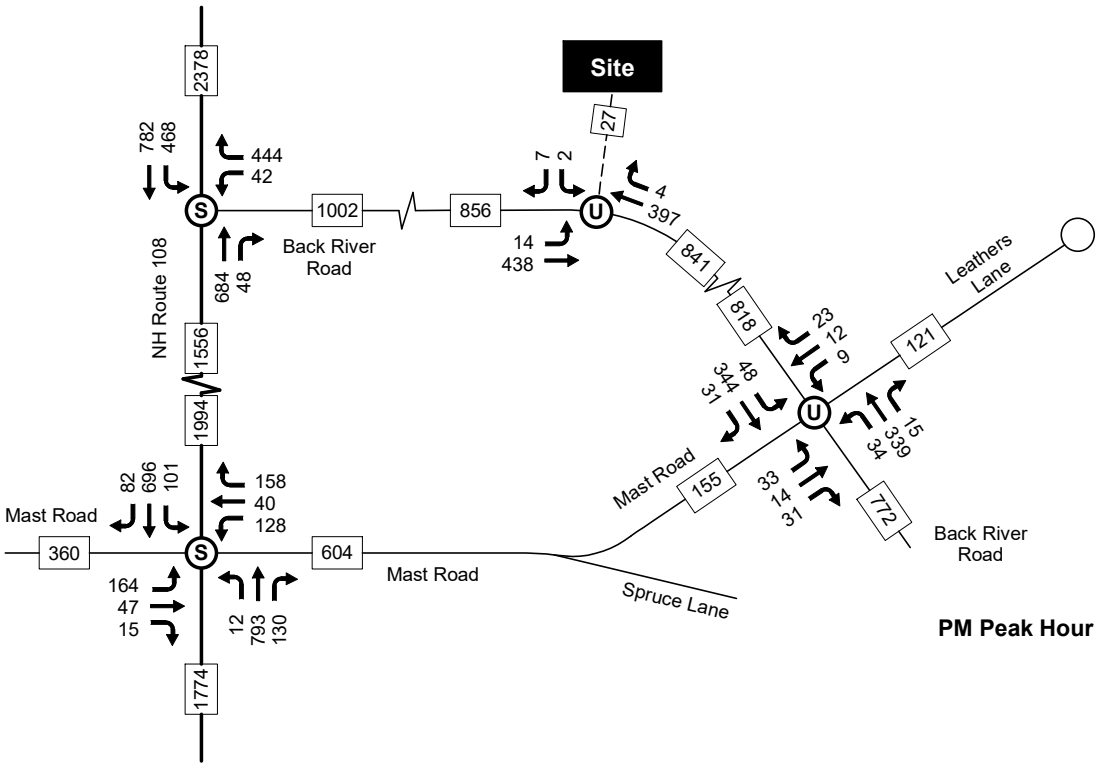
2037A

Figure 5

2022 Build Traffic Volumes

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire





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2037A

Figure 6

2032 Build Traffic Volumes

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire

IMPACT SUMMARY

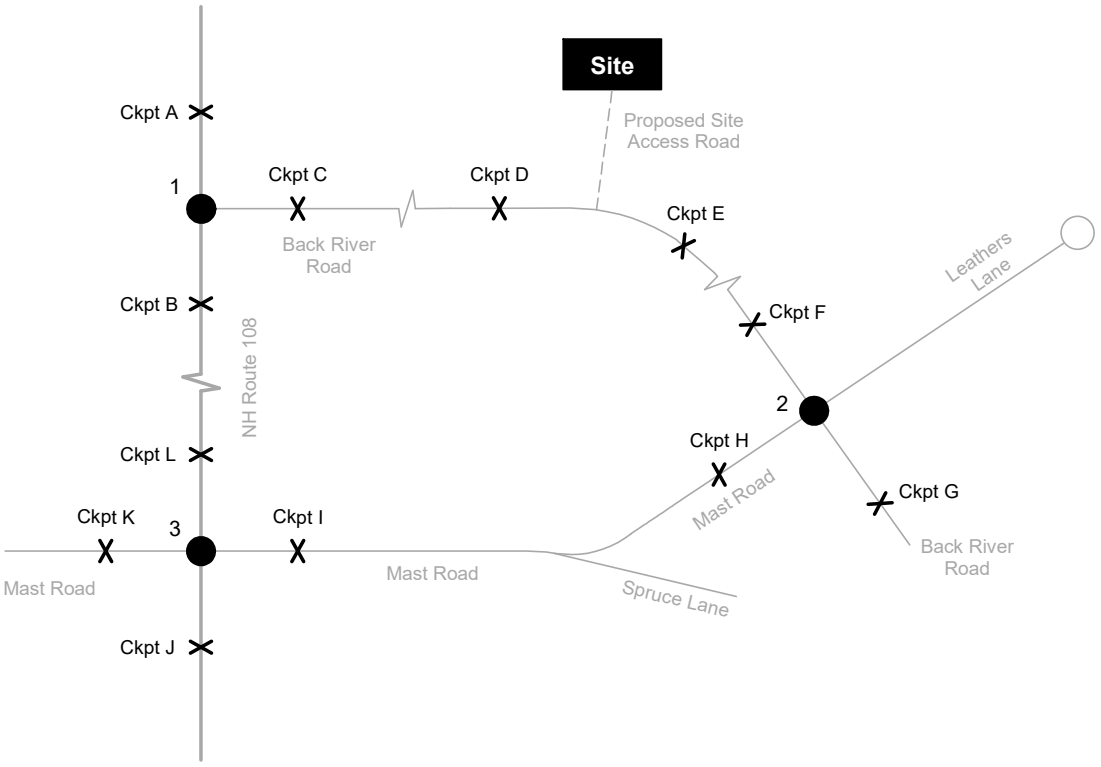
TRAFFIC VOLUME INCREASES

The net impact that the proposed residential development will have on area roadway and intersection traffic volumes can be estimated by comparing the No-Build traffic projections with the Build projections. A comparison for the two peak hour cases is summarized on Figure 7.

In terms of roadway segments, this analysis shows that the greatest impact will occur during the PM peak hour period on the section of Back River Road between NH108 and the subject site. The traffic volume on this roadway segment is projected to increase +2% (+21 vehicles) during the worst-case PM peak hour period. The increase on Back River Road south of the site is projected to increase by +1% (+6 vehicles) during the PM peak hour. Similarly, the traffic volume on NH108 during the PM peak hour is expected to increase by +1% north of Back River Road, and less than 1% south of Mast Road.

In terms of intersection volumes (total vehicles entering) the NH108/Back River Road intersection is expected to accommodate approximately +21 additional vehicles during the PM peak hour period, or by +1%. This translates into approximately one additional vehicle every three minutes on average, during this hour. The NH108/Mast Road intersection will accommodate increases of less than 1%. The net increases during the AM peak hour will be lower than during the PM peak hour.

Oftentimes, random traffic flow from one day to the next accounts for “impacts” that are much greater than will occur due to the 44 proposed cottages. This is evident from both the automatic traffic recorder data in Appendix B and a comparison between the volumes found on Figure 2A and Figure 2B (consecutive count days).



AM Peak Hour					PM Peak Hour				
Location	2022 No-Build	2022 Build	Change	% Change	Location	2022 No-Build	2022 Build	Change	% Change
Intersection 1	2284	2295	+11 veh	<1%	Intersection 1	2217	2238	+21 veh	1%
Intersection 2	1007	1010	+3 veh	<1%	Intersection 2	850	856	+6 veh	1%
Intersection 3	1856	1859	+3 veh	<1%	Intersection 3	2135	2142	+7 veh	<1%
Checkpoint A	2211	2221	+10 veh	<1%	Checkpoint A	2137	2156	+19 veh	1%
Checkpoint B	1258	1259	+1 veh	<1%	Checkpoint B	1407	1409	+2 veh	<1%
Checkpoint C	1099	1110	+11 veh	1%	Checkpoint C	890	911	+21 veh	2%
Checkpoint D	909	920	+11 veh	1%	Checkpoint D	758	779	+21 veh	3%
Checkpoint E	909	912	+3 veh	<1%	Checkpoint E	758	764	+6 veh	1%
Checkpoint F	936	939	+3 veh	<1%	Checkpoint F	741	747	+6 veh	1%
Checkpoint G	877	878	+1 veh	<1%	Checkpoint G	700	701	+1 veh	<1%
Checkpoint H	106	108	+2 veh	2%	Checkpoint H	138	143	+5 veh	4%
Checkpoint I	555	557	+2 veh	<1%	Checkpoint I	542	547	+5 veh	1%
Checkpoint J	1421	1424	+3 veh	<1%	Checkpoint J	1602	1607	+5 veh	<1%
Checkpoint K	223	223	0 veh	<1%	Checkpoint K	324	326	+2 veh	1%
Checkpoint L	1513	1514	+1 veh	<1%	Checkpoint L	1802	1804	+2 veh	<1%

NORTH

2037A

Figure 7

2022 Impact Summary

Traffic Evaluation, Proposed Affordable Housing Development, Dover, New Hampshire

TRAFFIC OPERATIONS AND SAFETY

INTERSECTION CAPACITY – UNSIGNALIZED INTERSECTIONS

The short-range (2022) and long-range (2032) traffic projections form the basis for assessing traffic operations at the Back River Road/Proposed Site Access Road intersection from a capacity and delay standpoint. This intersection was analyzed according to the methodologies of the *Highway Capacity Manual 2010*[2] as replicated by the latest edition of the *Synchro Signal Timing Software (Version 10),* which is capable of analyzing unsignalized intersections as well.

Capacity and Level of Service (LOS) calculations pertaining to unsignalized intersections address the quality of service for those vehicles turning into and out of the intersecting side street or driveway. The availability of adequate gaps in the traffic stream on the major street (Back River Road) actually controls the potential capacity for vehicle movements to and from the minor approach (Proposed Site Access Road). Levels of Service are simply letter grades (A-F) which categorize the vehicle delays associated with specific turning maneuvers. The following table describes the criteria used in this analysis.

Table 2 – Level-of-Service Criteria for Unsignalized Intersections

Control Delay (seconds/vehicle)	Level of Service by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	v/c > 1.0
0 - 10	A	F
> 10 - 15	B	F
> 15 - 25	C	F
> 25 - 35	D	F
> 35 - 50	E	F
> 50	F	F

Source: Transportation Research Board, Highway Capacity Manual 2010.

Back River Road/Proposed Site Access Road – The analysis of this intersection is summarized on Table 3 and indicates that the departure movement from the subject site will operate at LOS C during the peak hour periods in 2032 with the subject site fully occupied. The left-turn arrival movement from Back River Road into the access road will operate at LOS A during all hours of the day through the horizon year and beyond with all dwelling units fully occupied. These are the highest or best levels attainable, and mean that vehicle delays and queuing will be minimal. In all cases, this intersection will operate well below capacity through 2032 and beyond with the subject site fully occupied. Traffic congestion will not result. Appendix G contains the computations pertaining to the unsignalized intersection capacity and Level of Service analyses.

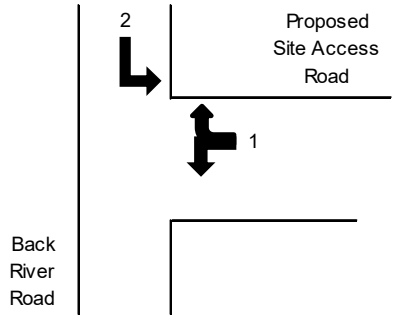
[2] Transportation Research Board, *Highway Capacity Manual* (Washington, D.C., 2010).

Table 3

STOP-Controlled Intersection Capacity Analysis
Back River Road / Proposed Site Access Road

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	Delay [1]	V/C [2]	LOS [3]	Queue [4]	Delay [1]	V/C [2]	LOS [3]	Queue [4]
1. Proposed Site Driveway - WB Departures								
2022 Build	14.1	0.03	B	<1	12.6	0.02	B	<1
2032 Build	15.2	0.03	C	<1	13.3	0.02	B	<1
2. Back River Road - SB LT-Turn Arrivals								
2022 Build	8.5	0.00	A	<1	8.2	0.02	A	<1
2032 Build	8.7	0.00	A	<1	8.4	0.02	A	<1

[1] HCM Control Delay (seconds per vehicle), [2] HCM Volume to Capacity Ratio, [3] HCM Level of Service, [4] HCM 95th Percentile Queue (vehicles)



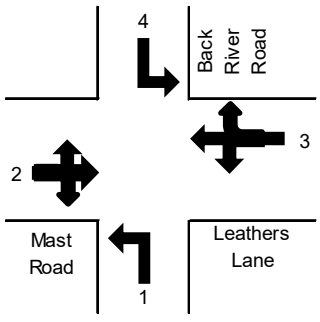
Back River Road/Mast Road-Leathers Lane – Table 4 summarizes the results of the analysis for this intersection, and shows that this intersection will continue to operate well below capacity through 2032, both with and without the proposed affordable housing development in operation. By 2032, eastbound departures from Mast Road are expected to operate at LOS E during the AM peak hour and LOS D during the PM peak hour. Site traffic is not of sufficient magnitude to significantly alter the Level of Service or queuing situation at this intersection. The capacity and Level of Service analyses are contained in Appendix G.

Table 4

STOP-Controlled Intersection Capacity Analysis
Back River Road / Mast Road / Leathers Lane

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	Delay [1]	V/C [2]	LOS [3]	Queue [4]	Delay [1]	V/C [2]	LOS [3]	Queue [4]
1. Back River Road - NB Left Turn Arrivals								
2020 Existing	8.3	0.02	A	<1	7.8	0.02	A	<1
2022 No Build	9.0	0.03	A	<1	8.1	0.03	A	<1
2022 Build	9.1	0.03	A	<1	8.1	0.03	A	<1
2032 No Build	9.3	0.03	A	<1	8.2	0.03	A	<1
2032 Build	9.3	0.03	A	<1	8.2	0.03	A	<1
2. Mast Road - EB Departures								
2020 Existing	16.3	0.08	C	<1	14.0	0.14	B	1
2022 No Build	35.5	0.28	E	1	20.7	0.28	C	1
2022 Build	36.4	0.29	E	1	21.5	0.30	C	1
2032 No Build	48.3	0.38	E	2	24.4	0.35	C	2
2032 Build	49.8	0.39	E	2	25.5	0.37	D	2
3. Leathers Lane - WB Departures								
2020 Existing	13.6	0.10	B	<1	12.8	0.06	B	<1
2022 No Build	26.7	0.40	D	2	17.0	0.16	C	1
2022 Build	26.8	0.40	D	2	17.0	0.16	C	1
2032 No Build	33.7	0.47	D	2	18.8	0.18	C	1
2032 Build	33.7	0.47	D	2	18.8	0.18	C	1
4. Back River Road - SB Left Turn Arrivals								
2020 Existing	7.9	0.01	A	<1	7.9	0.02	A	<1
2022 No Build	8.3	0.02	A	<1	8.2	0.04	A	<1
2022 Build	8.3	0.02	A	<1	8.2	0.04	A	<1
2032 No Build	8.5	0.02	A	<1	8.3	0.04	A	<1
2032 Build	8.5	0.02	A	<1	8.3	0.04	A	<1

[1] HCM Control Delay (seconds per vehicle), [2] HCM Volume to Capacity Ratio, [3] HCM Level of Service, [4] HCM 95th Percentile Queue (vehicles)



INTERSECTION CAPACITY – SIGNALIZED INTERSECTIONS

The two signalized study area intersections were analyzed utilizing the methods of the *Highway Capacity Manual*[3], as replicated by the *Synchro Traffic Signal Coordination Software (Version 10)*. A traffic flow rate, capacity, Level of Service (LOS), delay estimate, and average and 95th queue lengths (given in feet) was determined for each traffic movement, and for the overall intersection. Levels of Service are simply letter grades (A-F), which categorize the vehicle delays associated with specific turning maneuvers. Table 5 describes the criteria used in this analysis.

Table 5 — Level-of-Service Criteria for Signalized Intersections

Control Delay (seconds/vehicle)	Level of Service by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10 - 20	B	F
> 20 - 35	C	F
> 35 - 55	D	F
> 55 - 80	E	F
> 80	F	F

Source: Transportation Research Board, Highway Capacity Manual 2010.

Table 6 summarizes the results of the analysis for the NH108/Back River Road intersection, and the 2022 analyses show that the overall intersection will be capacity-deficient during the AM peak hour under the No-Build case, and will operate below capacity during the PM peak hour. Although additional approach lanes would typically address this type of deficiency, it appears that physical constraints (bridge, river crossing, and interchange proximity) does not make widening feasible. Favorably, the impact from the proposed development project is minimal: the overall volume-capacity ratio of the intersection increases by only one percentage point during the worst-case AM peak hour, and the overall Level of Service remains unchanged. During the PM peak hour, this intersection is projected to operate close to capacity (v/c = 0.99) by 2032 with the development occupied.

[3] Transportation Research Board, *Highway Capacity Manual* (Washington, D.C., 2010).

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Table 6

Signal-Controlled Intersection Capacity Analysis Summary
NH108/Back River Road

	2020 Existing				2022 No-Build				2022 Build				2032 No-Build				2032 Build			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
Weekday AM Peak Hour																				
NH108 - NB TH	0.31	5.2	A	36 (146)	0.45	5.4	A	58 (239)	0.45	5.4	A	58 (239)	0.41	3.9	A	86 (265)	0.41	3.9	A	86 (265)
NH108 - NB RT	0.02	0.9	A	0 (7)	0.03	0.9	A	0 (8)	0.03	0.9	A	0 (8)	0.03	0.5	A	0 (6)	0.03	0.5	A	0 (6)
NH108 - SB LT	0.62	8.6	A	57 (211)	1.17	106.5	F	267 (522)	1.18	109.4	F	270 (527)	1.12	86.8	F	604 (847)	1.13	89.2	F	610 (855)
NH108 - SB TH	0.48	6.2	A	68 (216)	0.71	8.8	A	124 (399)	0.71	8.8	A	124 (399)	0.65	6.2	A	192 (457)	0.65	6.2	A	192 (457)
Back River Road - NW LT-Turn	0.14	26.3	C	8 (33)	0.27	29.3	C	13 (47)	0.28	29.4	C	14 (48)	0.37	58.1	E	32 (77)	0.37	58.2	E	32 (79)
Back River Road - NW RT-Turn	0.23	26.9	C	0 (114)	0.36	30.3	C	0 (155)	0.42	30.9	C	2 (163)	1.62	379.3	F	172 (430)	1.70	412.6	F	185 (445)
Overall	**0.54**	**11.2**	**B**		**1.03**	**36.0**	**D**		**1.04**	**37.0**	**D**		**1.13**	**106.4**	**F**		**1.14**	**114.9**	**F**	
Cycle Length (Lost Time)	**90 (14.0)**				**90 (14.0)**				**90 (14.0)**				**150 (14.0)**				**150 (14.0)**			
Weekday PM Peak Hour																				
NH108 - NB TH	0.42	5.7	A	59 (226)	0.52	5.9	A	76 (308)	0.52	5.9	A	76 (308)	0.48	4.3	A	114 (345)	0.48	4.3	A	114 (345)
NH108 - NB RT	0.02	0.9	A	0 (7)	0.03	0.9	A	0 (8)	0.03	0.9	A	0 (8)	0.03	0.5	A	0 (6)	0.03	0.5	A	0 (6)
NH108 - SB LT	0.64	9.3	A	50 (283)	1.03	60.4	E	112 (456)	1.06	69.6	E	123 (472)	0.96	40.0	D	214 (722)	0.99	47.3	D	242 (750)
NH108 - SB TH	0.51	6.2	A	77 (296)	0.63	7.3	A	105 (426)	0.63	7.3	A	105 (426)	0.58	5.2	A	158 (485)	0.58	5.2	A	158 (485)
Back River Road - NW LT-Turn	0.21	27.9	C	12 (38)	0.33	29.8	C	16 (48)	0.34	29.9	C	17 (49)	0.45	59.3	E	39 (81)	0.46	59.4	E	40 (82)
Back River Road - NW RT-Turn	0.24	28.2	C	0 (45)	0.31	29.8	C	0 (63)	0.32	29.9	C	0 (63)	1.31	250.4	F	122 (224)	1.38	280.7	F	135 (237)
Overall	**0.56**	**11.3**	**B**		**0.90**	**21.6**	**C**		**0.93**	**23.5**	**C**		**0.96**	**61.7**	**E**		**0.99**	**69.6**	**E**	
Cycle Length (Lost Time)	**90 (14.0)**				**90 (14.0)**				**90 (14.0)**				**150 (14.0)**				**150 (14.0)**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in feet

Table 7 summarizes the results of the analysis for the NH108/Mast Road intersection, and the 2022 analyses show that the overall intersection will be capacity-deficient during the PM peak hour under the No-Build case, and will operate below capacity during the AM peak hour. This type of deficiency could be addressed by widening the intersection to provide additional approach lanes. Favorably, the impact from the proposed development project is minimal: there is no change to the overall volume-capacity ratio of the intersection or the Level of Service in the opening year (2022). By the horizon year (2032) the volume-capacity ratio increases by only one percentage point during the peak hour periods, and the overall Level of Service remains unchanged.

The capacity and Level of Service analyses are contained in Appendix H.

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Table 7

Signal-Controlled Intersection Capacity Analysis Summary
NH108/Mast Road

	2020 Existing				2022 No-Build				2022 Build				2032 No-Build				2032 Build			
	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]	V/C [1]	Delay [2]	LOS [3]	Queue Avg/95th [4]
Weekday AM Peak Hour																				
Mast Road - EB LT	0.33	18.1	B	14 (46)	0.72	37.0	D	24 (87)	0.72	37.0	D	24 (87)	0.78	52.2	D	45 (114)	0.78	52.2	D	45 (114)
Mast Road - EB TH&RT	0.14	16.7	B	8 (32)	0.23	18.9	B	13 (43)	0.23	18.9	B	13 (43)	0.23	25.1	C	26 (60)	0.23	25.1	C	26 (60)
Mast Road - WB LT	0.55	22.5	C	26 (123)	0.99	87.8	F	46 (199)	1.00	89.8	F	46 (200)	0.89	62.0	E	82 (251)	0.89	63.1	E	82 (253)
Mast Road - WB TH&RT	0.18	18.6	B	6 (53)	0.30	21.1	C	10 (81)	0.30	21.1	C	10 (81)	0.30	27.3	C	21 (92)	0.30	27.3	C	21 (92)
NH108 - NB LT&TH	0.55	11.9	B	75 (279)	0.83	20.7	C	137 (493)	0.83	20.7	C	137 (493)	0.78	20.4	C	216 (590)	0.78	20.4	C	216 (590)
NH108 - NB RT	0.04	9.9	A	0 (0)	0.06	10.3	B	0 (1)	0.06	10.3	B	0 (2)	0.07	11.3	B	0 (20)	0.07	11.3	B	0 (21)
NH108 - SB LT	0.17	5.4	A	5 (38)	0.36	8.0	A	8 (54)	0.36	8.0	A	8 (54)	0.42	11.4	B	16 (65)	0.42	11.4	B	16 (65)
NH108 - SB TH&RT	0.49	6.3	A	46 (232)	0.73	9.5	A	89 (489)	0.73	9.5	A	89 (490)	0.77	13.0	B	192 (646)	0.77	13.1	B	193 (647)
Overall	**0.52**	**11.3**	**B**		**0.80**	**21.6**	**C**		**0.80**	**21.8**	**C**		**0.80**	**22.4**	**C**		**0.81**	**22.5**	**C**	
Cycle Length (Lost Time)	**65 (14.0)**				**65 (14.0)**				**65 (14.0)**				**90 (14.0)**				**90 (14.0)**			
Weekday PM Peak Hour																				
Mast Road - EB LT	1.04	98.8	F	50 (132)	1.64	334.2	F	95 (185)	1.65	339.1	F	95 (185)	1.14	148.5	F	259 (283)	1.15	152.1	F	261 (285)
Mast Road - EB TH&RT	0.18	17.9	B	11 (33)	0.25	17.6	B	16 (41)	0.25	17.6	B	16 (42)	0.18	33.9	C	54 (76)	0.18	33.9	C	55 (76)
Mast Road - WB LT	0.60	25.3	C	28 (104)	0.80	41.0	D	38 (143)	0.82	44.0	D	39 (146)	0.47	39.5	D	112 (182)	0.47	39.6	D	113 (184)
Mast Road - WB TH&RT	0.24	19.8	B	8 (47)	0.30	19.6	B	11 (54)	0.31	19.6	B	11 (54)	0.33	37.2	D	78 (136)	0.34	37.4	D	83 (142)
NH108 - NB LT&TH	0.85	21.4	C	143 (521)	1.11	81.2	F	261 (692)	1.11	81.6	F	261 (693)	1.00	61.1	E	713 (1250)	1.00	61.4	E	715 (1252)
NH108 - NB RT	0.06	9.8	A	0 (2)	0.08	10.0	A	0 (16)	0.08	10.0	A	0 (18)	0.13	18.2	B	27 (79)	0.13	18.2	B	28 (81)
NH108 - SB LT	0.24	7.6	A	5 (39)	0.30	9.5	A	6 (48)	0.30	9.5	A	6 (48)	0.73	49.7	D	36 (165)	0.73	49.8	D	36 (165)
NH108 - SB TH&RT	0.53	6.4	A	52 (301)	0.69	8.7	A	77 (497)	0.69	8.8	A	77 (498)	0.76	23.3	C	443 (895)	0.76	23.3	C	444 (897)
Overall	**0.84**	**23.4**	**C**		**1.17**	**67.8**	**E**		**1.17**	**68.5**	**E**		**1.02**	**51.4**	**D**		**1.03**	**51.8**	**D**	
Cycle Length (Lost Time)	**65 (14.0)**				**65 (14.0)**				**65 (14.0)**				**150 (14.0)**				**150 (14.0)**			

1) Volume-to-capacity ratio, 2) Delay in vehicles per seconds, 3) Level of Service, 4) Queue length in feet

AUXILIARY TURN LANE WARRANTS ANALYSIS

Left-Turn Treatment – The type of treatment needed to accommodate a left-turning vehicle from any street or highway to an intersecting side street can range from no treatment, where turning volumes are low; to the provision of a bypass lane for through traffic to travel around left-turning vehicles; to the addition of a formal center turn lane used exclusively by left-turning vehicles for deceleration and storage while waiting to complete their maneuvers.

Analysis of the Proposed Site Access Road intersection on Back River Road using NCHRP 457 guidelines is summarized on Table 8 and it indicates that left-turn treatment is not warranted on Back River Road to accommodate left-turns into the subject site. This means that the existing eastbound travel lane on Back River Road will function safely and adequately as a shared left-through lane. This finding is due in part to the low number of turning vehicles and the moderate traffic volumes found on Back River Road during the peak hour periods.

Table 8 — **Left-Turn Lane Warrants Analysis**
Back River Road / Proposed Site Access Road

	2032 AM Build Volumes	2032 PM Build Volumes
Peak Hour Inputs		
Left-Turn Volume (EB)	3	14
Advancing Volume (EB)	523	452
Opposing Volume (WB)	483	401
Percent Lefts	0.6%	3.1%
Speed (mph)	30	30
Limiting Advancing Volume (veh/h)	1502	711
Conclusion		
Left-Turn Treatment Warranted	**NO**	**NO**

Right-Turn Treatment – At unsignalized intersections, the type of treatment needed to accommodate right-turning vehicles from any street or highway to any intersecting side street can range from radius only, where turning volumes are low; to the provision of a short 10:1 taper; to the addition of an exclusive right-turn lane, where turning volumes and through traffic volumes are significant.

Analysis of the Proposed Site Access Road intersection on Back River Road using NCHRP 457 guidelines is summarized on Table 9 and it confirms that right-turn treatment on Back River Road is not warranted at this intersection. This means that the existing westbound travel lane on Back River Road will function safely and adequately as a shared through-right lane.

Table 9	Right-Turn Lane Warrants Analysis Back River Road / Proposed Site Access Road	
	2032 AM Build Volumes	2032 PM Build Volumes
Peak Hour Inputs		
Right-Turn Volume (WB)	1	4
Total Approach Volume (WB)	483	401
Speed (mph)	30	30
Limiting Right-Turn Volume (veh/h)	652	1597
Conclusion		
Add Right-Turn Bay	**NO**	**NO**

Minor-Road Approach Analysis – The type of treatment needed to accommodate exiting vehicles from the minor-road approach at a stop-controlled intersection can range from a single lane (shared left-right lane) in low-volume conditions, to two exit lanes (exclusive left-turn lane and exclusive right-turn lane) where turning volumes and through traffic volumes are significant, to multiple exit lanes in extreme cases.

Analysis of the Proposed Site Access Road intersection using NCHRP 457 guidelines confirmed that one exit lane on the access road approach to Back River Road is sufficient for the anticipated traffic volumes. The results of these analyses are summarized on Table 10.

Table 10	Minor-Road Approach Geometry Back River Road / Proposed Site Access Road	
	2032 AM Build Volumes	2032 PM Build Volumes
Peak Hour Inputs		
Major-Road Volume (WB-EB)	1006	853
% Right-Turns on Minor (SB)	80	78
Minor-Road Approach Volume	10	9
Limiting Minor-Road Volume (veh/h)	289	325
Conclusion		
Consider TWO Approach Lanes	**NO**	**NO**

The computations pertaining to all of the auxiliary turn lane warrants analyses are contained in Appendix I.

SIGHT DISTANCE

The sight distance looking left and right from the new minor approach to Back River Road is an important safety consideration. Appendix J contains photographs showing the view looking left and right from the Proposed Site Access Road location. The available sight distances exceed the safe stopping sight distance requirements for the posted speed limit (30 mph = 200-feet) and a reasonable "design speed" (40 mph = 305-feet). To maximize sight distances, roadside vegetation (and snow banks) should be maintained, and any signage should not restrict the line of sight looking left and right.

PARKING GENERATION

To estimate the peak parking demand that will occur at the affordable housing development site Pernaw & Company, Inc. considered the standardized parking generation rates and equations published by the Institute of Transportation Engineers (ITE)[4]. This publication contains various parking generation rates and equations using either the number of dwelling units or the number of bedrooms as the independent variable. According to Land Use Code 223 (Affordable Housing – Income Limits), the results below range from 24-44 parked vehicles (occupied parking stalls).

Peak Period Parking Demand per Dw elling Unit	
Average Rate = 0.99 X 44 units =	44 parked vehicles
Fitted Curve Equation: P = 1.13 (44) - 21.94 =	28 parked vehicles
Peak Period Parking Demand per Bedroom	
Average Rate = 0.54 X 44 bedrooms =	24 parked vehicles
Fitted Curve Equation: P = 0.47 (44) + 6.17 =	27 parked vehicles

Given the unique size of each dwelling unit (384 sf), our experience suggests that the bedroom-based estimates are the more credible estimates.

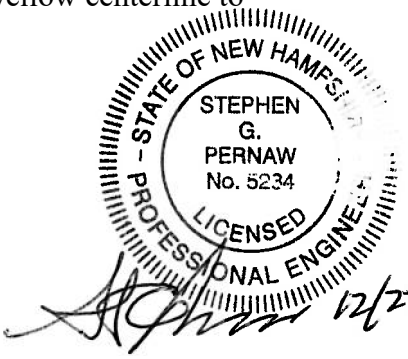
[4] Institute of Transportation Engineers, *Parking Generation Manual,* fifth edition (Washington, D.C., 2019).

STUDY FINDINGS AND RECOMMENDATIONS

Based upon the existing conditions data collected at the three existing study area intersections, the anticipated traffic increases from the proposed affordable housing development, and the analysis of future traffic levels in the study area, Pernaw & Company, Inc. concludes that:

1. Vehicular access to the affordable housing development is proposed via one two-way site access road that will intersect the east side of Back River Road approximately 250-feet south of Red Barn Drive.
2. The recent traffic count data collected revealed that the traffic flow on Back River Road passing the subject site totaled 583 vehicles (AM) and 572 vehicles (PM) during the peak hour periods. The heavier directional flow was eastbound during the AM peak hour (52%) and eastbound during the PM peak hour (52%) periods.
3. The trip generation analysis indicates that, on an average weekday basis, the overall development will generate approximately 14 vehicle-trips (4 arrivals, 10 departures) during the weekday AM peak hour; and 27 vehicle-trips (18 arrivals, 9 departures) during the weekday PM peak hour. These trip estimates take into consideration the fact that each dwelling unit is small (384-sf) and will be occupied by one or two persons. The use of carpooling has the potential to reduce these trip estimates further. By way of comparison, a conventional subdivision with 13 homes generates approximately 14 vehicle-trips during the peak hour periods.
4. The trip distribution analysis indicates that approximately 75% of the site traffic will travel to/from the northwest on Back River Road, towards NH108.
5. The comparison between the Build and No-Build traffic volumes revealed that site traffic will increase the utilization of the NH108/Back River Road signalized intersection by approximately +0.5% (AM) and +1.0% (PM) during the peak hour periods. This corresponds to increases of +11 vehicles during the morning peak hour, and +21 vehicles during the PM peak hour.
6. Analysis of the two study area signalized intersections on NH108 confirms that these intersections will be capacity-deficient during peak periods in 2022 with or without the proposed development. Favorably, the impacts from the proposed development are minimal at these locations; with no change in the overall intersection Level of Service.
7. Analysis of the proposed Site Access Road intersection on Back River Road confirmed that auxiliary turn lanes are not needed to safely accommodate the anticipated traffic levels. This means that the existing travel lanes on Back River Road will function adequately as a shared left-through lane and shared through-right lane at the subject intersection. Similarly, one exit lane on the Site Access Road is sufficient for the anticipated number of departures from the site.
8. Ample sight distance exists looking left and right from the Proposed Site Access Road approach to Back River Road. Proper maintenance of roadside vegetation and winter snow banks is advisable.

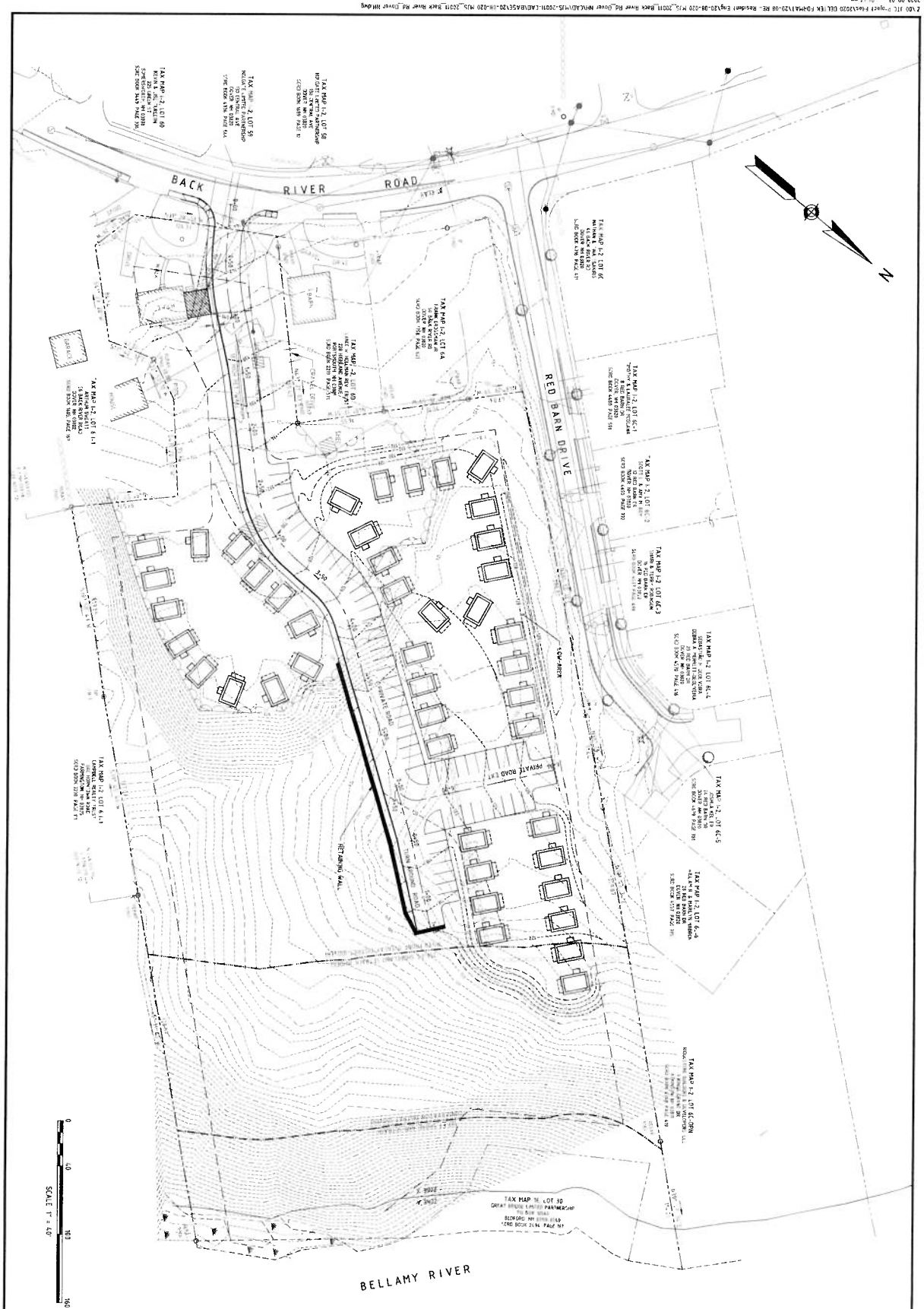
The appropriate forms of traffic control at the Proposed Site Access Road approach to Back River Road includes the installation of: 1) a stop sign (MUTCD #R1-1) on the minor approach, 2) an 18-inch white stop line, and 3) a short section of four-inch double-yellow centerline to separate ingress and egress vehicles.



APPENDIX

Appendix A	Site Plan
Appendix B	Automatic Traffic Recorder Counts
Appendix C	Intersection Turning Movement Counts
Appendix D	Adjustment Factors
Appendix E	Other Development Traffic Volumes
Appendix F	Site Generated Traffic Volumes / Trip Distribution
Appendix G	Capacity and Level of Service Calculations – Unsignalized
Appendix H	Capacity and Level of Service Calculations - Signalized
Appendix I	Auxiliary Turn Lane Warrants Analysis
Appendix J	Sight Distance Photographs

Appendix A **Site Plan**



C-102

JOB 20-011

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
1 Railroad St., P.O. Box 950
Newmarket NH 03857
Phone: (603) 659-4951 Fax: (603) 659-4627
E-mail: mjs@mjs-engineering.com

GRADING PLAN

prepared for
JOHN RANDOLPH
TAX MAP 1, LOT 6
54 BACK RIVER ROAD, DOVER, NH

DATE ISSUED	6/12/20
SCALE	1"=40'
DESIGNED BY	XXX
DRAWN BY	XXX
APPROVED BY	MJS
DWG FILE	20-08-020 MJS_2001 Back River Rd_Dover NH

SEAL

NO	REVISIONS	DATE	INT
0	XXXXXX	7/6/20	XXX

Z:\00 JTC Projects\Files\2020 CLIENT FOLDER\20-08 RE- Resident Eng\20-08-020 MJS_2001 Back River Rd_Dover NH\CADD\MJS-2001-LAYOUT-20-08-020 MJS_2001 Back River Rd_Dover NH.dwg
2020 09 03 04:47 pm

Appendix B Automatic Traffic Recorder Counts

New Hampshire DOT Department of Transportation

MS2

Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82125077	**Type:**	SPOT
Located On:	Central Ave	:	
Direction:	2-WAY		
Community:	DOVER	**Period:**	Mon 9/9/2019 - Sun 9/15/2019
AADT:	18047		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM			63	65	103	177	120	106	0.6%
1:00 AM			30	57	50	111	97	69	0.4%
2:00 AM			26	32	26	58	45	37	0.2%
3:00 AM			42	47	45	46	32	42	0.2%
4:00 AM			97	117	122	69	48	91	0.5%
5:00 AM			297	340	290	122	98	229	1.2%
6:00 AM			981	950	944	278	203	671	3.6%
7:00 AM			1813	1798	1792	501	367	1,254	6.6%
8:00 AM			1485	1514	1425	951	689	1,213	6.4%
9:00 AM			994	1142	1078	1068	794	1,015	5.4%
10:00 AM			1008	1030	1095	1447	1158	1,148	6.1%
11:00 AM			1173	1154	1242	1473	1261	1,261	6.7%
12:00 PM			1134	1095	1217	1428	1350	1,245	6.6%
1:00 PM			1123	1209	1239	1336	1125	1,206	6.4%
2:00 PM			1447	1343	1517	1376	1012	1,339	7.1%
3:00 PM			1593	1632	1714	1196	975	1,422	7.5%
4:00 PM			1784	1774	1895	1124	1127	1,541	8.1%
5:00 PM			1983	1907	1797	1018	1019	1,545	8.2%
6:00 PM			1202	1367	1377	868	881	1,139	6.0%
7:00 PM			1037	991	864	701	671	853	4.5%
8:00 PM			614	868	623	523	440	614	3.2%
9:00 PM			368	388	530	470	315	414	2.2%
10:00 PM			245	250	368	311	166	268	1.4%
11:00 PM			134	168	306	215	100	185	1.0%
Total	**0**	**0**	**20,673**	**21,238**	**21,659**	**16,867**	**14,093**		
24hr Total			20673	21238	21659	16867	14093	18,906	
AM Pk Hr			7:00	7:00	7:00	11:00	11:00		
AM Peak			1813	1798	1792	1473	1261	1,627	
PM Pk Hr			5:00	5:00	4:00	12:00	12:00		
PM Peak			1983	1907	1895	1428	1350	1,713	
% Pk Hr			9.59%	8.98%	8.75%	8.73%	9.58%	9.13%	

New Hampshire DOT Department of Transportation

MS2

Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82125077	**Type:**	SPOT
Located On:	Central Ave	:	
Direction:	2-WAY		
Community:	DOVER	**Period:**	Mon 9/16/2019 - Sun 9/22/2019
AADT:	18047		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM	67							67	0.3%
1:00 AM	37							37	0.2%
2:00 AM	31							31	0.2%
3:00 AM	49							49	0.2%
4:00 AM	119							119	0.6%
5:00 AM	319							319	1.6%
6:00 AM	912							912	4.5%
7:00 AM	1806							1,806	9.0%
8:00 AM	1391							1,391	6.9%
9:00 AM	1000							1,000	5.0%
10:00 AM	963							963	4.8%
11:00 AM	1063							1,063	5.3%
12:00 PM	1085							1,085	5.4%
1:00 PM	1128							1,128	5.6%
2:00 PM	1386							1,386	6.9%
3:00 PM	1579							1,579	7.9%
4:00 PM	1892							1,892	9.4%
5:00 PM	1958							1,958	9.7%
6:00 PM	1131							1,131	5.6%
7:00 PM	989							989	4.9%
8:00 PM	547							547	2.7%
9:00 PM	338							338	1.7%
10:00 PM	199							199	1.0%
11:00 PM	111							111	0.6%
Total	**20,100**	**0**	**0**	**0**	**0**	**0**	**0**		
24hr Total	20100							20,100	
AM Pk Hr	7:00								
AM Peak	1806							1,806	
PM Pk Hr	5:00								
PM Peak	1958							1,958	
% Pk Hr	9.74%							9.74%	

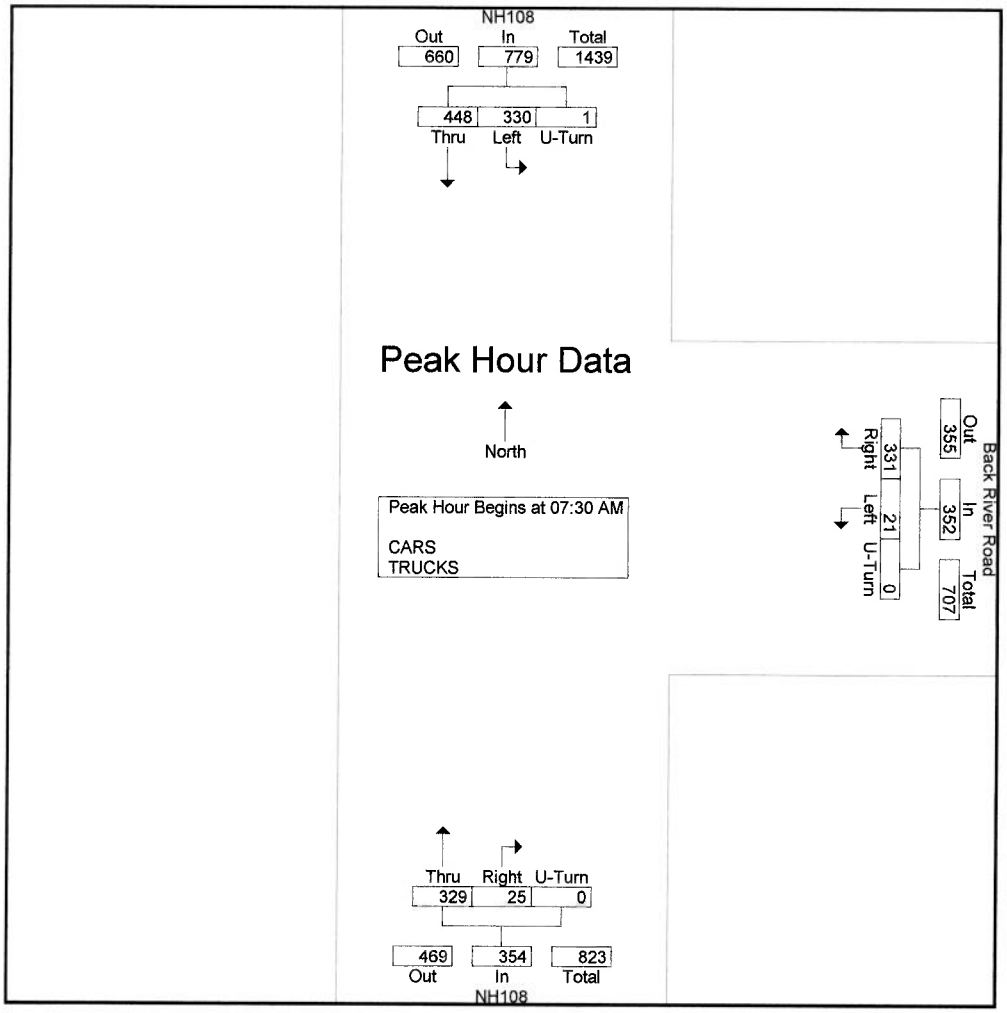
Appendix C **Intersection Turning Movement Counts**

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	122	99	0	221	78	**7**	0	85	**9**	84	0	93	399
07:45 AM	**133**	**111**	**1**	**245**	**95**	2	0	97	7	75	0	82	**424**
08:00 AM	93	68	0	161	92	7	0	**99**	5	**89**	0	**94**	354
08:15 AM	100	52	0	152	66	5	0	71	4	81	0	85	308
Total Volume	448	330	1	779	331	21	0	352	25	329	0	354	1485
% App. Total	57.5	42.4	0.1		94	6	0		7.1	92.9	0		
PHF	.842	.743	.250	.795	.871	.750	.000	.889	.694	.924	.000	.941	.876

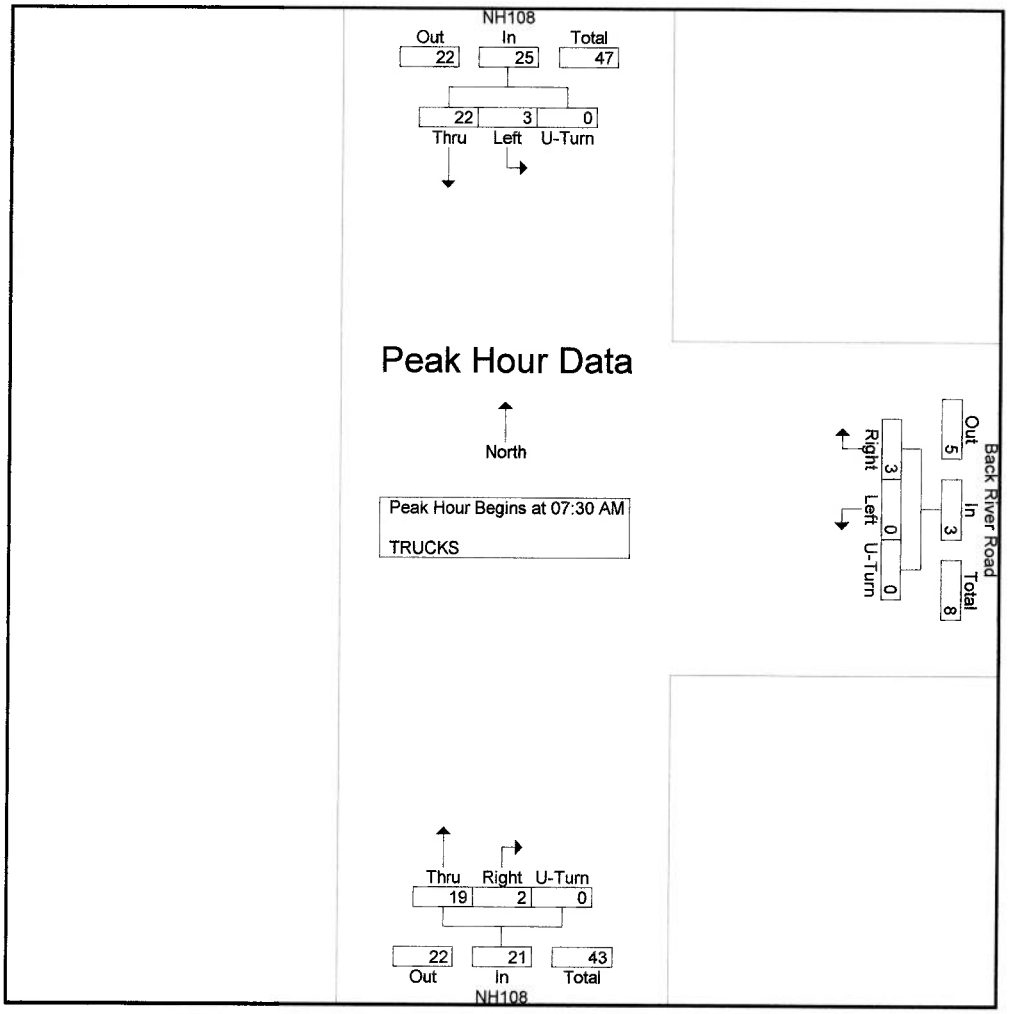


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	4	**2**	0	6	**1**	0	0	**1**	0	4	0	4	11
07:45 AM	6	0	0	6	1	0	0	1	**1**	5	0	6	13
08:00 AM	5	1	0	6	1	0	0	1	0	4	0	4	11
08:15 AM	**7**	0	0	**7**	0	0	0	0	1	**6**	0	**7**	**14**
Total Volume	22	3	0	25	3	0	0	3	2	19	0	21	49
% App. Total	88	12	0		100	0	0		9.5	90.5	0		
PHF	.786	.375	.000	.893	.750	.000	.000	.750	.500	.792	.000	.750	.875



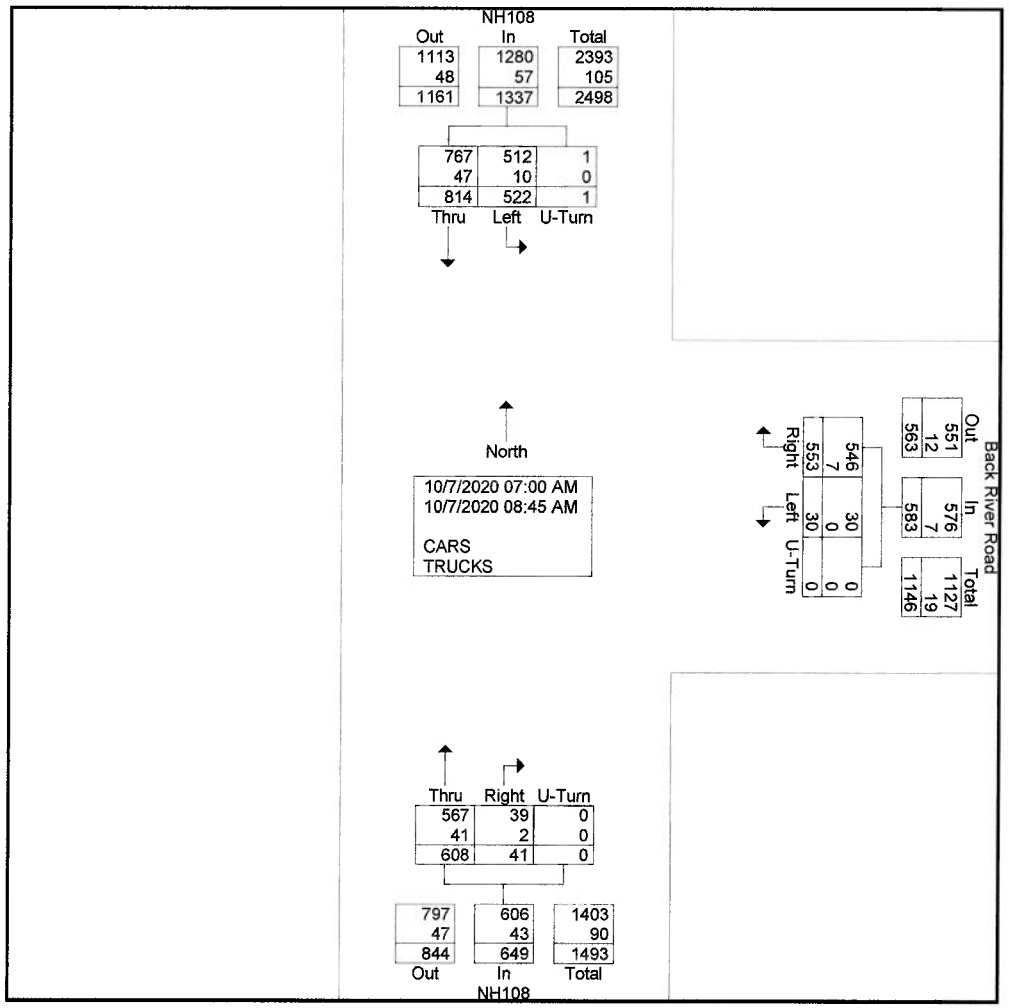
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	68	41	0	109	51	3	0	54	1	53	0	54	217
07:15 AM	90	67	0	157	70	3	0	73	2	63	0	65	295
07:30 AM	122	99	0	221	78	7	0	85	9	84	0	93	399
07:45 AM	133	111	1	245	95	2	0	97	7	75	0	82	424
Total	413	318	1	732	294	15	0	309	19	275	0	294	1335
08:00 AM	93	68	0	161	92	7	0	99	5	89	0	94	354
08:15 AM	100	52	0	152	66	5	0	71	4	81	0	85	308
08:30 AM	101	46	0	147	48	1	0	49	8	87	0	95	291
08:45 AM	107	38	0	145	53	2	0	55	5	76	0	81	281
Total	401	204	0	605	259	15	0	274	22	333	0	355	1234
Grand Total	814	522	1	1337	553	30	0	583	41	608	0	649	2569
Apprch %	60.9	39	0.1		94.9	5.1	0		6.3	93.7	0		
Total %	31.7	20.3	0	52	21.5	1.2	0	22.7	1.6	23.7	0	25.3	
CARS	767	512	1	1280	546	30	0	576	39	567	0	606	2462
% CARS	94.2	98.1	100	95.7	98.7	100	0	98.8	95.1	93.3	0	93.4	95.8
TRUCKS	47	10	0	57	7	0	0	7	2	41	0	43	107
% TRUCKS	5.8	1.9	0	4.3	1.3	0	0	1.2	4.9	6.7	0	6.6	4.2



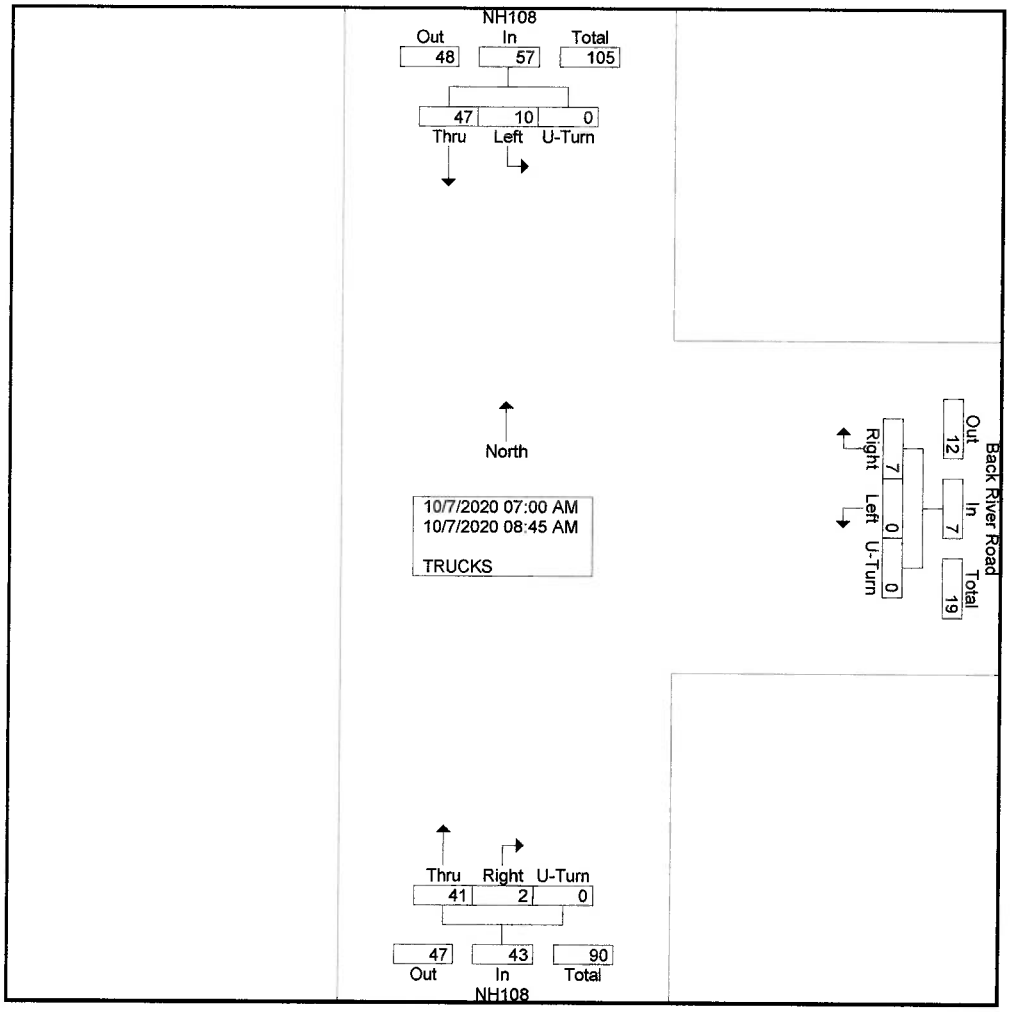
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	1	2	0	3	1	0	0	1	0	11	0	11	15
07:15 AM	4	2	0	6	0	0	0	0	0	2	0	2	8
07:30 AM	4	2	0	6	1	0	0	1	0	4	0	4	11
07:45 AM	6	0	0	6	1	0	0	1	1	5	0	6	13
Total	15	6	0	21	3	0	0	3	1	22	0	23	47
08:00 AM	5	1	0	6	1	0	0	1	0	4	0	4	11
08:15 AM	7	0	0	7	0	0	0	0	1	6	0	7	14
08:30 AM	12	3	0	15	1	0	0	1	0	4	0	4	20
08:45 AM	8	0	0	8	2	0	0	2	0	5	0	5	15
Total	32	4	0	36	4	0	0	4	1	19	0	20	60
Grand Total	47	10	0	57	7	0	0	7	2	41	0	43	107
Apprch %	82.5	17.5	0		100	0	0		4.7	95.3	0		
Total %	43.9	9.3	0	53.3	6.5	0	0	6.5	1.9	38.3	0	40.2	



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Weather: Clear
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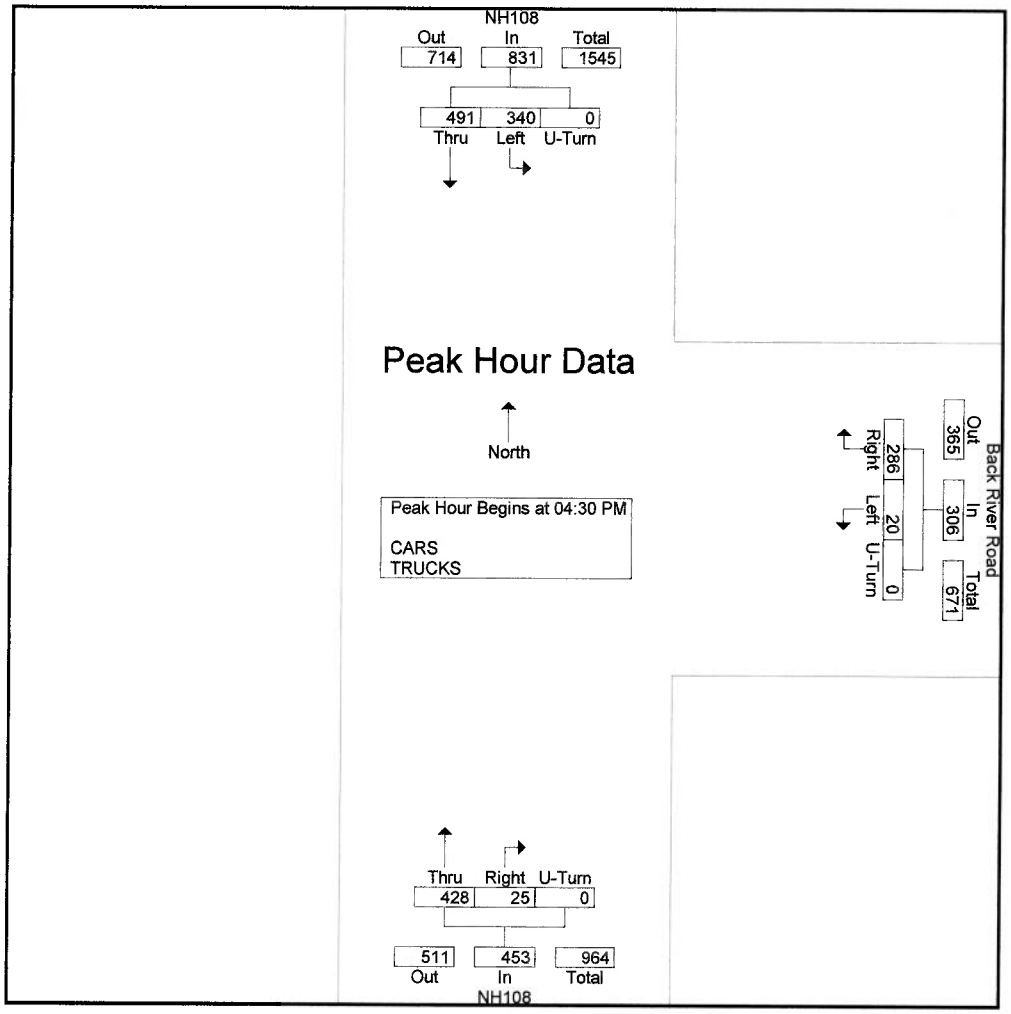
File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 3

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	**136**	85	0	**221**	75	4	0	79	6	107	0	113	**413**
04:45 PM	125	**95**	0	220	59	7	0	66	3	**112**	0	115	401
05:00 PM	119	75	0	194	**77**	0	0	77	5	102	0	107	378
05:15 PM	111	85	0	196	75	**9**	0	**84**	**11**	107	0	**118**	398
Total Volume	491	340	0	831	286	20	0	306	25	428	0	453	1590
% App. Total	59.1	40.9	0		93.5	6.5	0		5.5	94.5	0		
PHF	.903	.895	.000	.940	.929	.556	.000	.911	.568	.955	.000	.960	.962



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Site Code : 2037A
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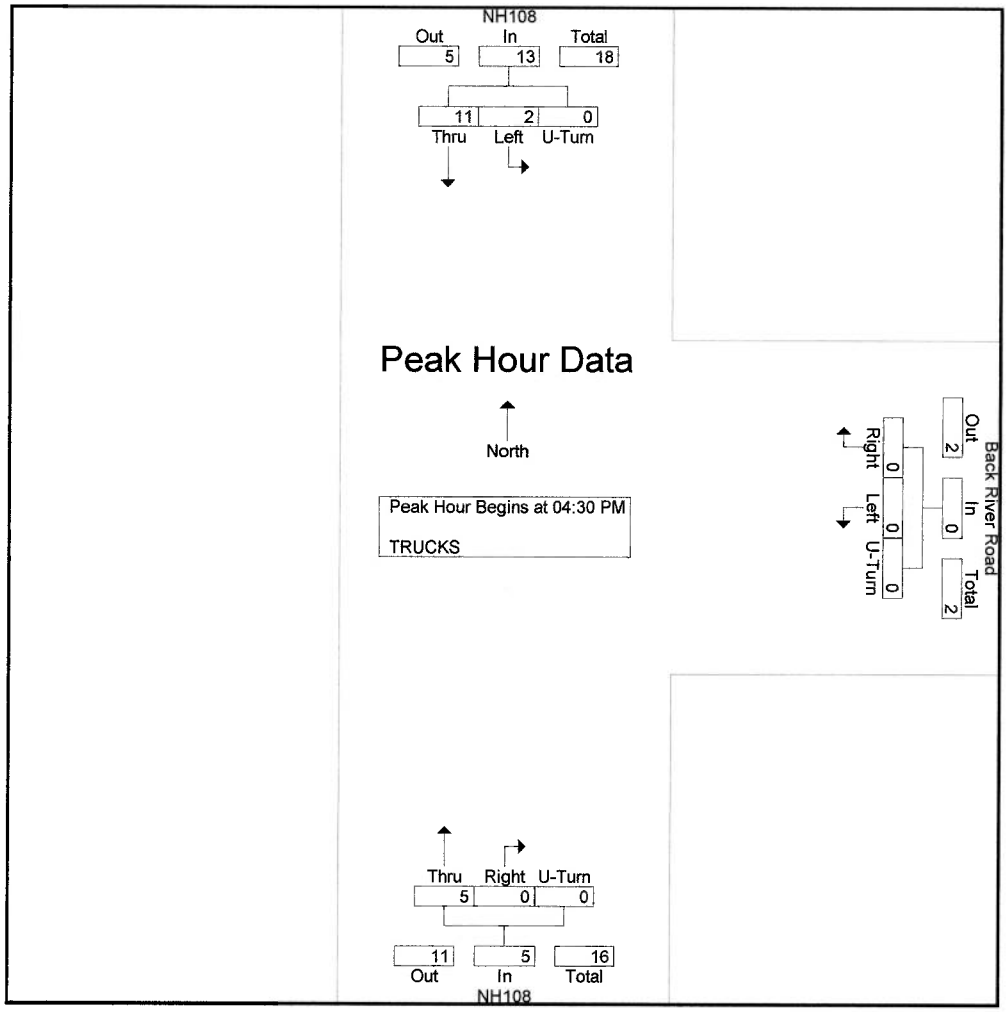
Page No : 2

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	2	**2**	0	4	0	0	0	0	0	**3**	0	**3**	**7**
04:45 PM	**5**	0	0	**5**	0	0	0	0	0	1	0	1	6
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	3	0	0	3	0	0	0	0	0	1	0	1	4
Total Volume	11	2	0	13	0	0	0	0	0	5	0	5	18
% App. Total	84.6	15.4	0		0	0	0		0	100	0		
PHF	.550	.250	.000	.650	.000	.000	.000	.000	.000	.417	.000	.417	.643



Stephen G. Pernaw & Company, Inc.
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Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	94	86	2	182	65	7	0	72	9	129	0	138	392
03:15 PM	100	71	0	171	74	4	0	78	8	105	0	113	362
03:30 PM	119	51	0	170	89	9	0	98	8	129	0	137	405
03:45 PM	144	59	0	203	65	5	0	70	7	145	0	152	425
Total	457	267	2	726	293	25	0	318	32	508	0	540	1584
04:00 PM	115	71	0	186	63	2	0	65	9	102	0	111	362
04:15 PM	111	61	0	172	57	4	0	61	6	96	0	102	335
04:30 PM	136	85	0	221	75	4	0	79	6	107	0	113	413
04:45 PM	125	95	0	220	59	7	0	66	3	112	0	115	401
Total	487	312	0	799	254	17	0	271	24	417	0	441	1511
05:00 PM	119	75	0	194	77	0	0	77	5	102	0	107	378
05:15 PM	111	85	0	196	75	9	0	84	11	107	0	118	398
05:30 PM	98	65	1	164	59	5	0	64	5	95	0	100	328
05:45 PM	112	66	0	178	52	3	0	55	10	114	0	124	357
Total	440	291	1	732	263	17	0	280	31	418	0	449	1461
Grand Total	1384	870	3	2257	810	59	0	869	87	1343	0	1430	4556
Apprch %	61.3	38.5	0.1		93.2	6.8	0		6.1	93.9	0		
Total %	30.4	19.1	0.1	49.5	17.8	1.3	0	19.1	1.9	29.5	0	31.4	
CARS	1347	866	3	2216	806	59	0	865	87	1310	0	1397	4478
% CARS	97.3	99.5	100	98.2	99.5	100	0	99.5	100	97.5	0	97.7	98.3
TRUCKS	37	4	0	41	4	0	0	4	0	33	0	33	78
% TRUCKS	2.7	0.5	0	1.8	0.5	0	0	0.5	0	2.5	0	2.3	1.7

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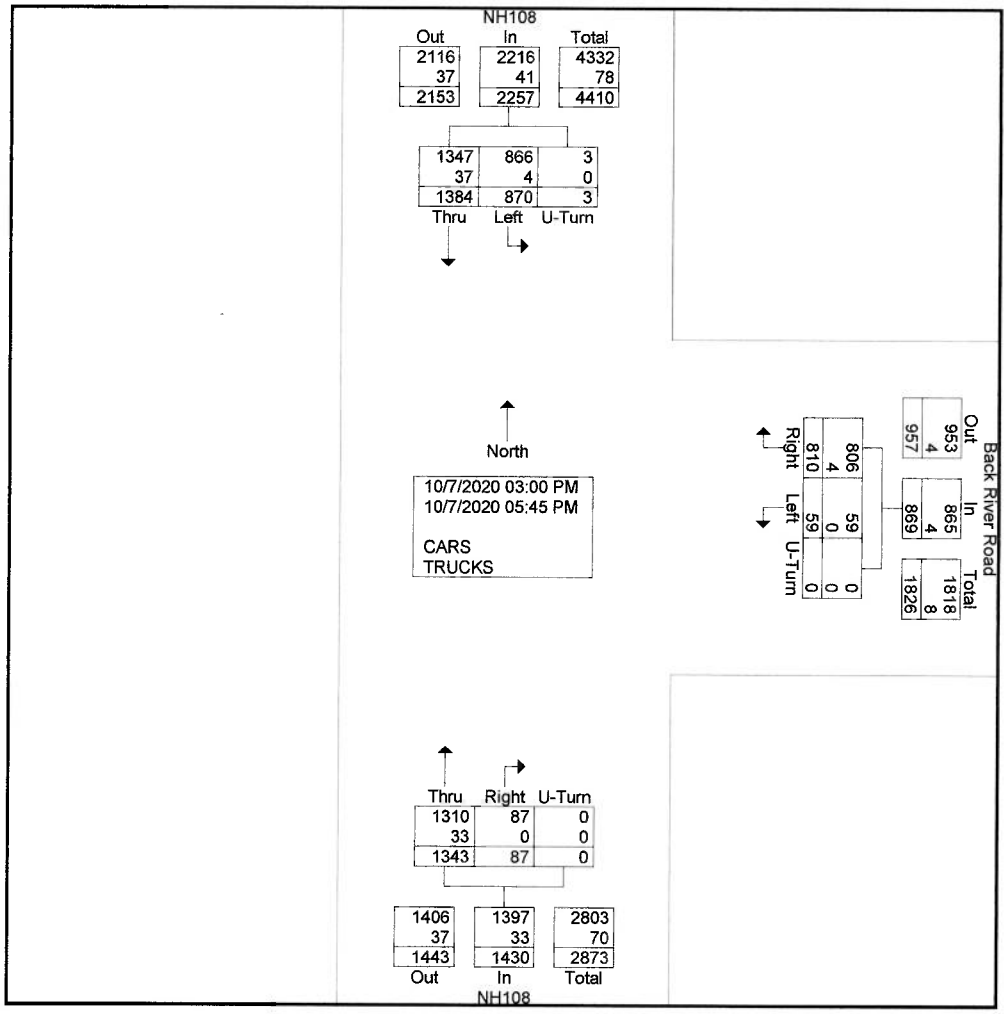
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2



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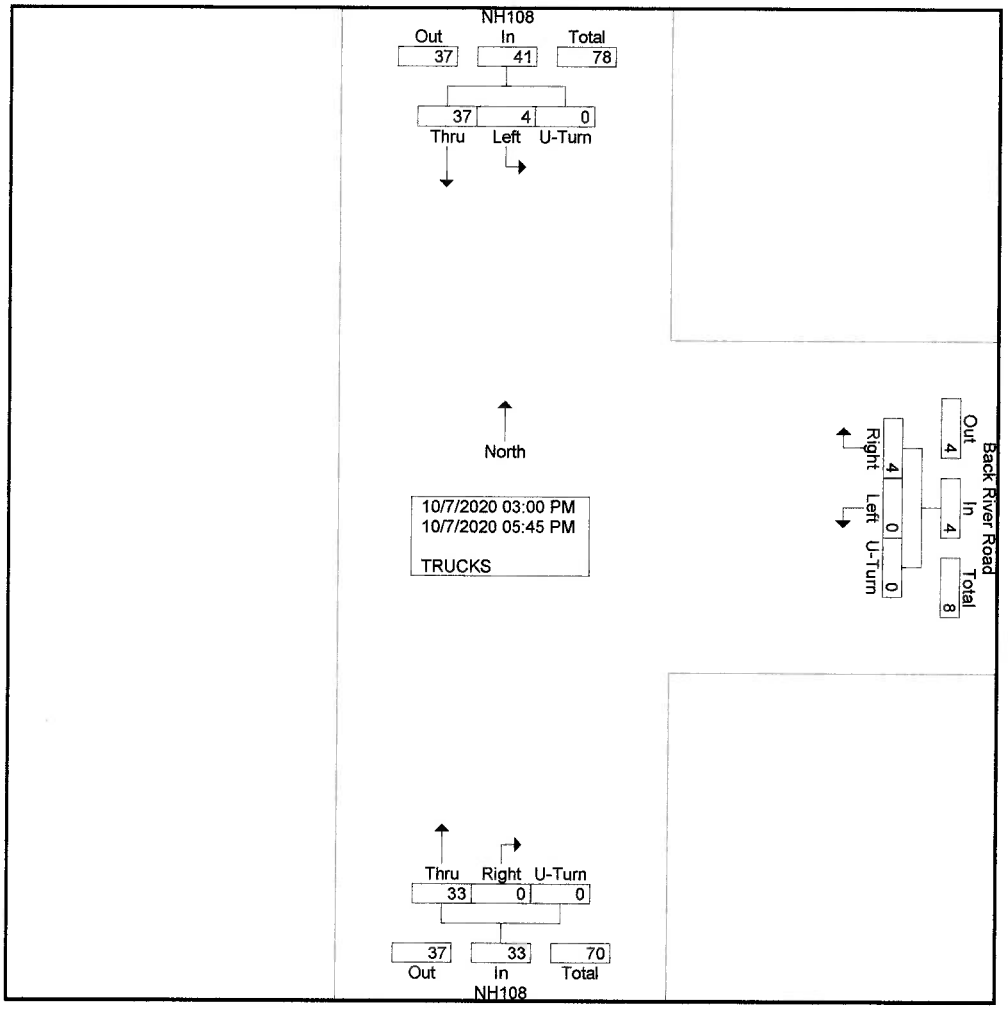
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	NH108 From North				Back River Road From East				NH108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	6	0	0	6	0	0	0	0	0	7	0	7	13
03:15 PM	2	2	0	4	1	0	0	1	0	3	0	3	8
03:30 PM	3	0	0	3	0	0	0	0	0	7	0	7	10
03:45 PM	8	0	0	8	1	0	0	1	0	2	0	2	11
Total	19	2	0	21	2	0	0	2	0	19	0	19	42
04:00 PM	3	0	0	3	0	0	0	0	0	3	0	3	6
04:15 PM	2	0	0	2	2	0	0	2	0	0	0	0	4
04:30 PM	2	2	0	4	0	0	0	0	0	3	0	3	7
04:45 PM	5	0	0	5	0	0	0	0	0	1	0	1	6
Total	12	2	0	14	2	0	0	2	0	7	0	7	23
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	3	0	0	3	0	0	0	0	0	1	0	1	4
05:30 PM	2	0	0	2	0	0	0	0	0	3	0	3	5
05:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	3
Total	6	0	0	6	0	0	0	0	0	7	0	7	13
Grand Total	37	4	0	41	4	0	0	4	0	33	0	33	78
Apprch %	90.2	9.8	0		100	0	0		0	100	0		
Total %	47.4	5.1	0	52.6	5.1	0	0	5.1	0	42.3	0	42.3	



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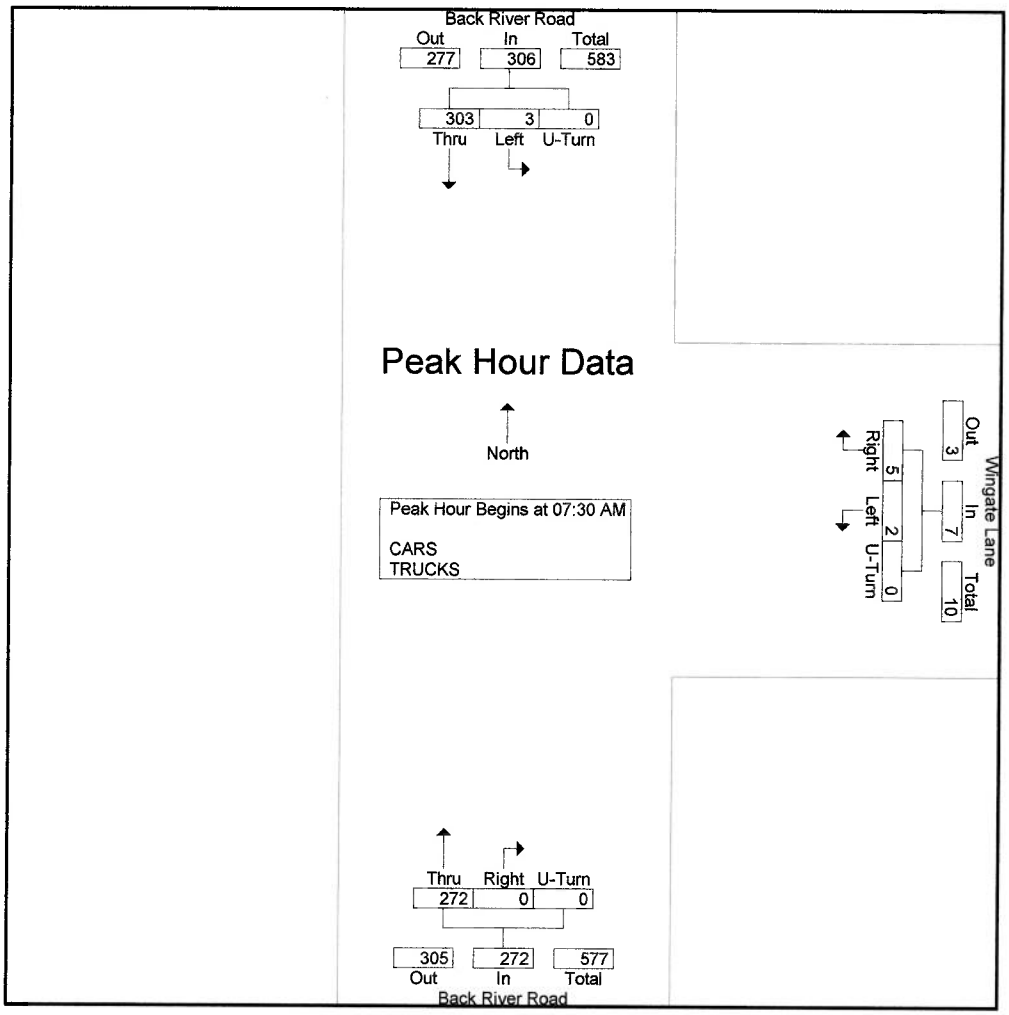
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Wed_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	92	1	0	93	**2**	0	0	2	0	58	0	58	153
07:45 AM	**107**	0	0	**107**	2	**1**	0	**3**	0	81	0	81	**191**
08:00 AM	68	0	0	68	0	1	0	1	0	**85**	0	**85**	154
08:15 AM	36	**2**	0	38	1	0	0	1	0	48	0	48	87
Total Volume	303	3	0	306	5	2	0	7	0	272	0	272	585
% App. Total	99	1	0		71.4	28.6	0		0	100	0		
PHF	.708	.375	.000	.715	.625	.500	.000	.583	.000	.800	.000	.800	.766



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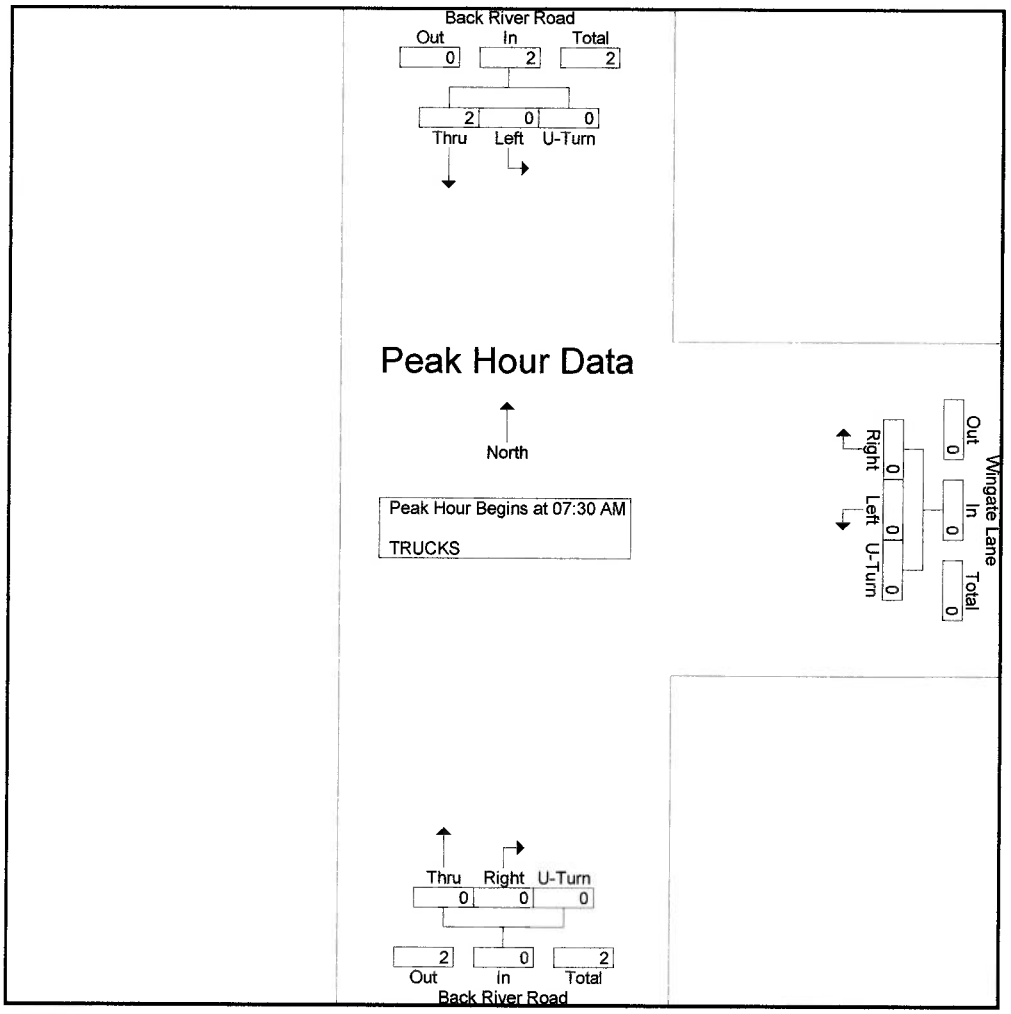
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Wed_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
08:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	2
% App. Total	100	0	0		0	0	0		0	0	0		
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.500



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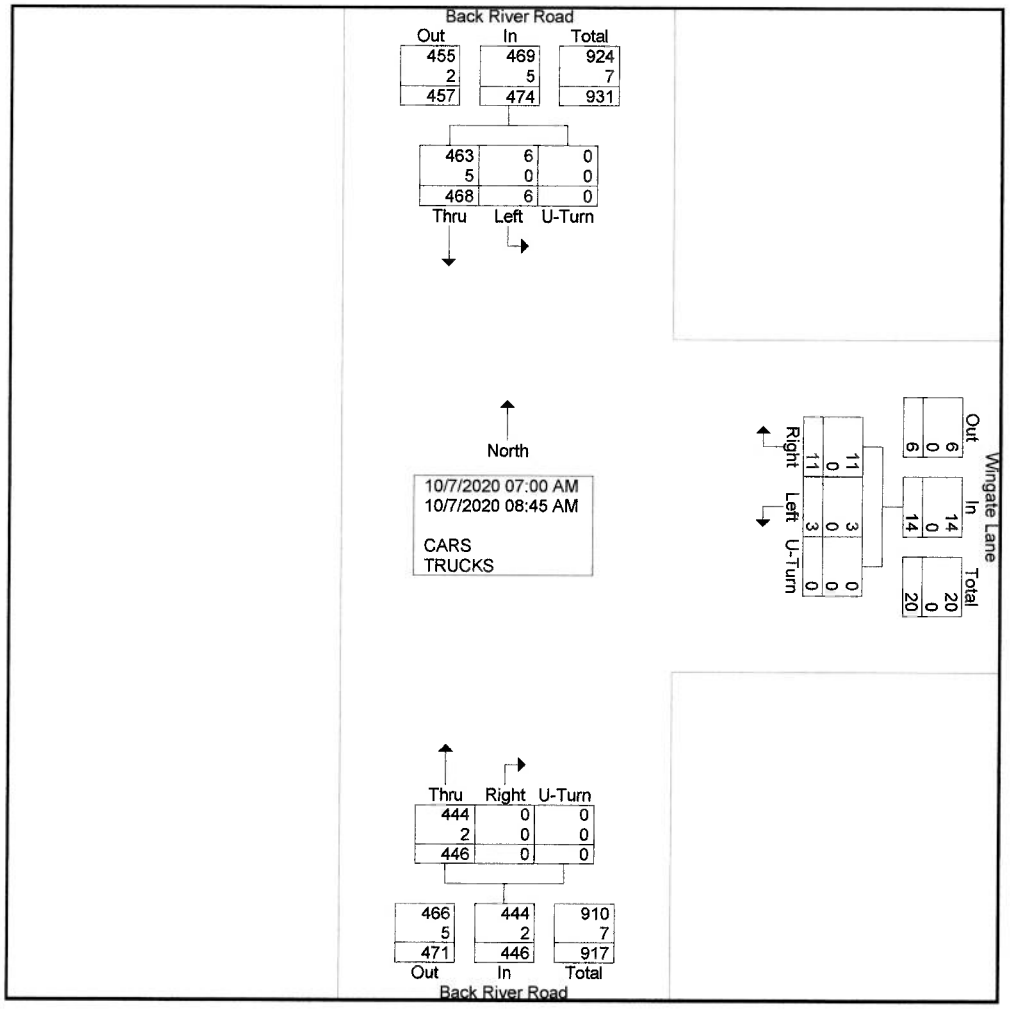
WED

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Tues~~_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	33	0	0	33	1	0	0	1	0	41	0	41	75
07:15 AM	55	1	0	56	1	0	0	1	0	55	0	55	112
07:30 AM	92	1	0	93	2	0	0	2	0	58	0	58	153
07:45 AM	107	0	0	107	2	1	0	3	0	81	0	81	191
Total	287	2	0	289	6	1	0	7	0	235	0	235	531
08:00 AM	68	0	0	68	0	1	0	1	0	85	0	85	154
08:15 AM	36	2	0	38	1	0	0	1	0	48	0	48	87
08:30 AM	43	2	0	45	4	1	0	5	0	36	0	36	86
08:45 AM	34	0	0	34	0	0	0	0	0	42	0	42	76
Total	181	4	0	185	5	2	0	7	0	211	0	211	403
Grand Total	468	6	0	474	11	3	0	14	0	446	0	446	934
Apprch %	98.7	1.3	0		78.6	21.4	0		0	100	0		
Total %	50.1	0.6	0	50.7	1.2	0.3	0	1.5	0	47.8	0	47.8	
CARS	463	6	0	469	11	3	0	14	0	444	0	444	927
% CARS	98.9	100	0	98.9	100	100	0	100	0	99.6	0	99.6	99.3
TRUCKS	5	0	0	5	0	0	0	0	0	2	0	2	7
% TRUCKS	1.1	0	0	1.1	0	0	0	0	0	0.4	0	0.4	0.7



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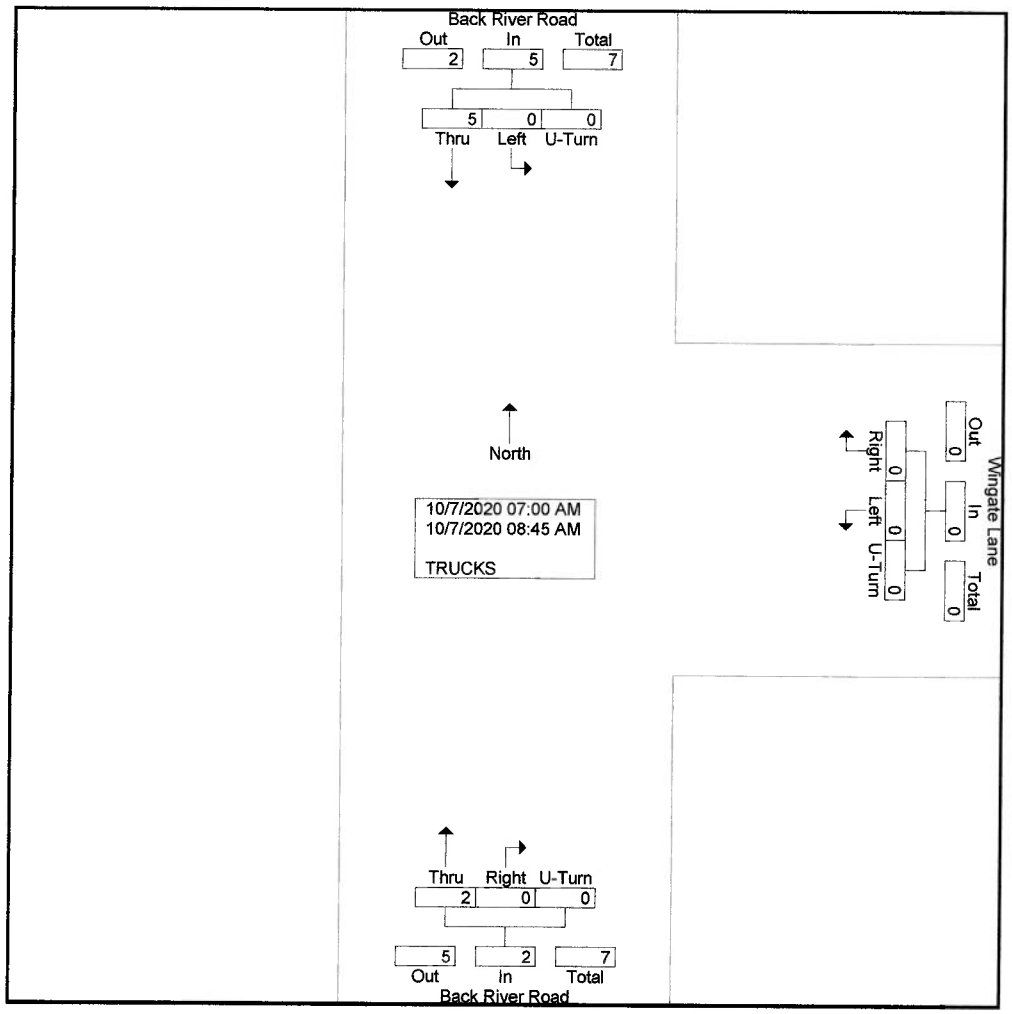
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	2	0	0	2	0	0	0	0	0	1	0	1	3
08:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	3	0	0	3	0	0	0	0	0	1	0	1	4
Grand Total	5	0	0	5	0	0	0	0	0	2	0	2	7
Apprch %	100	0	0		0	0	0		0	100	0		
Total %	71.4	0	0	71.4	0	0	0	0	0	28.6	0	28.6	



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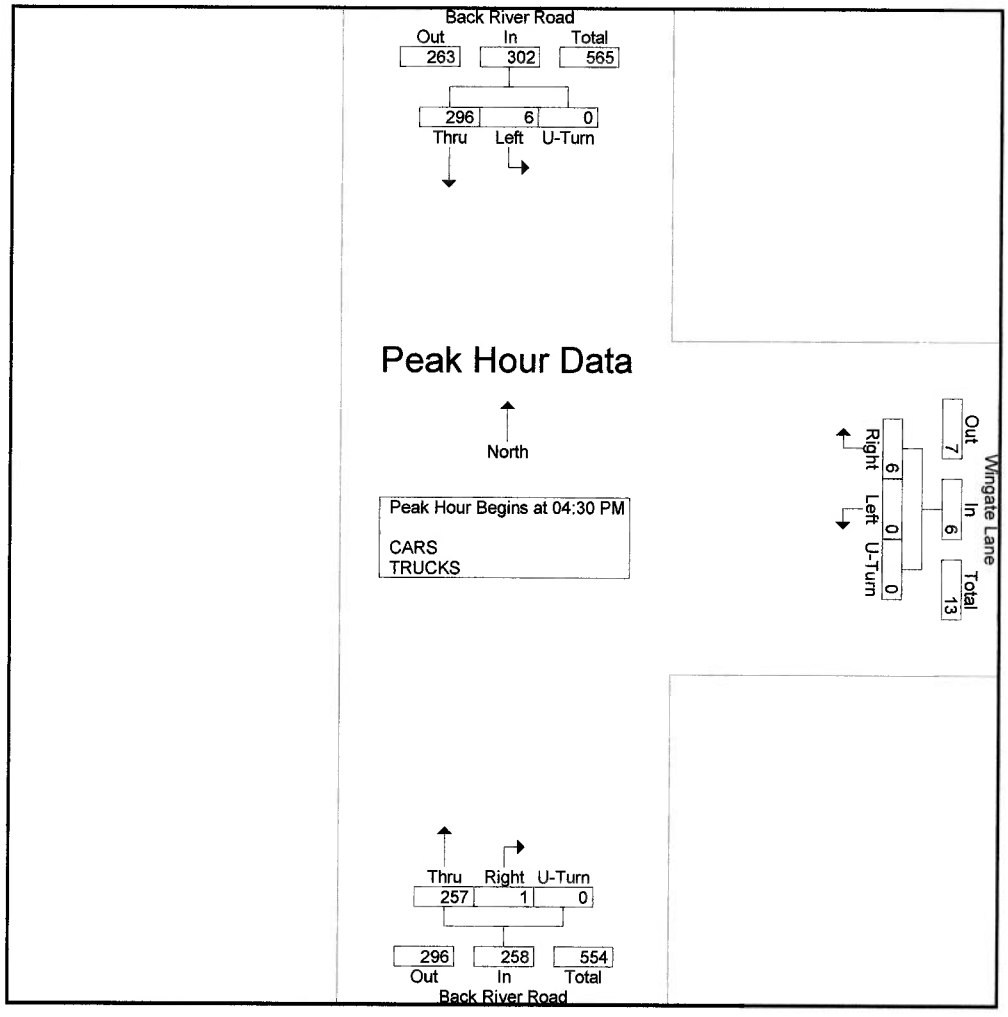
WED

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Tues~~_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 3

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	75	1	0	76	2	0	0	2	0	67	0	67	145
04:45 PM	**85**	**2**	0	**87**	1	0	0	1	0	49	0	49	137
05:00 PM	64	2	0	66	**3**	0	0	**3**	**1**	61	0	62	131
05:15 PM	72	1	0	73	0	0	0	0	0	**80**	0	**80**	**153**
Total Volume	296	6	0	302	6	0	0	6	1	257	0	258	566
% App. Total	98	2	0		100	0	0		0.4	99.6	0		
PHF	.871	.750	.000	.868	.500	.000	.000	.500	.250	.803	.000	.806	.925



Stephen G. Pernaw & Company, Inc.
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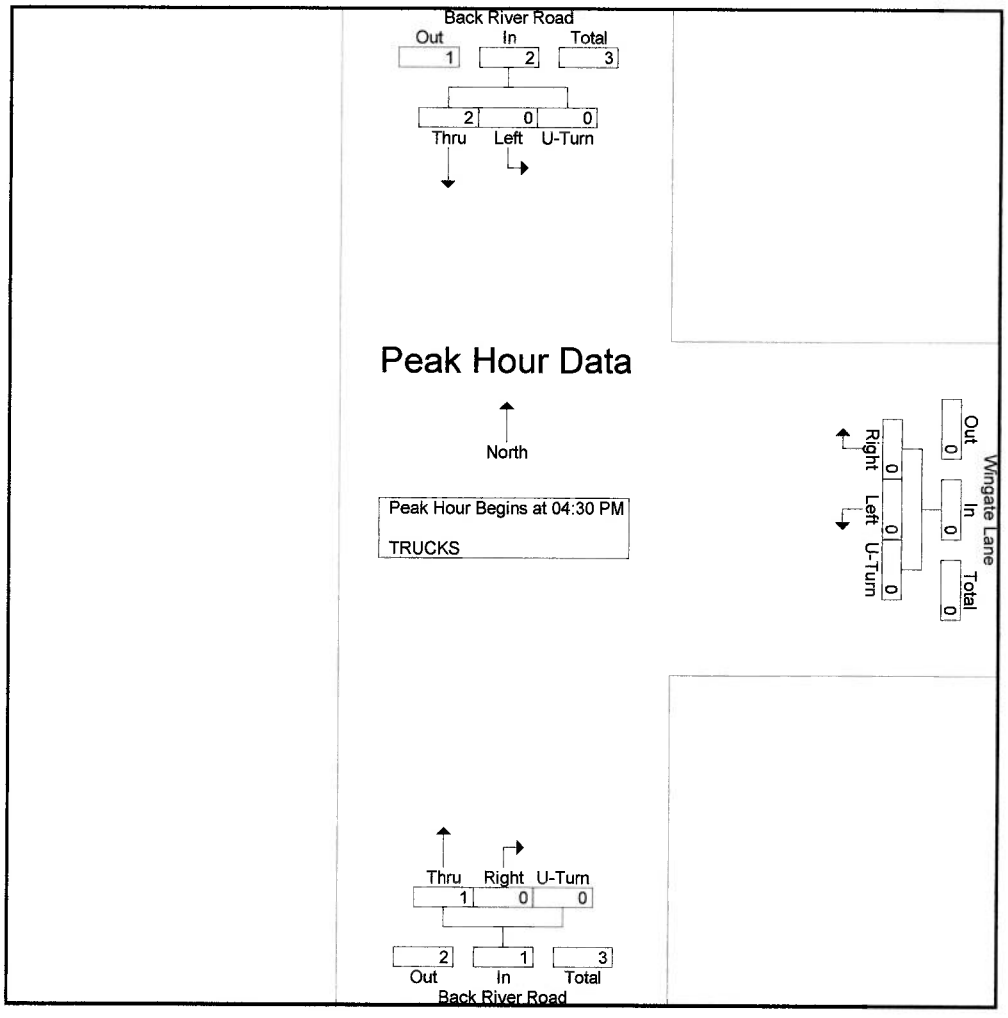
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	**2**	0	0	**2**	0	0	0	0	0	**1**	0	**1**	**3**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	2	0	0	0	0	0	1	0	1	3
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.250



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Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	78	2	0	80	1	0	0	1	2	58	0	60	141
03:15 PM	64	0	0	64	1	0	0	1	1	80	0	81	146
03:30 PM	47	1	0	48	1	0	0	1	0	77	1	78	127
03:45 PM	55	0	0	55	2	0	0	2	1	52	0	53	110
Total	244	3	0	247	5	0	0	5	4	267	1	272	524
04:00 PM	53	2	0	55	2	0	0	2	0	56	0	56	113
04:15 PM	56	1	0	57	0	0	0	0	1	45	0	46	103
04:30 PM	75	1	0	76	2	0	0	2	0	67	0	67	145
04:45 PM	85	2	0	87	1	0	0	1	0	49	0	49	137
Total	269	6	0	275	5	0	0	5	1	217	0	218	498
05:00 PM	64	2	0	66	3	0	0	3	1	61	0	62	131
05:15 PM	72	1	0	73	0	0	0	0	0	80	0	80	153
05:30 PM	57	2	0	59	1	0	0	1	0	47	0	47	107
05:45 PM	55	2	0	57	0	0	0	0	2	44	0	46	103
Total	248	7	0	255	4	0	0	4	3	232	0	235	494
Grand Total	761	16	0	777	14	0	0	14	8	716	1	725	1516
Apprch %	97.9	2.1	0		100	0	0		1.1	98.8	0.1		
Total %	50.2	1.1	0	51.3	0.9	0	0	0.9	0.5	47.2	0.1	47.8	
CARS	756	16	0	772	14	0	0	14	8	713	1	722	1508
% CARS	99.3	100	0	99.4	100	0	0	100	100	99.6	100	99.6	99.5
TRUCKS	5	0	0	5	0	0	0	0	0	3	0	3	8
% TRUCKS	0.7	0	0	0.6	0	0	0	0	0	0.4	0	0.4	0.5

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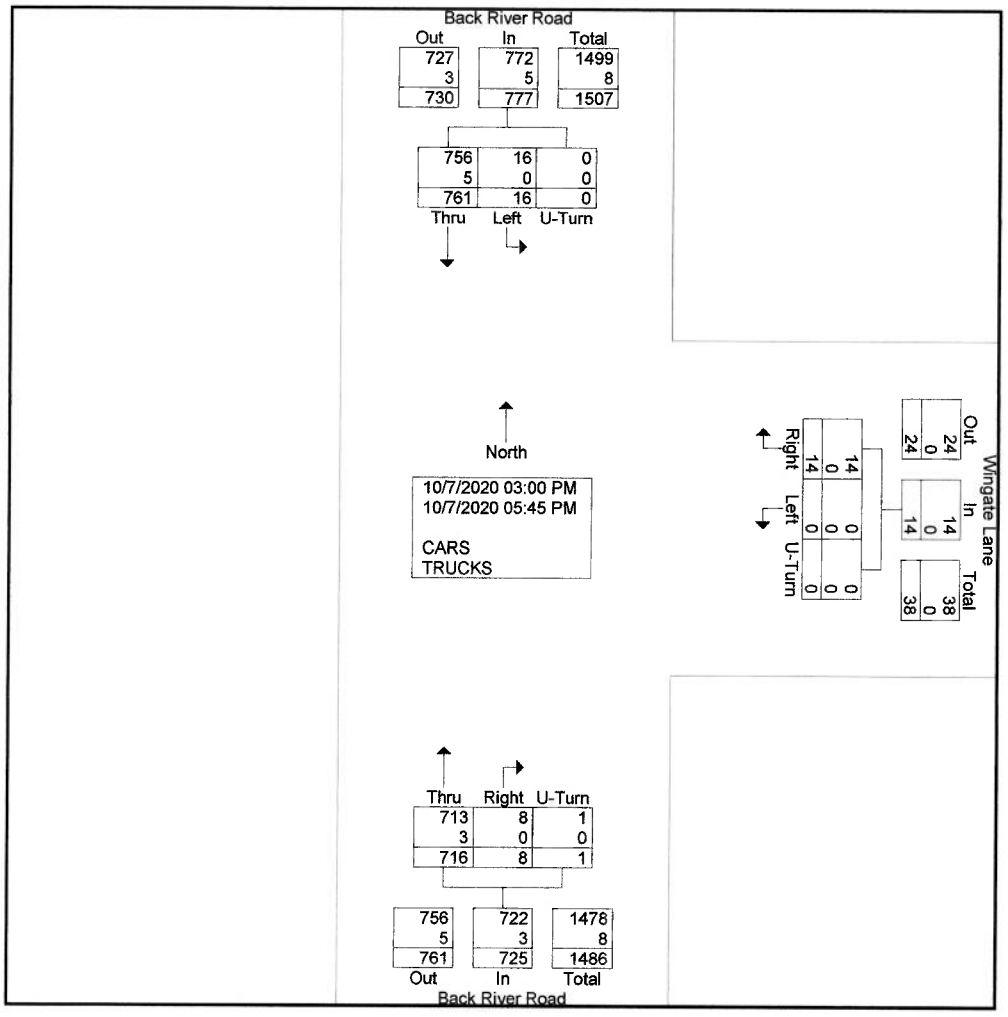
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2



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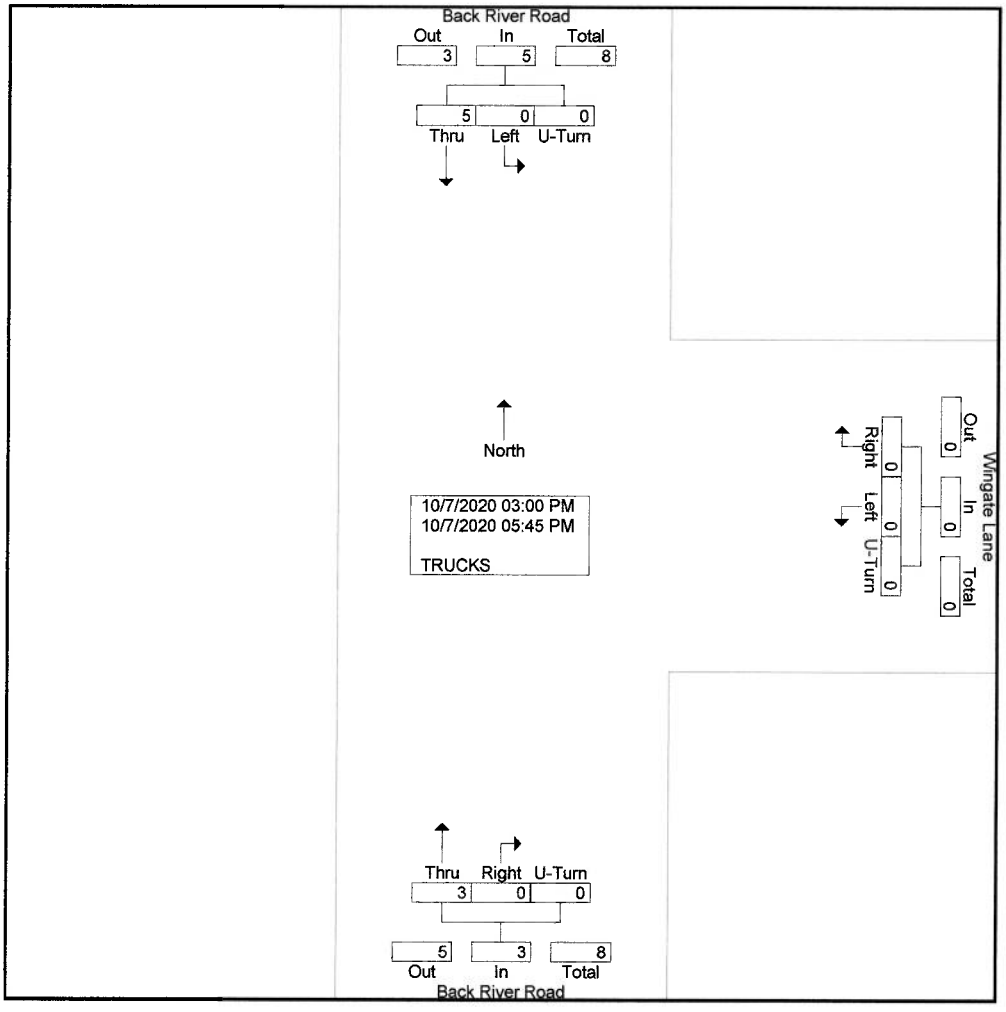
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_2_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
03:15 PM	2	0	0	2	0	0	0	0	0	1	0	1	3
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	3	0	0	3	0	0	0	0	0	2	0	2	5
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	2	0	0	2	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	0	0	0	1	0	1	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	5	0	0	5	0	0	0	0	0	3	0	3	8
Apprch %	100	0	0		0	0	0		0	100	0		
Total %	62.5	0	0	62.5	0	0	0	0	0	37.5	0	37.5	



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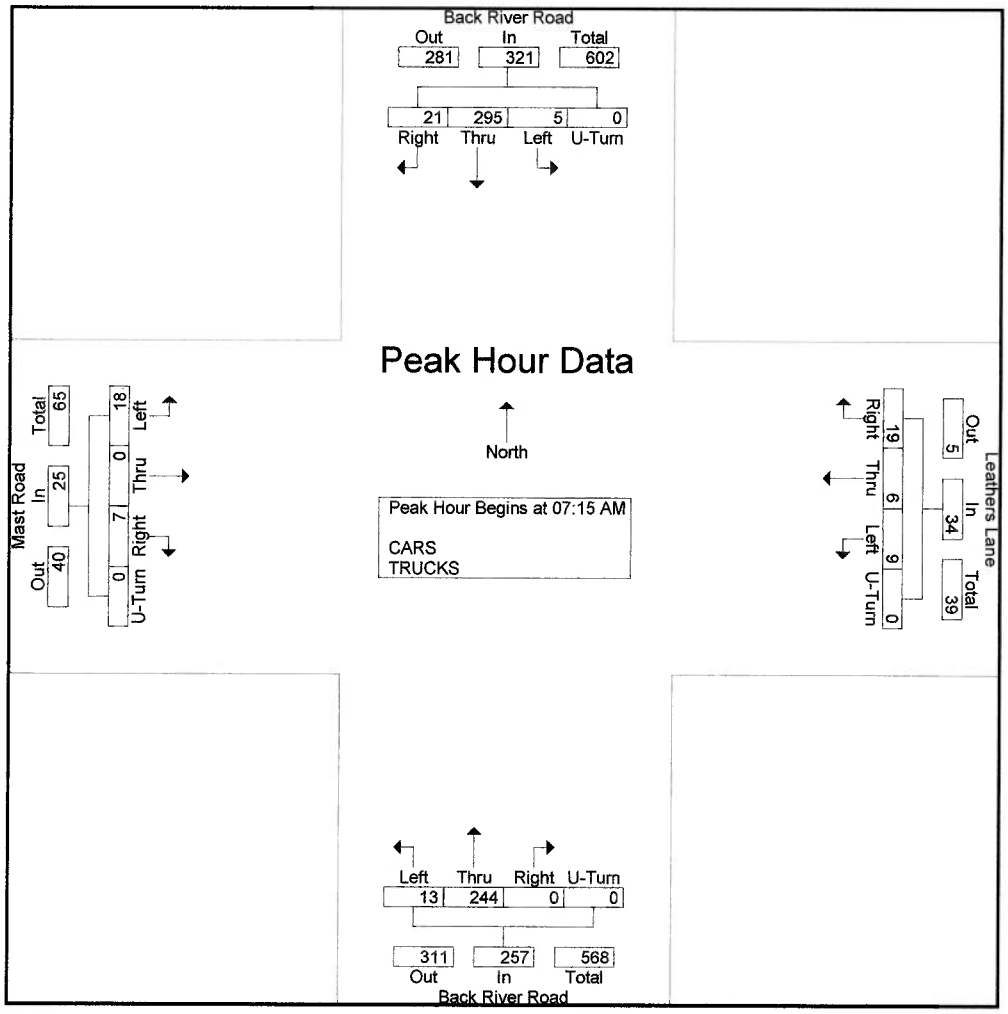
WED

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_~~Tues~~_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	53	**2**	0	55	5	**3**	1	0	9	0	45	3	0	48	2	0	**5**	0	**7**	119
07:30 AM	6	82	0	0	88	3	0	2	0	5	0	51	**4**	0	55	**3**	0	4	0	7	155
07:45 AM	7	**99**	1	0	**107**	**6**	2	**4**	0	**12**	0	72	2	0	74	2	0	4	0	6	**199**
08:00 AM	**8**	61	2	0	71	5	1	2	0	8	0	**76**	4	0	**80**	0	0	5	0	5	164
Total Volume	21	295	5	0	321	19	6	9	0	34	0	244	13	0	257	7	0	18	0	25	637
% App. Total	6.5	91.9	1.6	0		55.9	17.6	26.5	0		0	94.9	5.1	0		28	0	72	0		
PHF	.656	.745	.625	.000	.750	.792	.500	.563	.000	.708	.000	.803	.813	.000	.803	.583	.000	.900	.000	.893	.800

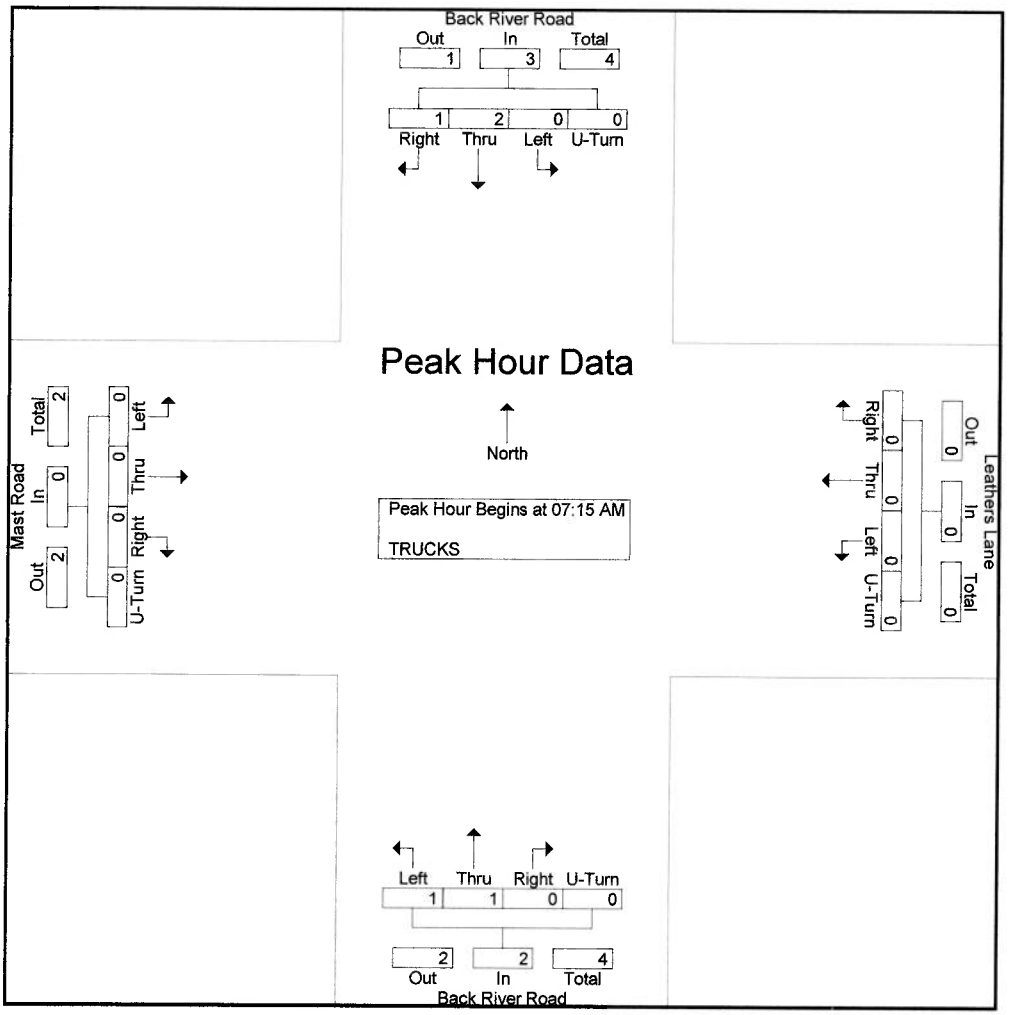


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	**1**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	2	0	0	3	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	5
% App. Total	33.3	66.7	0	0		0	0	0	0		0	50	50	0		0	0	0	0		
PHF	.250	.500	.000	.000	.750	.000	.000	.000	.000	.000	.000	.250	.250	.000	.500	.000	.000	.000	.000	.000	.625



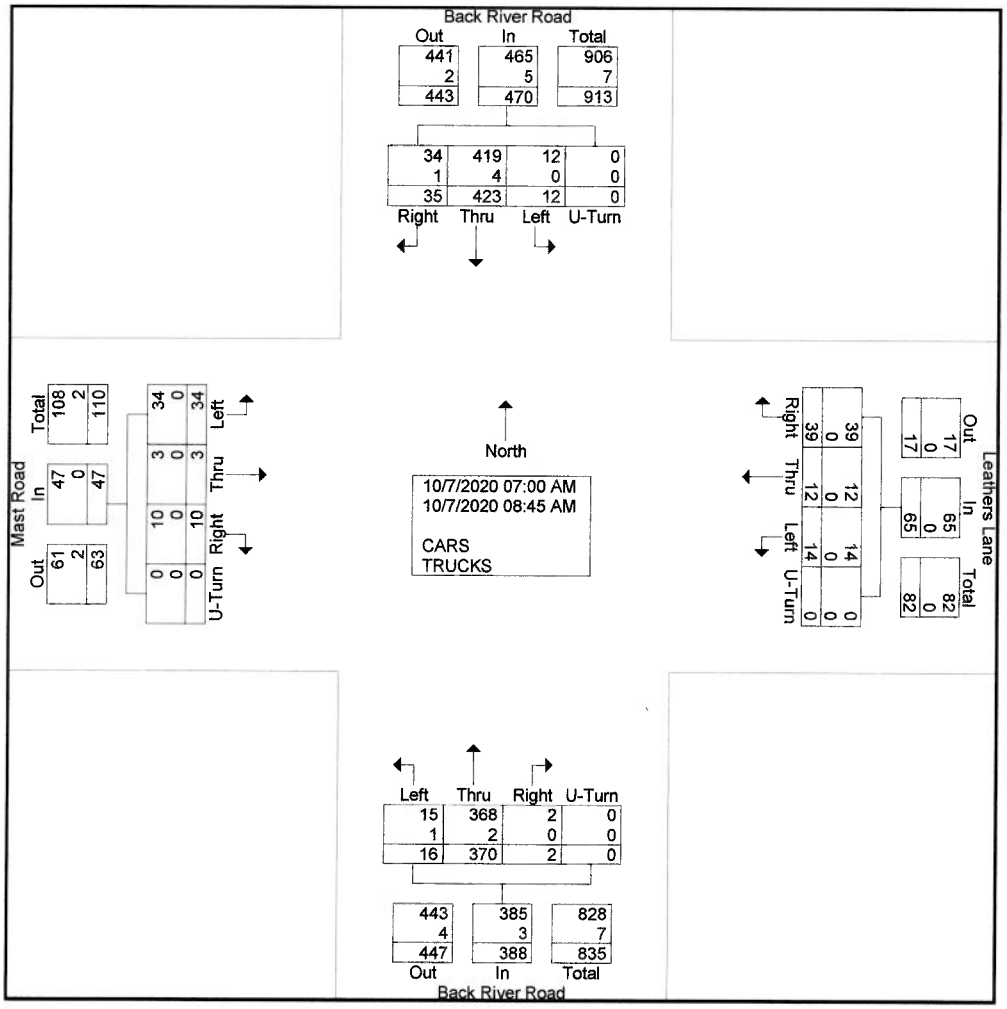
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	30	1	0	32	6	0	5	0	11	1	31	1	0	33	1	0	2	0	3	79
07:15 AM	0	53	2	0	55	5	3	1	0	9	0	45	3	0	48	2	0	5	0	7	119
07:30 AM	6	82	0	0	88	3	0	2	0	5	0	51	4	0	55	3	0	4	0	7	155
07:45 AM	7	99	1	0	107	6	2	4	0	12	0	72	2	0	74	2	0	4	0	6	199
Total	14	264	4	0	282	20	5	12	0	37	1	199	10	0	210	8	0	15	0	23	552
08:00 AM	8	61	2	0	71	5	1	2	0	8	0	76	4	0	80	0	0	5	0	5	164
08:15 AM	5	30	4	0	39	3	2	0	0	5	0	41	0	0	41	2	0	3	0	5	90
08:30 AM	4	38	1	0	43	4	2	0	0	6	0	24	1	0	25	0	2	6	0	8	82
08:45 AM	4	30	1	0	35	7	2	0	0	9	1	30	1	0	32	0	1	5	0	6	82
Total	21	159	8	0	188	19	7	2	0	28	1	171	6	0	178	2	3	19	0	24	418
Grand Total	35	423	12	0	470	39	12	14	0	65	2	370	16	0	388	10	3	34	0	47	970
Apprch %	7.4	90	2.6	0		60	18.5	21.5	0		0.5	95.4	4.1	0		21.3	6.4	72.3	0		
Total %	3.6	43.6	1.2	0	48.5	4	1.2	1.4	0	6.7	0.2	38.1	1.6	0	40	1	0.3	3.5	0	4.8	
CARS	34	419	12	0	465	39	12	14	0	65	2	368	15	0	385	10	3	34	0	47	962
% CARS	97.1	99.1	100	0	98.9	100	100	100	0	100	100	99.5	93.8	0	99.2	100	100	100	0	100	99.2
TRUCKS	1	4	0	0	5	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	8
% TRUCKS	2.9	0.9	0	0	1.1	0	0	0	0	0	0	0.5	6.2	0	0.8	0	0	0	0	0	0.8



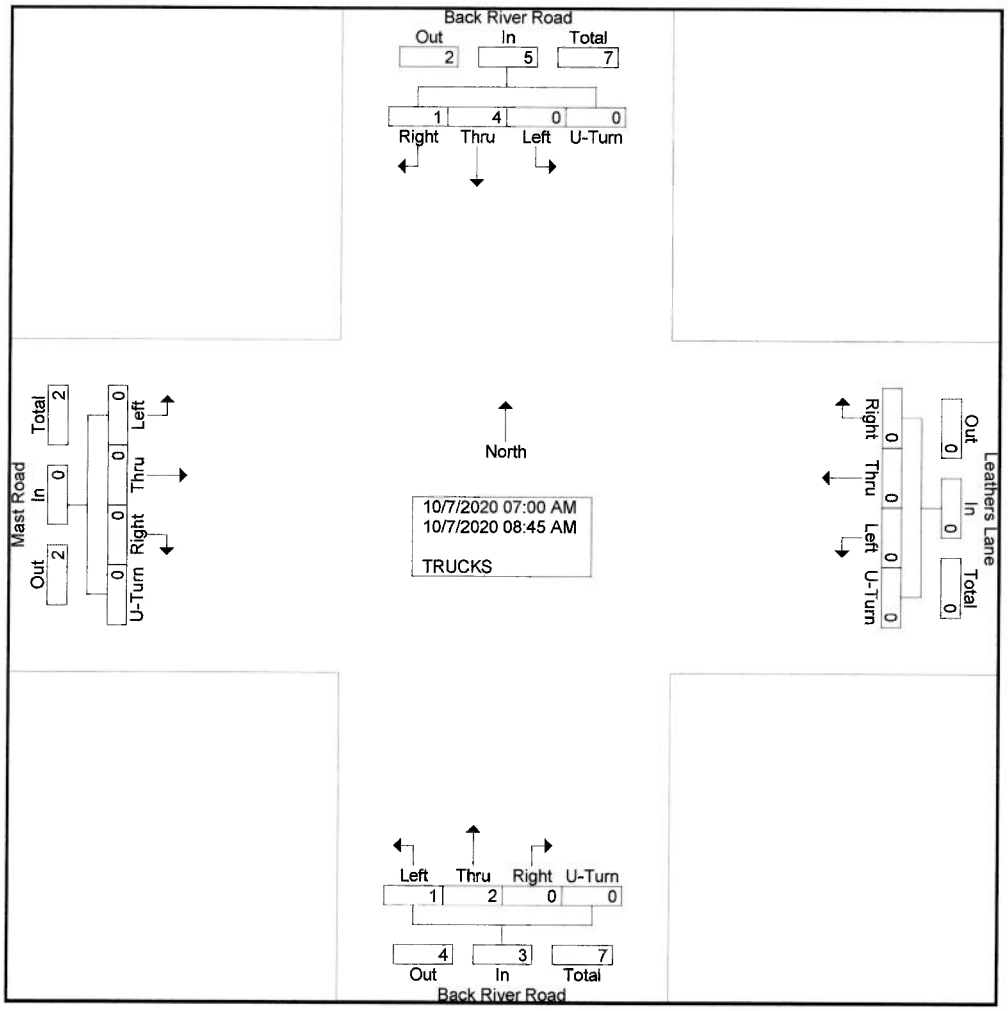
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
08:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	1	2	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
Grand Total	1	4	0	0	5	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	8
Apprch %	20	80	0	0		0	0	0	0		0	66.7	33.3	0		0	0	0	0		
Total %	12.5	50	0	0	62.5	0	0	0	0	0	0	25	12.5	0	37.5	0	0	0	0	0	

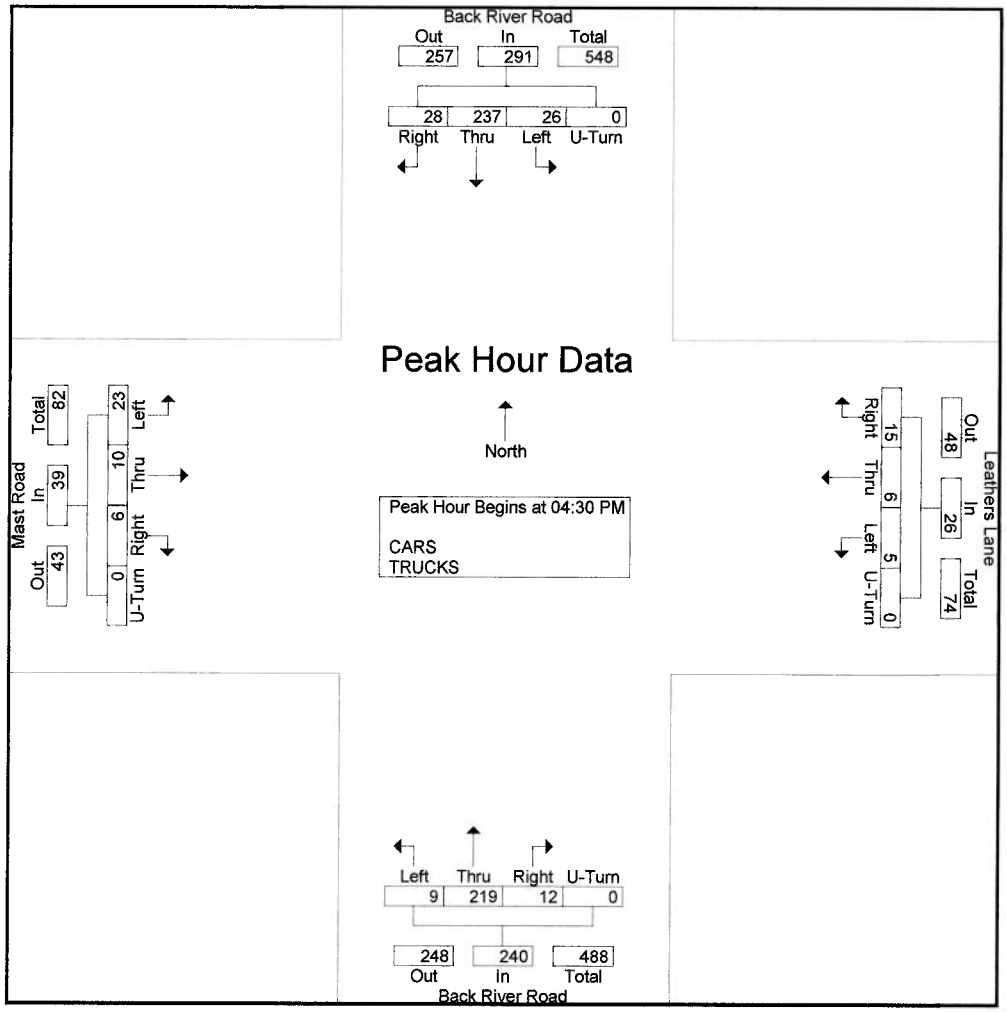


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_~~Tues~~WED_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 3

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**9**	47	**15**	0	71	2	1	**2**	0	5	0	57	**3**	0	60	1	2	**8**	0	**11**	147
04:45 PM	6	**81**	1	0	**88**	3	**2**	1	0	6	1	44	2	0	47	**4**	**3**	4	0	11	152
05:00 PM	8	46	6	0	60	**7**	1	2	0	**10**	**6**	50	3	0	59	1	2	3	0	6	135
05:15 PM	5	63	4	0	72	3	2	0	0	5	5	**68**	1	0	**74**	0	3	8	0	11	**162**
Total Volume	28	237	26	0	291	15	6	5	0	26	12	219	9	0	240	6	10	23	0	39	596
% App. Total	9.6	81.4	8.9	0		57.7	23.1	19.2	0		5	91.2	3.8	0		15.4	25.6	59	0		
PHF	.778	.731	.433	.000	.827	.536	.750	.625	.000	.650	.500	.805	.750	.000	.811	.375	.833	.719	.000	.886	.920

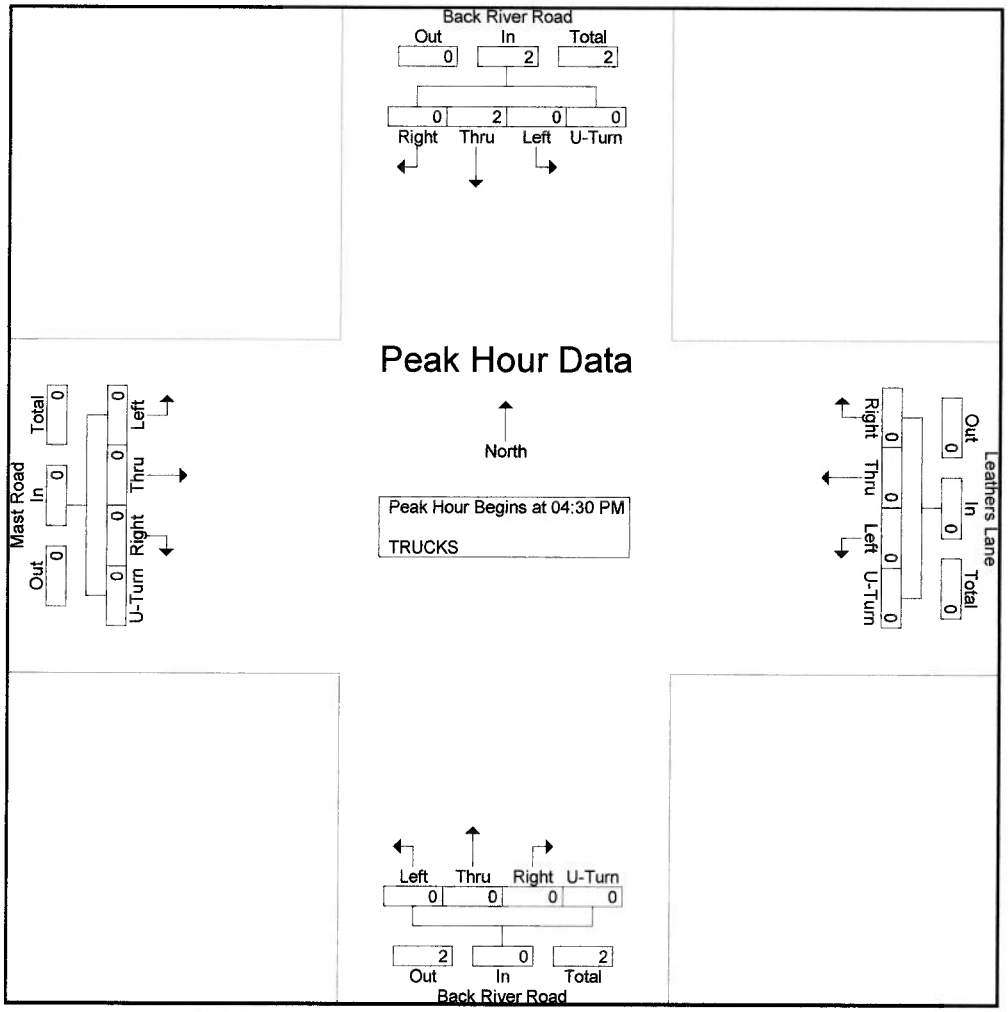


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**2**	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

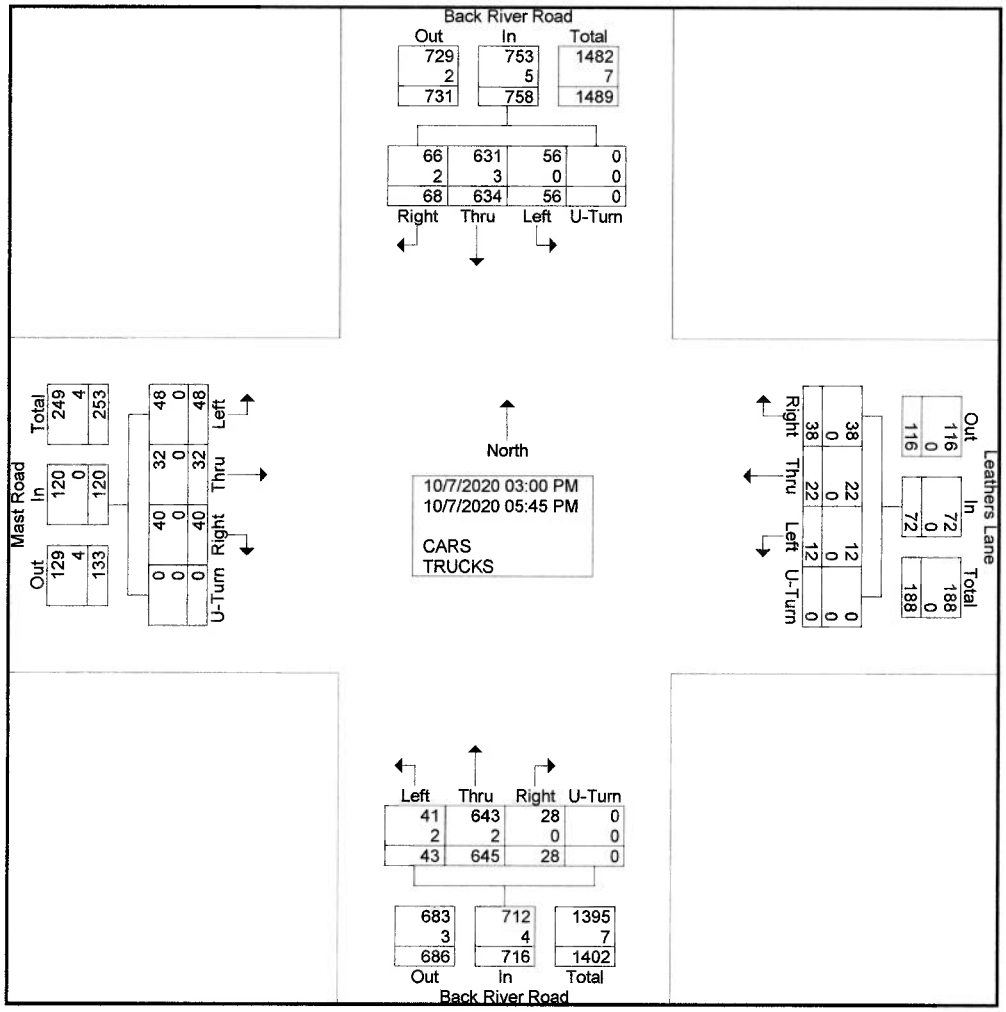
Groups Printed- CARS - TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	5	69	2	0	76	1	1	1	0	3	3	61	6	0	70	4	1	1	0	6	155
03:15 PM	4	59	5	0	68	4	1	0	0	5	4	74	4	0	82	2	2	2	0	6	161
03:30 PM	2	42	1	0	45	2	1	0	0	3	0	74	10	0	84	6	3	3	0	12	144
03:45 PM	7	43	4	0	54	4	1	0	0	5	1	48	1	0	50	3	6	0	0	9	118
Total	18	213	12	0	243	11	4	1	0	16	8	257	21	0	286	15	12	6	0	33	578
04:00 PM	2	46	5	0	53	4	4	1	0	9	2	48	5	0	55	4	1	4	0	9	126
04:15 PM	5	48	3	0	56	4	3	3	0	10	3	38	2	0	43	3	2	5	0	10	119
04:30 PM	9	47	15	0	71	2	1	2	0	5	0	57	3	0	60	1	2	8	0	11	147
04:45 PM	6	81	1	0	88	3	2	1	0	6	1	44	2	0	47	4	3	4	0	11	152
Total	22	222	24	0	268	13	10	7	0	30	6	187	12	0	205	12	8	21	0	41	544
05:00 PM	8	46	6	0	60	7	1	2	0	10	6	50	3	0	59	1	2	3	0	6	135
05:15 PM	5	63	4	0	72	3	2	0	0	5	5	68	1	0	74	0	3	8	0	11	162
05:30 PM	7	46	8	0	61	2	2	1	0	5	2	43	5	0	50	5	1	5	0	11	127
05:45 PM	8	44	2	0	54	2	3	1	0	6	1	40	1	0	42	7	6	5	0	18	120
Total	28	199	20	0	247	14	8	4	0	26	14	201	10	0	225	13	12	21	0	46	544
Grand Total	68	634	56	0	758	38	22	12	0	72	28	645	43	0	716	40	32	48	0	120	1666
Apprch %	9	83.6	7.4	0		52.8	30.6	16.7	0		3.9	90.1	6	0		33.3	26.7	40	0		
Total %	4.1	38.1	3.4	0	45.5	2.3	1.3	0.7	0	4.3	1.7	38.7	2.6	0	43	2.4	1.9	2.9	0	7.2	
CARS	66	631	56	0	753	38	22	12	0	72	28	643	41	0	712	40	32	48	0	120	1657
% CARS	97.1	99.5	100	0	99.3	100	100	100	0	100	100	99.7	95.3	0	99.4	100	100	100	0	100	99.5
TRUCKS	2	3	0	0	5	0	0	0	0	0	0	2	2	0	4	0	0	0	0	0	9
% TRUCKS	2.9	0.5	0	0	0.7	0	0	0	0	0	0	0.3	4.7	0	0.6	0	0	0	0	0	0.5

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2



Stephen G. Pernaw & Company, Inc.
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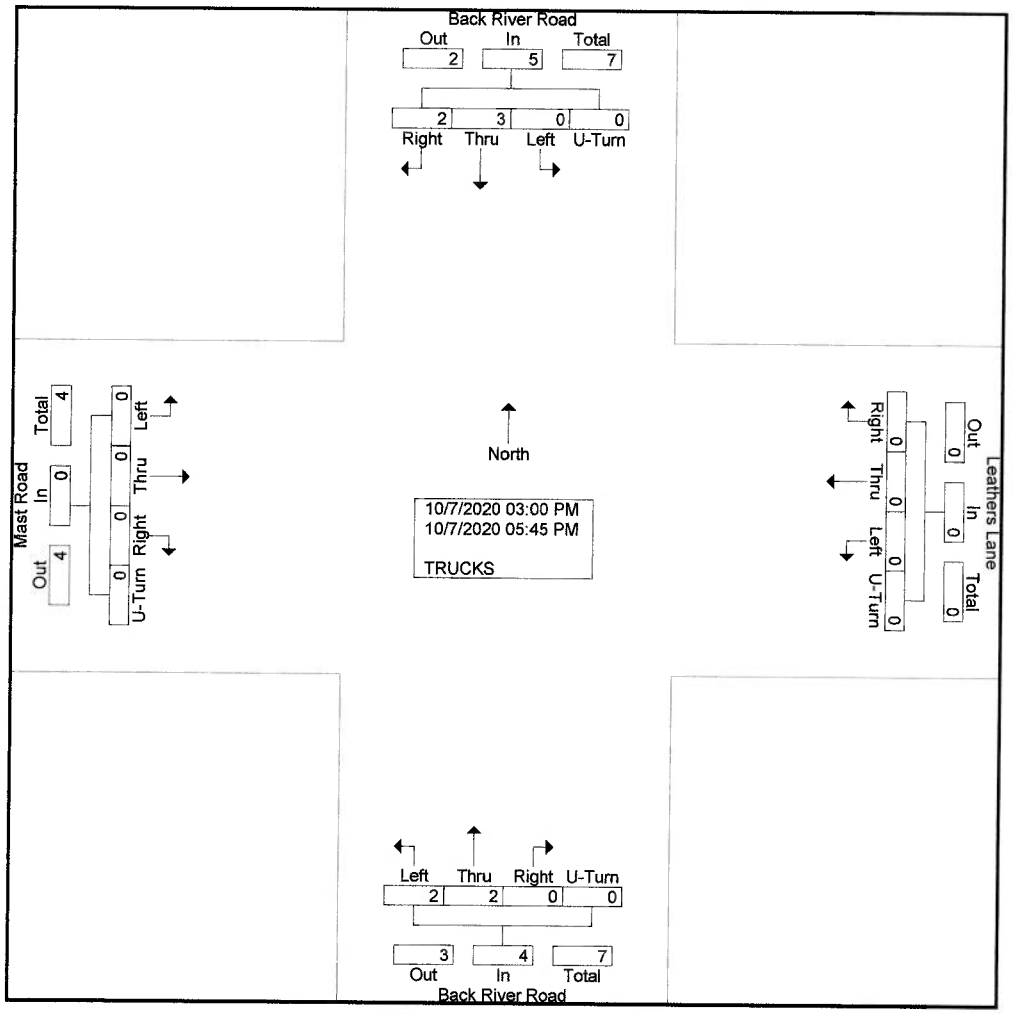
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Tues_AM_&_PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
03:15 PM	2	1	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	2	1	0	0	3	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	6
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2	3	0	0	5	0	0	0	0	0	0	2	2	0	4	0	0	0	0	0	9
Apprch %	40	60	0	0		0	0	0	0		0	50	50	0		0	0	0	0		
Total %	22.2	33.3	0	0	55.6	0	0	0	0	0	0	22.2	22.2	0	44.4	0	0	0	0	0	

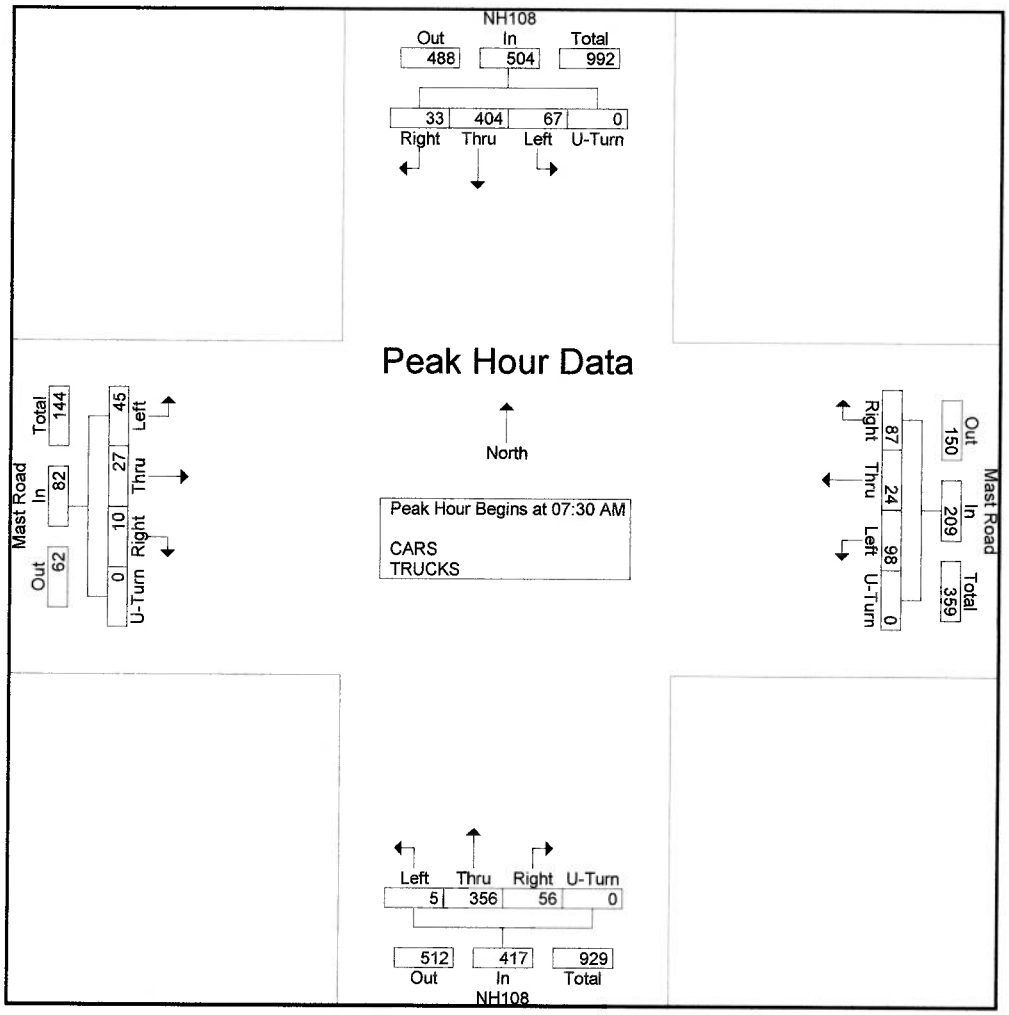


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	6	100	14	0	120	**27**	4	22	0	53	20	**100**	1	0	**121**	**3**	8	12	0	23	317
07:45 AM	**12**	**122**	17	0	**151**	27	**9**	23	0	59	**26**	92	**2**	0	120	3	**13**	**14**	0	**30**	**360**
08:00 AM	8	95	**20**	0	123	20	6	**35**	0	**61**	6	80	1	0	87	2	5	7	0	14	285
08:15 AM	7	87	16	0	110	13	5	18	0	36	4	84	1	0	89	2	1	12	0	15	250
Total Volume	33	404	67	0	504	87	24	98	0	209	56	356	5	0	417	10	27	45	0	82	1212
% App. Total	6.5	80.2	13.3	0		41.6	11.5	46.9	0		13.4	85.4	1.2	0		12.2	32.9	54.9	0		
PHF	.688	.828	.838	.000	.834	.806	.667	.700	.000	.857	.538	.890	.625	.000	.862	.833	.519	.804	.000	.683	.842

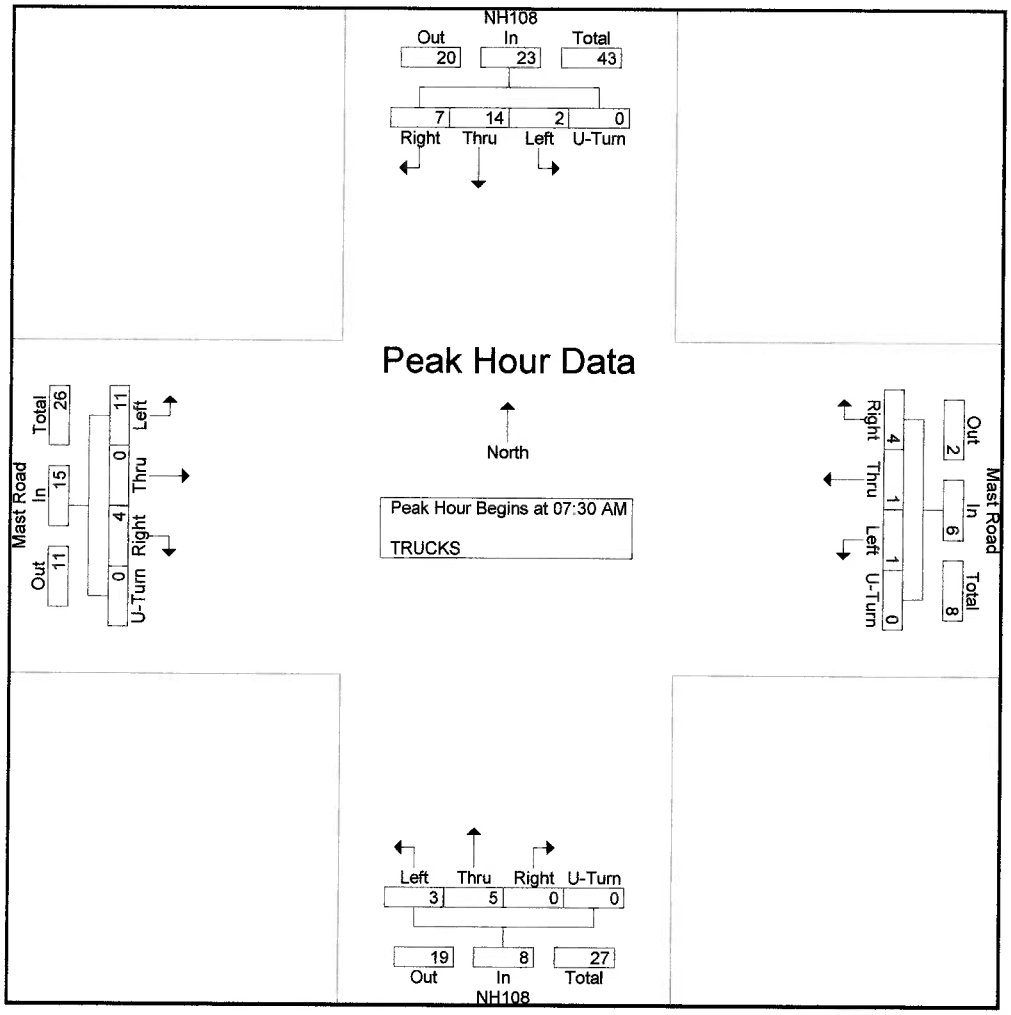


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	2	**1**	0	3	1	0	**1**	0	2	0	1	0	0	1	1	0	2	0	3	9
07:45 AM	**4**	1	0	0	5	1	0	0	0	1	0	1	**2**	0	**3**	**2**	0	**5**	0	**7**	**16**
08:00 AM	3	4	1	0	**8**	0	0	0	0	0	0	1	0	0	1	1	0	1	0	2	11
08:15 AM	0	**7**	0	0	7	**2**	**1**	0	0	**3**	0	**2**	1	0	3	0	0	3	0	3	16
Total Volume	7	14	2	0	23	4	1	1	0	6	0	5	3	0	8	4	0	11	0	15	52
% App. Total	30.4	60.9	8.7	0		66.7	16.7	16.7	0		0	62.5	37.5	0		26.7	0	73.3	0		
PHF	.438	.500	.500	.000	.719	.500	.250	.250	.000	.500	.000	.625	.375	.000	.667	.500	.000	.550	.000	.536	.813



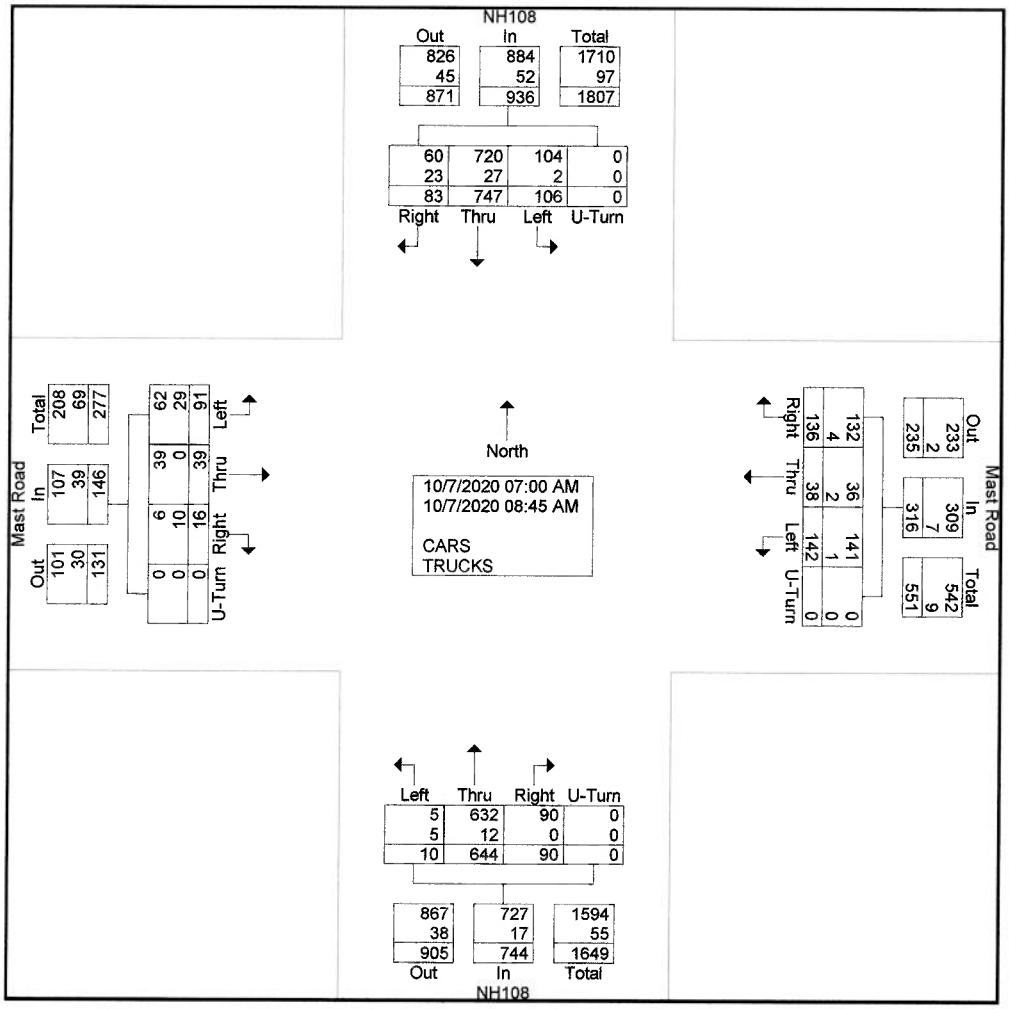
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	9	79	9	0	97	13	4	8	0	25	9	56	1	0	66	1	1	18	0	20	208
07:15 AM	7	78	10	0	95	13	5	14	0	32	16	75	2	0	93	2	7	14	0	23	243
07:30 AM	6	100	14	0	120	27	4	22	0	53	20	100	1	0	121	3	8	12	0	23	317
07:45 AM	12	122	17	0	151	27	9	23	0	59	26	92	2	0	120	3	13	14	0	30	360
Total	34	379	50	0	463	80	22	67	0	169	71	323	6	0	400	9	29	58	0	96	1128
08:00 AM	8	95	20	0	123	20	6	35	0	61	6	80	1	0	87	2	5	7	0	14	285
08:15 AM	7	87	16	0	110	13	5	18	0	36	4	84	1	0	89	2	1	12	0	15	250
08:30 AM	15	92	9	0	116	13	4	13	0	30	7	87	0	0	94	1	3	5	0	9	249
08:45 AM	19	94	11	0	124	10	1	9	0	20	2	70	2	0	74	2	1	9	0	12	230
Total	49	368	56	0	473	56	16	75	0	147	19	321	4	0	344	7	10	33	0	50	1014
Grand Total	83	747	106	0	936	136	38	142	0	316	90	644	10	0	744	16	39	91	0	146	2142
Apprch %	8.9	79.8	11.3	0		43	12	44.9	0		12.1	86.6	1.3	0		11	26.7	62.3	0		
Total %	3.9	34.9	4.9	0	43.7	6.3	1.8	6.6	0	14.8	4.2	30.1	0.5	0	34.7	0.7	1.8	4.2	0	6.8	
CARS	60	720	104	0	884	132	36	141	0	309	90	632	5	0	727	6	39	62	0	107	2027
% CARS	72.3	96.4	98.1	0	94.4	97.1	94.7	99.3	0	97.8	100	98.1	50	0	97.7	37.5	100	68.1	0	73.3	94.6
TRUCKS	23	27	2	0	52	4	2	1	0	7	0	12	5	0	17	10	0	29	0	39	115
% TRUCKS	27.7	3.6	1.9	0	5.6	2.9	5.3	0.7	0	2.2	0	1.9	50	0	2.3	62.5	0	31.9	0	26.7	5.4



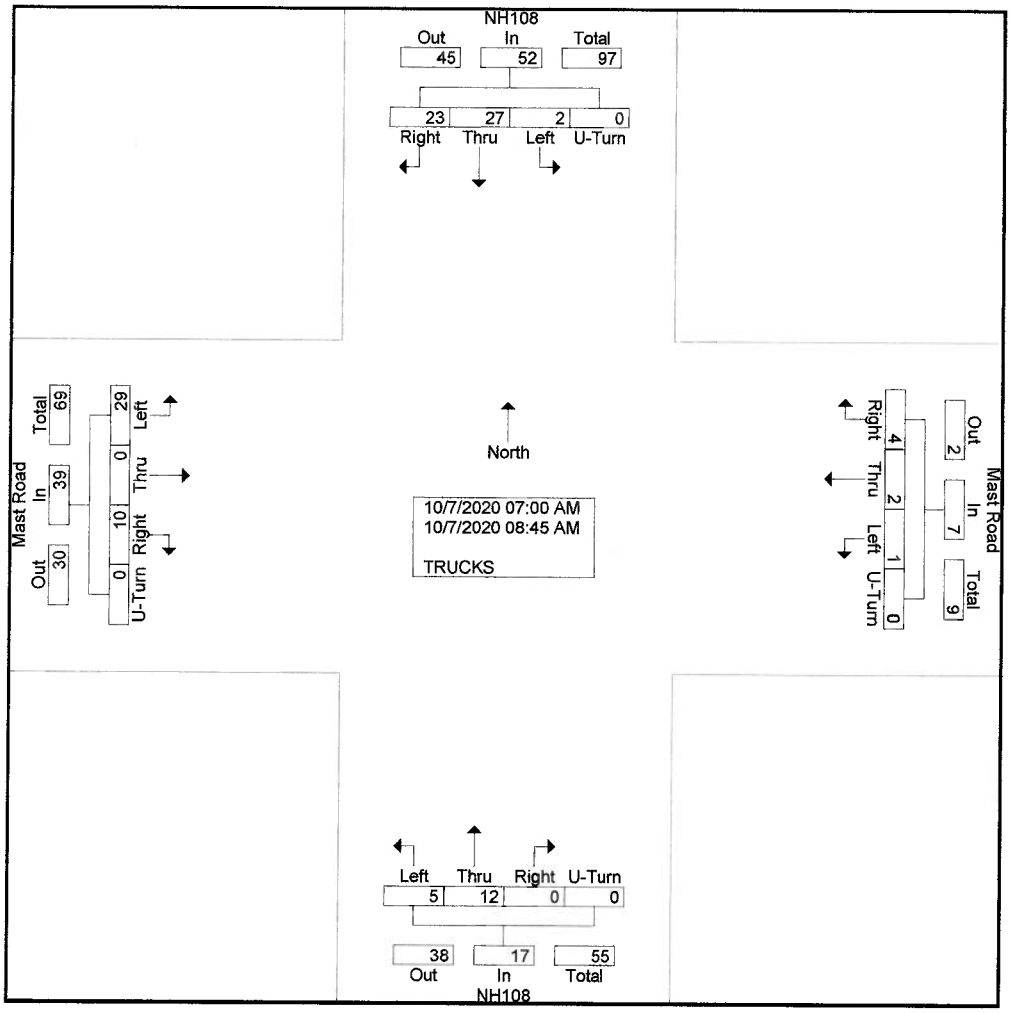
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	1	0	0	2	0	0	0	0	0	0	2	0	0	2	1	0	10	0	11	15
07:15 AM	1	6	0	0	7	0	0	0	0	0	0	0	1	0	1	2	0	4	0	6	14
07:30 AM	0	2	1	0	3	1	0	1	0	2	0	1	0	0	1	1	0	2	0	3	9
07:45 AM	4	1	0	0	5	1	0	0	0	1	0	1	2	0	3	2	0	5	0	7	16
Total	6	10	1	0	17	2	0	1	0	3	0	4	3	0	7	6	0	21	0	27	54
08:00 AM	3	4	1	0	8	0	0	0	0	0	0	1	0	0	1	1	0	1	0	2	11
08:15 AM	0	7	0	0	7	2	1	0	0	3	0	2	1	0	3	0	0	3	0	3	16
08:30 AM	8	6	0	0	14	0	1	0	0	1	0	2	0	0	2	1	0	2	0	3	20
08:45 AM	6	0	0	0	6	0	0	0	0	0	0	3	1	0	4	2	0	2	0	4	14
Total	17	17	1	0	35	2	2	0	0	4	0	8	2	0	10	4	0	8	0	12	61
Grand Total	23	27	2	0	52	4	2	1	0	7	0	12	5	0	17	10	0	29	0	39	115
Apprch %	44.2	51.9	3.8	0		57.1	28.6	14.3	0		0	70.6	29.4	0		25.6	0	74.4	0		
Total %	20	23.5	1.7	0	45.2	3.5	1.7	0.9	0	6.1	0	10.4	4.3	0	14.8	8.7	0	25.2	0	33.9	

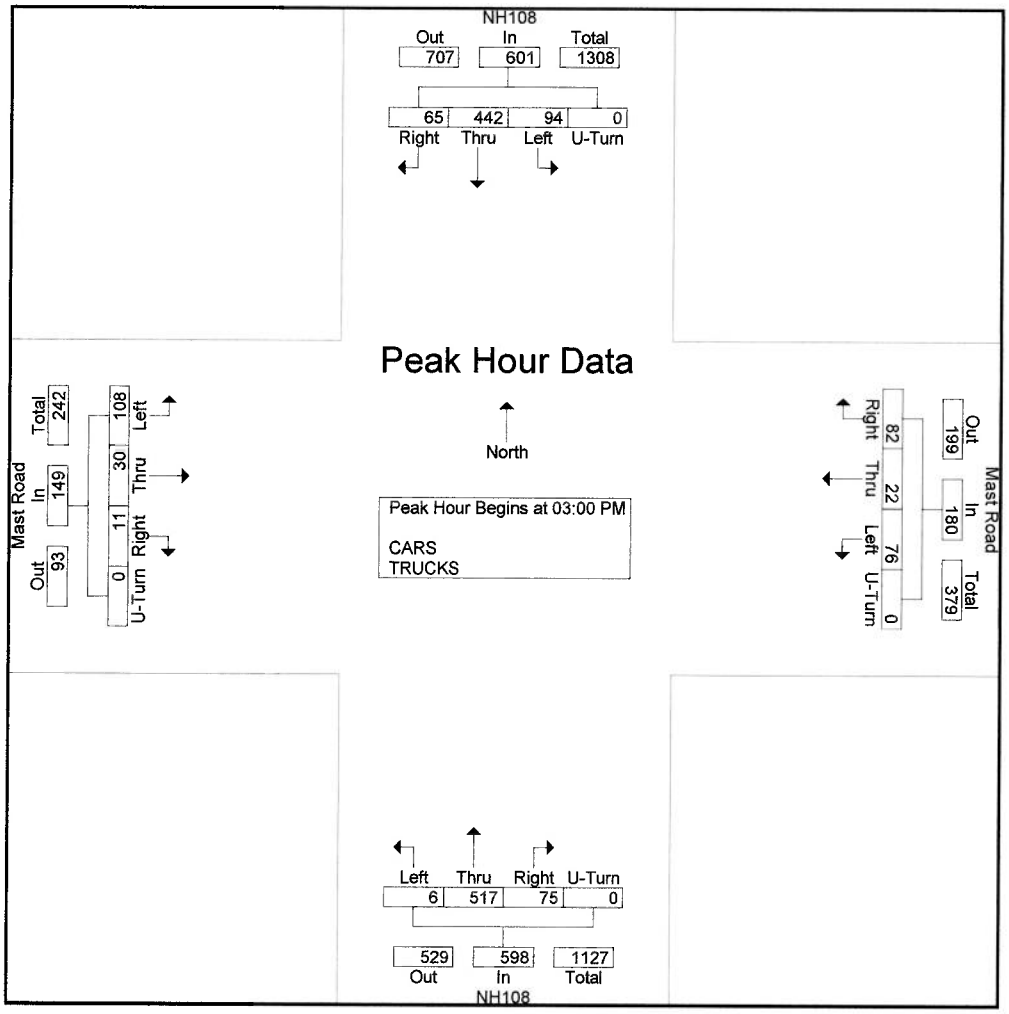


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 3

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	9	107	16	0	132	10	5	13	0	28	**23**	115	0	0	138	3	7	37	0	47	345
03:15 PM	**22**	102	19	0	143	22	7	23	0	52	19	130	**3**	0	152	1	5	10	0	16	363
03:30 PM	17	108	**31**	0	156	**36**	**8**	**26**	0	**70**	13	126	2	0	141	**4**	**14**	**39**	0	**57**	**424**
03:45 PM	17	**125**	28	0	**170**	14	2	14	0	30	20	**146**	1	0	**167**	3	4	22	0	29	396
Total Volume	65	442	94	0	601	82	22	76	0	180	75	517	6	0	598	11	30	108	0	149	1528
% App. Total	10.8	73.5	15.6	0		45.6	12.2	42.2	0		12.5	86.5	1	0		7.4	20.1	72.5	0		
PHF	.739	.884	.758	.000	.884	.569	.688	.731	.000	.643	.815	.885	.500	.000	.895	.688	.536	.692	.000	.654	.901

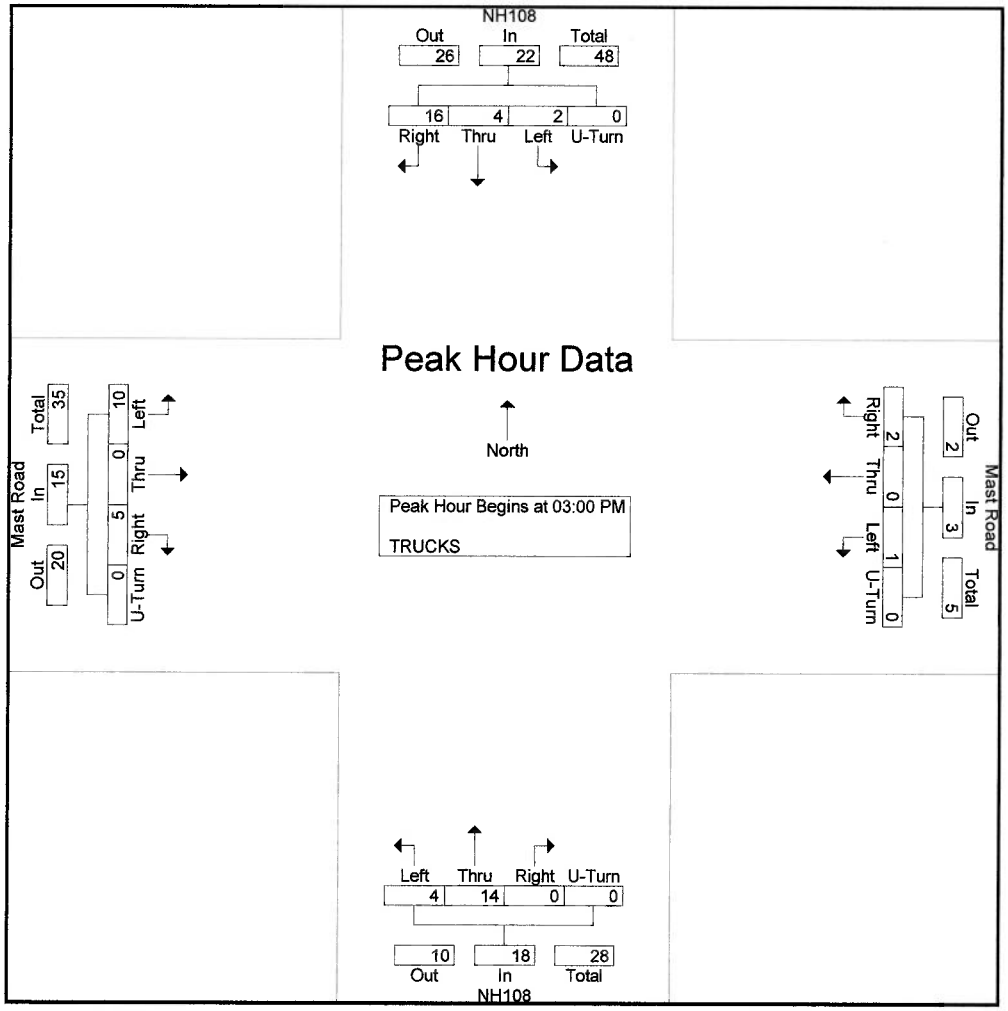


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	4	1	0	0	5	0	0	**1**	0	**1**	0	**4**	0	0	4	1	0	**4**	0	**5**	15
03:15 PM	4	0	**1**	0	5	**1**	0	0	0	1	0	4	**3**	0	**7**	1	0	4	0	5	**18**
03:30 PM	1	**2**	1	0	4	0	0	0	0	0	0	4	1	0	5	**2**	0	2	0	4	13
03:45 PM	**7**	1	0	0	**8**	1	0	0	0	1	0	2	0	0	2	1	0	0	0	1	12
Total Volume	16	4	2	0	22	2	0	1	0	3	0	14	4	0	18	5	0	10	0	15	58
% App. Total	72.7	18.2	9.1	0		66.7	0	33.3	0		0	77.8	22.2	0		33.3	0	66.7	0		
PHF	.571	.500	.500	.000	.688	.500	.000	.250	.000	.750	.000	.875	.333	.000	.643	.625	.000	.625	.000	.750	.806



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

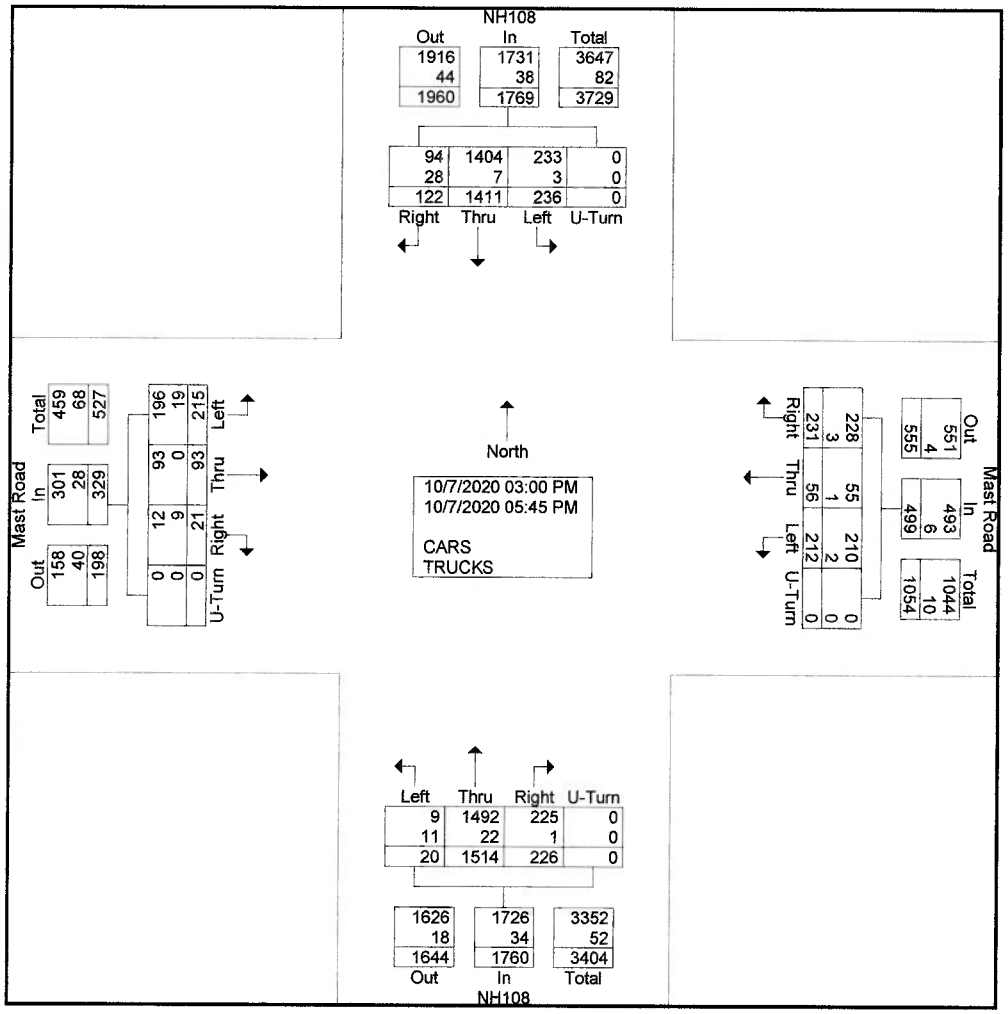
Groups Printed- CARS - TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	9	107	16	0	132	10	5	13	0	28	23	115	0	0	138	3	7	37	0	47	345
03:15 PM	22	102	19	0	143	22	7	23	0	52	19	130	3	0	152	1	5	10	0	16	363
03:30 PM	17	108	31	0	156	36	8	26	0	70	13	126	2	0	141	4	14	39	0	57	424
03:45 PM	17	125	28	0	170	14	2	14	0	30	20	146	1	0	167	3	4	22	0	29	396
Total	65	442	94	0	601	82	22	76	0	180	75	517	6	0	598	11	30	108	0	149	1528
04:00 PM	8	100	20	0	128	19	1	15	0	35	13	116	0	0	129	1	5	17	0	23	315
04:15 PM	7	127	16	0	150	14	4	15	0	33	22	119	3	0	144	3	11	12	0	26	353
04:30 PM	10	131	19	0	160	31	4	20	0	55	18	136	2	0	156	3	10	12	0	25	396
04:45 PM	10	143	21	0	174	15	5	21	0	41	18	115	2	0	135	0	9	20	0	29	379
Total	35	501	76	0	612	79	14	71	0	164	71	486	7	0	564	7	35	61	0	103	1443
05:00 PM	7	137	16	0	160	21	2	18	0	41	17	134	2	0	153	1	9	10	0	20	374
05:15 PM	5	118	21	0	144	21	10	18	0	49	18	139	2	0	159	1	7	14	0	22	374
05:30 PM	5	105	14	0	124	15	5	21	0	41	19	108	2	0	129	0	3	15	0	18	312
05:45 PM	5	108	15	0	128	13	3	8	0	24	26	130	1	0	157	1	9	7	0	17	326
Total	22	468	66	0	556	70	20	65	0	155	80	511	7	0	598	3	28	46	0	77	1386
Grand Total	122	1411	236	0	1769	231	56	212	0	499	226	1514	20	0	1760	21	93	215	0	329	4357
Apprch %	6.9	79.8	13.3	0		46.3	11.2	42.5	0		12.8	86	1.1	0		6.4	28.3	65.3	0		
Total %	2.8	32.4	5.4	0	40.6	5.3	1.3	4.9	0	11.5	5.2	34.7	0.5	0	40.4	0.5	2.1	4.9	0	7.6	
CARS	94	1404	233	0	1731	228	55	210	0	493	225	1492	9	0	1726	12	93	196	0	301	4251
% CARS	77	99.5	98.7	0	97.9	98.7	98.2	99.1	0	98.8	99.6	98.5	45	0	98.1	57.1	100	91.2	0	91.5	97.6
TRUCKS	28	7	3	0	38	3	1	2	0	6	1	22	11	0	34	9	0	19	0	28	106
% TRUCKS	23	0.5	1.3	0	2.1	1.3	1.8	0.9	0	1.2	0.4	1.5	55	0	1.9	42.9	0	8.8	0	8.5	2.4

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 2



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
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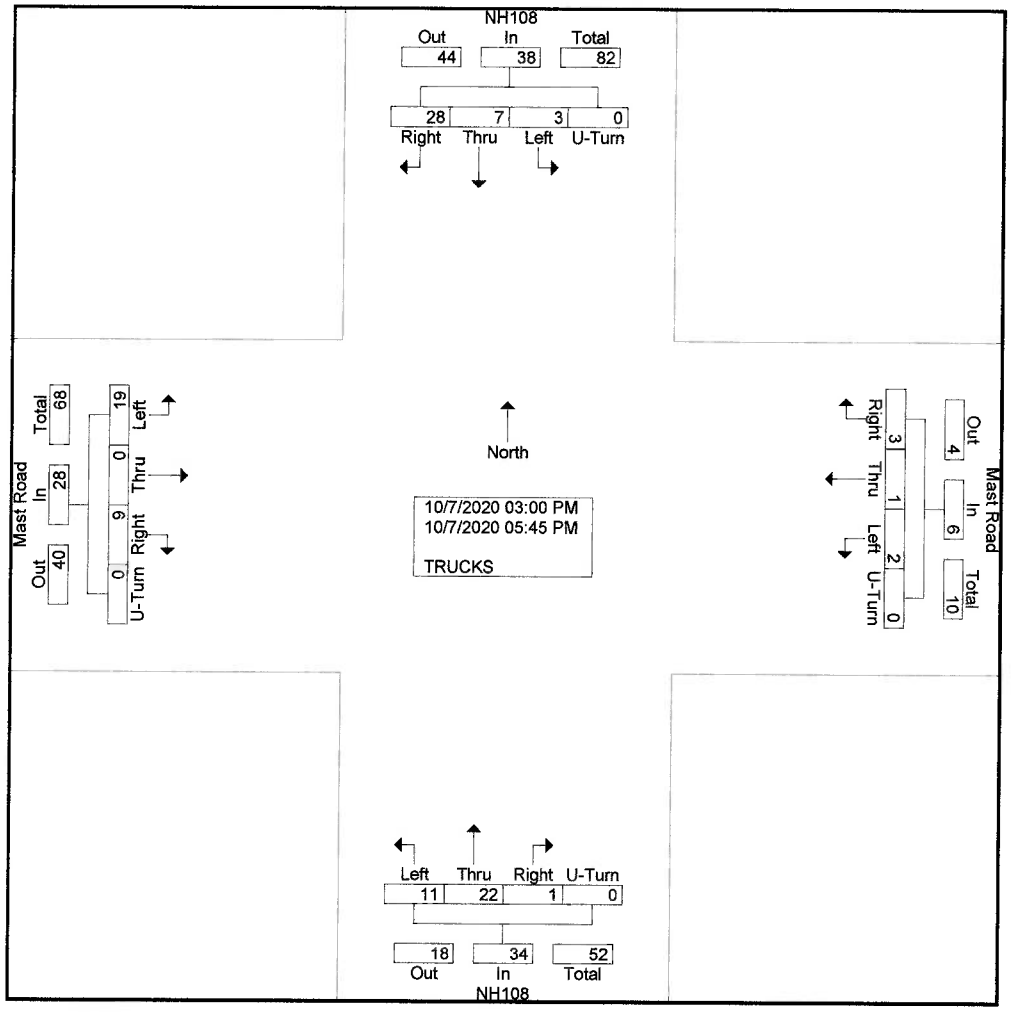
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT 4 Wed AM & PM
Site Code : 2037A
Start Date : 10/7/2020
Page No : 1

Groups Printed- TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	4	1	0	0	5	0	0	1	0	1	0	4	0	0	4	1	0	4	0	5	15
03:15 PM	4	0	1	0	5	1	0	0	0	1	0	4	3	0	7	1	0	4	0	5	18
03:30 PM	1	2	1	0	4	0	0	0	0	0	0	4	1	0	5	2	0	2	0	4	13
03:45 PM	7	1	0	0	8	1	0	0	0	1	0	2	0	0	2	1	0	0	0	1	12
Total	16	4	2	0	22	2	0	1	0	3	0	14	4	0	18	5	0	10	0	15	58
04:00 PM	3	0	0	0	3	1	0	1	0	2	0	3	0	0	3	1	0	1	0	2	10
04:15 PM	1	0	1	0	2	0	0	0	0	0	0	1	2	0	3	1	0	1	0	2	7
04:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	4	0	5	7
04:45 PM	2	1	0	0	3	0	1	0	0	1	0	1	2	0	3	0	0	0	0	0	7
Total	7	1	1	0	9	1	1	1	0	3	0	5	5	0	10	3	0	6	0	9	31
05:00 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
05:30 PM	1	1	0	0	2	0	0	0	0	0	1	3	1	0	5	0	0	2	0	2	9
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	2
Total	5	2	0	0	7	0	0	0	0	0	1	3	2	0	6	1	0	3	0	4	17
Grand Total	28	7	3	0	38	3	1	2	0	6	1	22	11	0	34	9	0	19	0	28	106
Apprch %	73.7	18.4	7.9	0		50	16.7	33.3	0		2.9	64.7	32.4	0		32.1	0	67.9	0		
Total %	26.4	6.6	2.8	0	35.8	2.8	0.9	1.9	0	5.7	0.9	20.8	10.4	0	32.1	8.5	0	17.9	0	26.4	

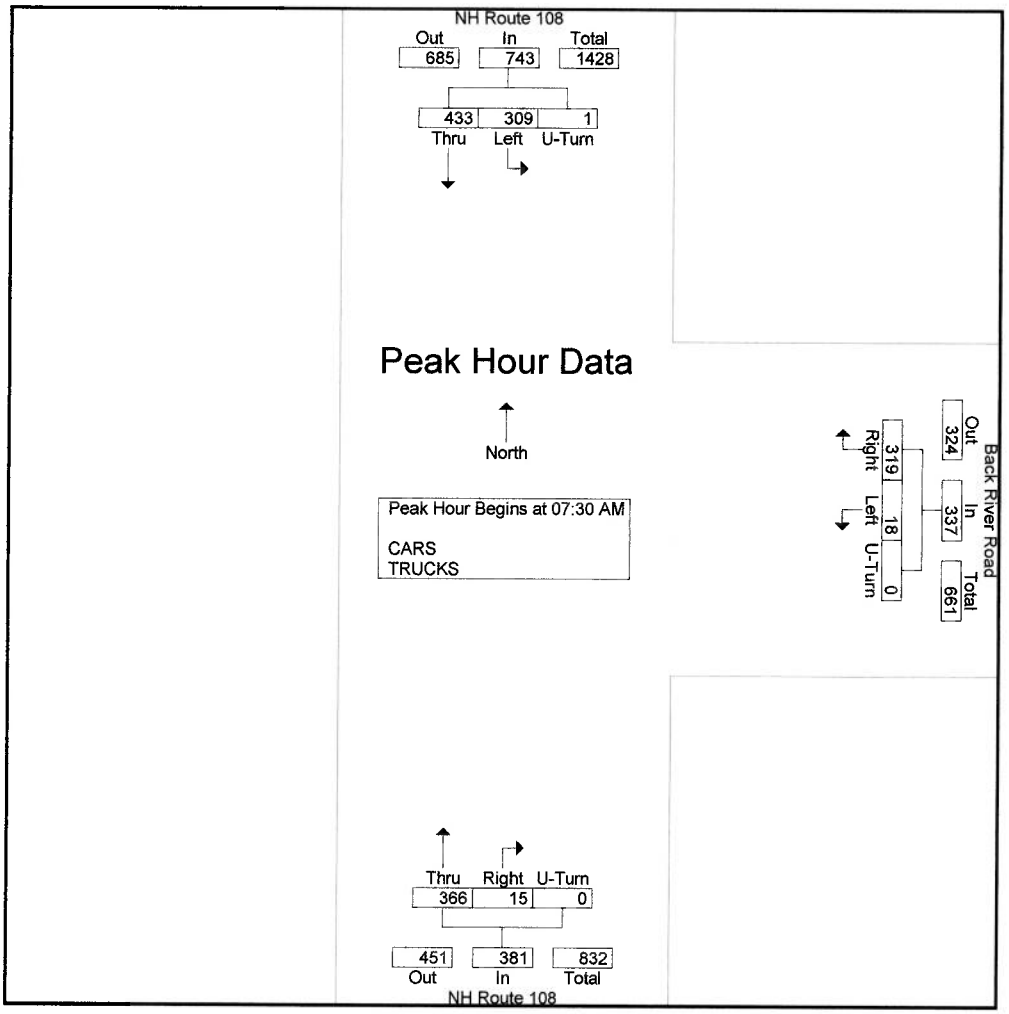


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**125**	99	0	224	68	**8**	0	76	3	90	0	93	393
07:45 AM	124	**109**	0	**233**	**95**	2	0	**97**	1	79	0	80	**410**
08:00 AM	100	61	**1**	162	91	4	0	95	**7**	98	0	**105**	362
08:15 AM	84	40	0	124	65	4	0	69	4	**99**	0	103	296
Total Volume	433	309	1	743	319	18	0	337	15	366	0	381	1461
% App. Total	58.3	41.6	0.1		94.7	5.3	0		3.9	96.1	0		
PHF	.866	.709	.250	.797	.839	.563	.000	.869	.536	.924	.000	.907	.891

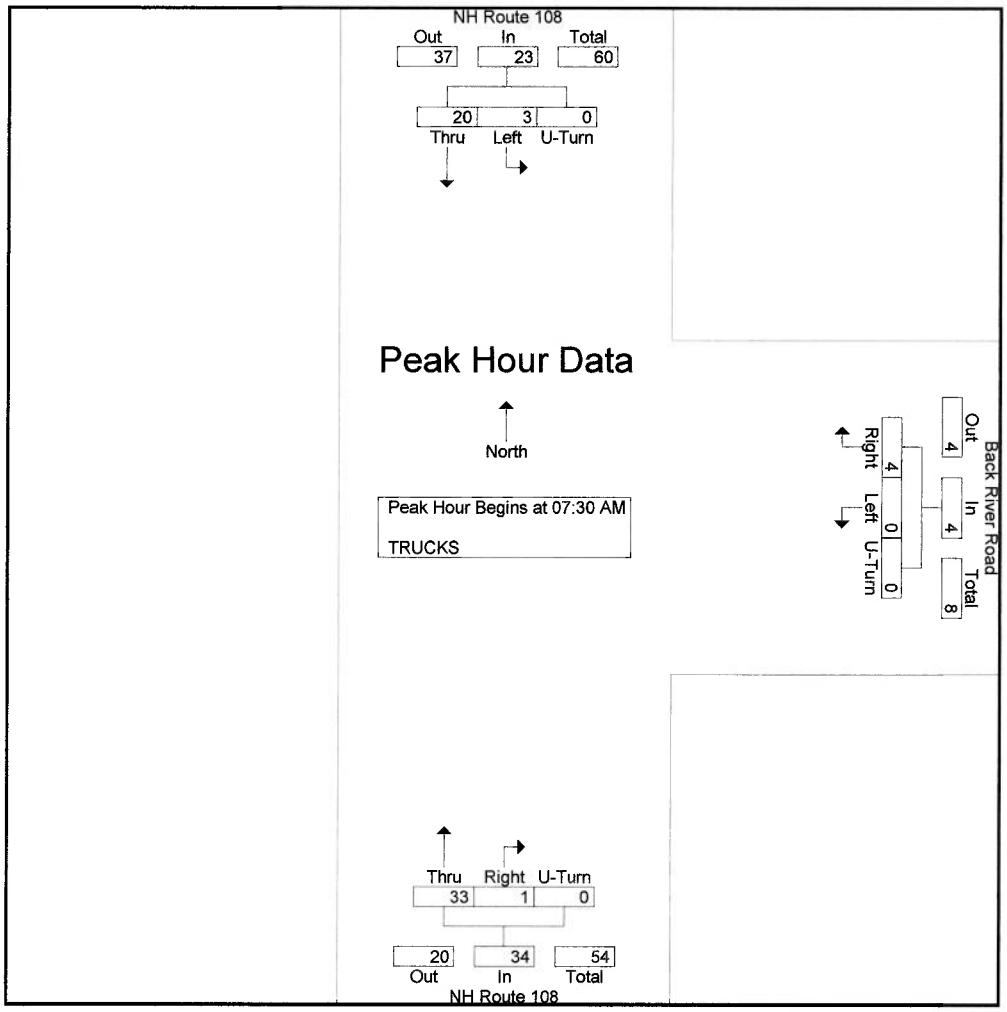


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**8**	1	0	**9**	**2**	0	0	**2**	**1**	8	0	**9**	**20**
07:45 AM	5	**2**	0	7	1	0	0	1	0	**9**	0	9	17
08:00 AM	5	0	0	5	1	0	0	1	0	8	0	8	14
08:15 AM	2	0	0	2	0	0	0	0	0	8	0	8	10
Total Volume	20	3	0	23	4	0	0	4	1	33	0	34	61
% App. Total	87	13	0		100	0	0		2.9	97.1	0		
PHF	.625	.375	.000	.639	.500	.000	.000	.500	.250	.917	.000	.944	.763



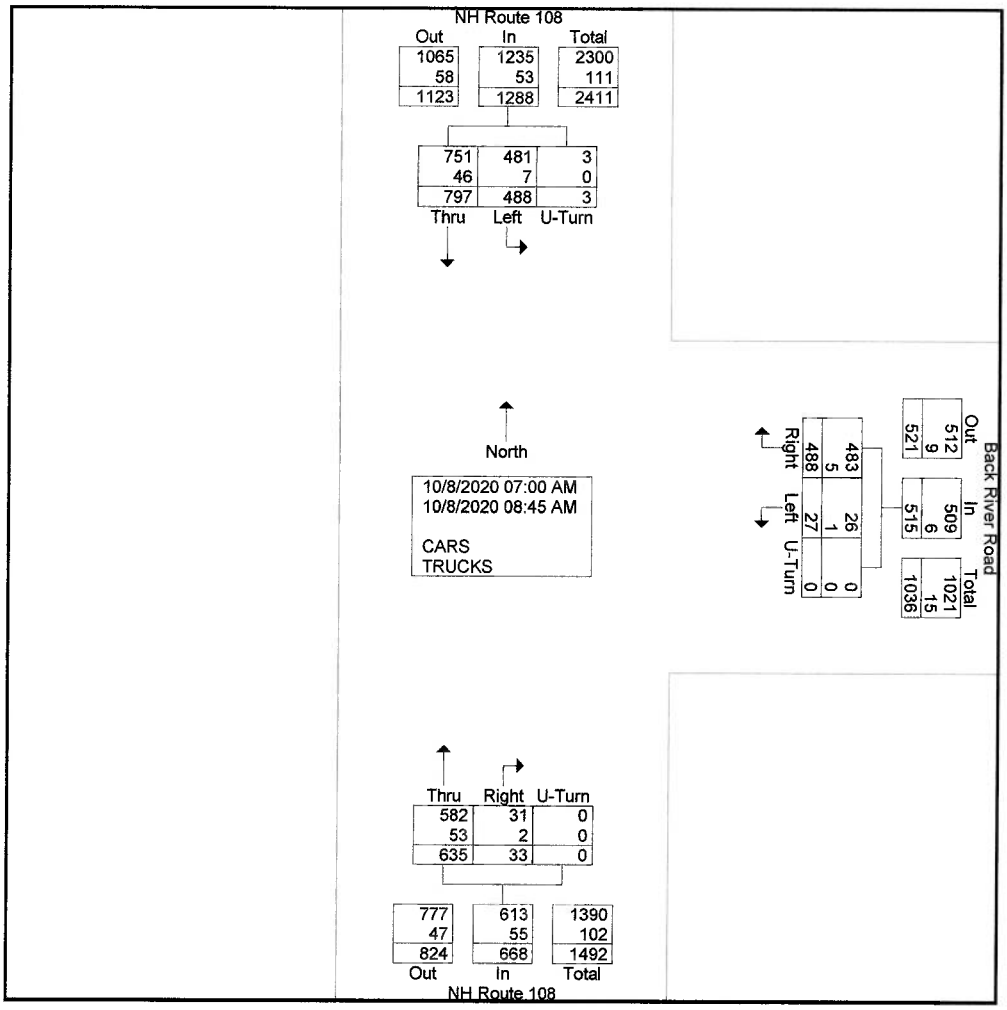
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	90	31	0	121	36	4	0	40	5	57	0	62	223
07:15 AM	84	59	2	145	65	1	0	66	7	65	0	72	283
07:30 AM	125	99	0	224	68	8	0	76	3	90	0	93	393
07:45 AM	124	109	0	233	95	2	0	97	1	79	0	80	410
Total	423	298	2	723	264	15	0	279	16	291	0	307	1309
08:00 AM	100	61	1	162	91	4	0	95	7	98	0	105	362
08:15 AM	84	40	0	124	65	4	0	69	4	99	0	103	296
08:30 AM	82	40	0	122	35	2	0	37	3	72	0	75	234
08:45 AM	108	49	0	157	33	2	0	35	3	75	0	78	270
Total	374	190	1	565	224	12	0	236	17	344	0	361	1162
Grand Total	797	488	3	1288	488	27	0	515	33	635	0	668	2471
Apprch %	61.9	37.9	0.2		94.8	5.2	0		4.9	95.1	0		
Total %	32.3	19.7	0.1	52.1	19.7	1.1	0	20.8	1.3	25.7	0	27	
CARS	751	481	3	1235	483	26	0	509	31	582	0	613	2357
% CARS	94.2	98.6	100	95.9	99	96.3	0	98.8	93.9	91.7	0	91.8	95.4
TRUCKS	46	7	0	53	5	1	0	6	2	53	0	55	114
% TRUCKS	5.8	1.4	0	4.1	1	3.7	0	1.2	6.1	8.3	0	8.2	4.6



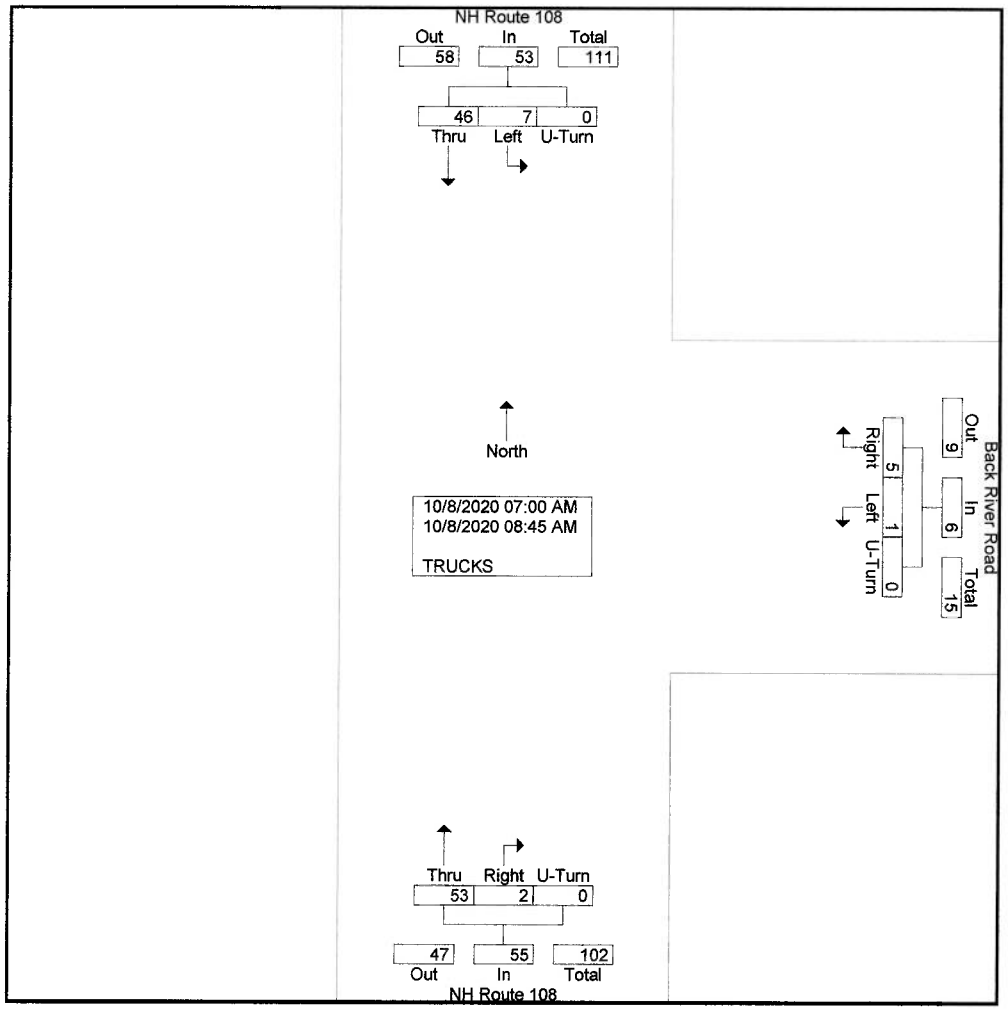
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	4	0	0	4	1	0	0	1	1	4	0	5	10
07:15 AM	6	2	0	8	0	0	0	0	0	7	0	7	15
07:30 AM	8	1	0	9	2	0	0	2	1	8	0	9	20
07:45 AM	5	2	0	7	1	0	0	1	0	9	0	9	17
Total	23	5	0	28	4	0	0	4	2	28	0	30	62
08:00 AM	5	0	0	5	1	0	0	1	0	8	0	8	14
08:15 AM	2	0	0	2	0	0	0	0	0	8	0	8	10
08:30 AM	7	1	0	8	0	1	0	1	0	6	0	6	15
08:45 AM	9	1	0	10	0	0	0	0	0	3	0	3	13
Total	23	2	0	25	1	1	0	2	0	25	0	25	52
Grand Total	46	7	0	53	5	1	0	6	2	53	0	55	114
Apprch %	86.8	13.2	0		83.3	16.7	0		3.6	96.4	0		
Total %	40.4	6.1	0	46.5	4.4	0.9	0	5.3	1.8	46.5	0	48.2	

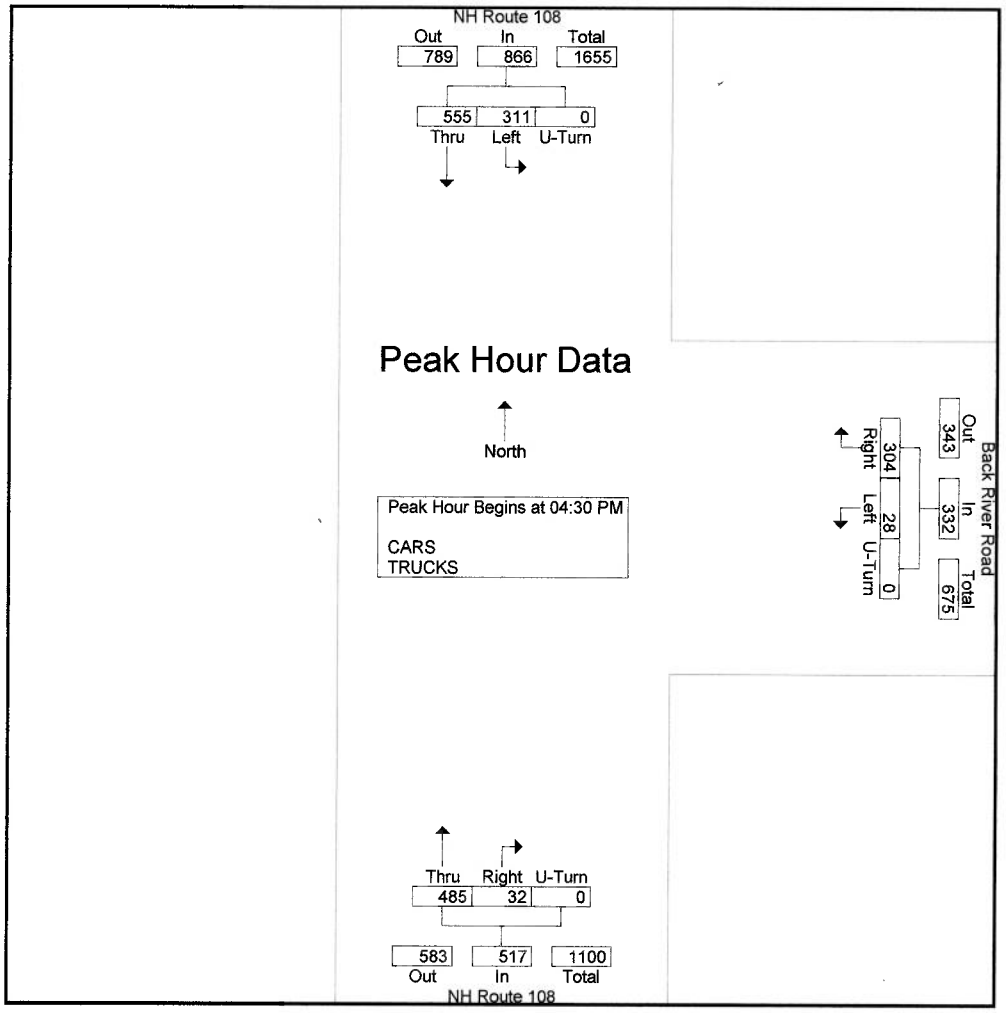


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 3

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	137	67	0	204	63	4	0	67	6	123	0	129	400
04:45 PM	**155**	**86**	0	**241**	67	6	0	73	7	**127**	0	134	**448**
05:00 PM	129	77	0	206	81	6	0	87	**12**	124	0	**136**	429
05:15 PM	134	81	0	215	**93**	**12**	0	**105**	7	111	0	118	438
Total Volume	555	311	0	866	304	28	0	332	32	485	0	517	1715
% App. Total	64.1	35.9	0		91.6	8.4	0		6.2	93.8	0		
PHF	.895	.904	.000	.898	.817	.583	.000	.790	.667	.955	.000	.950	.957

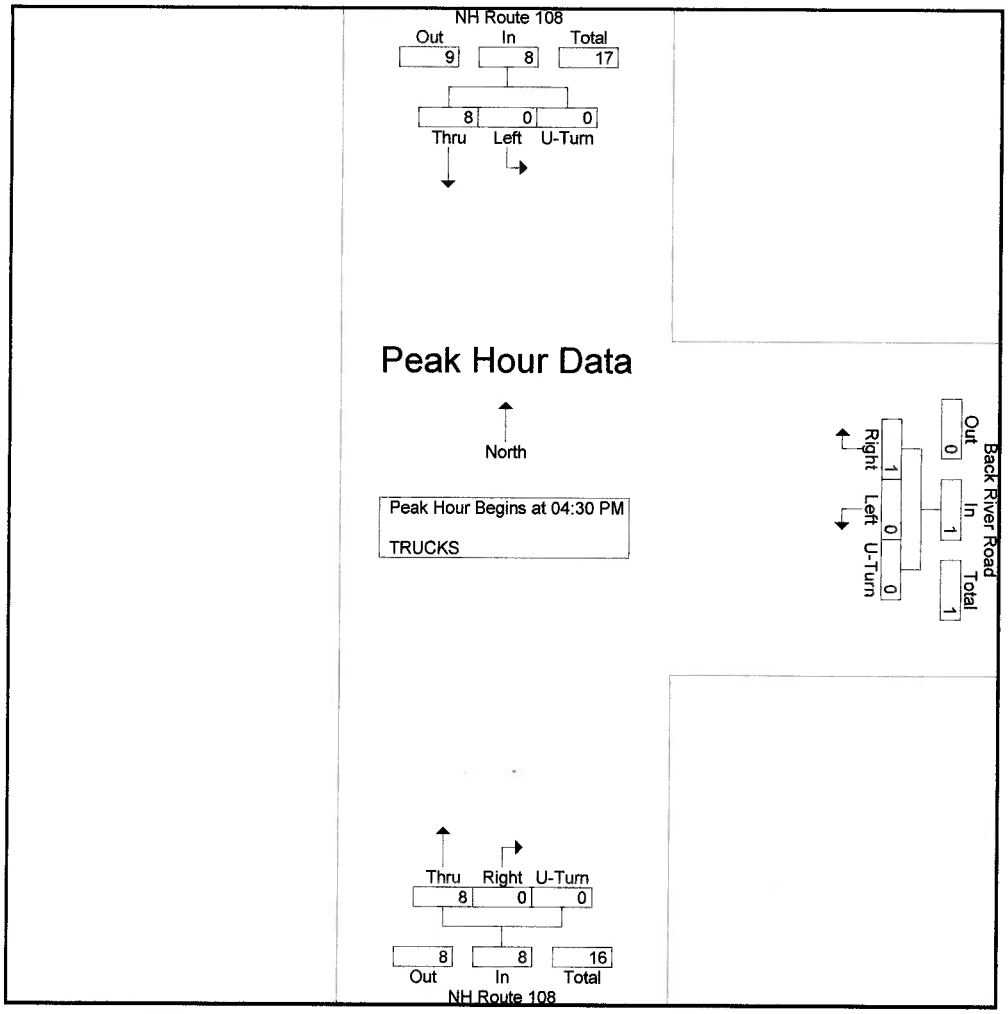


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	1	0	0	1	0	0	0	0	0	**4**	0	**4**	5
04:45 PM	2	0	0	2	0	0	0	0	0	2	0	2	4
05:00 PM	**4**	0	0	**4**	**1**	0	0	**1**	0	1	0	1	**6**
05:15 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total Volume	8	0	0	8	1	0	0	1	0	8	0	8	17
% App. Total	100	0	0		100	0	0		0	100	0		
PHF	.500	.000	.000	.500	.250	.000	.000	.250	.000	.500	.000	.500	.708



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Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	97	99	1	197	51	3	0	54	7	114	0	121	372
03:15 PM	127	59	0	186	78	7	0	85	5	101	0	106	377
03:30 PM	147	75	0	222	85	3	0	88	12	138	0	150	460
03:45 PM	116	54	0	170	67	10	0	77	7	162	0	169	416
Total	487	287	1	775	281	23	0	304	31	515	0	546	1625
04:00 PM	120	65	1	186	60	6	0	66	9	109	0	118	370
04:15 PM	143	60	0	203	60	10	0	70	7	105	0	112	385
04:30 PM	137	67	0	204	63	4	0	67	6	123	0	129	400
04:45 PM	155	86	0	241	67	6	0	73	7	127	0	134	448
Total	555	278	1	834	250	26	0	276	29	464	0	493	1603
05:00 PM	129	77	0	206	81	6	0	87	12	124	0	136	429
05:15 PM	134	81	0	215	93	12	0	105	7	111	0	118	438
05:30 PM	105	60	0	165	55	4	0	59	5	134	0	139	363
05:45 PM	96	60	0	156	66	6	0	72	6	116	0	122	350
Total	464	278	0	742	295	28	0	323	30	485	0	515	1580
Grand Total	1506	843	2	2351	826	77	0	903	90	1464	0	1554	4808
Apprch %	64.1	35.9	0.1		91.5	8.5	0		5.8	94.2	0		
Total %	31.3	17.5	0	48.9	17.2	1.6	0	18.8	1.9	30.4	0	32.3	
CARS	1466	839	2	2307	821	77	0	898	89	1438	0	1527	4732
% CARS	97.3	99.5	100	98.1	99.4	100	0	99.4	98.9	98.2	0	98.3	98.4
TRUCKS	40	4	0	44	5	0	0	5	1	26	0	27	76
% TRUCKS	2.7	0.5	0	1.9	0.6	0	0	0.6	1.1	1.8	0	1.7	1.6

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
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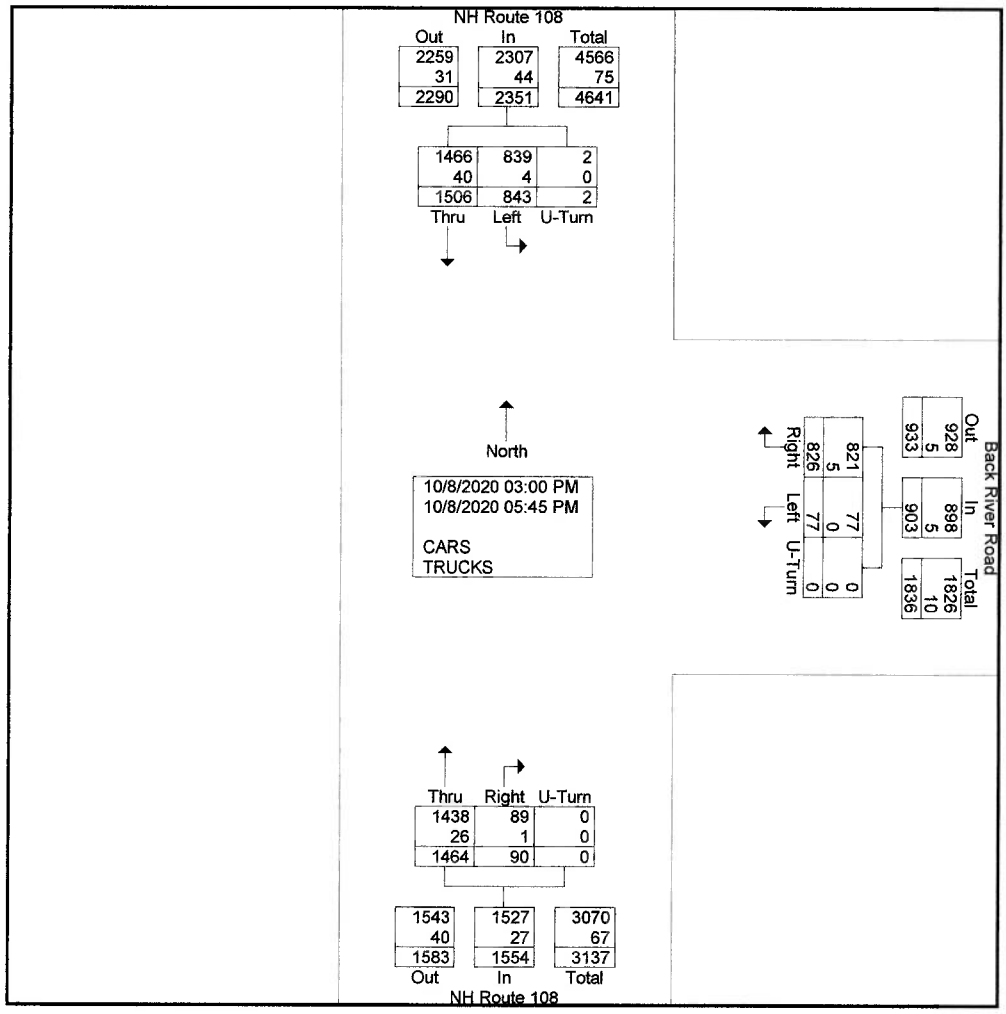


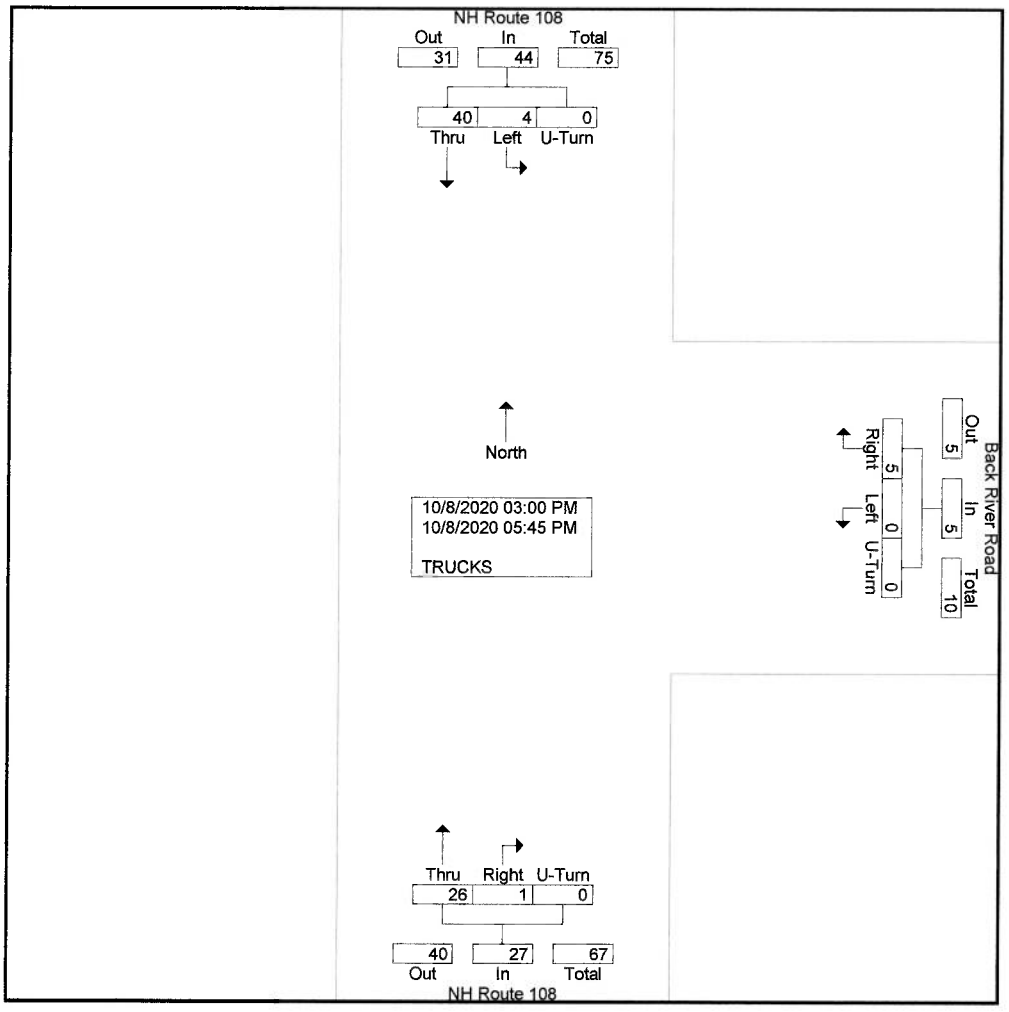
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Back_River_INT 1 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	NH Route 108 From North				Back River Road From East				NH Route 108 From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	6	0	0	6	2	0	0	2	1	3	0	4	12
03:15 PM	5	1	0	6	0	0	0	0	0	2	0	2	8
03:30 PM	9	1	0	10	1	0	0	1	0	2	0	2	13
03:45 PM	1	0	0	1	1	0	0	1	0	7	0	7	9
Total	21	2	0	23	4	0	0	4	1	14	0	15	42
04:00 PM	3	1	0	4	0	0	0	0	0	2	0	2	6
04:15 PM	6	1	0	7	0	0	0	0	0	0	0	0	7
04:30 PM	1	0	0	1	0	0	0	0	0	4	0	4	5
04:45 PM	2	0	0	2	0	0	0	0	0	2	0	2	4
Total	12	2	0	14	0	0	0	0	0	8	0	8	22
05:00 PM	4	0	0	4	1	0	0	1	0	1	0	1	6
05:15 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
05:30 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	7	0	0	7	1	0	0	1	0	4	0	4	12
Grand Total	40	4	0	44	5	0	0	5	1	26	0	27	76
Apprch %	90.9	9.1	0		100	0	0		3.7	96.3	0		
Total %	52.6	5.3	0	57.9	6.6	0	0	6.6	1.3	34.2	0	35.5	



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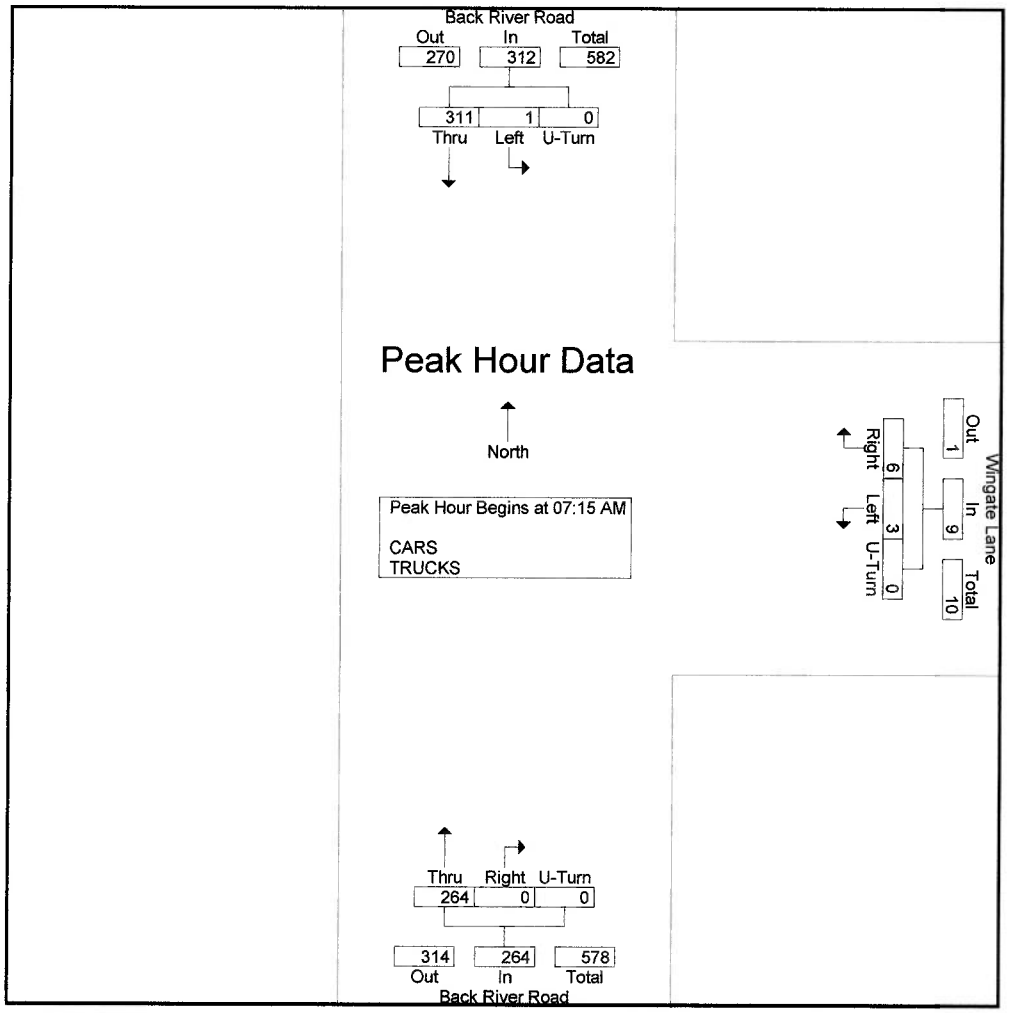
Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~ Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	57	**1**	0	58	**2**	0	0	2	0	49	0	49	109
07:30 AM	91	0	0	91	2	**2**	0	**4**	0	62	0	62	157
07:45 AM	**100**	0	0	**100**	2	0	0	2	0	**79**	0	**79**	**181**
08:00 AM	63	0	0	63	0	1	0	1	0	74	0	74	138
Total Volume	311	1	0	312	6	3	0	9	0	264	0	264	585
% App. Total	99.7	0.3	0		66.7	33.3	0		0	100	0		
PHF	.778	.250	.000	.780	.750	.375	.000	.563	.000	.835	.000	.835	.808

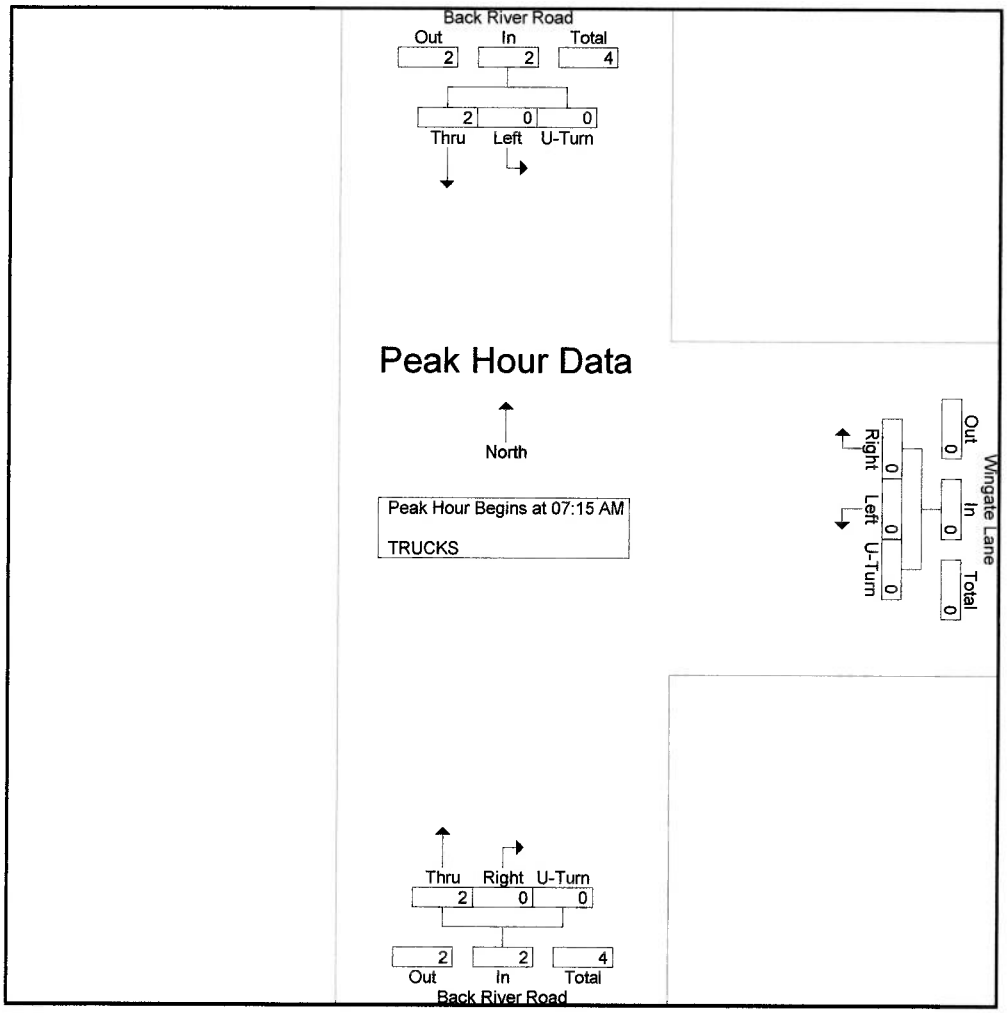


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~Thu_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	**1**	0	0	**1**	0	0	0	0	0	**1**	0	**1**	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	2	0	0	2	0	0	0	0	0	2	0	2	4
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.500	.000	.500	.500



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

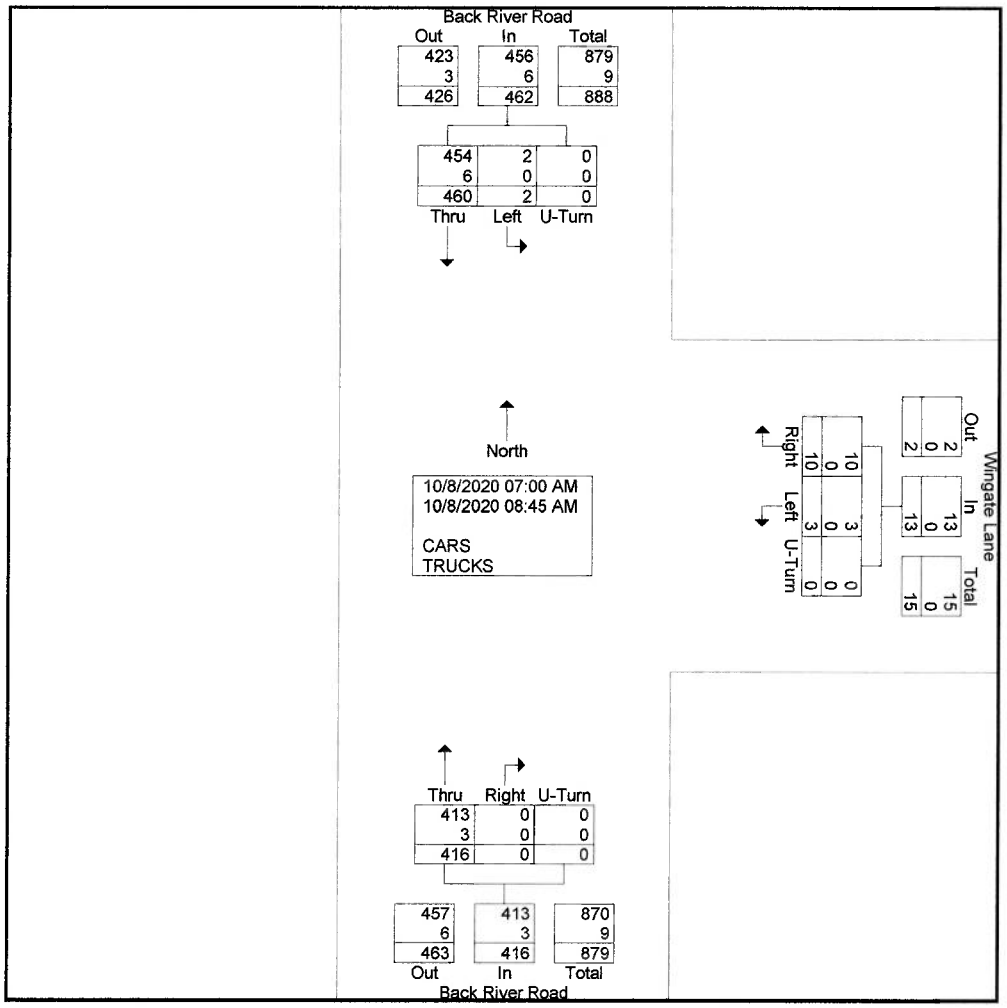
Thurs

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	29	0	0	29	1	0	0	1	0	38	0	38	68
07:15 AM	57	1	0	58	2	0	0	2	0	49	0	49	109
07:30 AM	91	0	0	91	2	2	0	4	0	62	0	62	157
07:45 AM	100	0	0	100	2	0	0	2	0	79	0	79	181
Total	277	1	0	278	7	2	0	9	0	228	0	228	515
08:00 AM	63	0	0	63	0	1	0	1	0	74	0	74	138
08:15 AM	34	1	0	35	0	0	0	0	0	55	0	55	90
08:30 AM	38	0	0	38	3	0	0	3	0	29	0	29	70
08:45 AM	48	0	0	48	0	0	0	0	0	30	0	30	78
Total	183	1	0	184	3	1	0	4	0	188	0	188	376
Grand Total	460	2	0	462	10	3	0	13	0	416	0	416	891
Apprch %	99.6	0.4	0		76.9	23.1	0		0	100	0		
Total %	51.6	0.2	0	51.9	1.1	0.3	0	1.5	0	46.7	0	46.7	
CARS	454	2	0	456	10	3	0	13	0	413	0	413	882
% CARS	98.7	100	0	98.7	100	100	0	100	0	99.3	0	99.3	99
TRUCKS	6	0	0	6	0	0	0	0	0	3	0	3	9
% TRUCKS	1.3	0	0	1.3	0	0	0	0	0	0.7	0	0.7	1



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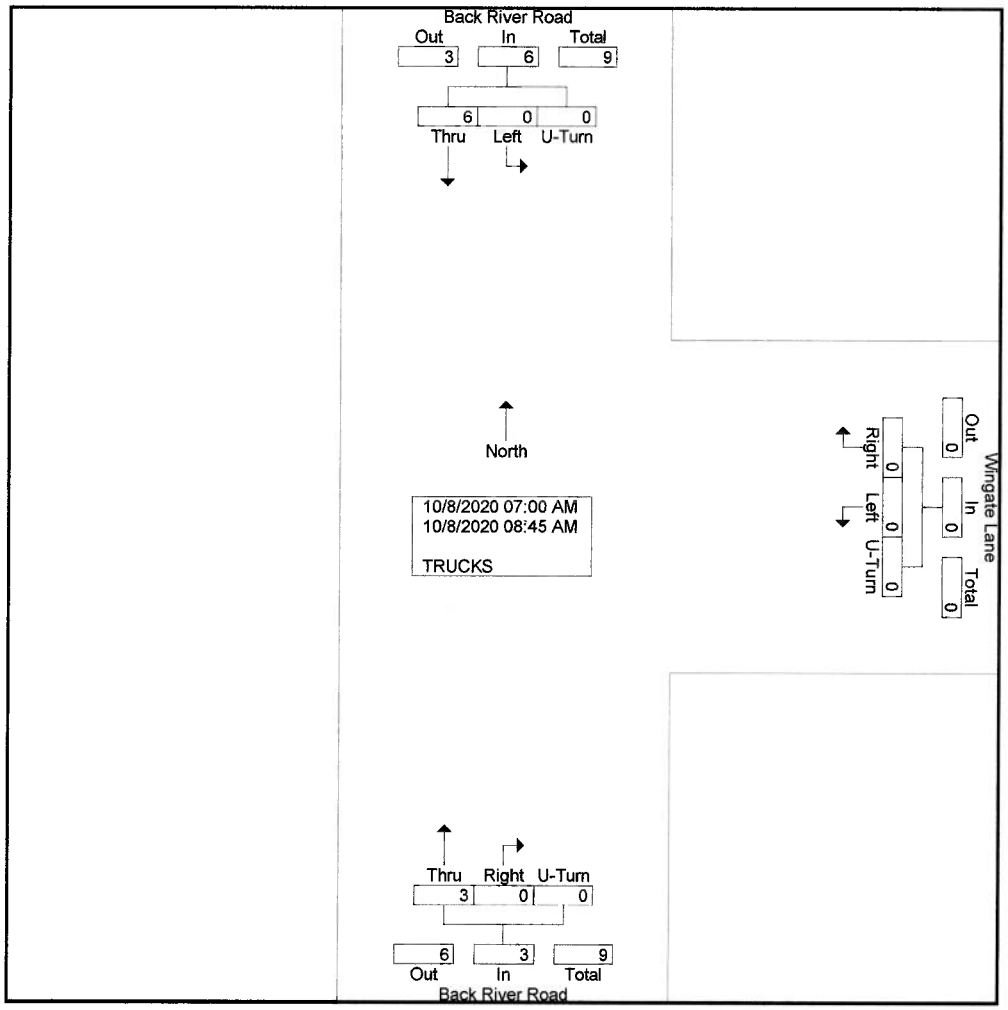
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~ Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	2	0	0	2	0	0	0	0	0	1	0	1	3
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
08:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
08:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total	4	0	0	4	0	0	0	0	0	2	0	2	6
Grand Total	6	0	0	6	0	0	0	0	0	3	0	3	9
Apprch %	100	0	0		0	0	0		0	100	0		
Total %	66.7	0	0	66.7	0	0	0	0	0	33.3	0	33.3	



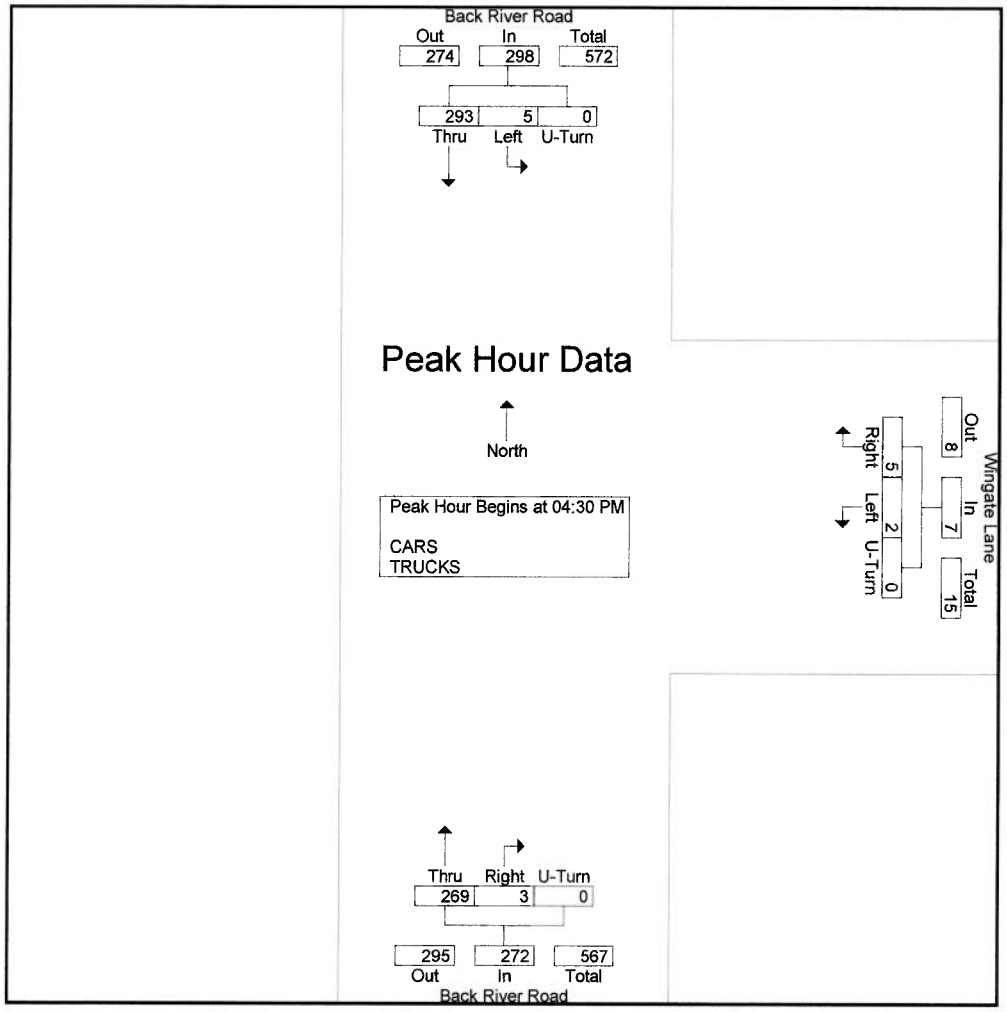
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Thurs

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 3

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	72	1	0	73	1	0	0	1	0	51	0	51	125
04:45 PM	**78**	1	0	**79**	0	0	0	0	0	64	0	64	143
05:00 PM	75	1	0	76	**3**	0	0	**3**	**2**	71	0	73	152
05:15 PM	68	**2**	0	70	1	**2**	0	3	1	**83**	0	**84**	**157**
Total Volume	293	5	0	298	5	2	0	7	3	269	0	272	577
% App. Total	98.3	1.7	0		71.4	28.6	0		1.1	98.9	0		
PHF	.939	.625	.000	.943	.417	.250	.000	.583	.375	.810	.000	.810	.919



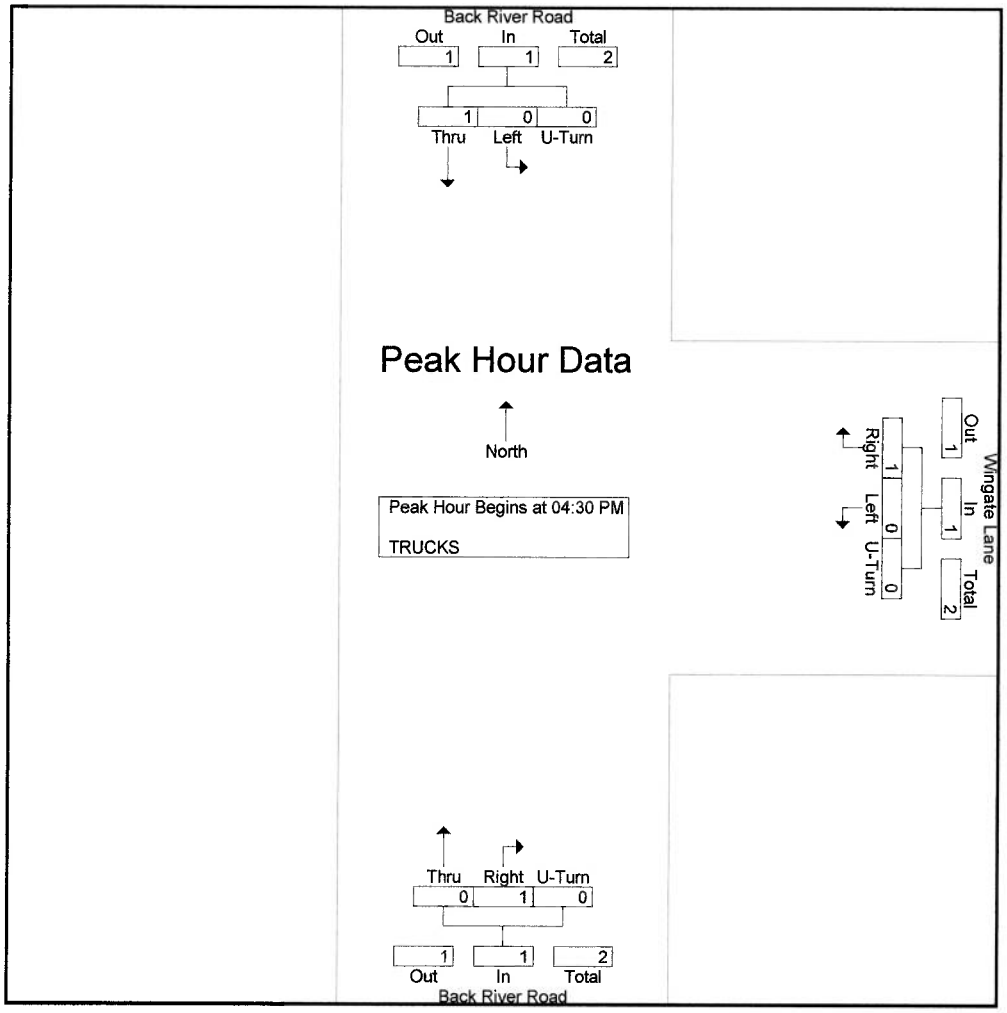
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Thurs

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	**1**	0	0	**1**	**1**	0	0	**1**	**2**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	1	0	0	1	1	0	0	1	3
% App. Total	100	0	0		100	0	0		100	0	0		
PHF	.250	.000	.000	.250	.250	.000	.000	.250	.250	.000	.000	.250	.375



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
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Thurs

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

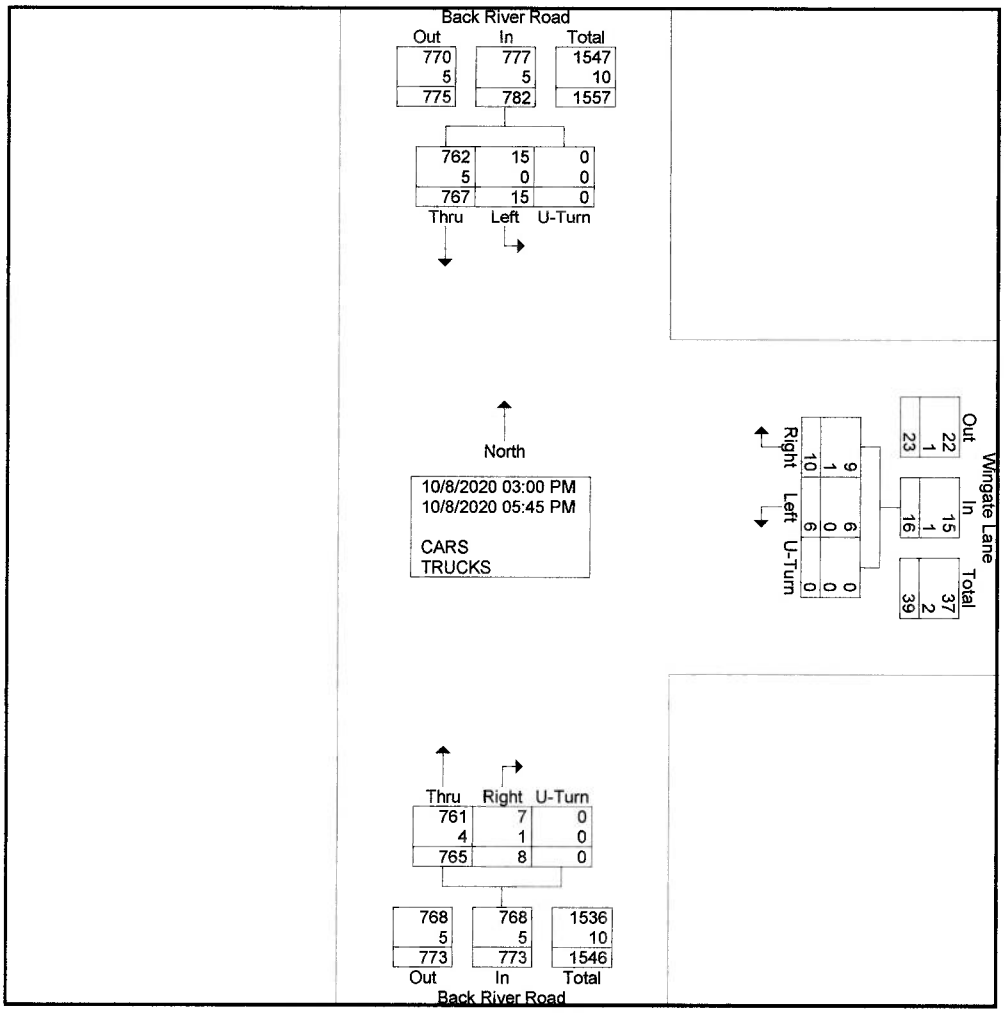
	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	96	5	0	101	0	0	0	0	0	50	0	50	151
03:15 PM	55	0	0	55	2	0	0	2	2	83	0	85	142
03:30 PM	69	2	0	71	0	2	0	2	0	86	0	86	159
03:45 PM	52	0	0	52	0	0	0	0	0	59	0	59	111
Total	272	7	0	279	2	2	0	4	2	278	0	280	563
04:00 PM	50	1	0	51	1	0	0	1	0	59	0	59	111
04:15 PM	51	0	0	51	0	2	0	2	3	60	0	63	116
04:30 PM	72	1	0	73	1	0	0	1	0	51	0	51	125
04:45 PM	78	1	0	79	0	0	0	0	0	64	0	64	143
Total	251	3	0	254	2	2	0	4	3	234	0	237	495
05:00 PM	75	1	0	76	3	0	0	3	2	71	0	73	152
05:15 PM	68	2	0	70	1	2	0	3	1	83	0	84	157
05:30 PM	55	2	0	57	1	0	0	1	0	51	0	51	109
05:45 PM	46	0	0	46	1	0	0	1	0	48	0	48	95
Total	244	5	0	249	6	2	0	8	3	253	0	256	513
Grand Total	767	15	0	782	10	6	0	16	8	765	0	773	1571
Apprch %	98.1	1.9	0		62.5	37.5	0		1	99	0		
Total %	48.8	1	0	49.8	0.6	0.4	0	1	0.5	48.7	0	49.2	
CARS	762	15	0	777	9	6	0	15	7	761	0	768	1560
% CARS	99.3	100	0	99.4	90	100	0	93.8	87.5	99.5	0	99.4	99.3
TRUCKS	5	0	0	5	1	0	0	1	1	4	0	5	11
% TRUCKS	0.7	0	0	0.6	10	0	0	6.2	12.5	0.5	0	0.6	0.7

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Thurs

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_Wed_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2



Stephen G. Pernaw & Company, Inc.
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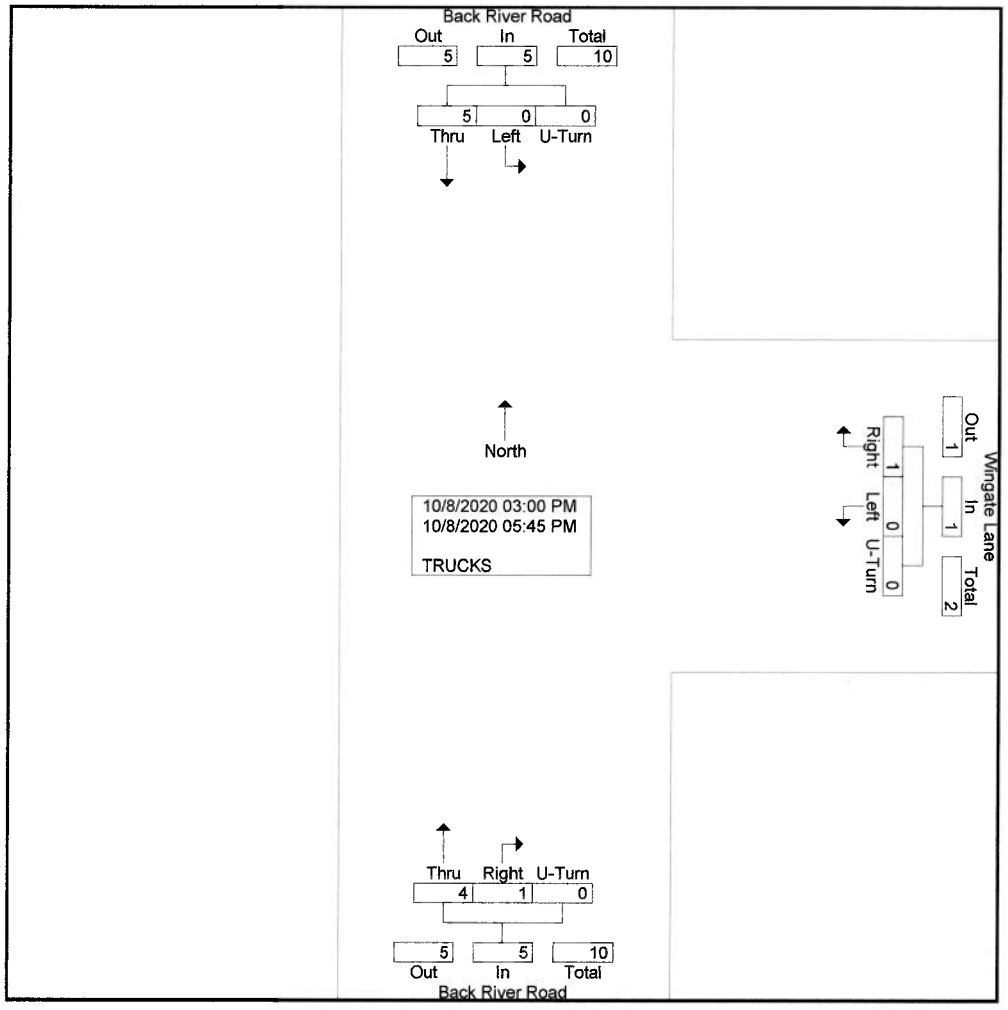
Thurs

Weather: Clear
Collected By: MV
Job Number: 2050A
Town/State: Dover, NH

File Name : 2037A_INT_2_~~Wed~~_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North				Wingate Lane From East				Back River Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
03:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
03:30 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
03:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	2	0	0	2	0	0	0	0	0	4	0	4	6
04:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	1	0	0	1	1	0	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	1	0	0	1	1	0	0	1	3
Grand Total	5	0	0	5	1	0	0	1	1	4	0	5	11
Apprch %	100	0	0		100	0	0		20	80	0		
Total %	45.5	0	0	45.5	9.1	0	0	9.1	9.1	36.4	0	45.5	

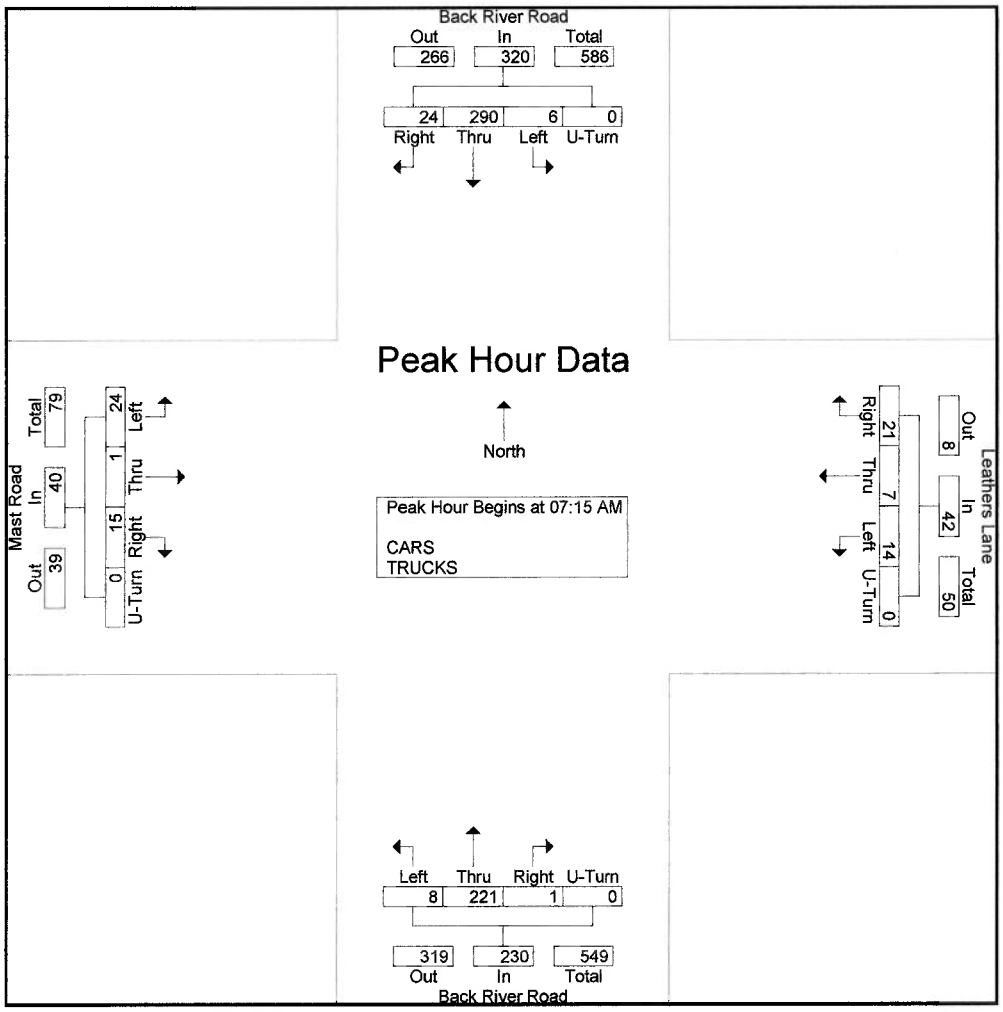


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	3	54	2	0	59	**6**	**3**	1	0	10	0	40	2	0	42	5	0	4	0	9	120
07:30 AM	6	86	0	0	92	4	2	**8**	0	**14**	0	49	**3**	0	52	2	**1**	8	0	11	169
07:45 AM	**9**	**91**	1	0	**101**	6	1	3	0	10	0	64	2	0	66	**7**	0	**9**	0	**16**	**193**
08:00 AM	6	59	**3**	0	68	5	1	2	0	8	**1**	**68**	1	0	**70**	1	0	3	0	4	150
Total Volume	24	290	6	0	320	21	7	14	0	42	1	221	8	0	230	15	1	24	0	40	632
% App. Total	7.5	90.6	1.9	0		50	16.7	33.3	0		0.4	96.1	3.5	0		37.5	2.5	60	0		
PHF	.667	.797	.500	.000	.792	.875	.583	.438	.000	.750	.250	.813	.667	.000	.821	.536	.250	.667	.000	.625	.819



Stephen G. Pernaw & Company, Inc.
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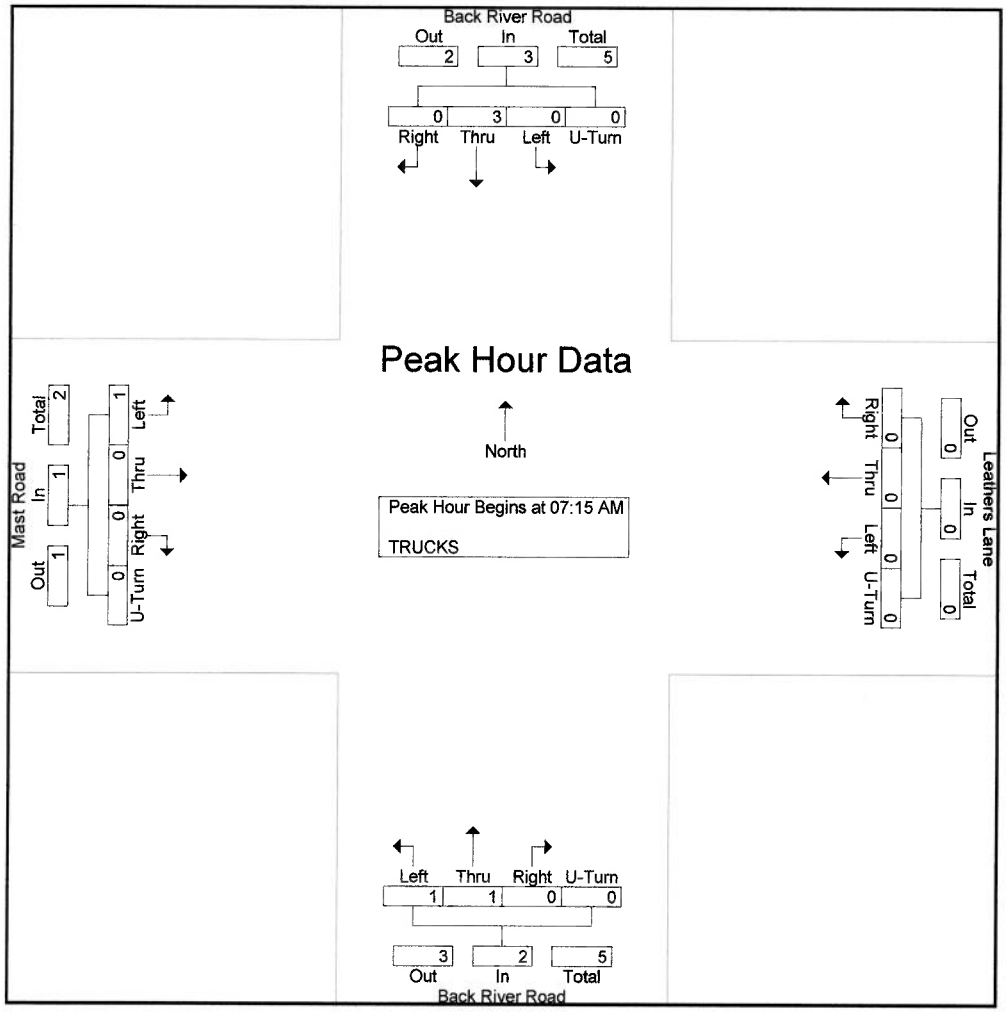
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	**2**	0	0	**2**	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	**3**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	1
Total Volume	0	3	0	0	3	0	0	0	0	0	0	1	1	0	2	0	0	1	0	1	6
% App. Total	0	100	0	0		0	0	0	0		0	50	50	0		0	0	100	0		
PHF	.000	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.250	.250	.000	.500	.000	.000	.250	.000	.250	.500



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
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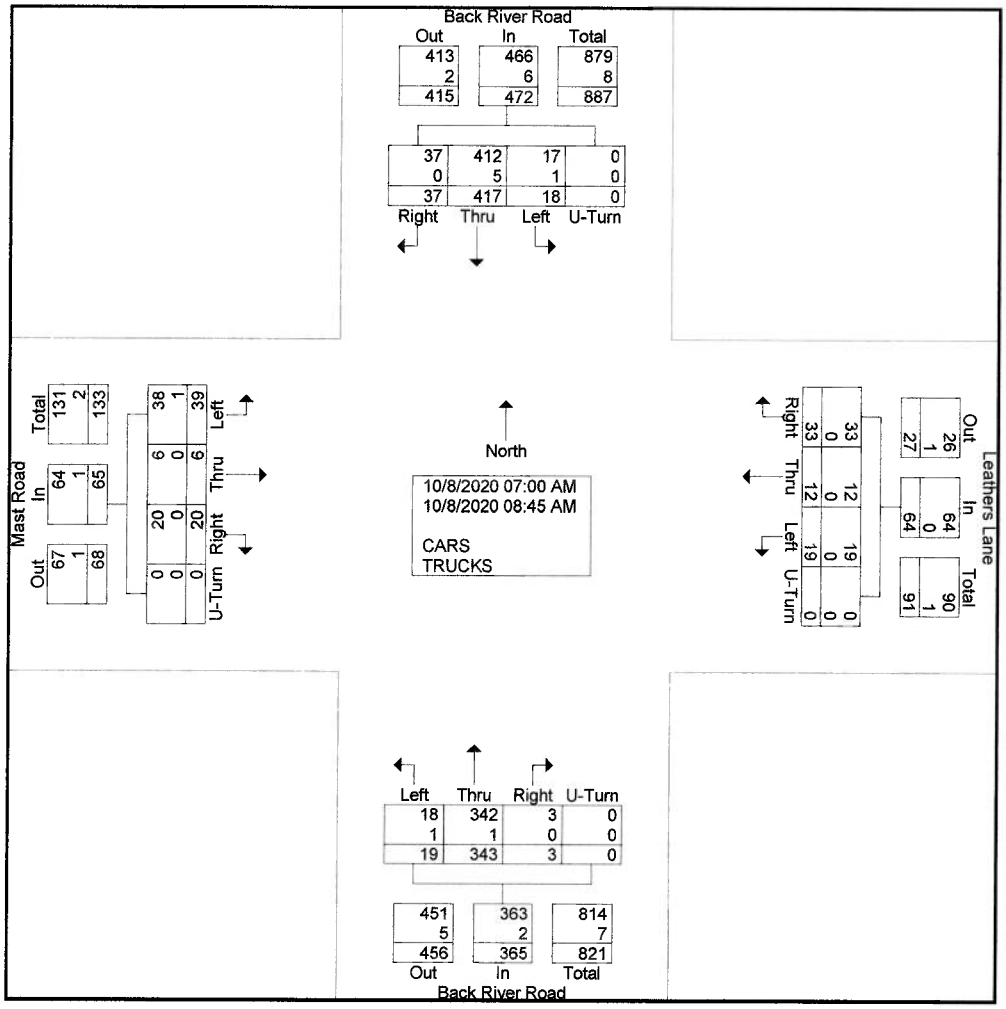
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	26	1	0	28	3	0	3	0	6	0	29	3	0	32	0	2	5	0	7	73
07:15 AM	3	54	2	0	59	6	3	1	0	10	0	40	2	0	42	5	0	4	0	9	120
07:30 AM	6	86	0	0	92	4	2	8	0	14	0	49	3	0	52	2	1	8	0	11	169
07:45 AM	9	91	1	0	101	6	1	3	0	10	0	64	2	0	66	7	0	9	0	16	193
Total	19	257	4	0	280	19	6	15	0	40	0	182	10	0	192	14	3	26	0	43	555
08:00 AM	6	59	3	0	68	5	1	2	0	8	1	68	1	0	70	1	0	3	0	4	150
08:15 AM	5	27	4	0	36	4	3	2	0	9	0	47	3	0	50	3	1	4	0	8	103
08:30 AM	6	35	2	0	43	3	1	0	0	4	2	22	1	0	25	2	1	3	0	6	78
08:45 AM	1	39	5	0	45	2	1	0	0	3	0	24	4	0	28	0	1	3	0	4	80
Total	18	160	14	0	192	14	6	4	0	24	3	161	9	0	173	6	3	13	0	22	411
Grand Total	37	417	18	0	472	33	12	19	0	64	3	343	19	0	365	20	6	39	0	65	966
Apprch %	7.8	88.3	3.8	0		51.6	18.8	29.7	0		0.8	94	5.2	0		30.8	9.2	60	0		
Total %	3.8	43.2	1.9	0	48.9	3.4	1.2	2	0	6.6	0.3	35.5	2	0	37.8	2.1	0.6	4	0	6.7	
CARS	37	412	17	0	466	33	12	19	0	64	3	342	18	0	363	20	6	38	0	64	957
% CARS	100	98.8	94.4	0	98.7	100	100	100	0	100	100	99.7	94.7	0	99.5	100	100	97.4	0	98.5	99.1
TRUCKS	0	5	1	0	6	0	0	0	0	0	0	1	1	0	2	0	0	1	0	1	9
% TRUCKS	0	1.2	5.6	0	1.3	0	0	0	0	0	0	0.3	5.3	0	0.5	0	0	2.6	0	1.5	0.9



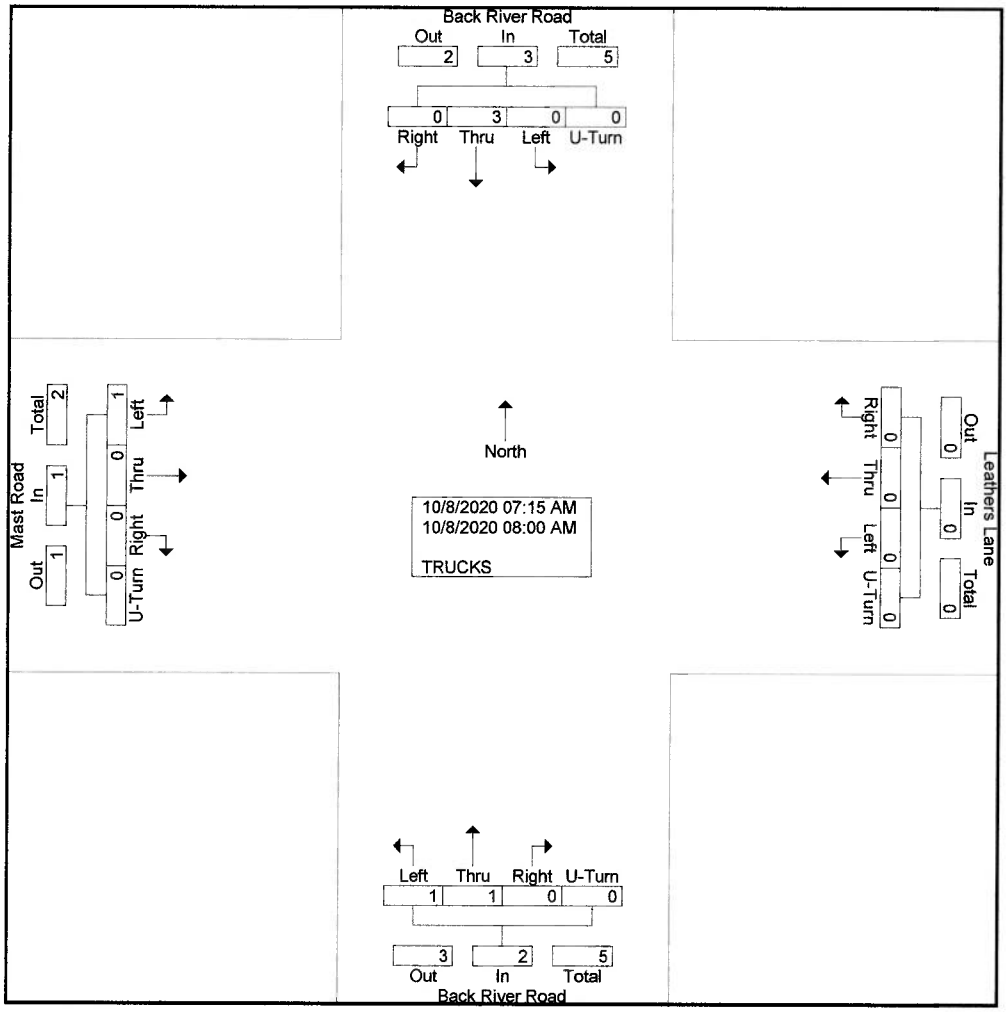
Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:15 AM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	3	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	3	0	0	3	0	0	0	0	0	0	1	1	0	2	0	0	1	0	1	6
Apprch %	0	100	0	0		0	0	0	0		0	50	50	0		0	0	100	0		
Total %	0	50	0	0	50	0	0	0	0	0	0	16.7	16.7	0	33.3	0	0	16.7	0	16.7	

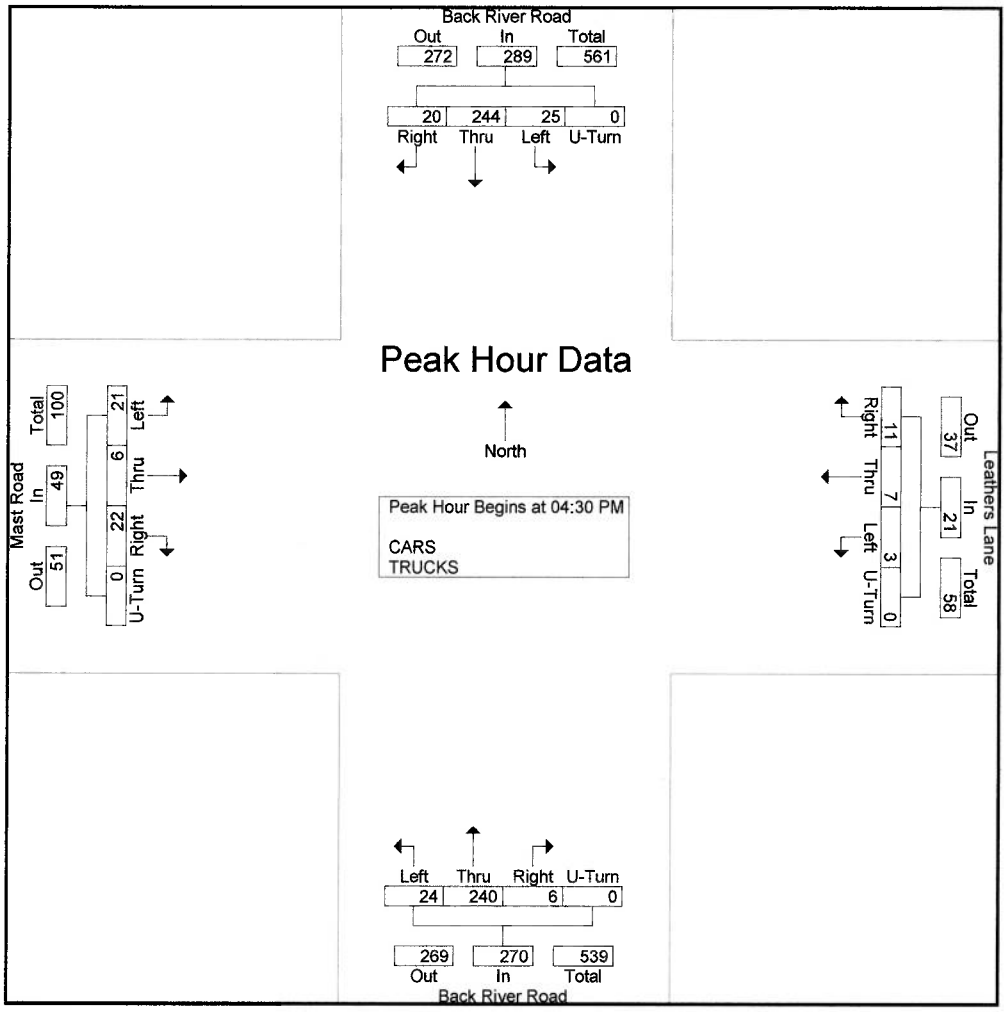


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 3

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	4	60	7	0	71	3	**4**	0	0	**7**	**3**	43	6	0	52	5	1	5	0	11	141
04:45 PM	2	**73**	1	0	**76**	**4**	0	**1**	0	5	0	57	8	0	65	5	0	4	0	9	155
05:00 PM	**8**	55	8	0	71	2	1	1	0	4	2	68	**9**	0	**79**	**9**	2	2	0	13	**167**
05:15 PM	6	56	**9**	0	71	2	2	1	0	5	1	**72**	1	0	74	3	**3**	**10**	0	**16**	166
Total Volume	20	244	25	0	289	11	7	3	0	21	6	240	24	0	270	22	6	21	0	49	629
% App. Total	6.9	84.4	8.7	0		52.4	33.3	14.3	0		2.2	88.9	8.9	0		44.9	12.2	42.9	0		
PHF	.625	.836	.694	.000	.951	.688	.438	.750	.000	.750	.500	.833	.667	.000	.854	.611	.500	.525	.000	.766	.942

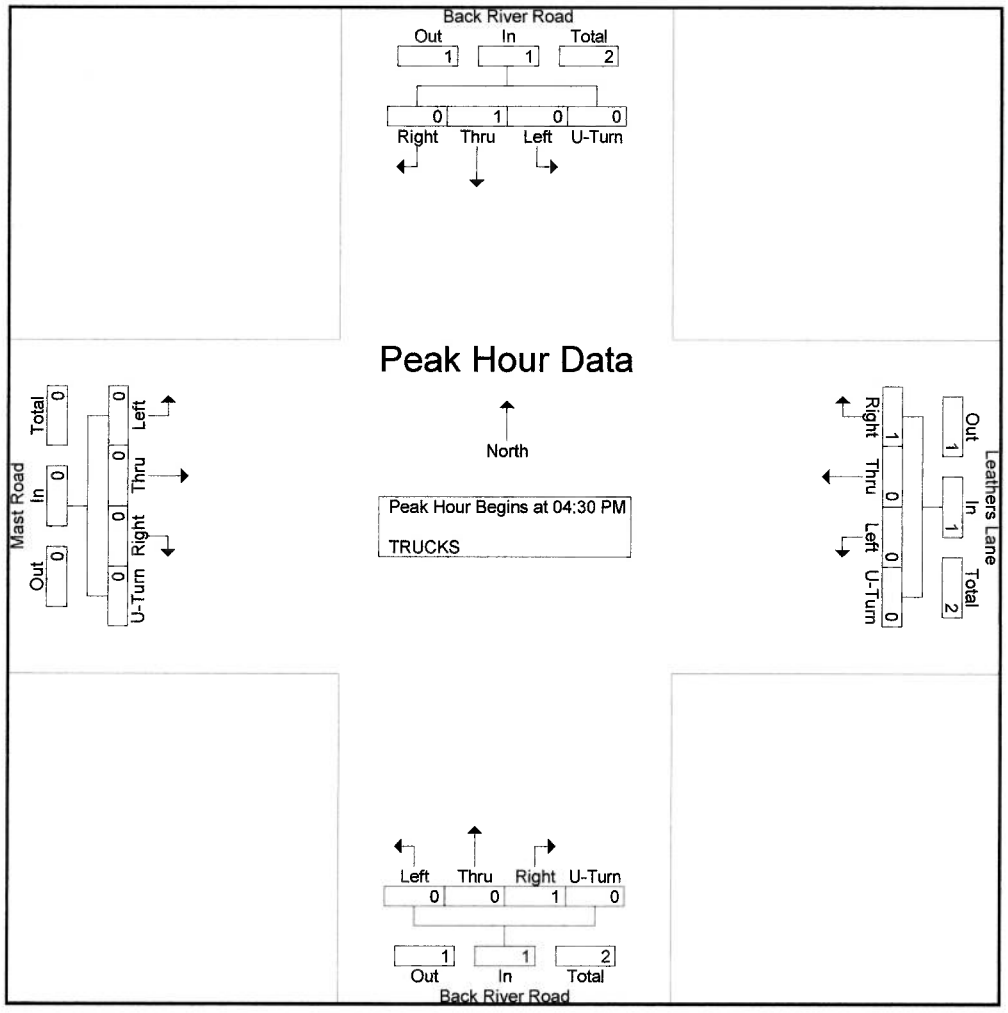


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**1**	0	0	**1**	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	**2**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	3
% App. Total	0	100	0	0		100	0	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.375



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	9	82	6	0	97	3	2	0	0	5	4	44	3	0	51	4	0	2	0	6	159
03:15 PM	5	47	3	0	55	1	2	4	0	7	2	80	8	0	90	3	3	4	0	10	162
03:30 PM	3	61	3	0	67	6	1	2	0	9	3	76	9	0	88	1	2	5	0	8	172
03:45 PM	10	40	5	0	55	3	0	2	0	5	1	51	6	0	58	3	3	3	0	9	127
Total	27	230	17	0	274	13	5	8	0	26	10	251	26	0	287	11	8	14	0	33	620
04:00 PM	5	32	4	0	41	5	4	1	0	10	1	53	10	0	64	4	2	2	0	8	123
04:15 PM	9	46	7	0	62	3	0	0	0	3	1	50	3	0	54	2	3	10	0	15	134
04:30 PM	4	60	7	0	71	3	4	0	0	7	3	43	6	0	52	5	1	5	0	11	141
04:45 PM	2	73	1	0	76	4	0	1	0	5	0	57	8	0	65	5	0	4	0	9	155
Total	20	211	19	0	250	15	8	2	0	25	5	203	27	0	235	16	6	21	0	43	553
05:00 PM	8	55	8	0	71	2	1	1	0	4	2	68	9	0	79	9	2	2	0	13	167
05:15 PM	6	56	9	0	71	2	2	1	0	5	1	72	1	0	74	3	3	10	0	16	166
05:30 PM	6	46	5	0	57	9	0	1	0	10	3	36	6	0	45	2	4	6	0	12	124
05:45 PM	2	38	4	0	44	3	0	2	0	5	1	45	1	0	47	1	3	1	0	5	101
Total	22	195	26	0	243	16	3	5	0	24	7	221	17	0	245	15	12	19	0	46	558
Grand Total	69	636	62	0	767	44	16	15	0	75	22	675	70	0	767	42	26	54	0	122	1731
Apprch %	9	82.9	8.1	0		58.7	21.3	20	0		2.9	88	9.1	0		34.4	21.3	44.3	0		
Total %	4	36.7	3.6	0	44.3	2.5	0.9	0.9	0	4.3	1.3	39	4	0	44.3	2.4	1.5	3.1	0	7	
CARS	68	633	62	0	763	43	16	15	0	74	21	672	70	0	763	42	26	54	0	122	1722
% CARS	98.6	99.5	100	0	99.5	97.7	100	100	0	98.7	95.5	99.6	100	0	99.5	100	100	100	0	100	99.5
TRUCKS	1	3	0	0	4	1	0	0	0	1	1	3	0	0	4	0	0	0	0	0	9
% TRUCKS	1.4	0.5	0	0	0.5	2.3	0	0	0	1.3	4.5	0.4	0	0	0.5	0	0	0	0	0	0.5

Stephen G. Pernaw & Company, Inc.
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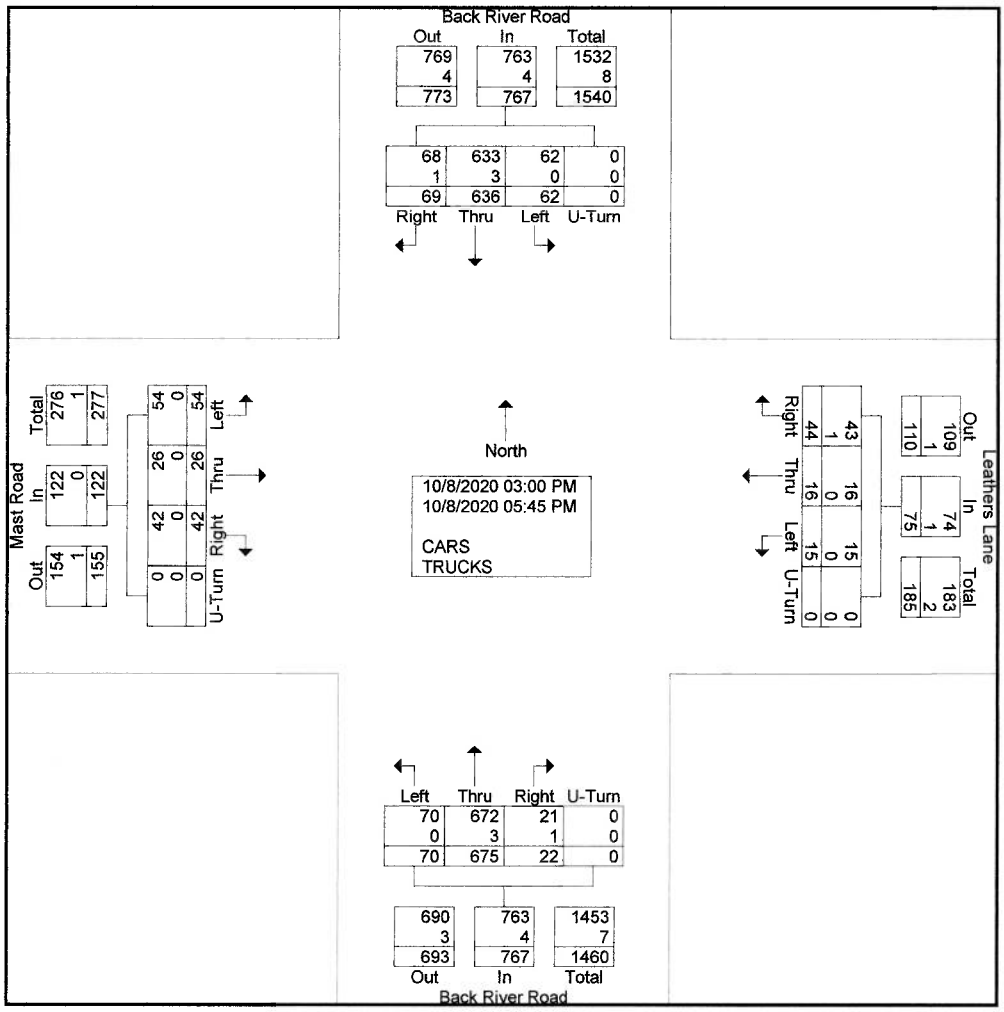
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2



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Weather: Clear
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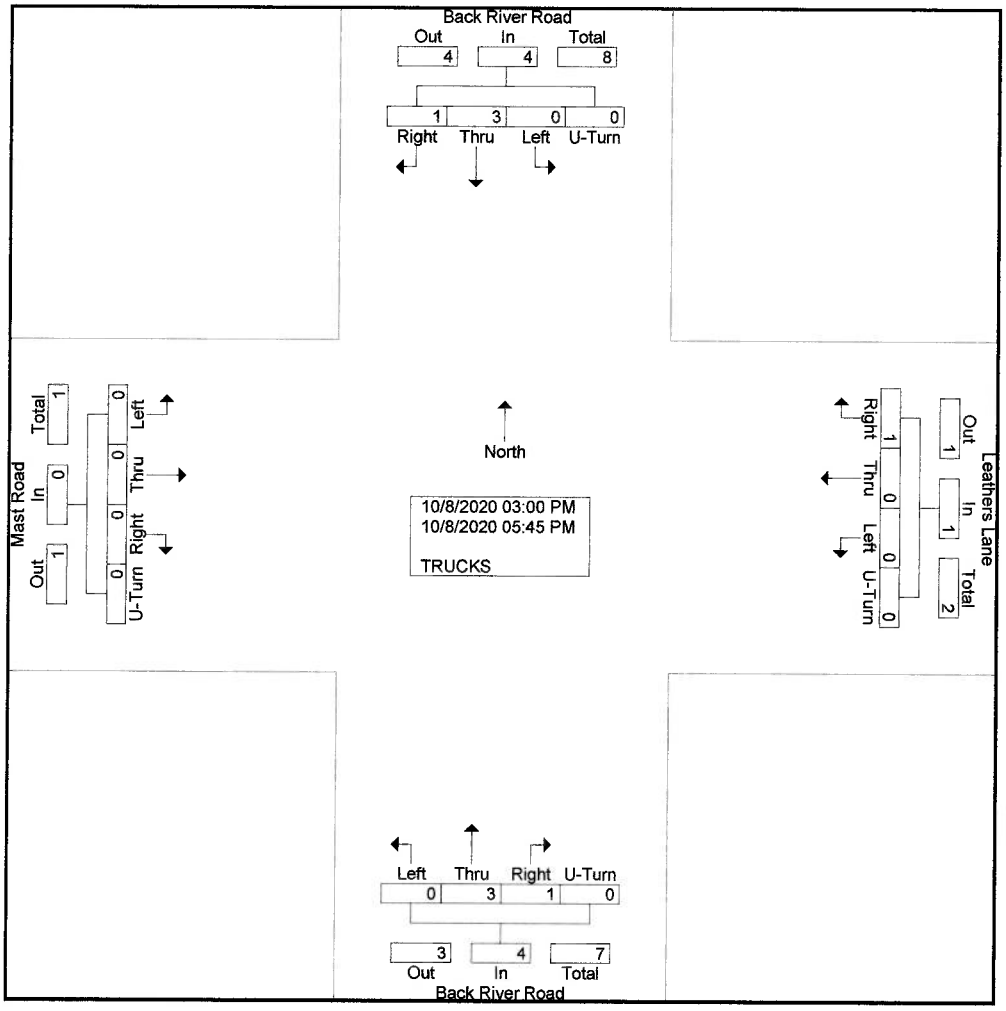
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_INT_3_Thurs_AM_&_PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	Back River Road From North					Leathers Lane From East					Back River Road From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Grand Total	1	3	0	0	4	1	0	0	0	1	1	3	0	0	4	0	0	0	0	0	9
Apprch %	25	75	0	0		100	0	0	0		25	75	0	0		0	0	0	0		
Total %	11.1	33.3	0	0	44.4	11.1	0	0	0	11.1	11.1	33.3	0	0	44.4	0	0	0	0	0	



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
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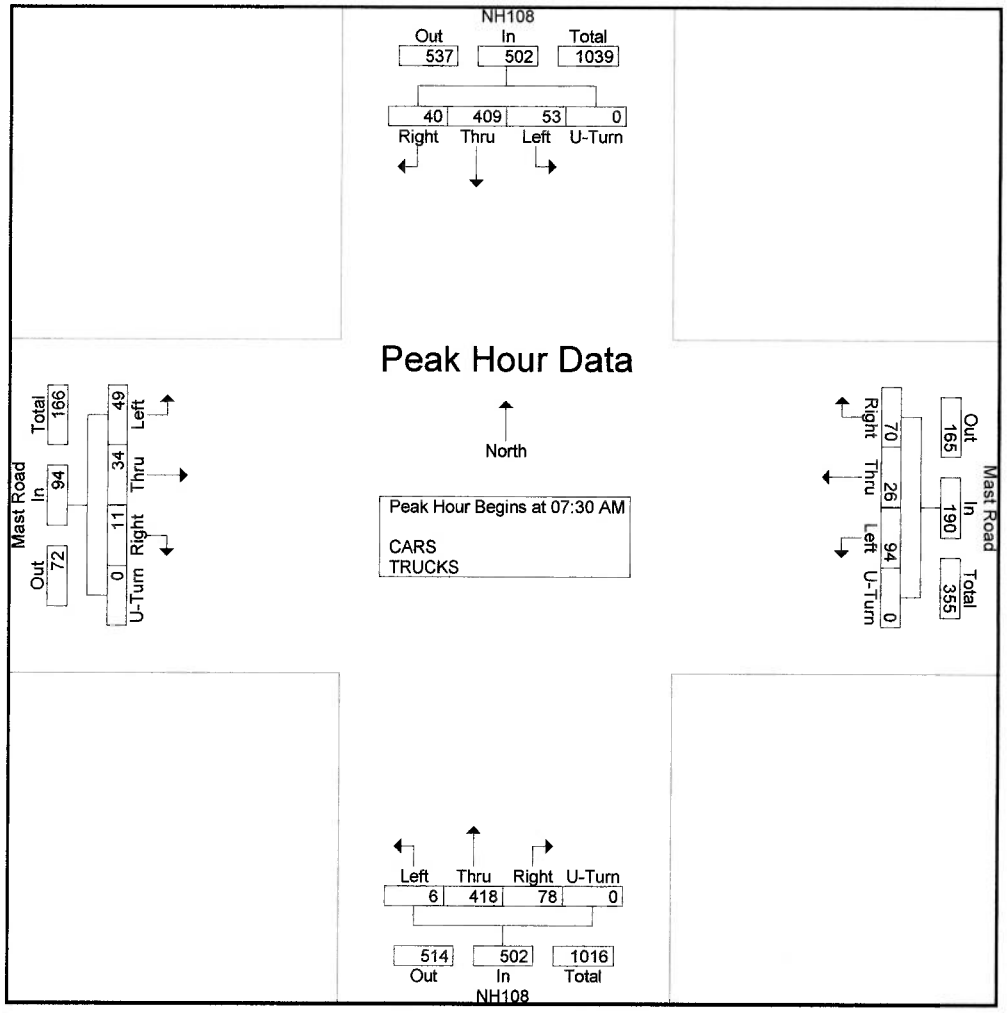
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**13**	97	14	0	124	19	5	21	0	45	24	**127**	2	0	**153**	1	11	**16**	0	28	350
07:45 AM	9	**124**	13	0	**146**	**21**	**8**	**32**	0	**61**	**26**	109	**3**	0	138	4	**14**	12	0	**30**	**375**
08:00 AM	10	101	**15**	0	126	17	6	29	0	52	20	98	0	0	118	1	6	9	0	16	312
08:15 AM	8	87	11	0	106	13	7	12	0	32	8	84	1	0	93	**5**	3	12	0	20	251
Total Volume	40	409	53	0	502	70	26	94	0	190	78	418	6	0	502	11	34	49	0	94	1288
% App. Total	8	81.5	10.6	0		36.8	13.7	49.5	0		15.5	83.3	1.2	0		11.7	36.2	52.1	0		
PHF	.769	.825	.883	.000	.860	.833	.813	.734	.000	.779	.750	.823	.500	.000	.820	.550	.607	.766	.000	.783	.859



Stephen G. Pernaw & Company, Inc.
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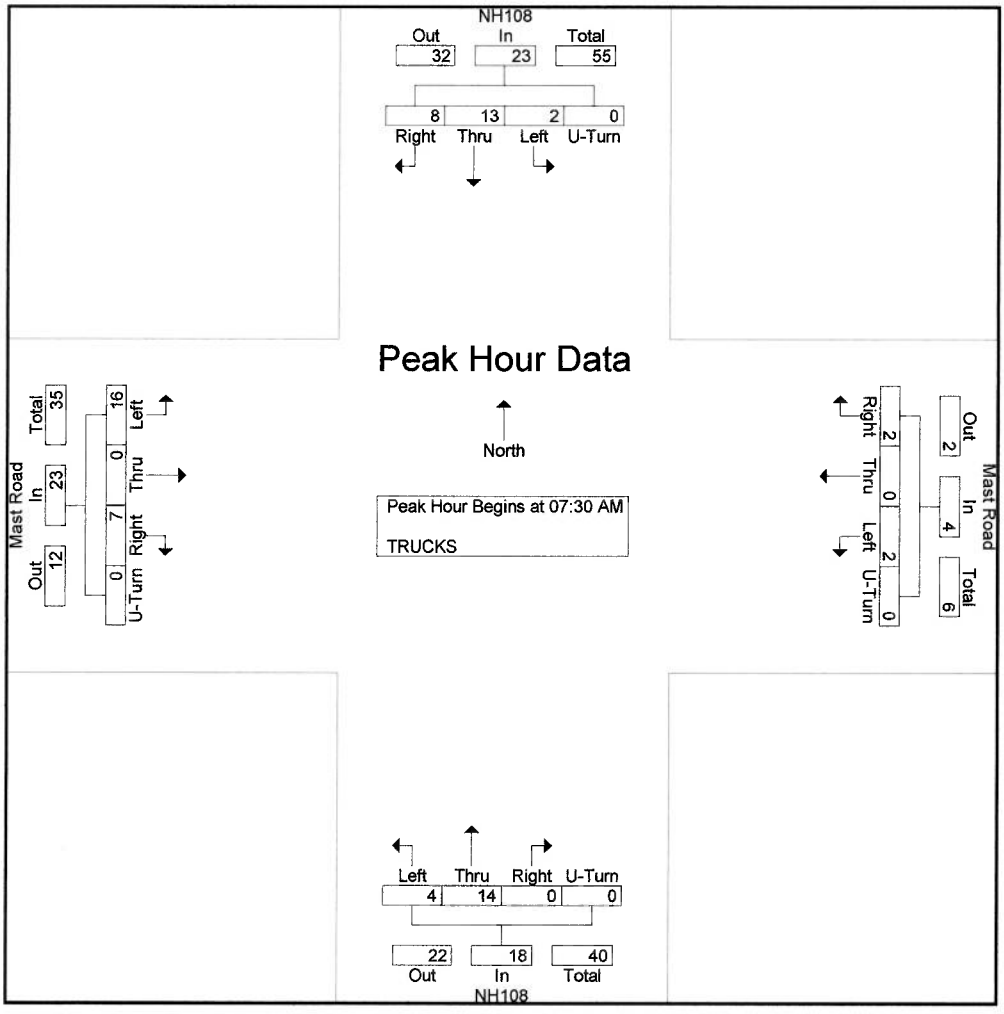
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**6**	3	**1**	0	**10**	**1**	0	**1**	0	**2**	0	3	1	0	4	0	0	**8**	0	**8**	**24**
07:45 AM	0	3	1	0	4	1	0	1	0	2	0	**4**	**2**	0	**6**	**4**	0	4	0	8	20
08:00 AM	2	3	0	0	5	0	0	0	0	0	0	4	0	0	4	1	0	2	0	3	12
08:15 AM	0	**4**	0	0	4	0	0	0	0	0	0	3	1	0	4	2	0	2	0	4	12
Total Volume	8	13	2	0	23	2	0	2	0	4	0	14	4	0	18	7	0	16	0	23	68
% App. Total	34.8	56.5	8.7	0		50	0	50	0		0	77.8	22.2	0		30.4	0	69.6	0		
PHF	.333	.813	.500	.000	.575	.500	.000	.500	.000	.500	.000	.875	.500	.000	.750	.438	.000	.500	.000	.719	.708



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Weather: Clear
Collected By: MV
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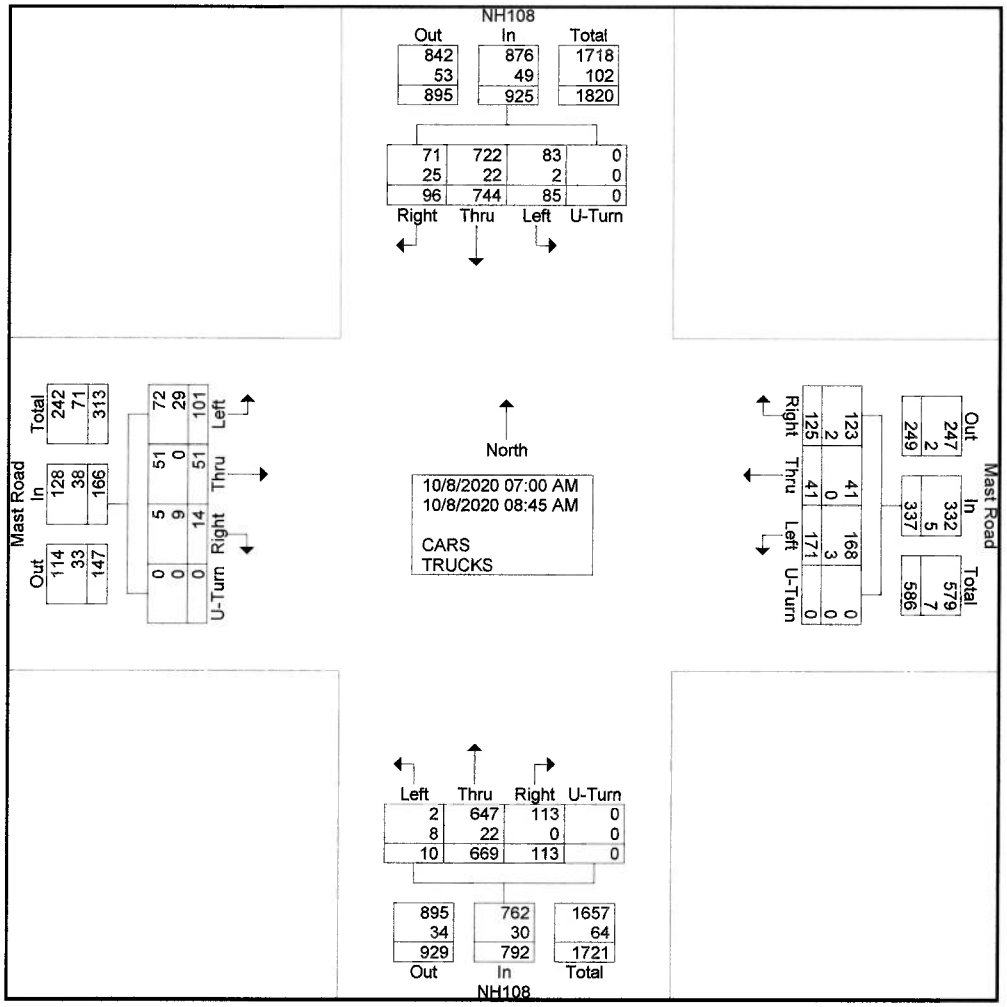
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	12	82	11	0	105	12	3	18	0	33	10	51	1	0	62	0	5	15	0	20	220
07:15 AM	12	74	11	0	97	12	3	17	0	32	9	69	0	0	78	2	5	13	0	20	227
07:30 AM	13	97	14	0	124	19	5	21	0	45	24	127	2	0	153	1	11	16	0	28	350
07:45 AM	9	124	13	0	146	21	8	32	0	61	26	109	3	0	138	4	14	12	0	30	375
Total	46	377	49	0	472	64	19	88	0	171	69	356	6	0	431	7	35	56	0	98	1172
08:00 AM	10	101	15	0	126	17	6	29	0	52	20	98	0	0	118	1	6	9	0	16	312
08:15 AM	8	87	11	0	106	13	7	12	0	32	8	84	1	0	93	5	3	12	0	20	251
08:30 AM	14	93	4	0	111	18	5	10	0	33	7	65	3	0	75	0	6	13	0	19	238
08:45 AM	18	86	6	0	110	13	4	32	0	49	9	66	0	0	75	1	1	11	0	13	247
Total	50	367	36	0	453	61	22	83	0	166	44	313	4	0	361	7	16	45	0	68	1048
Grand Total	96	744	85	0	925	125	41	171	0	337	113	669	10	0	792	14	51	101	0	166	2220
Apprch %	10.4	80.4	9.2	0		37.1	12.2	50.7	0		14.3	84.5	1.3	0		8.4	30.7	60.8	0		
Total %	4.3	33.5	3.8	0	41.7	5.6	1.8	7.7	0	15.2	5.1	30.1	0.5	0	35.7	0.6	2.3	4.5	0	7.5	
CARS	71	722	83	0	876	123	41	168	0	332	113	647	2	0	762	5	51	72	0	128	2098
% CARS	74	97	97.6	0	94.7	98.4	100	98.2	0	98.5	100	96.7	20	0	96.2	35.7	100	71.3	0	77.1	94.5
TRUCKS	25	22	2	0	49	2	0	3	0	5	0	22	8	0	30	9	0	29	0	38	122
% TRUCKS	26	3	2.4	0	5.3	1.6	0	1.8	0	1.5	0	3.3	80	0	3.8	64.3	0	28.7	0	22.9	5.5



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Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
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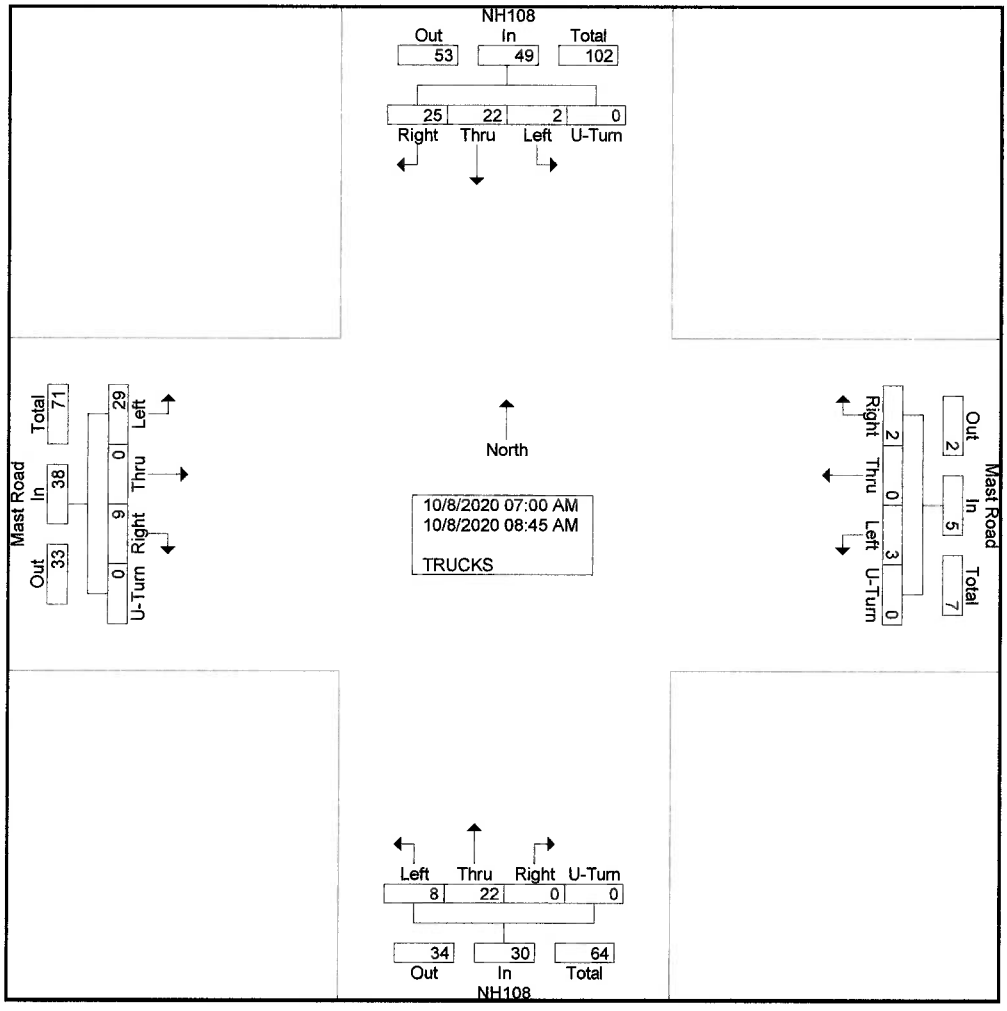
Groups Printed- TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	2	1	0	0	3	0	0	0	0	0	0	2	1	0	3	0	0	3	0	3	9
07:15 AM	2	3	0	0	5	0	0	0	0	0	0	1	0	0	1	2	0	5	0	7	13
07:30 AM	6	3	1	0	10	1	0	1	0	2	0	3	1	0	4	0	0	8	0	8	24
07:45 AM	0	3	1	0	4	1	0	1	0	2	0	4	2	0	6	4	0	4	0	8	20
Total	10	10	2	0	22	2	0	2	0	4	0	10	4	0	14	6	0	20	0	26	66
08:00 AM	2	3	0	0	5	0	0	0	0	0	0	4	0	0	4	1	0	2	0	3	12
08:15 AM	0	4	0	0	4	0	0	0	0	0	0	3	1	0	4	2	0	2	0	4	12
08:30 AM	3	5	0	0	8	0	0	0	0	0	0	3	3	0	6	0	0	3	0	3	17
08:45 AM	10	0	0	0	10	0	0	1	0	1	0	2	0	0	2	0	0	2	0	2	15
Total	15	12	0	0	27	0	0	1	0	1	0	12	4	0	16	3	0	9	0	12	56
Grand Total	25	22	2	0	49	2	0	3	0	5	0	22	8	0	30	9	0	29	0	38	122
Apprch %	51	44.9	4.1	0		40	0	60	0		0	73.3	26.7	0		23.7	0	76.3	0		
Total %	20.5	18	1.6	0	40.2	1.6	0	2.5	0	4.1	0	18	6.6	0	24.6	7.4	0	23.8	0	31.1	



Stephen G. Pernaw & Company, Inc.
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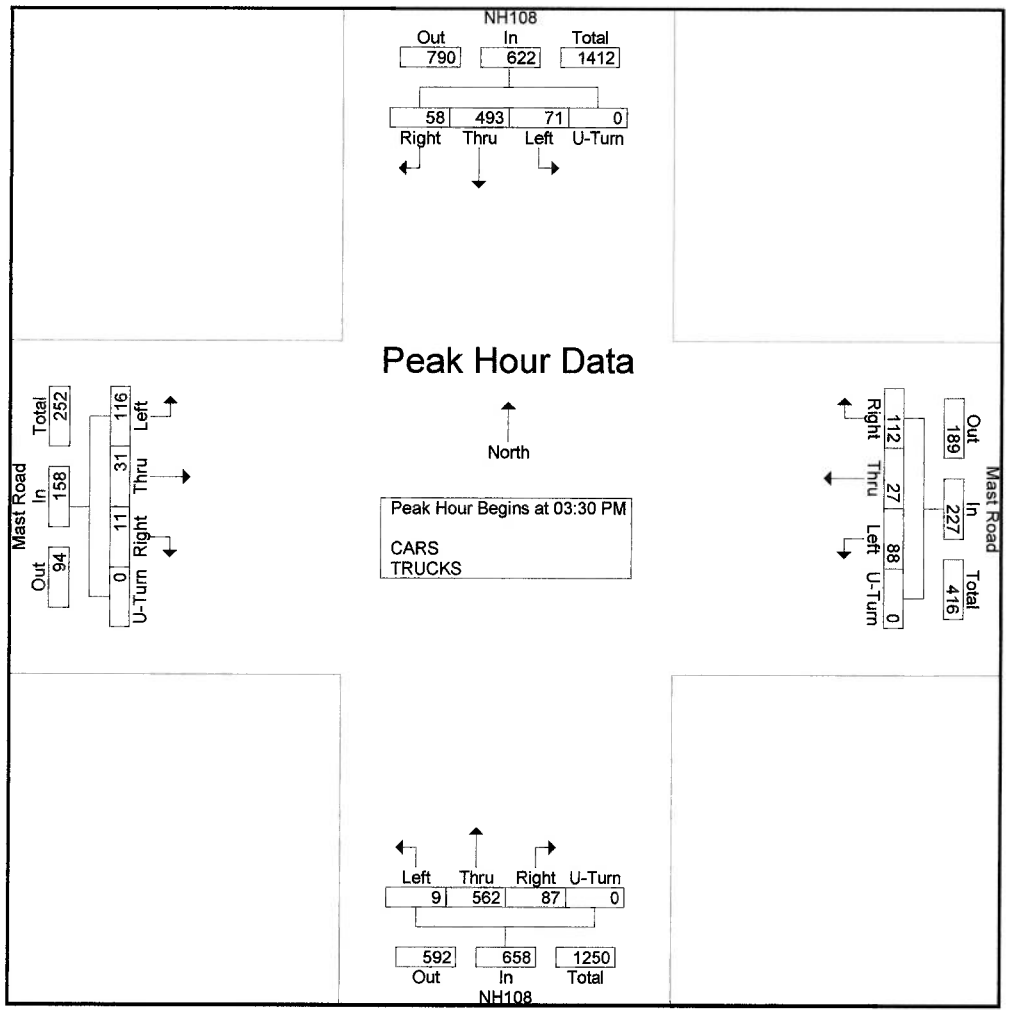
Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 3

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	**18**	124	**22**	0	**164**	**41**	**10**	**24**	0	**75**	12	134	**3**	0	149	0	9	**57**	0	**66**	**454**
03:45 PM	16	109	16	0	141	27	5	18	0	50	**28**	**160**	2	0	**190**	**4**	6	24	0	34	415
04:00 PM	12	125	16	0	153	19	2	24	0	45	21	122	2	0	145	3	**10**	22	0	35	378
04:15 PM	12	**135**	17	0	164	25	10	22	0	57	26	146	2	0	174	4	6	13	0	23	418
Total Volume	58	493	71	0	622	112	27	88	0	227	87	562	9	0	658	11	31	116	0	158	1665
% App. Total	9.3	79.3	11.4	0		49.3	11.9	38.8	0		13.2	85.4	1.4	0		7	19.6	73.4	0		
PHF	.806	.913	.807	.000	.948	.683	.675	.917	.000	.757	.777	.878	.750	.000	.866	.688	.775	.509	.000	.598	.917

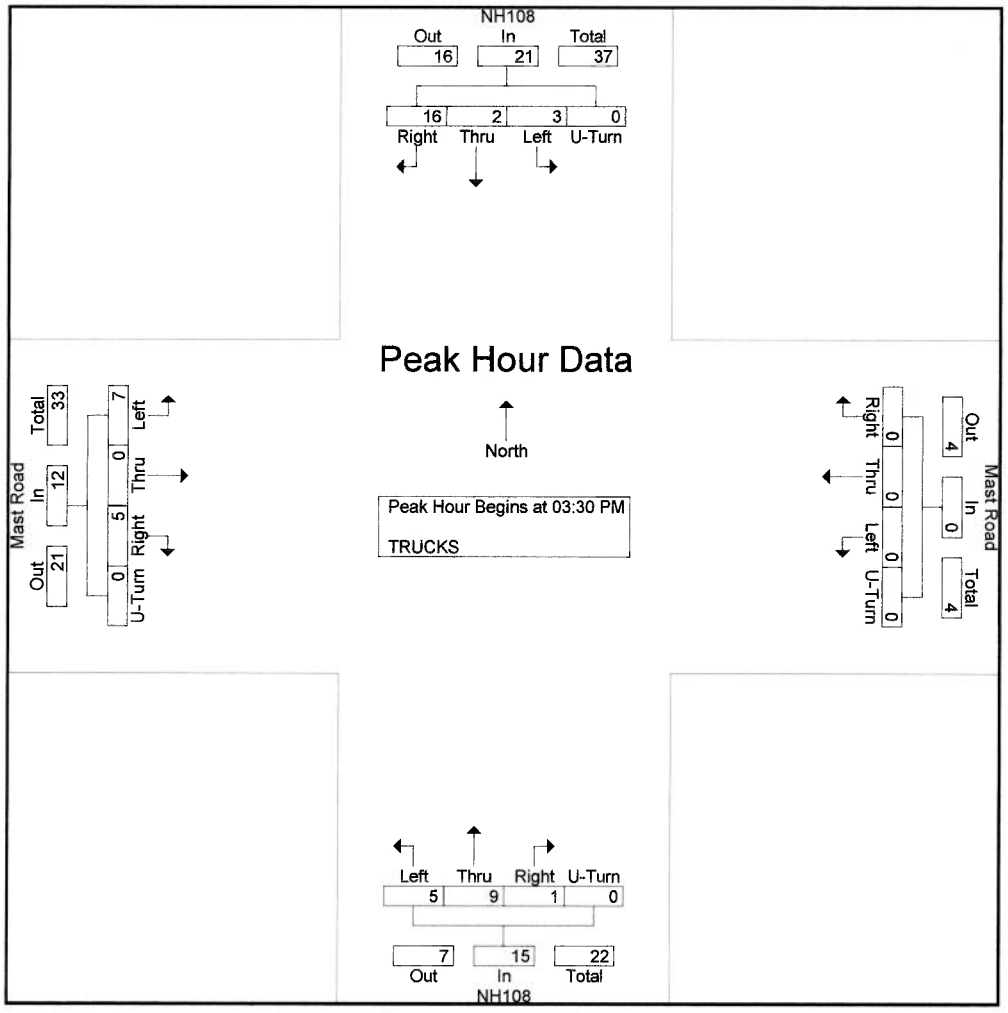


Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 2

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	**8**	**1**	0	0	**9**	0	0	0	0	0	0	0	**2**	0	2	0	0	3	0	3	14
03:45 PM	2	0	1	0	3	0	0	0	0	0	0	**7**	1	0	**8**	2	0	**4**	0	**6**	**17**
04:00 PM	2	0	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
04:15 PM	4	1	**2**	0	7	0	0	0	0	0	**1**	1	1	0	3	**3**	0	0	0	3	13
Total Volume	16	2	3	0	21	0	0	0	0	0	1	9	5	0	15	5	0	7	0	12	48
% App. Total	76.2	9.5	14.3	0		0	0	0	0		6.7	60	33.3	0		41.7	0	58.3	0		
PHF	.500	.500	.375	.000	.583	.000	.000	.000	.000	.000	.250	.321	.625	.000	.469	.417	.000	.438	.000	.500	.706



Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Clear
Collected By: MV
Job Number: 2037A
Town/State: Dover, NH

File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- CARS - TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	31	102	12	0	145	11	5	15	0	31	20	106	2	0	128	6	8	43	0	57	361
03:15 PM	20	99	23	0	142	27	11	29	0	67	16	102	3	0	121	3	4	33	0	40	370
03:30 PM	18	124	22	0	164	41	10	24	0	75	12	134	3	0	149	0	9	57	0	66	454
03:45 PM	16	109	16	0	141	27	5	18	0	50	28	160	2	0	190	4	6	24	0	34	415
Total	85	434	73	0	592	106	31	86	0	223	76	502	10	0	588	13	27	157	0	197	1600
04:00 PM	12	125	16	0	153	19	2	24	0	45	21	122	2	0	145	3	10	22	0	35	378
04:15 PM	12	135	17	0	164	25	10	22	0	57	26	146	2	0	174	4	6	13	0	23	418
04:30 PM	6	138	30	0	174	28	5	30	0	63	23	141	0	0	164	0	6	8	0	14	415
04:45 PM	9	126	21	0	156	21	8	21	0	50	18	143	2	0	163	2	10	20	0	32	401
Total	39	524	84	0	647	93	25	97	0	215	88	552	6	0	646	9	32	63	0	104	1612
05:00 PM	10	144	22	0	176	20	5	16	0	41	20	124	1	0	145	1	7	20	0	28	390
05:15 PM	6	144	14	0	164	25	4	18	0	47	17	131	2	0	150	2	5	15	0	22	383
05:30 PM	8	110	22	0	140	21	4	15	0	40	14	152	1	0	167	1	3	8	0	12	359
05:45 PM	4	91	19	0	114	16	3	6	0	25	20	165	0	0	185	0	5	12	0	17	341
Total	28	489	77	0	594	82	16	55	0	153	71	572	4	0	647	4	20	55	0	79	1473
Grand Total	152	1447	234	0	1833	281	72	238	0	591	235	1626	20	0	1881	26	79	275	0	380	4685
Apprch %	8.3	78.9	12.8	0		47.5	12.2	40.3	0		12.5	86.4	1.1	0		6.8	20.8	72.4	0		
Total %	3.2	30.9	5	0	39.1	6	1.5	5.1	0	12.6	5	34.7	0.4	0	40.1	0.6	1.7	5.9	0	8.1	
CARS	125	1435	230	0	1790	280	72	237	0	589	234	1608	9	0	1851	15	79	262	0	356	4586
% CARS	82.2	99.2	98.3	0	97.7	99.6	100	99.6	0	99.7	99.6	98.9	45	0	98.4	57.7	100	95.3	0	93.7	97.9
TRUCKS	27	12	4	0	43	1	0	1	0	2	1	18	11	0	30	11	0	13	0	24	99
% TRUCKS	17.8	0.8	1.7	0	2.3	0.4	0	0.4	0	0.3	0.4	1.1	55	0	1.6	42.3	0	4.7	0	6.3	2.1

Stephen G. Pernaw & Company, Inc.
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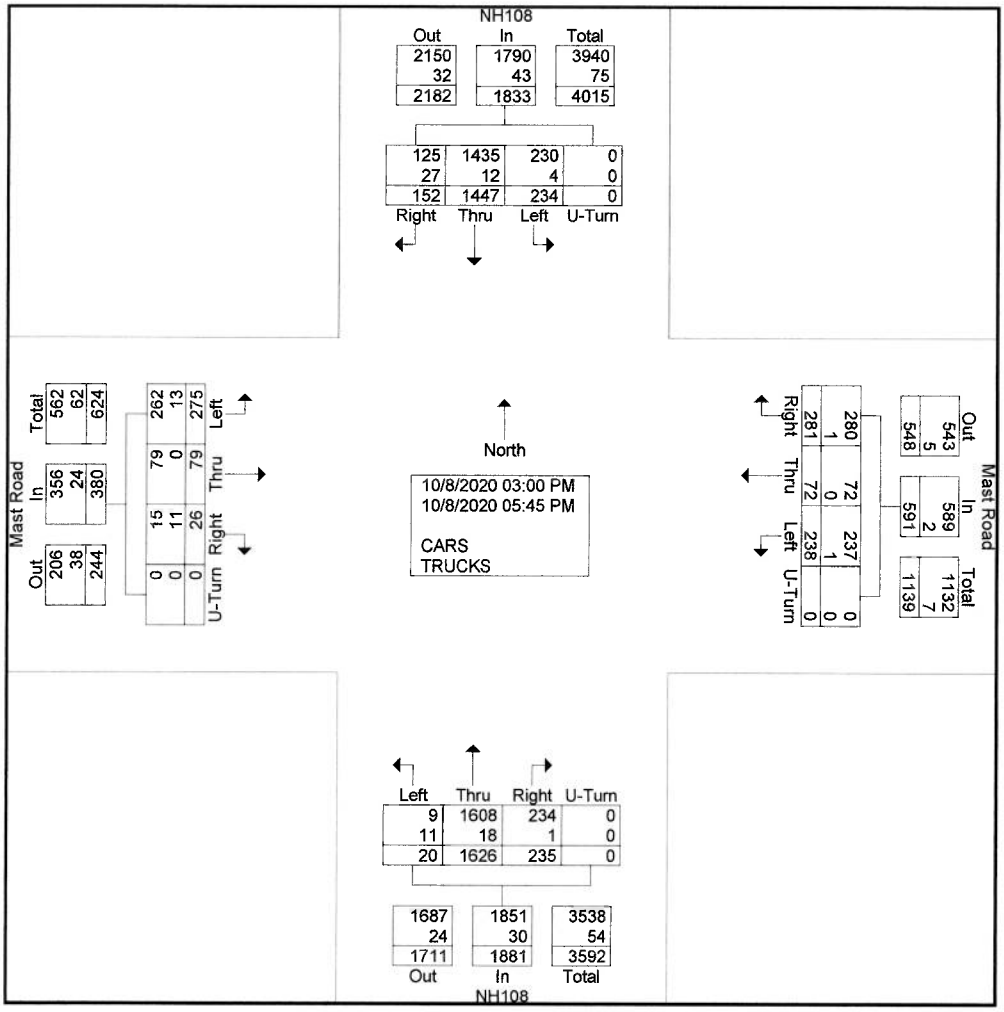

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Weather: Clear
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Job Number: 2037A
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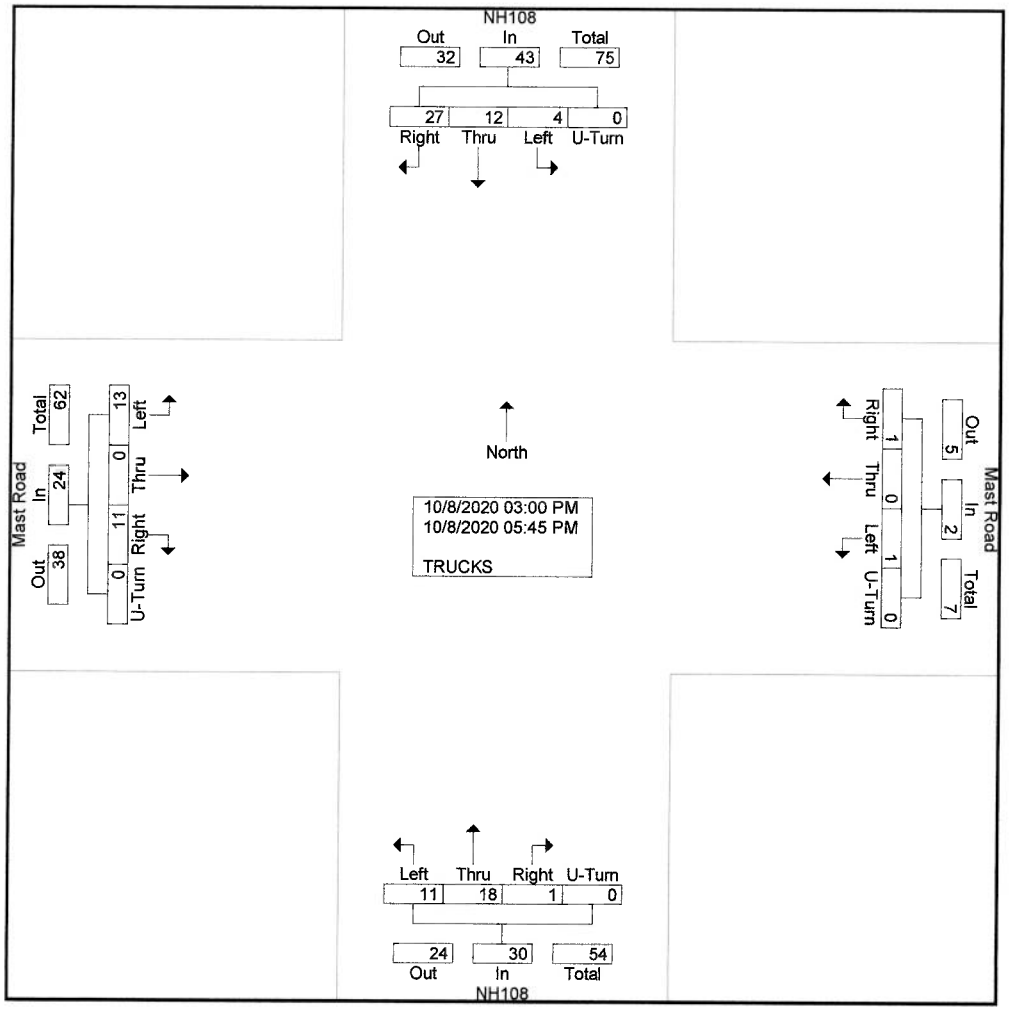
File Name : 2037A_NH108_Mast_INT 4 Thurs AM & PM
Site Code : 2037A
Start Date : 10/8/2020
Page No : 1

Groups Printed- TRUCKS

	NH108 From North					Mast Road From East					NH108 From South					Mast Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	4	3	0	0	7	0	0	1	0	1	0	2	1	0	3	2	0	3	0	5	16
03:15 PM	2	3	0	0	5	0	0	0	0	0	0	1	2	0	3	1	0	1	0	2	10
03:30 PM	8	1	0	0	9	0	0	0	0	0	0	0	2	0	2	0	0	3	0	3	14
03:45 PM	2	0	1	0	3	0	0	0	0	0	0	7	1	0	8	2	0	4	0	6	17
Total	16	7	1	0	24	0	0	1	0	1	0	10	6	0	16	5	0	11	0	16	57
04:00 PM	2	0	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
04:15 PM	4	1	2	0	7	0	0	0	0	0	1	1	1	0	3	3	0	0	0	3	13
04:30 PM	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	4
Total	7	1	2	0	10	0	0	0	0	0	1	5	4	0	10	4	0	1	0	5	25
05:00 PM	3	2	1	0	6	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	8
05:15 PM	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	3
05:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total	4	4	1	0	9	1	0	0	0	1	0	3	1	0	4	2	0	1	0	3	17
Grand Total	27	12	4	0	43	1	0	1	0	2	1	18	11	0	30	11	0	13	0	24	99
Apprch %	62.8	27.9	9.3	0		50	0	50	0		3.3	60	36.7	0		45.8	0	54.2	0		
Total %	27.3	12.1	4	0	43.4	1	0	1	0	2	1	18.2	11.1	0	30.3	11.1	0	13.1	0	24.2	



Appendix D Adjustment Factors

Seasonal Adjustment Factors
NHDOT Group 4 (Urban Highways)

Stephen G. Pernaw & Company, Inc.

Year 2019 Monthly Data - Urban

		Adjustment to	
Month	ADT	Average	Peak
Jan	11,431	1.12	1.23
Feb	11,848	1.08	1.18
Mar	12,141	1.06	1.15
Apr	12,860	1.00	1.09
May	13,551	0.95	1.03
Jun	13,785	0.93	1.02
Jul	13,942	0.92	1.01
Aug	14,016	0.92	1.00
Sep	13,379	0.96	1.05
Oct	13,339	0.96	1.05
Nov	12,265	1.05	1.14
Dec	11,496	1.12	1.22

Year 2018 Monthly Data - Urban

		Adjustment to	
Month	ADT	Average	Peak
Jan	11,282	1.13	1.24
Feb	11,848	1.08	1.18
Mar	11,828	1.08	1.18
Apr	12,491	1.02	1.12
May	13,587	0.94	1.03
Jun	13,911	0.92	1.00
Jul	13,765	0.93	1.01
Aug	13,945	0.92	1.00
Sep	13,168	0.97	1.06
Oct	13,367	0.96	1.04
Nov	12,215	1.05	1.14
Dec	11,963	1.07	1.17

Year 2017 Monthly Data - Urban

		Adjustment to	
Month	ADT	Average	Peak
Jan	12254	1.21	1.33
Feb	13494	1.10	1.21
Mar	14335	1.03	1.14
Apr	15004	0.99	1.09
May	15547	0.95	1.05
Jun	16310	0.91	1.00
Jul	15523	0.95	1.05
Aug	15974	0.93	1.02
Sep	15546	0.95	1.05
Oct	15104	0.98	1.08
Nov	14544	1.02	1.12
Dec	14151	1.05	1.15

Average Peak-Month Factor	**1.06**

Stephen G. Pernaw & Company, Inc.

STEPHEN G. PERNAW & COMPANY, INC.
PROJECT: Proposed Affordable Housing, Dover, New Hampshire
NUMBER: 2037A
COUNT STATION: 82125077

HISTORICAL GROWTH CALCULATIONS

LOCATION : NH108 (North of Back River Road) - Dover, NH
CASE : AADT

ARITHMETIC PROJECTIONS

YEAR	AADT
2015	15790
2016	14901
2017	15199
2018	15503

Regression Output:

Constant	128877.2
Std Err of Y Est	461.27557
R Squared	0.0359051
No. of Observations	4
Degrees of Freedom	2
X Coefficient	-56.3
Std Err of Coef.	206.28871

PROJECTIONS

2020	15151
2021	15095
2022	15039
2023	14982
2024	14926
2025	14870
2026	14813
2027	14757
2028	14701
2029	14645
2030	14588

RATE = -56 VPD/YEAR

GEOMETRIC PROJECTIONS

YEAR	AADT	Ln AADT
2015	15790	9.66713
2016	14901	9.60918
2017	15199	9.62898
2018	15503	9.64879

Regression Output:

Constant	16.74235
Std Err of Y Est	0.030113
R Squared	0.0330833
No. of Observations	4
Degrees of Freedom	2
X Coefficient	-0.0035229
Std Err of Coef.	0.013467

PROJECTIONS

2020	15157
2021	15103
2022	15050
2023	14997
2024	14945
2025	14892
2026	14840
2027	14787
2028	14735
2029	14684
2030	14632

CONCLUSION: USE 1% PER YEAR

RATE = -0.4 % / YEAR

New Hampshire DOT Department of Transportation

MS2

Transportation Data Management System

List View | All DIRs

Record 2375 of 5744 Goto Record go

Location ID	82125077	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	S0000108__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	NH 108
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	Central Ave		
Loc On Alias	NH 108 (DURHAM RD) NORTH OF BACK RIVER RD (SB-NB) (81125202-81125203)		

More Detail

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2019	18,047	1,983	11	61	16,532 (92%)	1,515 (8%)	
2018	15,503[3]		10	53	14,293 (92%)	1,210 (8%)	Grown from 2017
2017	15,199[3]		10	53	14,105 (93%)	1,094 (7%)	Grown from 2016
2016	14,901	1,418	10	53	13,589 (91%)	1,312 (9%)	
2015	15,790[3]						Grown from 2014

|<< < > >>| 1-5 of 16

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Mon 9/16/2019	60	20,100
	Sun 9/15/2019	60	14,093
	Sat 9/14/2019	60	16,867
	Fri 9/13/2019	60	21,659
	Thu 9/12/2019	60	21,238
	Wed 9/11/2019	60	20,673
	Thu 8/25/2016	60	17,051
	Wed 8/24/2016	60	16,380

VOLUME TREND

Year	Annual Growth
2019	16%
2018	2%
2017	2%
2016	-6%
2015	3%
2014	2%
2013	-6%
2012	5%

CALCULATION SHEET

Stephen G. Pernaw & Company, Inc.

Project:	Residential - Dover	Job Number:	2037A
Calculated By:	SP	Date:	10/29/2020
Checked By:	CA	Date:	10/29/2020
Sheet No:	1	Of:	1
Subject:	COVID-19 Adjustment Factor		

Given:

A. Intersection turning movement counts conducted at Back River Road/Mast Road/Leathers Lane intersection in 2019 & 2020.

1. 11/21/19 AM peak hour = 833 vehicles entering the intersection (pre-Covid).
2. 11/21/19 PM peak hour = 654 vehicles entering the intersection (pre-Covid).
3. 10/7/20 AM peak hour = 637 vehicles entering the intersection (with Covid).
4. 10/7/20 PM peak hour = 596 vehicles entering the intersection (with Covid).

B. Annual background growth rate = 1.0% per year.

C. Peak-month seasonal adjustment factors for NHDOT Group 4 areas:

1. November to peak month = (1.14 + 1.14 + 1.12) / 3 = 1.13 (three-year average)
2. October to peak month = (1.05 + 1.04 + 1.08) / 3 = 1.06 (three-year average)

Calculate 2020 peak-month entering volumes from the 2019 pre-Covid data and the 2020 date with Covid

November 2019 AM peak hour entering volume = 833 X 1.01 (historical) X 1.13 (seasonal) = 951 vehicles in 2020 (w/o Covid)

November 2019 PM peak hour entering volume = 654 X 1.01 (historical) X 1.13 (seasonal) = 746 vehicles in 2020 (w/o Covid)

October 2020 AM peak hour entering volume = 637 X 1.00 (historical) X 1.06 (seasonal) = 675 vehicles in 2020 (w/ Covid)

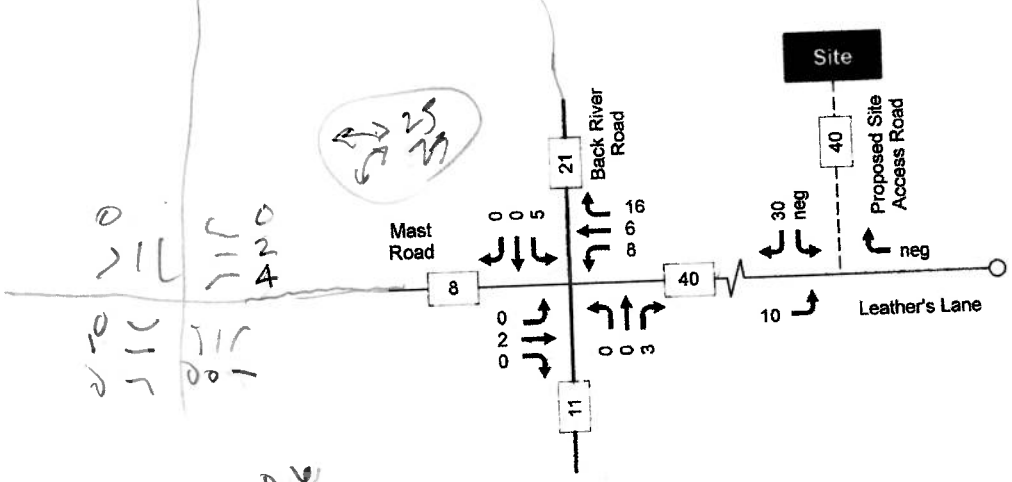
October 2020 PM peak hour entering volume = 596 X 1.00 (historical) X 1.06 (seasonal) = 632 vehicles in 2020 (w/ Covid)

Calculate Covid Factors

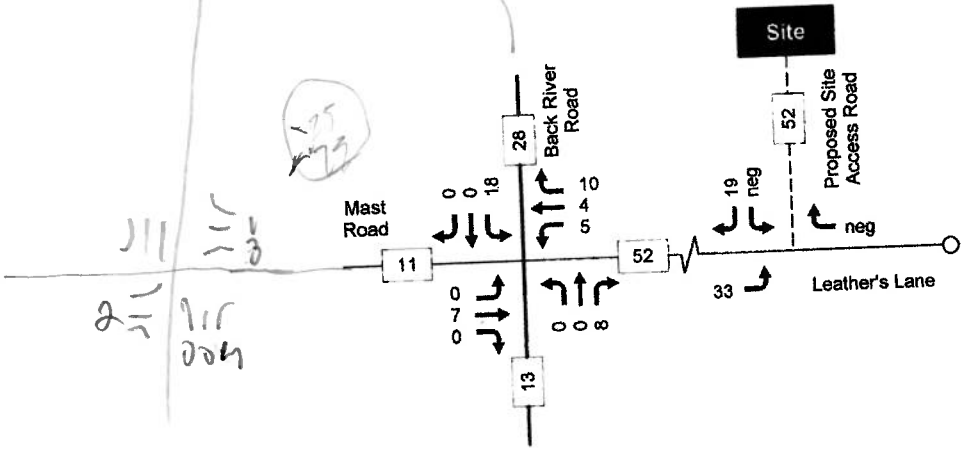
AM peak hour Covid factor = 951 / 675 = 1.41

PM peak hour Covid factor = 746 / 632 = 1.18

Appendix E **Other Development Traffic Volumes**



AM Peak Hour



PM Peak Hour

SOURCE: S.G. PERNAW & CO., INC. TRAFFIC EVALUATION - PROPOSED RESIDENTIAL DEVELOPMENT, DOVER, NH DATED JANUARY 2, 2020

NORTH

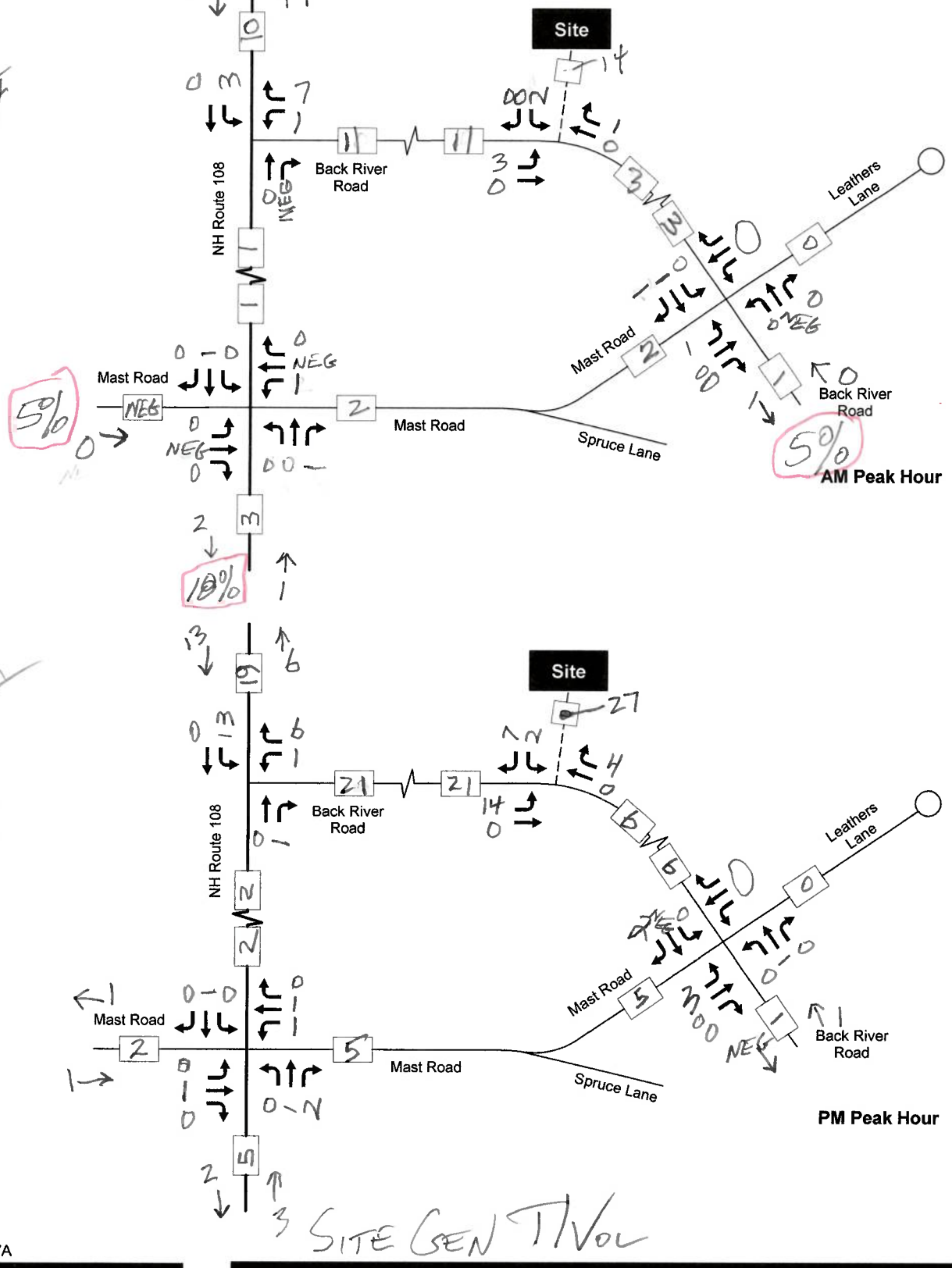
1980A

Appendix

Site Generated Traffic Volumes

Traffic Evaluation, Proposed Residential Development, Dover, New Hampshire

Appendix E **Site Generated Traffic Volumes / Trip Distribution**


Site
Back River Road
NH Route 108
Mast Road
Spruce Lane
Leathers Lane
Back River Road
AM Peak Hour
Site
Back River Road
NH Route 108
Mast Road
Spruce Lane
Leathers Lane
Back River Road
PM Peak Hour
NORTH

2037A

Trip Generation Summary

Alternative: Alternative 1
Phase:
Project: 2037A

Open Date: 10/15/2020
Analysis Date: 10/15/2020

ITE	Land Use		Weekday Average Daily Trips *	Enter	Exit	Total	Weekday AM Peak Hour of Adjacent Street Traffic *	Enter	Exit	Total	Weekday PM Peak Hour of Adjacent Street Traffic *	Enter	Exit	Total
210	SFHOUSE 2 TRIP EQUATION METHOD			116	116	232		4	10	14		18	9	27
	66	Residents												
210	SFHOUSE 1 TRIP RATE METHOD			88	87	175		4	10	14		12	6	18
	66	Residents												
Unadjusted Volume				204	203	407		8	20	28		30	15	45
Internal Capture Trips				0	0	0		0	0	0		0	0	0
Pass-By Trips				0	0	0		0	0	0		0	0	0
Volume Added to Adjacent Streets				204	203	407		8	20	28		30	15	45

Total Weekday Average Daily Trips Internal Capture = 0 Percent
Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition
TRIP GENERATION 10, TRAFFICWARE, LLC

Stephen G. Pernaw & Company, Inc.

Location: Dover, New Hampshire
Job Number: 2037A

TRIP DISTRIBUTION ANALYSIS - Method A

Work Destination Report - Where Workers are Employed Who Live in the Selection Area - by County Subdivisions

Total All Jobs

Jobs Counts by County Subdivisions Where Workers are Employed - All Jobs	Count	Gateway % A	Gateway % B	Gateway % C	Gateway % D		Gateway Allocation A	Gateway Allocation B	Gateway Allocation C	Gateway Allocation D	
Dover city (Strafford, NH)	3,755	0.85	0.05	0.05	0.05	1.00	3192	188	188	188	3756
Portsmouth city (Rockingham, NH)	3,102	0.90	0.10			1.00	2792	310	0	0	3102
Rochester city (Strafford, NH)	812	1.00				1.00	812	0	0	0	812
Durham town (Strafford, NH)	722			1.00		1.00	0	0	722	0	722
Somersworth city (Strafford, NH)	660	1.00				1.00	660	0	0	0	660
Newington town (Rockingham, NH)	462	0.90	0.10			1.00	416	46	0	0	462
Exeter town (Rockingham, NH)	449	0.30		0.70		1.00	135	0	314	0	449
Manchester city (Hillsborough, NH)	423			0.50	0.50	1.00	0	0	212	212	424
Concord city (Merrimack, NH)	399			0.80	0.20	1.00	0	0	319	80	399
Nashua city (Hillsborough, NH)	363			0.80	0.20	1.00	0	0	290	73	363
	11147						8007	544	2045	553	11149
							71.8%	4.9%	18.3%	5.0%	100%

KEY
A = T/F North on NH108
B = T/F South on Back River Road
C = T/F South on NH108
D = T/F West on Mast Road

72	5	18	5	100
72	28			

Stephen G. Pernaw & Company, Inc.

Project Location: Dover, NH
Project Number: 2037A

TRIP DISTRIBUTION ANALYSIS - Method B

TMC Patterns at Back River Road/Wingate Lane Intersection

	Wednesday, October 7, 2020						Thursday, October 8, 2020					
AM (2-hrs)												
To/From North =	6	+ 11	=	17	85%		2	+ 10	=	12	80%	
To/From South =	3	+ 0	=	3	15%		3	+ 0	=	3	20%	
				20	100%					15	100%	
PM (3-hrs)												
To/From North =	16	+ 14	=	30	79%		15	+ 10	=	25	64%	
To/From South =	0	+ 8	=	8	21%		6	+ 8	=	14	36%	
				38	100%					39	100%	
Combined (5-hr, AM & PM)												
To/From North =	17	+ 30	=	47	81%		12	+ 25	=	37	69%	
To/From South =	3	+ 8	=	11	19%		3	+ 14	=	17	31%	
				58	100%					54	100%	
	USE	**= 81% N**	**-**	**19% S**			**USE**	**= 69% N**	**-**	**31% S**		

Combine Both Days

To/From North =	47	+ 37	=	84	**75%**
To/From South =	11	+ 17	=	28	**25%**
				112	**100%**

Appendix F Capacity and Level of Service Calculations – Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	438	1	3	471
Future Vol, veh/h	2	8	438	1	3	471
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	81	81	72	72
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	2	9	541	1	4	654

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1204	542	0	0	542	0
Stage 1	542	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	205	544	-	-	1037	-
Stage 1	587	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	204	544	-	-	1037	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	514	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	408	1037	-
HCM Lane V/C Ratio	-	-	0.027	0.004	-
HCM Control Delay (s)	-	-	14.1	8.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	482	1	3	520
Future Vol, veh/h	2	8	482	1	3	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	81	81	72	72
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	2	9	595	1	4	722

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1326	596	0	0	596	0
Stage 1	596	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	173	507	-	-	990	-
Stage 1	554	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	172	507	-	-	990	-
Mov Cap-2 Maneuver	172	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	478	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	365	990	-
HCM Lane V/C Ratio	-	-	0.03	0.004	-
HCM Control Delay (s)	-	-	15.2	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	360	4	14	398
Future Vol, veh/h	2	7	360	4	14	398
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	83	83	78	78
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	2	8	434	5	18	510

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	983	437	0	0	439	0
Stage 1	437	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	278	624	-	-	1132	-
Stage 1	655	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	272	624	-	-	1132	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	571	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	485	1132	-
HCM Lane V/C Ratio	-	-	0.021	0.016	-
HCM Control Delay (s)	-	-	12.6	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	397	4	14	438
Future Vol, veh/h	2	7	397	4	14	438
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	83	83	78	78
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	2	8	478	5	18	562

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1079	481	0	0	483	0
Stage 1	481	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	244	589	-	-	1090	-
Stage 1	626	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	238	589	-	-	1090	-
Mov Cap-2 Maneuver	238	-	-	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	540	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	444	1090	-
HCM Lane V/C Ratio	-	-	0.023	0.016	-
HCM Control Delay (s)	-	-	13.3	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	7	9	6	19	13	244	0	5	295	21
Future Vol, veh/h	18	0	7	9	6	19	13	244	0	5	295	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	71	71	71	80	80	80	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	8	1	0	0	1	5
Mvmt Flow	20	0	8	13	8	27	16	305	0	7	393	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	776	758	407	762	772	305	421	0	0	305	0	0
Stage 1	421	421	-	337	337	-	-	-	-	-	-	-
Stage 2	355	337	-	425	435	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	317	339	648	324	333	740	1107	-	-	1267	-	-
Stage 1	614	592	-	681	645	-	-	-	-	-	-	-
Stage 2	666	645	-	611	584	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	294	331	648	314	325	740	1107	-	-	1267	-	-
Mov Cap-2 Maneuver	294	331	-	314	325	-	-	-	-	-	-	-
Stage 1	604	588	-	669	634	-	-	-	-	-	-	-
Stage 2	623	634	-	599	580	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	13.6	0.4	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1107	-	-	347	467	1267	-	-
HCM Lane V/C Ratio	0.015	-	-	0.081	0.103	0.005	-	-
HCM Control Delay (s)	8.3	0	-	16.3	13.6	7.9	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.3	0	-	-

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	2	11	21	14	43	20	372	3	12	450	32
Future Vol, veh/h	27	2	11	21	14	43	20	372	3	12	450	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	71	71	71	80	80	80	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	8	1	0	0	1	5
Mvmt Flow	30	2	12	30	20	61	25	465	4	16	600	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1212	1173	622	1178	1192	467	643	0	0	469	0	0
Stage 1	654	654	-	517	517	-	-	-	-	-	-	-
Stage 2	558	519	-	661	675	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	160	194	490	169	189	600	914	-	-	1103	-	-
Stage 1	459	466	-	545	537	-	-	-	-	-	-	-
Stage 2	518	536	-	455	456	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	183	490	156	178	600	914	-	-	1103	-	-
Mov Cap-2 Maneuver	126	183	-	156	178	-	-	-	-	-	-	-
Stage 1	442	455	-	525	517	-	-	-	-	-	-	-
Stage 2	431	516	-	431	446	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.5	26.7	0.5	0.2
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	914	-	-	162	274	1103	-	-
HCM Lane V/C Ratio	0.027	-	-	0.277	0.401	0.015	-	-
HCM Control Delay (s)	9	0	-	35.5	26.7	8.3	0	-
HCM Lane LOS	A	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	1.8	0	-	-

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	2	11	21	14	43	20	372	3	12	451	33
Future Vol, veh/h	28	2	11	21	14	43	20	372	3	12	451	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	71	71	71	80	80	80	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	8	1	0	0	1	5
Mvmt Flow	31	2	12	30	20	61	25	465	4	16	601	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1213	1174	623	1179	1194	467	645	0	0	469	0	0
Stage 1	655	655	-	517	517	-	-	-	-	-	-	-
Stage 2	558	519	-	662	677	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	160	193	490	169	188	600	912	-	-	1103	-	-
Stage 1	458	466	-	545	537	-	-	-	-	-	-	-
Stage 2	518	536	-	454	455	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	182	490	156	177	600	912	-	-	1103	-	-
Mov Cap-2 Maneuver	126	182	-	156	177	-	-	-	-	-	-	-
Stage 1	441	455	-	525	517	-	-	-	-	-	-	-
Stage 2	431	516	-	430	445	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.4	26.8	0.5	0.2
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	912	-	-	160	273	1103	-	-
HCM Lane V/C Ratio	0.027	-	-	0.288	0.402	0.015	-	-
HCM Control Delay (s)	9.1	0	-	36.4	26.8	8.3	0	-
HCM Lane LOS	A	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	1.9	0	-	-

Intersection												
Int Delay, s/veh	4.6											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	2	12	21	14	43	22	411	3	12	497	35
Future Vol, veh/h	30	2	12	21	14	43	22	411	3	12	497	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	71	71	71	80	80	80	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	8	1	0	0	1	5
Mvmt Flow	34	2	13	30	20	61	28	514	4	16	663	47

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1332	1293	687	1298	1314	516	710	0	0	518	0	0
Stage 1	719	719	-	572	572	-	-	-	-	-	-	-
Stage 2	613	574	-	726	742	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	133	164	450	140	160	563	862	-	-	1058	-	-
Stage 1	423	436	-	509	508	-	-	-	-	-	-	-
Stage 2	483	506	-	419	425	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	153	450	127	149	563	862	-	-	1058	-	-
Mov Cap-2 Maneuver	101	153	-	127	149	-	-	-	-	-	-	-
Stage 1	404	425	-	486	485	-	-	-	-	-	-	-
Stage 2	394	483	-	394	414	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	48.3	33.7	0.5	0.2
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	862	-	-	131	232	1058	-	-
HCM Lane V/C Ratio	0.032	-	-	0.377	0.474	0.015	-	-
HCM Control Delay (s)	9.3	0	-	48.3	33.7	8.5	0	-
HCM Lane LOS	A	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.6	2.3	0	-	-

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	2	12	21	14	43	22	411	3	12	498	36
Future Vol, veh/h	31	2	12	21	14	43	22	411	3	12	498	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	71	71	71	80	80	80	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	8	1	0	0	1	5
Mvmt Flow	35	2	13	30	20	61	28	514	4	16	664	48

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1333	1294	688	1300	1316	516	712	0	0	518	0	0
Stage 1	720	720	-	572	572	-	-	-	-	-	-	-
Stage 2	613	574	-	728	744	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	132	164	450	140	159	563	861	-	-	1058	-	-
Stage 1	422	435	-	509	508	-	-	-	-	-	-	-
Stage 2	483	506	-	418	424	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	100	153	450	127	148	563	861	-	-	1058	-	-
Mov Cap-2 Maneuver	100	153	-	127	148	-	-	-	-	-	-	-
Stage 1	403	424	-	486	485	-	-	-	-	-	-	-
Stage 2	394	483	-	393	413	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	49.8	33.7	0.5	0.2
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	861	-	-	129	232	1058	-	-
HCM Lane V/C Ratio	0.032	-	-	0.392	0.474	0.015	-	-
HCM Control Delay (s)	9.3	0	-	49.8	33.7	8.5	0	-
HCM Lane LOS	A	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	2.3	0	-	-

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	6	22	3	7	11	24	240	6	25	244	20
Future Vol, veh/h	21	6	22	3	7	11	24	240	6	25	244	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	75	75	75	85	85	85	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	27	8	29	4	9	15	28	282	7	26	257	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	674	665	268	680	672	286	278	0	0	289	0	0
Stage 1	320	320	-	342	342	-	-	-	-	-	-	-
Stage 2	354	345	-	338	330	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	371	383	776	368	380	758	1296	-	-	1284	-	-
Stage 1	696	656	-	677	642	-	-	-	-	-	-	-
Stage 2	667	640	-	681	649	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	343	364	776	336	361	758	1296	-	-	1284	-	-
Mov Cap-2 Maneuver	343	364	-	336	361	-	-	-	-	-	-	-
Stage 1	678	640	-	659	625	-	-	-	-	-	-	-
Stage 2	628	623	-	632	633	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	12.8	0.7	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1296	-	-	462	490	1284	-	-
HCM Lane V/C Ratio	0.022	-	-	0.138	0.057	0.02	-	-
HCM Control Delay (s)	7.8	0	-	14	12.8	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.2	0.1	-	-

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	14	28	9	12	23	31	306	15	48	311	26
Future Vol, veh/h	27	14	28	9	12	23	31	306	15	48	311	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	75	75	75	85	85	85	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	35	18	36	12	16	31	36	360	18	51	327	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	908	893	341	911	897	369	354	0	0	378	0	0
Stage 1	443	443	-	441	441	-	-	-	-	-	-	-
Stage 2	465	450	-	470	456	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	258	283	706	257	281	681	1216	-	-	1192	-	-
Stage 1	598	579	-	599	580	-	-	-	-	-	-	-
Stage 2	581	575	-	578	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	219	258	706	215	256	681	1216	-	-	1192	-	-
Mov Cap-2 Maneuver	219	258	-	215	256	-	-	-	-	-	-	-
Stage 1	575	548	-	576	558	-	-	-	-	-	-	-
Stage 2	518	553	-	502	542	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.7	17	0.7	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1216	-	-	318	359	1192	-	-
HCM Lane V/C Ratio	0.03	-	-	0.282	0.163	0.042	-	-
HCM Control Delay (s)	8.1	0	-	20.7	17	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.6	0.1	-	-

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	14	28	9	12	23	31	307	15	48	311	28
Future Vol, veh/h	30	14	28	9	12	23	31	307	15	48	311	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	75	75	75	85	85	85	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	39	18	36	12	16	31	36	361	18	51	327	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	910	895	342	913	900	370	356	0	0	379	0	0
Stage 1	444	444	-	442	442	-	-	-	-	-	-	-
Stage 2	466	451	-	471	458	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	258	282	705	256	280	680	1214	-	-	1191	-	-
Stage 1	597	579	-	598	580	-	-	-	-	-	-	-
Stage 2	581	574	-	577	570	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	219	257	705	214	255	680	1214	-	-	1191	-	-
Mov Cap-2 Maneuver	219	257	-	214	255	-	-	-	-	-	-	-
Stage 1	574	548	-	575	558	-	-	-	-	-	-	-
Stage 2	518	552	-	501	539	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.5	17	0.7	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1214	-	-	311	358	1191	-	-
HCM Lane V/C Ratio	0.03	-	-	0.301	0.164	0.042	-	-
HCM Control Delay (s)	8.1	0	-	21.5	17	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.6	0.1	-	-

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	14	31	9	12	23	34	338	15	48	344	29
Future Vol, veh/h	30	14	31	9	12	23	34	338	15	48	344	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	75	75	75	85	85	85	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	39	18	40	12	16	31	40	398	18	51	362	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	991	976	378	996	982	407	393	0	0	416	0	0
Stage 1	480	480	-	487	487	-	-	-	-	-	-	-
Stage 2	511	496	-	509	495	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	227	253	673	225	251	648	1177	-	-	1154	-	-
Stage 1	571	558	-	566	554	-	-	-	-	-	-	-
Stage 2	549	549	-	550	549	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	189	228	673	184	226	648	1177	-	-	1154	-	-
Mov Cap-2 Maneuver	189	228	-	184	226	-	-	-	-	-	-	-
Stage 1	546	526	-	541	530	-	-	-	-	-	-	-
Stage 2	485	525	-	471	518	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.4	18.8	0.7	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1177	-	-	282	320	1154	-	-
HCM Lane V/C Ratio	0.034	-	-	0.345	0.183	0.044	-	-
HCM Control Delay (s)	8.2	0	-	24.4	18.8	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.7	0.1	-	-

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	33	14	31	9	12	23	34	339	15	48	344	31
Future Vol, veh/h	33	14	31	9	12	23	34	339	15	48	344	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	75	75	75	85	85	85	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	43	18	40	12	16	31	40	399	18	51	362	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	993	978	379	998	985	408	395	0	0	417	0	0
Stage 1	481	481	-	488	488	-	-	-	-	-	-	-
Stage 2	512	497	-	510	497	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	226	252	672	224	250	648	1175	-	-	1153	-	-
Stage 1	570	557	-	565	553	-	-	-	-	-	-	-
Stage 2	548	548	-	550	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	188	227	672	183	226	648	1175	-	-	1153	-	-
Mov Cap-2 Maneuver	188	227	-	183	226	-	-	-	-	-	-	-
Stage 1	545	525	-	540	529	-	-	-	-	-	-	-
Stage 2	484	524	-	471	517	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.5	18.8	0.7	0.9
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1175	-	-	275	319	1153	-	-
HCM Lane V/C Ratio	0.034	-	-	0.368	0.184	0.044	-	-
HCM Control Delay (s)	8.2	0	-	25.5	18.8	8.3	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.6	0.7	0.1	-	-

Appendix G **Capacity and Level of Service Calculations - Signalized**

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	329	25	330	448	21	331
Future Volume (vph)	329	25	330	448	21	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1792	1495	1787	1810	1805	1599
Flt Permitted	1.00	1.00	0.55	1.00	0.95	1.00
Satd. Flow (perm)	1792	1495	1037	1810	1805	1599
Peak-hour factor, PHF	0.94	0.94	0.80	0.80	0.89	0.89
Adj. Flow (vph)	350	27	412	560	24	372
RTOR Reduction (vph)	0	5	0	0	0	336
Lane Group Flow (vph)	350	22	413	560	24	36
Heavy Vehicles (%)	6%	8%	1%	5%	0%	1%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	40.1	52.2	40.1	40.1	6.1	6.1
Effective Green, g (s)	40.1	52.2	40.1	40.1	6.1	6.1
Actuated g/C Ratio	0.64	0.83	0.64	0.64	0.10	0.10
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1146	1244	663	1157	175	155
v/s Ratio Prot	0.20	0.02		0.31	0.01	c0.02
v/s Ratio Perm			c0.40			
v/c Ratio	0.31	0.02	0.62	0.48	0.14	0.23
Uniform Delay, d1	5.1	0.9	6.8	5.9	25.9	26.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	1.8	0.3	0.4	0.8
Delay (s)	5.2	0.9	8.6	6.2	26.3	26.9
Level of Service	A	A	A	A	C	C
Approach Delay (s)	4.9			7.2	26.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	62.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

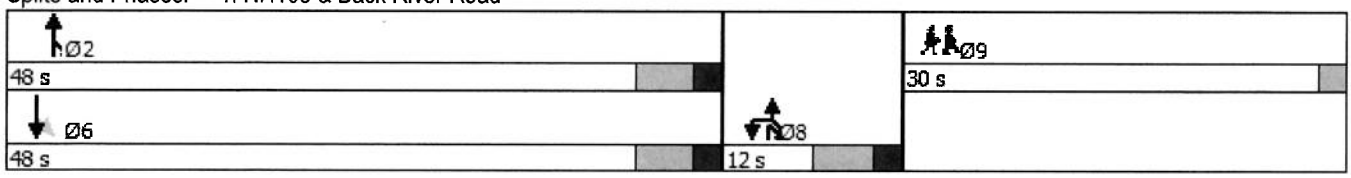
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations	↑	↱	↰	↑	↰	↱	
Traffic Volume (vph)	329	25	330	448	21	331	
Future Volume (vph)	329	25	330	448	21	331	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	48.0		48.0	48.0	12.0	12.0	30.0
Total Split (%)	53.3%		53.3%	53.3%	13.3%	13.3%	33%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	40.1	57.4	40.1	40.1	6.1	6.1	
Actuated g/C Ratio	0.66	0.94	0.66	0.66	0.10	0.10	
v/c Ratio	0.30	0.02	0.61	0.47	0.13	0.75	
Control Delay	6.5	1.2	13.2	8.2	30.8	15.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.5	1.2	13.2	8.2	30.8	15.6	
LOS	A	A	B	A	C	B	
Approach Delay	6.2			10.3	16.5		
Approach LOS	A			B	B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 61.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 10.8
Intersection LOS: B
Intersection Capacity Utilization 53.9%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	350	27	413	560	24	372
v/c Ratio	0.30	0.02	0.61	0.47	0.13	0.75
Control Delay	6.5	1.2	13.2	8.2	30.8	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	1.2	13.2	8.2	30.8	15.6
Queue Length 50th (ft)	36	0	57	68	8	0
Queue Length 95th (ft)	146	7	211	216	33	#114
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1251	1368	724	1264	180	494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.02	0.57	0.44	0.13	0.75

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	502	39	507	683	34	519
Future Volume (vph)	502	39	507	683	34	519
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1792	1495	1787	1810	1805	1599
Flt Permitted	1.00	1.00	0.43	1.00	0.95	1.00
Satd. Flow (perm)	1792	1495	812	1810	1805	1599
Peak-hour factor, PHF	0.94	0.94	0.80	0.80	0.89	0.89
Adj. Flow (vph)	534	41	634	854	38	583
RTOR Reduction (vph)	0	7	0	0	0	537
Lane Group Flow (vph)	534	34	634	854	38	46
Heavy Vehicles (%)	6%	8%	1%	5%	0%	1%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	43.5	54.6	43.5	43.5	5.1	5.1
Effective Green, g (s)	43.5	54.6	43.5	43.5	5.1	5.1
Actuated g/C Ratio	0.67	0.84	0.67	0.67	0.08	0.08
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1195	1251	541	1207	141	125
v/s Ratio Prot	0.30	0.02		0.47	0.02	c0.03
v/s Ratio Perm			c0.78			
v/c Ratio	0.45	0.03	1.17	0.71	0.27	0.36
Uniform Delay, d1	5.1	0.9	10.9	6.8	28.3	28.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	95.7	1.9	1.0	1.8
Delay (s)	5.4	0.9	106.5	8.8	29.3	30.3
Level of Service	A	A	F	A	C	C
Approach Delay (s)	5.1			50.4	30.3	
Approach LOS	A			D	C	

Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

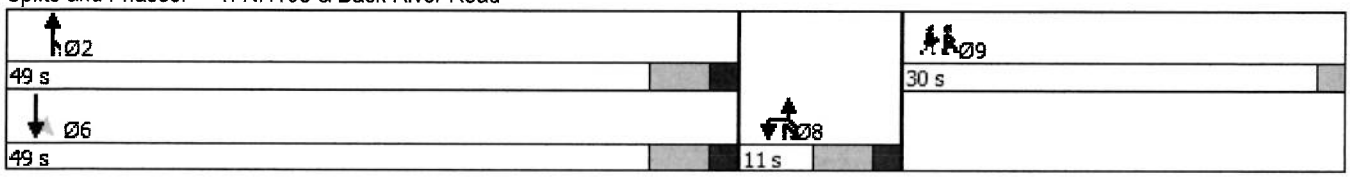
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations	↑	↱	↰	↑	↰	↱	
Traffic Volume (vph)	502	39	507	683	34	519	
Future Volume (vph)	502	39	507	683	34	519	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	49.0		49.0	49.0	11.0	11.0	30.0
Total Split (%)	54.4%		54.4%	54.4%	12.2%	12.2%	33%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	43.5	59.7	43.5	43.5	5.1	5.1	
Actuated g/C Ratio	0.68	0.94	0.68	0.68	0.08	0.08	
v/c Ratio	0.44	0.03	1.14	0.69	0.27	0.88	
Control Delay	7.3	1.0	100.4	12.2	34.9	20.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.3	1.0	100.4	12.2	34.9	20.3	
LOS	A	A	F	B	C	C	
Approach Delay	6.8			49.8	21.2		
Approach LOS	A			D	C		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 34.0 — Intersection LOS: C
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	534	41	634	854	38	583
v/c Ratio	0.44	0.03	1.14	0.69	0.27	0.88
Control Delay	7.3	1.0	100.4	12.2	34.9	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	1.0	100.4	12.2	34.9	20.3
Queue Length 50th (ft)	58	0	~267	124	13	0
Queue Length 95th (ft)	239	8	#522	399	47	#155
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1225	1405	555	1237	143	663
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.03	1.14	0.69	0.27	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	502	39	510	683	35	526
Future Volume (vph)	502	39	510	683	35	526
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1792	1495	1787	1810	1805	1599
Flt Permitted	1.00	1.00	0.43	1.00	0.95	1.00
Satd. Flow (perm)	1792	1495	812	1810	1805	1599
Peak-hour factor, PHF	0.94	0.94	0.80	0.80	0.89	0.89
Adj. Flow (vph)	534	41	638	854	39	591
RTOR Reduction (vph)	0	7	0	0	0	538
Lane Group Flow (vph)	534	34	638	854	39	53
Heavy Vehicles (%)	6%	8%	1%	5%	0%	1%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	43.5	54.6	43.5	43.5	5.1	5.1
Effective Green, g (s)	43.5	54.6	43.5	43.5	5.1	5.1
Actuated g/C Ratio	0.67	0.84	0.67	0.67	0.08	0.08
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1195	1251	541	1207	141	125
v/s Ratio Prot	0.30	0.02		0.47	0.02	c0.03
v/s Ratio Perm			c0.79			
v/c Ratio	0.45	0.03	1.18	0.71	0.28	0.42
Uniform Delay, d1	5.1	0.9	10.9	6.8	28.3	28.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	98.6	1.9	1.1	2.3
Delay (s)	5.4	0.9	109.4	8.8	29.4	30.9
Level of Service	A	A	F	A	C	C
Approach Delay (s)	5.1			51.8	30.8	
Approach LOS	A			D	C	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

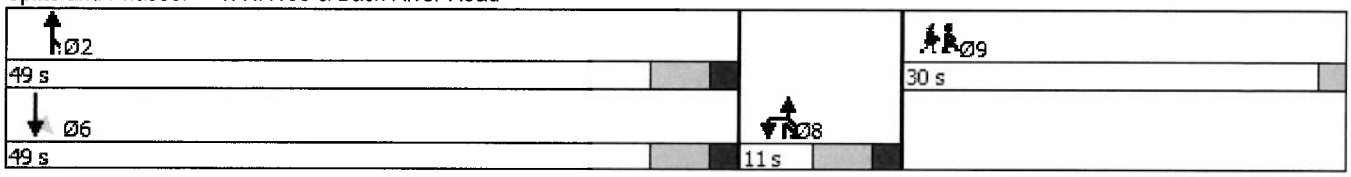
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations	↑	↱	↰	↑	↰	↱	
Traffic Volume (vph)	502	39	510	683	35	526	
Future Volume (vph)	502	39	510	683	35	526	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	49.0		49.0	49.0	11.0	11.0	30.0
Total Split (%)	54.4%		54.4%	54.4%	12.2%	12.2%	33%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	43.5	59.7	43.5	43.5	5.1	5.1	
Actuated g/C Ratio	0.68	0.94	0.68	0.68	0.08	0.08	
v/c Ratio	0.44	0.03	1.15	0.69	0.27	0.89	
Control Delay	7.3	1.0	103.2	12.2	35.0	21.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.3	1.0	103.2	12.2	35.0	21.7	
LOS	A	A	F	B	D	C	
Approach Delay	6.8			51.1	22.5		
Approach LOS	A			D	C		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 35.0
Intersection LOS: C
Intersection Capacity Utilization 73.0%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	534	41	638	854	39	591
v/c Ratio	0.44	0.03	1.15	0.69	0.27	0.89
Control Delay	7.3	1.0	103.2	12.2	35.0	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	1.0	103.2	12.2	35.0	21.7
Queue Length 50th (ft)	58	0	~270	124	14	2
Queue Length 95th (ft)	239	8	#527	399	48	#163
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1225	1405	555	1237	143	664
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.03	1.15	0.69	0.27	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	555	43	560	755	37	572
Future Volume (vph)	555	43	560	755	37	572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1792	1495	1787	1810	1805	1599
Flt Permitted	1.00	1.00	0.41	1.00	0.95	1.00
Satd. Flow (perm)	1792	1495	780	1810	1805	1599
Peak-hour factor, PHF	0.94	0.94	0.80	0.80	0.89	0.89
Adj. Flow (vph)	590	46	700	944	42	643
RTOR Reduction (vph)	0	4	0	0	0	477
Lane Group Flow (vph)	590	42	700	944	42	166
Heavy Vehicles (%)	6%	8%	1%	5%	0%	1%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	100.3	114.3	100.3	100.3	8.0	8.0
Effective Green, g (s)	100.3	114.3	100.3	100.3	8.0	8.0
Actuated g/C Ratio	0.80	0.91	0.80	0.80	0.06	0.06
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1435	1364	624	1450	115	102
v/s Ratio Prot	0.33	0.03		0.52	0.02	c0.10
v/s Ratio Perm			c0.90			
v/c Ratio	0.41	0.03	1.12	0.65	0.37	1.62
Uniform Delay, d1	3.7	0.5	12.5	5.2	56.2	58.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	74.4	1.1	2.0	320.7
Delay (s)	3.9	0.5	86.8	6.2	58.1	379.3
Level of Service	A	A	F	A	E	F
Approach Delay (s)	3.6			40.6	359.6	
Approach LOS	A			D	F	

Intersection Summary			
HCM 2000 Control Delay	106.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

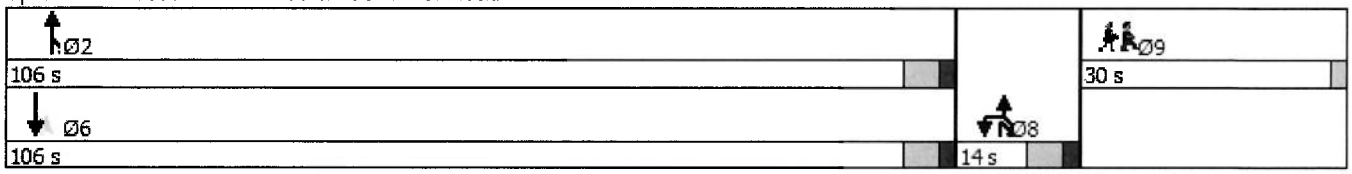
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations							
Traffic Volume (vph)	555	43	560	755	37	572	
Future Volume (vph)	555	43	560	755	37	572	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	106.0		106.0	106.0	14.0	14.0	30.0
Total Split (%)	70.7%		70.7%	70.7%	9.3%	9.3%	20%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	100.3	119.3	100.3	100.3	8.0	8.0	
Actuated g/C Ratio	0.81	0.97	0.81	0.81	0.06	0.06	
v/c Ratio	0.41	0.03	1.11	0.64	0.36	1.11	
Control Delay	4.9	0.5	84.0	8.2	66.3	82.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.9	0.5	84.0	8.2	66.3	82.3	
LOS	A	A	F	A	E	F	
Approach Delay	4.6			40.5	81.3		
Approach LOS	A			D	F		

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 42.2 — Intersection LOS: D
Intersection Capacity Utilization 78.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	590	46	700	944	42	643
v/c Ratio	0.41	0.03	1.11	0.64	0.36	1.11
Control Delay	4.9	0.5	84.0	8.2	66.3	82.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	0.5	84.0	8.2	66.3	82.3
Queue Length 50th (ft)	86	0	~604	192	32	~172
Queue Length 95th (ft)	265	6	#847	457	77	#430
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1454	1445	633	1469	117	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.03	1.11	0.64	0.36	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	555	43	563	755	38	579
Future Volume (vph)	555	43	563	755	38	579
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1792	1495	1787	1810	1805	1599
Flt Permitted	1.00	1.00	0.41	1.00	0.95	1.00
Satd. Flow (perm)	1792	1495	780	1810	1805	1599
Peak-hour factor, PHF	0.94	0.94	0.80	0.80	0.89	0.89
Adj. Flow (vph)	590	46	704	944	43	651
RTOR Reduction (vph)	0	4	0	0	0	477
Lane Group Flow (vph)	590	42	704	944	43	174
Heavy Vehicles (%)	6%	8%	1%	5%	0%	1%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	100.3	114.3	100.3	100.3	8.0	8.0
Effective Green, g (s)	100.3	114.3	100.3	100.3	8.0	8.0
Actuated g/C Ratio	0.80	0.91	0.80	0.80	0.06	0.06
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1435	1364	624	1450	115	102
v/s Ratio Prot	0.33	0.03		0.52	0.02	c0.11
v/s Ratio Perm			c0.90			
v/c Ratio	0.41	0.03	1.13	0.65	0.37	1.70
Uniform Delay, d1	3.7	0.5	12.5	5.2	56.2	58.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	76.8	1.1	2.0	354.0
Delay (s)	3.9	0.5	89.2	6.2	58.2	412.6
Level of Service	A	A	F	A	E	F
Approach Delay (s)	3.6			41.7	390.6	
Approach LOS	A			D	F	

Intersection Summary			
HCM 2000 Control Delay	114.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

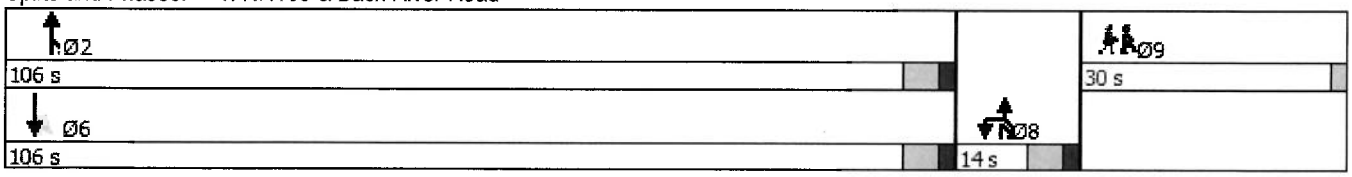
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations							
Traffic Volume (vph)	555	43	563	755	38	579	
Future Volume (vph)	555	43	563	755	38	579	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	106.0		106.0	106.0	14.0	14.0	30.0
Total Split (%)	70.7%		70.7%	70.7%	9.3%	9.3%	20%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	100.3	119.3	100.3	100.3	8.0	8.0	
Actuated g/C Ratio	0.81	0.97	0.81	0.81	0.06	0.06	
v/c Ratio	0.41	0.03	1.11	0.64	0.37	1.12	
Control Delay	4.9	0.5	86.3	8.2	66.6	87.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.9	0.5	86.3	8.2	66.6	87.5	
LOS	A	A	F	A	E	F	
Approach Delay	4.6			41.6	86.2		
Approach LOS	A			D	F		

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 44.1 — Intersection LOS: D
Intersection Capacity Utilization 78.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	590	46	704	944	43	651
v/c Ratio	0.41	0.03	1.11	0.64	0.37	1.12
Control Delay	4.9	0.5	86.3	8.2	66.6	87.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	0.5	86.3	8.2	66.6	87.5
Queue Length 50th (ft)	86	0	~610	192	32	~185
Queue Length 95th (ft)	265	6	#855	457	79	#445
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1454	1445	633	1469	117	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.03	1.11	0.64	0.37	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	485	32	311	555	28	304
Future Volume (vph)	485	32	311	555	28	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1615	1787	1863	1805	1615
Flt Permitted	1.00	1.00	0.44	1.00	0.95	1.00
Satd. Flow (perm)	1881	1615	831	1863	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.79	0.79
Adj. Flow (vph)	511	34	346	617	35	385
RTOR Reduction (vph)	0	6	0	0	0	349
Lane Group Flow (vph)	511	28	346	617	35	36
Heavy Vehicles (%)	1%	0%	1%	2%	0%	0%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	42.5	54.6	42.5	42.5	6.1	6.1
Effective Green, g (s)	42.5	54.6	42.5	42.5	6.1	6.1
Actuated g/C Ratio	0.65	0.84	0.65	0.65	0.09	0.09
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1226	1352	541	1214	168	151
v/s Ratio Prot	0.27	0.02		0.33	0.02	c0.02
v/s Ratio Perm			c0.42			
v/c Ratio	0.42	0.02	0.64	0.51	0.21	0.24
Uniform Delay, d1	5.4	0.9	6.8	5.9	27.3	27.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	2.5	0.3	0.6	0.8
Delay (s)	5.7	0.9	9.3	6.2	27.9	28.2
Level of Service	A	A	A	A	C	C
Approach Delay (s)	5.4			7.3	28.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

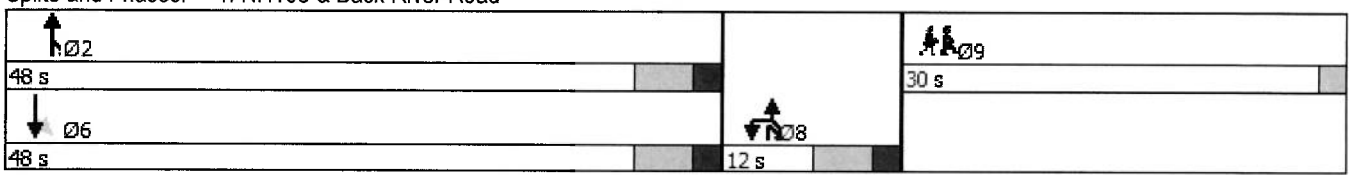
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations							
Traffic Volume (vph)	485	32	311	555	28	304	
Future Volume (vph)	485	32	311	555	28	304	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	48.0		48.0	48.0	12.0	12.0	30.0
Total Split (%)	53.3%		53.3%	53.3%	13.3%	13.3%	33%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	42.6	59.8	42.6	42.6	6.1	6.1	
Actuated g/C Ratio	0.67	0.94	0.67	0.67	0.10	0.10	
v/c Ratio	0.41	0.02	0.62	0.50	0.20	0.77	
Control Delay	7.3	1.1	15.3	8.4	32.1	16.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.3	1.1	15.3	8.4	32.1	16.0	
LOS	A	A	B	A	C	B	
Approach Delay	6.9			10.9	17.3		
Approach LOS	A			B	B		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 11.2 — Intersection LOS: B
Intersection Capacity Utilization 61.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	511	34	346	617	35	385
v/c Ratio	0.41	0.02	0.62	0.50	0.20	0.77
Control Delay	7.3	1.1	15.3	8.4	32.1	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	1.1	15.3	8.4	32.1	16.0
Queue Length 50th (ft)	59	0	50	77	12	0
Queue Length 95th (ft)	226	7	#283	296	38	45
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1256	1518	555	1244	171	502
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.02	0.62	0.50	0.20	0.77

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Volume (vph)	619	43	413	708	37	397
Future Volume (vph)	619	43	413	708	37	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1615	1787	1863	1805	1615
Flt Permitted	1.00	1.00	0.36	1.00	0.95	1.00
Satd. Flow (perm)	1881	1615	671	1863	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.79	0.79
Adj. Flow (vph)	652	45	459	787	47	503
RTOR Reduction (vph)	0	7	0	0	0	464
Lane Group Flow (vph)	652	38	459	787	47	39
Heavy Vehicles (%)	1%	0%	1%	2%	0%	0%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	43.5	54.6	43.5	43.5	5.1	5.1
Effective Green, g (s)	43.5	54.6	43.5	43.5	5.1	5.1
Actuated g/C Ratio	0.67	0.84	0.67	0.67	0.08	0.08
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1254	1352	447	1242	141	126
v/s Ratio Prot	0.35	0.02		0.42	c0.03	0.02
v/s Ratio Perm			c0.68			
v/c Ratio	0.52	0.03	1.03	0.63	0.33	0.31
Uniform Delay, d1	5.5	0.9	10.9	6.3	28.4	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	49.6	1.1	1.4	1.4
Delay (s)	5.9	0.9	60.4	7.3	29.8	29.8
Level of Service	A	A	E	A	C	C
Approach Delay (s)	5.6			26.9	29.8	
Approach LOS	A			C	C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

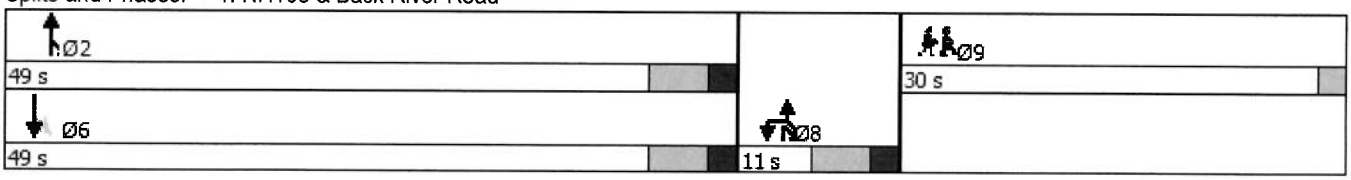
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations	↑	↱	↰	↑	↰	↱	
Traffic Volume (vph)	619	43	413	708	37	397	
Future Volume (vph)	619	43	413	708	37	397	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	49.0		49.0	49.0	11.0	11.0	30.0
Total Split (%)	54.4%		54.4%	54.4%	12.2%	12.2%	33%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	43.5	59.7	43.5	43.5	5.1	5.1	
Actuated g/C Ratio	0.68	0.94	0.68	0.68	0.08	0.08	
v/c Ratio	0.51	0.03	1.00	0.62	0.33	0.85	
Control Delay	8.0	1.0	59.2	9.9	36.5	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.0	1.0	59.2	9.9	36.5	19.4	
LOS	A	A	E	A	D	B	
Approach Delay	7.6			28.1	20.9		
Approach LOS	A			C	C		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 20.8
Intersection LOS: C
Intersection Capacity Utilization 73.8%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	652	45	459	787	47	503
v/c Ratio	0.51	0.03	1.00	0.62	0.33	0.85
Control Delay	8.0	1.0	59.2	9.9	36.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	1.0	59.2	9.9	36.5	19.4
Queue Length 50th (ft)	76	0	112	105	16	0
Queue Length 95th (ft)	308	8	#456	426	48	#63
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1286	1518	458	1273	143	591
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.03	1.00	0.62	0.33	0.85

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	619	44	426	708	38	403
Future Volume (vph)	619	44	426	708	38	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1615	1787	1863	1805	1615
Flt Permitted	1.00	1.00	0.36	1.00	0.95	1.00
Satd. Flow (perm)	1881	1615	671	1863	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.79	0.79
Adj. Flow (vph)	652	46	473	787	48	510
RTOR Reduction (vph)	0	7	0	0	0	470
Lane Group Flow (vph)	652	39	473	787	48	40
Heavy Vehicles (%)	1%	0%	1%	2%	0%	0%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	43.5	54.6	43.5	43.5	5.1	5.1
Effective Green, g (s)	43.5	54.6	43.5	43.5	5.1	5.1
Actuated g/C Ratio	0.67	0.84	0.67	0.67	0.08	0.08
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1254	1352	447	1242	141	126
v/s Ratio Prot	0.35	0.02		0.42	c0.03	0.02
v/s Ratio Perm			c0.71			
v/c Ratio	0.52	0.03	1.06	0.63	0.34	0.32
Uniform Delay, d1	5.5	0.9	10.9	6.3	28.5	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	58.8	1.1	1.4	1.4
Delay (s)	5.9	0.9	69.6	7.3	29.9	29.9
Level of Service	A	A	E	A	C	C
Approach Delay (s)	5.6			30.7	29.9	
Approach LOS	A			C	C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

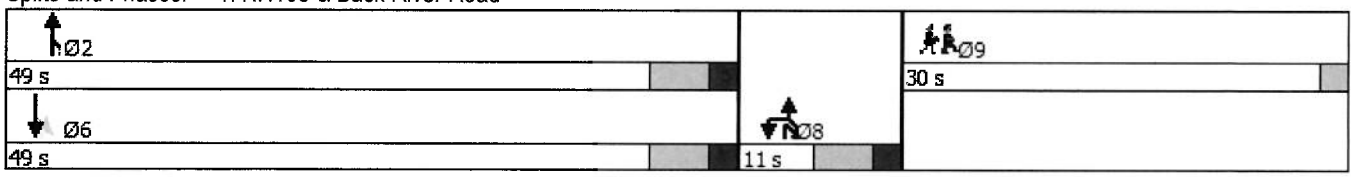
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations	↑	↱	↰	↑	↰	↱	
Traffic Volume (vph)	619	44	426	708	38	403	
Future Volume (vph)	619	44	426	708	38	403	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	49.0		49.0	49.0	11.0	11.0	30.0
Total Split (%)	54.4%		54.4%	54.4%	12.2%	12.2%	33%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	43.5	59.7	43.5	43.5	5.1	5.1	
Actuated g/C Ratio	0.68	0.94	0.68	0.68	0.08	0.08	
v/c Ratio	0.51	0.03	1.03	0.62	0.34	0.85	
Control Delay	8.0	1.0	67.4	9.9	36.7	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.0	1.0	67.4	9.9	36.7	19.4	
LOS	A	A	E	A	D	B	
Approach Delay	7.6			31.5	20.9		
Approach LOS	A			C	C		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 22.5
Intersection LOS: C
Intersection Capacity Utilization 74.5%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	652	46	473	787	48	510
v/c Ratio	0.51	0.03	1.03	0.62	0.34	0.85
Control Delay	8.0	1.0	67.4	9.9	36.7	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	1.0	67.4	9.9	36.7	19.4
Queue Length 50th (ft)	76	0	123	105	17	0
Queue Length 95th (ft)	308	8	#472	426	49	#63
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1286	1518	458	1273	143	598
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.03	1.03	0.62	0.34	0.85

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	684	47	455	782	41	438
Future Volume (vph)	684	47	455	782	41	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1615	1787	1863	1805	1615
Flt Permitted	1.00	1.00	0.35	1.00	0.95	1.00
Satd. Flow (perm)	1881	1615	659	1863	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.79	0.79
Adj. Flow (vph)	720	49	506	869	52	554
RTOR Reduction (vph)	0	4	0	0	0	419
Lane Group Flow (vph)	720	45	506	869	52	135
Heavy Vehicles (%)	1%	0%	1%	2%	0%	0%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	100.3	114.3	100.3	100.3	8.0	8.0
Effective Green, g (s)	100.3	114.3	100.3	100.3	8.0	8.0
Actuated g/C Ratio	0.80	0.91	0.80	0.80	0.06	0.06
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1506	1474	527	1492	115	103
v/s Ratio Prot	0.38	0.03		0.47	0.03	c0.08
v/s Ratio Perm			c0.77			
v/c Ratio	0.48	0.03	0.96	0.58	0.45	1.31
Uniform Delay, d1	4.0	0.5	10.7	4.6	56.5	58.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	29.3	0.6	2.8	191.8
Delay (s)	4.3	0.5	40.0	5.2	59.3	250.4
Level of Service	A	A	D	A	E	F
Approach Delay (s)	4.0			18.0	234.0	
Approach LOS	A			B	F	

Intersection Summary			
HCM 2000 Control Delay	61.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

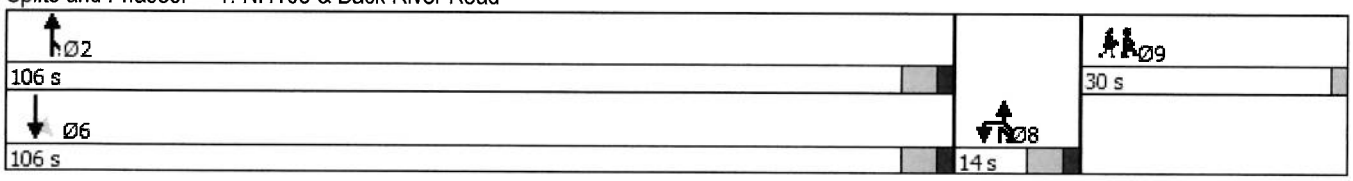
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations							
Traffic Volume (vph)	684	47	455	782	41	438	
Future Volume (vph)	684	47	455	782	41	438	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	106.0		106.0	106.0	14.0	14.0	30.0
Total Split (%)	70.7%		70.7%	70.7%	9.3%	9.3%	20%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	100.3	119.3	100.3	100.3	8.0	8.0	
Actuated g/C Ratio	0.81	0.97	0.81	0.81	0.06	0.06	
v/c Ratio	0.47	0.03	0.95	0.57	0.44	1.06	
Control Delay	5.5	0.4	41.4	6.9	70.0	67.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.5	0.4	41.4	6.9	70.0	67.7	
LOS	A	A	D	A	E	E	
Approach Delay	5.2			19.6	67.9		
Approach LOS	A			B	E		

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 26.2
Intersection LOS: C
Intersection Capacity Utilization 79.5%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	720	49	506	869	52	554
v/c Ratio	0.47	0.03	0.95	0.57	0.44	1.06
Control Delay	5.5	0.4	41.4	6.9	70.0	67.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	0.4	41.4	6.9	70.0	67.7
Queue Length 50th (ft)	114	0	214	158	39	~122
Queue Length 95th (ft)	345	6	#722	485	81	#224
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1526	1560	534	1512	117	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.03	0.95	0.57	0.44	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
1: NH108 & Back River Road

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	684	48	468	782	42	444
Future Volume (vph)	684	48	468	782	42	444
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1881	1615	1787	1863	1805	1615
Flt Permitted	1.00	1.00	0.35	1.00	0.95	1.00
Satd. Flow (perm)	1881	1615	659	1863	1805	1615
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.79	0.79
Adj. Flow (vph)	720	51	520	869	53	562
RTOR Reduction (vph)	0	4	0	0	0	419
Lane Group Flow (vph)	720	47	520	869	53	143
Heavy Vehicles (%)	1%	0%	1%	2%	0%	0%
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot
Protected Phases	2	2 8		6	8	8
Permitted Phases			6			
Actuated Green, G (s)	100.3	114.3	100.3	100.3	8.0	8.0
Effective Green, g (s)	100.3	114.3	100.3	100.3	8.0	8.0
Actuated g/C Ratio	0.80	0.91	0.80	0.80	0.06	0.06
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1506	1474	527	1492	115	103
v/s Ratio Prot	0.38	0.03		0.47	0.03	c0.09
v/s Ratio Perm			c0.79			
v/c Ratio	0.48	0.03	0.99	0.58	0.46	1.38
Uniform Delay, d1	4.0	0.5	11.8	4.6	56.5	58.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	35.4	0.6	2.9	222.1
Delay (s)	4.3	0.5	47.3	5.2	59.4	280.7
Level of Service	A	A	D	A	E	F
Approach Delay (s)	4.0			21.0	261.7	
Approach LOS	A			C	F	

Intersection Summary			
HCM 2000 Control Delay	69.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

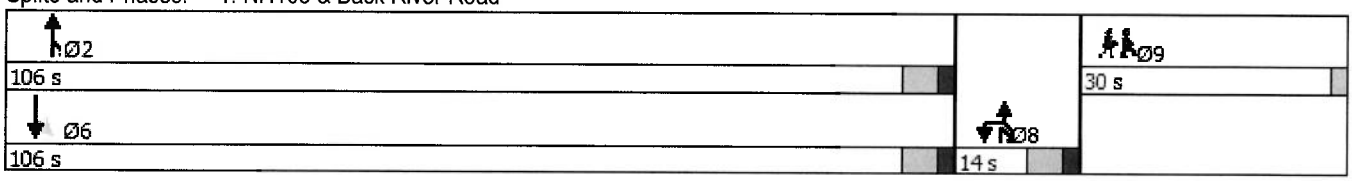
Timings
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø9
Lane Configurations	↑	↱	↰	↑	↰	↱	
Traffic Volume (vph)	684	48	468	782	42	444	
Future Volume (vph)	684	48	468	782	42	444	
Turn Type	NA	pt+ov	Perm	NA	Prot	Prot	
Protected Phases	2	2 8		6	8	8	9
Permitted Phases			6				
Detector Phase	2	2 8	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	22.0		22.0	22.0	11.0	11.0	30.0
Total Split (s)	106.0		106.0	106.0	14.0	14.0	30.0
Total Split (%)	70.7%		70.7%	70.7%	9.3%	9.3%	20%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Min		Min	Min	None	None	None
Act Effct Green (s)	100.3	119.3	100.3	100.3	8.0	8.0	
Actuated g/C Ratio	0.81	0.97	0.81	0.81	0.06	0.06	
v/c Ratio	0.47	0.03	0.97	0.57	0.45	1.07	
Control Delay	5.5	0.4	47.1	6.9	70.4	72.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.5	0.4	47.1	6.9	70.4	72.9	
LOS	A	A	D	A	E	E	
Approach Delay	5.2			21.9	72.7		
Approach LOS	A			C	E		

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 28.5
Intersection LOS: C
Intersection Capacity Utilization 80.3%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: NH108 & Back River Road



Queues
1: NH108 & Back River Road

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Group Flow (vph)	720	51	520	869	53	562
v/c Ratio	0.47	0.03	0.97	0.57	0.45	1.07
Control Delay	5.5	0.4	47.1	6.9	70.4	72.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	0.4	47.1	6.9	70.4	72.9
Queue Length 50th (ft)	114	0	242	158	40	~135
Queue Length 95th (ft)	345	6	#750	485	82	#237
Internal Link Dist (ft)	888			556	693	
Turn Bay Length (ft)		150				180
Base Capacity (vph)	1526	1560	534	1512	117	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.03	0.97	0.57	0.45	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	45	27	10	98	24	87	5	356	56	67	404	33
Future Volume (vph)	45	27	10	98	24	87	5	356	56	67	404	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1456	1643		1787	1600			1864	1615	1752	1800	
Flt Permitted	0.67	1.00		0.72	1.00			0.99	1.00	0.33	1.00	
Satd. Flow (perm)	1033	1643		1357	1600			1850	1615	607	1800	
Peak-hour factor, PHF	0.68	0.68	0.68	0.86	0.86	0.86	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	66	40	15	114	28	101	6	414	65	81	487	40
RTOR Reduction (vph)	0	12	0	0	86	0	0	0	41	0	3	0
Lane Group Flow (vph)	66	43	0	114	43	0	0	420	24	81	524	0
Heavy Vehicles (%)	24%	0%	40%	1%	4%	5%	60%	1%	0%	3%	3%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	7.5	7.5		5.5	5.5			18.3	18.3	27.0	27.0	
Effective Green, g (s)	9.5	9.5		7.5	7.5			20.3	18.3	29.0	29.0	
Actuated g/C Ratio	0.19	0.19		0.15	0.15			0.41	0.37	0.59	0.59	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	199	316		206	243			761	599	466	1058	
v/s Ratio Prot		0.03			0.03					0.02	c0.29	
v/s Ratio Perm	0.06			c0.08				0.23	0.01	0.09		
v/c Ratio	0.33	0.14		0.55	0.18			0.55	0.04	0.17	0.49	
Uniform Delay, d1	17.2	16.5		19.3	18.2			11.0	9.9	5.2	5.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.2		3.2	0.4			0.9	0.0	0.2	0.4	
Delay (s)	18.1	16.7		22.5	18.6			11.9	9.9	5.4	6.3	
Level of Service	B	B		C	B			B	A	A	A	
Approach Delay (s)		17.5			20.4			11.6			6.2	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

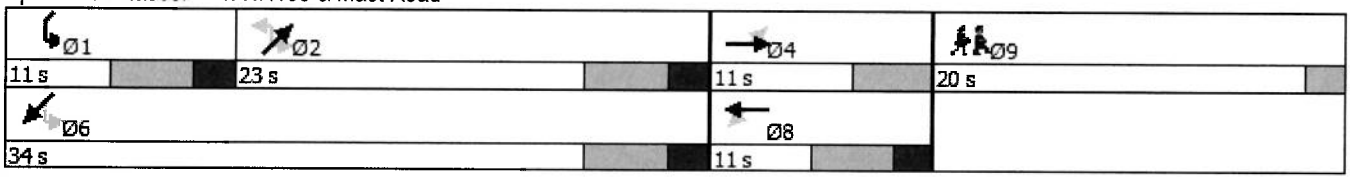
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	45	27	98	24	5	356	56	67	404	
Future Volume (vph)	45	27	98	24	5	356	56	67	404	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	11.0	11.0	11.0	11.0	23.0	23.0	23.0	11.0	34.0	20.0
Total Split (%)	16.9%	16.9%	16.9%	16.9%	35.4%	35.4%	35.4%	16.9%	52.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	9.6	9.6	7.5	7.5		20.4	18.3	26.5	26.5	
Actuated g/C Ratio	0.21	0.21	0.16	0.16		0.45	0.40	0.58	0.58	
v/c Ratio	0.30	0.15	0.51	0.37		0.51	0.09	0.15	0.50	
Control Delay	24.8	17.3	33.8	12.5		16.8	0.2	7.1	9.6	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	24.8	17.3	33.8	12.5		16.8	0.2	7.1	9.6	
LOS	C	B	C	B		B	A	A	A	
Approach Delay		21.4		22.5		14.6			9.2	
Approach LOS		C		C		B			A	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 45.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 14.3
Intersection LOS: B
Intersection Capacity Utilization 64.4%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	66	55	114	129	420	65	81	527
v/c Ratio	0.30	0.15	0.51	0.37	0.51	0.09	0.15	0.50
Control Delay	24.8	17.3	33.8	12.5	16.8	0.2	7.1	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	17.3	33.8	12.5	16.8	0.2	7.1	9.6
Queue Length 50th (ft)	14	8	26	6	75	0	5	46
Queue Length 95th (ft)	46	32	#123	53	#279	0	38	232
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	218	358	222	347	892	806	540	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.15	0.51	0.37	0.47	0.08	0.15	0.41

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	69	42	15	153	39	133	8	543	86	102	616	50
Future Volume (vph)	69	42	15	153	39	133	8	543	86	102	616	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1456	1652		1787	1603			1865	1615	1752	1800	
Flt Permitted	0.52	1.00		0.69	1.00			0.99	1.00	0.15	1.00	
Satd. Flow (perm)	796	1652		1301	1603			1841	1615	284	1800	
Peak-hour factor, PHF	0.68	0.68	0.68	0.86	0.86	0.86	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	101	62	22	178	45	155	9	631	100	123	742	60
RTOR Reduction (vph)	0	18	0	0	134	0	0	0	62	0	3	0
Lane Group Flow (vph)	101	66	0	178	66	0	0	640	38	123	799	0
Heavy Vehicles (%)	24%	0%	40%	1%	4%	5%	60%	1%	0%	3%	3%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	7.2	7.2		5.2	5.2			20.0	20.0	30.0	30.0	
Effective Green, g (s)	9.2	9.2		7.2	7.2			22.0	20.0	32.0	32.0	
Actuated g/C Ratio	0.18	0.18		0.14	0.14			0.42	0.38	0.61	0.61	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	140	290		179	220			774	617	342	1101	
v/s Ratio Prot		0.04			0.04					0.04	c0.44	
v/s Ratio Perm	0.13			c0.14				c0.35	0.02	0.18		
v/c Ratio	0.72	0.23		0.99	0.30			0.83	0.06	0.36	0.73	
Uniform Delay, d1	20.3	18.5		22.5	20.3			13.5	10.2	7.4	7.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.7	0.4		65.3	0.8			7.2	0.0	0.6	2.4	
Delay (s)	37.0	18.9		87.8	21.1			20.7	10.3	8.0	9.5	
Level of Service	D	B		F	C			C	B	A	A	
Approach Delay (s)		28.8			52.5			19.3			9.3	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

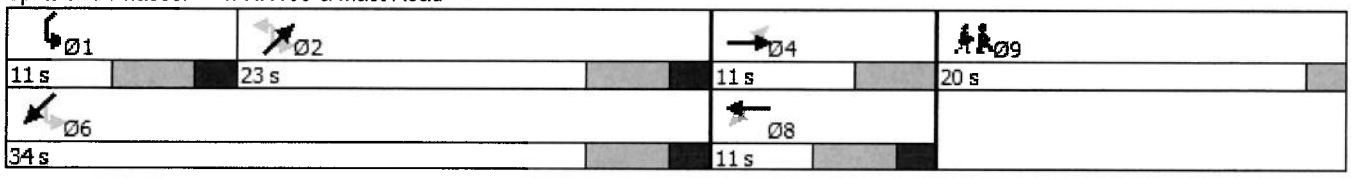
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	69	42	153	39	8	543	86	102	616	
Future Volume (vph)	69	42	153	39	8	543	86	102	616	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	11.0	11.0	11.0	11.0	23.0	23.0	23.0	11.0	34.0	20.0
Total Split (%)	16.9%	16.9%	16.9%	16.9%	35.4%	35.4%	35.4%	16.9%	52.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	9.3	9.3	7.2	7.2		22.0	20.0	30.9	30.9	
Actuated g/C Ratio	0.19	0.19	0.14	0.14		0.44	0.40	0.62	0.62	
v/c Ratio	0.68	0.26	0.95	0.55		0.78	0.13	0.32	0.71	
Control Delay	50.0	18.4	83.3	15.0		25.9	0.7	8.4	14.9	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	50.0	18.4	83.3	15.0		25.9	0.7	8.4	14.9	
LOS	D	B	F	B		C	A	A	B	
Approach Delay		35.7		47.1		22.5			14.0	
Approach LOS		D		D		C			B	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 49.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 24.3 — Intersection LOS: C
Intersection Capacity Utilization 91.9% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	101	84	178	200	640	100	123	802
v/c Ratio	0.68	0.26	0.95	0.55	0.78	0.13	0.32	0.71
Control Delay	50.0	18.4	83.3	15.0	25.9	0.7	8.4	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	18.4	83.3	15.0	25.9	0.7	8.4	14.9
Queue Length 50th (ft)	24	13	46	10	137	0	8	89
Queue Length 95th (ft)	#87	43	#199	#81	#493	1	54	#489
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	148	325	188	364	816	759	389	1123
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.26	0.95	0.55	0.78	0.13	0.32	0.71

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	69	42	15	154	39	133	8	543	87	102	617	50
Future Volume (vph)	69	42	15	154	39	133	8	543	87	102	617	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1456	1652		1787	1603			1865	1615	1752	1800	
Flt Permitted	0.52	1.00		0.69	1.00			0.99	1.00	0.15	1.00	
Satd. Flow (perm)	796	1652		1301	1603			1841	1615	284	1800	
Peak-hour factor, PHF	0.68	0.68	0.68	0.86	0.86	0.86	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	101	62	22	179	45	155	9	631	101	123	743	60
RTOR Reduction (vph)	0	18	0	0	134	0	0	0	62	0	3	0
Lane Group Flow (vph)	101	66	0	179	66	0	0	640	39	123	800	0
Heavy Vehicles (%)	24%	0%	40%	1%	4%	5%	60%	1%	0%	3%	3%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	7.2	7.2		5.2	5.2			20.0	20.0	30.0	30.0	
Effective Green, g (s)	9.2	9.2		7.2	7.2			22.0	20.0	32.0	32.0	
Actuated g/C Ratio	0.18	0.18		0.14	0.14			0.42	0.38	0.61	0.61	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	140	290		179	220			774	617	342	1101	
v/s Ratio Prot		0.04			0.04					0.04	c0.44	
v/s Ratio Perm	0.13			c0.14				c0.35	0.02	0.18		
v/c Ratio	0.72	0.23		1.00	0.30			0.83	0.06	0.36	0.73	
Uniform Delay, d1	20.3	18.5		22.5	20.3			13.5	10.2	7.4	7.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.7	0.4		67.3	0.8			7.2	0.0	0.6	2.4	
Delay (s)	37.0	18.9		89.8	21.1			20.7	10.3	8.0	9.5	
Level of Service	D	B		F	C			C	B	A	A	
Approach Delay (s)		28.8			53.5			19.3			9.3	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	69	42	154	39	8	543	87	102	617	
Future Volume (vph)	69	42	154	39	8	543	87	102	617	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	11.0	11.0	11.0	11.0	23.0	23.0	23.0	11.0	34.0	20.0
Total Split (%)	16.9%	16.9%	16.9%	16.9%	35.4%	35.4%	35.4%	16.9%	52.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	9.2	9.2	7.2	7.2		22.0	20.0	30.9	30.9	
Actuated g/C Ratio	0.19	0.19	0.14	0.14		0.44	0.40	0.62	0.62	
v/c Ratio	0.68	0.26	0.95	0.55		0.78	0.13	0.32	0.72	
Control Delay	50.0	18.4	84.5	15.0		25.8	0.7	8.4	14.9	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	50.0	18.4	84.5	15.0		25.8	0.7	8.4	14.9	
LOS	D	B	F	B		C	A	A	B	
Approach Delay		35.7		47.8		22.4			14.1	
Approach LOS		D		D		C			B	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 49.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 24.4 — Intersection LOS: C
Intersection Capacity Utilization 91.9% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road

Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	101	84	179	200	640	101	123	803
v/c Ratio	0.68	0.26	0.95	0.55	0.78	0.13	0.32	0.72
Control Delay	50.0	18.4	84.5	15.0	25.8	0.7	8.4	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	18.4	84.5	15.0	25.8	0.7	8.4	14.9
Queue Length 50th (ft)	24	13	46	10	137	0	8	89
Queue Length 95th (ft)	#87	43	#200	#81	#493	2	54	#490
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	148	325	188	364	816	759	389	1123
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.26	0.95	0.55	0.78	0.13	0.32	0.72

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	76	46	17	169	43	147	9	600	95	113	681	55
Future Volume (vph)	76	46	17	169	43	147	9	600	95	113	681	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1456	1646		1787	1603			1864	1615	1752	1801	
Flt Permitted	0.44	1.00		0.63	1.00			0.99	1.00	0.16	1.00	
Satd. Flow (perm)	676	1646		1194	1603			1841	1615	289	1801	
Peak-hour factor, PHF	0.68	0.68	0.68	0.86	0.86	0.86	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	112	68	25	197	50	171	10	698	110	136	820	66
RTOR Reduction (vph)	0	14	0	0	132	0	0	0	59	0	3	0
Lane Group Flow (vph)	112	79	0	197	89	0	0	708	51	136	883	0
Heavy Vehicles (%)	24%	0%	40%	1%	4%	5%	60%	1%	0%	3%	3%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	14.2	14.2		12.2	12.2			35.5	35.5	46.6	46.6	
Effective Green, g (s)	16.2	16.2		14.2	14.2			37.5	35.5	48.6	48.6	
Actuated g/C Ratio	0.21	0.21		0.19	0.19			0.49	0.47	0.64	0.64	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	143	349		222	298			906	752	320	1148	
v/s Ratio Prot		0.05			0.06					0.04	c0.49	
v/s Ratio Perm	0.17			c0.17				0.38	0.03	0.23		
v/c Ratio	0.78	0.23		0.89	0.30			0.78	0.07	0.42	0.77	
Uniform Delay, d1	28.3	24.8		30.2	26.7			16.0	11.2	10.5	9.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	23.8	0.3		31.7	0.6			4.4	0.0	0.9	3.2	
Delay (s)	52.2	25.1		62.0	27.3			20.4	11.3	11.4	13.0	
Level of Service	D	C		E	C			C	B	B	B	
Approach Delay (s)		39.9			43.6			19.2			12.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

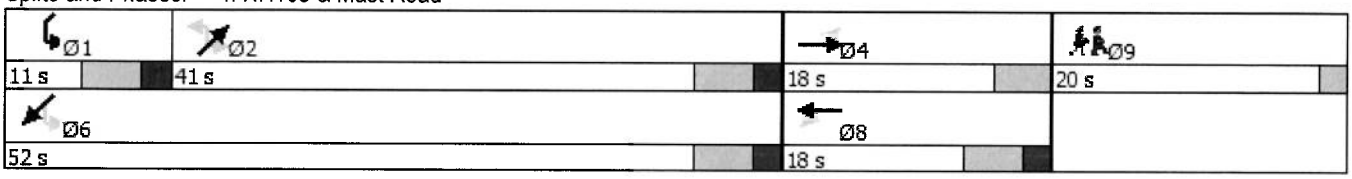
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	76	46	169	43	9	600	95	113	681	
Future Volume (vph)	76	46	169	43	9	600	95	113	681	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	18.0	18.0	18.0	18.0	41.0	41.0	41.0	11.0	52.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	45.6%	45.6%	45.6%	12.2%	57.8%	22%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	16.2	16.2	14.2	14.2		37.5	35.5	48.6	48.6	
Actuated g/C Ratio	0.22	0.22	0.19	0.19		0.50	0.48	0.65	0.65	
v/c Ratio	0.77	0.25	0.87	0.51		0.77	0.13	0.41	0.75	
Control Delay	64.1	24.3	67.8	14.3		24.2	2.7	10.6	16.7	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	64.1	24.3	67.8	14.3		24.2	2.7	10.6	16.7	
LOS	E	C	E	B		C	A	B	B	
Approach Delay		46.1		39.5		21.3			15.9	
Approach LOS		D		D		C			B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 74.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 24.2
Intersection LOS: C
Intersection Capacity Utilization 100.1%
ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	112	93	197	221	708	110	136	886
v/c Ratio	0.77	0.25	0.87	0.51	0.77	0.13	0.41	0.75
Control Delay	64.1	24.3	67.8	14.3	24.2	2.7	10.6	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	24.3	67.8	14.3	24.2	2.7	10.6	16.7
Queue Length 50th (ft)	45	26	82	21	216	0	16	192
Queue Length 95th (ft)	#114	60	#251	92	#590	20	65	#646
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	146	372	226	436	924	837	328	1176
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.25	0.87	0.51	0.77	0.13	0.41	0.75

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	76	46	17	170	43	147	9	600	96	113	682	55
Future Volume (vph)	76	46	17	170	43	147	9	600	96	113	682	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1456	1646		1787	1603			1864	1615	1752	1801	
Flt Permitted	0.44	1.00		0.63	1.00			0.99	1.00	0.16	1.00	
Satd. Flow (perm)	676	1646		1194	1603			1840	1615	289	1801	
Peak-hour factor, PHF	0.68	0.68	0.68	0.86	0.86	0.86	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	112	68	25	198	50	171	10	698	112	136	822	66
RTOR Reduction (vph)	0	14	0	0	132	0	0	0	60	0	3	0
Lane Group Flow (vph)	112	79	0	198	89	0	0	708	52	136	885	0
Heavy Vehicles (%)	24%	0%	40%	1%	4%	5%	60%	1%	0%	3%	3%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	14.2	14.2		12.2	12.2			35.5	35.5	46.6	46.6	
Effective Green, g (s)	16.2	16.2		14.2	14.2			37.5	35.5	48.6	48.6	
Actuated g/C Ratio	0.21	0.21		0.19	0.19			0.49	0.47	0.64	0.64	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	143	349		222	298			905	752	320	1148	
v/s Ratio Prot		0.05			0.06					0.04	c0.49	
v/s Ratio Perm	0.17			c0.17				0.38	0.03	0.23		
v/c Ratio	0.78	0.23		0.89	0.30			0.78	0.07	0.42	0.77	
Uniform Delay, d1	28.3	24.8		30.3	26.7			16.0	11.2	10.5	9.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	23.8	0.3		32.9	0.6			4.5	0.0	0.9	3.3	
Delay (s)	52.2	25.1		63.1	27.3			20.4	11.3	11.4	13.1	
Level of Service	D	C		E	C			C	B	B	B	
Approach Delay (s)		39.9			44.2			19.2			12.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

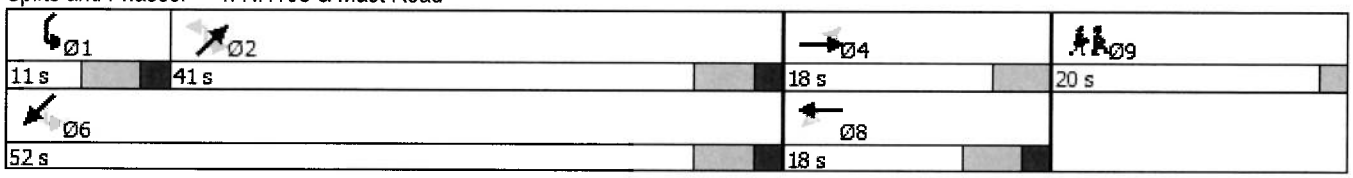
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	76	46	170	43	9	600	96	113	682	
Future Volume (vph)	76	46	170	43	9	600	96	113	682	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	18.0	18.0	18.0	18.0	41.0	41.0	41.0	11.0	52.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	45.6%	45.6%	45.6%	12.2%	57.8%	22%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	16.2	16.2	14.2	14.2		37.5	35.5	48.6	48.6	
Actuated g/C Ratio	0.22	0.22	0.19	0.19		0.50	0.48	0.65	0.65	
v/c Ratio	0.77	0.25	0.88	0.51		0.77	0.13	0.41	0.76	
Control Delay	64.1	24.3	68.5	14.3		24.2	2.8	10.6	16.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	64.1	24.3	68.5	14.3		24.2	2.8	10.6	16.8	
LOS	E	C	E	B		C	A	B	B	
Approach Delay		46.1		39.9		21.3			15.9	
Approach LOS		D		D		C			B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 74.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 24.3 — Intersection LOS: C
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	112	93	198	221	708	112	136	888
v/c Ratio	0.77	0.25	0.88	0.51	0.77	0.13	0.41	0.76
Control Delay	64.1	24.3	68.5	14.3	24.2	2.8	10.6	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	24.3	68.5	14.3	24.2	2.8	10.6	16.8
Queue Length 50th (ft)	45	26	82	21	216	0	16	193
Queue Length 95th (ft)	#114	60	#253	92	#590	21	65	#647
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	146	372	226	436	924	837	328	1176
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.25	0.88	0.51	0.77	0.13	0.41	0.76

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	116	31	11	88	27	112	9	562	87	71	493	58
Future Volume (vph)	116	31	11	88	27	112	9	562	87	71	493	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1637		1787	1645			1826	1615	1770	1806	
Flt Permitted	0.58	1.00		0.71	1.00			0.99	1.00	0.15	1.00	
Satd. Flow (perm)	1008	1637		1338	1645			1808	1615	288	1806	
Peak-hour factor, PHF	0.60	0.60	0.60	0.76	0.76	0.76	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	193	52	18	116	36	147	10	646	100	75	519	61
RTOR Reduction (vph)	0	15	0	0	126	0	0	0	61	0	5	0
Lane Group Flow (vph)	193	55	0	116	57	0	0	656	39	75	575	0
Heavy Vehicles (%)	9%	0%	45%	1%	0%	2%	67%	3%	0%	2%	1%	25%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	7.4	7.4		5.4	5.4			19.9	19.9	28.7	28.7	
Effective Green, g (s)	9.4	9.4		7.4	7.4			21.9	19.9	30.7	30.7	
Actuated g/C Ratio	0.18	0.18		0.15	0.15			0.43	0.39	0.60	0.60	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	185	301		194	238			776	630	312	1087	
v/s Ratio Prot		0.03			0.03					0.02	c0.32	
v/s Ratio Perm	c0.19			0.09				c0.36	0.02	0.12		
v/c Ratio	1.04	0.18		0.60	0.24			0.85	0.06	0.24	0.53	
Uniform Delay, d1	20.8	17.6		20.4	19.3			13.0	9.7	7.2	5.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	78.0	0.3		4.9	0.5			8.4	0.0	0.4	0.5	
Delay (s)	98.8	17.9		25.3	19.8			21.4	9.8	7.6	6.4	
Level of Service	F	B		C	B			C	A	A	A	
Approach Delay (s)		77.3			22.0			19.9			6.5	
Approach LOS		E			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

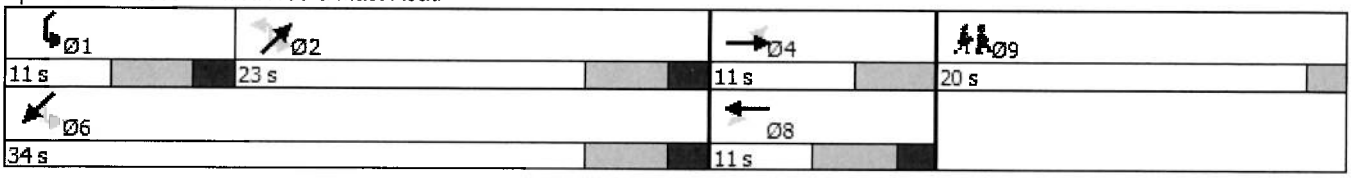
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	116	31	88	27	9	562	87	71	493	
Future Volume (vph)	116	31	88	27	9	562	87	71	493	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	11.0	11.0	11.0	11.0	23.0	23.0	23.0	11.0	34.0	20.0
Total Split (%)	16.9%	16.9%	16.9%	16.9%	35.4%	35.4%	35.4%	16.9%	52.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	9.5	9.5	7.4	7.4		22.0	19.9	28.1	28.1	
Actuated g/C Ratio	0.20	0.20	0.16	0.16		0.47	0.42	0.60	0.60	
v/c Ratio	0.96	0.20	0.56	0.48		0.78	0.13	0.19	0.54	
Control Delay	82.3	17.9	36.5	12.8		25.0	0.6	7.4	9.9	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	82.3	17.9	36.5	12.8		25.0	0.6	7.4	9.9	
LOS	F	B	D	B		C	A	A	A	
Approach Delay		65.1		22.0		21.8			9.6	
Approach LOS		E		C		C			A	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 47.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 23.6
Intersection LOS: C
Intersection Capacity Utilization 83.8%
ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	193	70	116	183	656	100	75	580
v/c Ratio	0.96	0.20	0.56	0.48	0.78	0.13	0.19	0.54
Control Delay	82.3	17.9	36.5	12.8	25.0	0.6	7.4	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	17.9	36.5	12.8	25.0	0.6	7.4	9.9
Queue Length 50th (ft)	50	11	28	8	143	0	5	52
Queue Length 95th (ft)	#132	33	#104	47	#521	2	39	301
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	202	343	209	381	844	789	403	1255
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.20	0.56	0.48	0.78	0.13	0.19	0.46

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	148	42	14	115	35	143	11	717	116	91	629	74
Future Volume (vph)	148	42	14	115	35	143	11	717	116	91	629	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1646		1787	1645			1826	1615	1770	1806	
Flt Permitted	0.46	1.00		0.68	1.00			0.99	1.00	0.16	1.00	
Satd. Flow (perm)	803	1646		1275	1645			1800	1615	299	1806	
Peak-hour factor, PHF	0.60	0.60	0.60	0.76	0.76	0.76	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	247	70	23	151	46	188	13	824	133	96	662	78
RTOR Reduction (vph)	0	17	0	0	160	0	0	0	83	0	5	0
Lane Group Flow (vph)	247	76	0	151	74	0	0	837	50	96	735	0
Heavy Vehicles (%)	9%	0%	45%	1%	0%	2%	67%	3%	0%	2%	1%	25%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	7.4	7.4		5.4	5.4			18.9	18.9	27.6	27.6	
Effective Green, g (s)	9.4	9.4		7.4	7.4			20.9	18.9	29.6	29.6	
Actuated g/C Ratio	0.19	0.19		0.15	0.15			0.42	0.38	0.59	0.59	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	151	310		189	244			755	612	316	1073	
v/s Ratio Prot		0.05			0.04					0.03	c0.41	
v/s Ratio Perm	c0.31			0.12				c0.47	0.03	0.15		
v/c Ratio	1.64	0.25		0.80	0.30			1.11	0.08	0.30	0.69	
Uniform Delay, d1	20.2	17.2		20.5	18.9			14.4	9.9	9.0	6.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	314.0	0.4		20.5	0.7			66.7	0.1	0.5	1.8	
Delay (s)	334.2	17.6		41.0	19.6			81.2	10.0	9.5	8.7	
Level of Service	F	B		D	B			F	A	A	A	
Approach Delay (s)		247.6			28.0			71.4			8.8	
Approach LOS		F			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	67.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

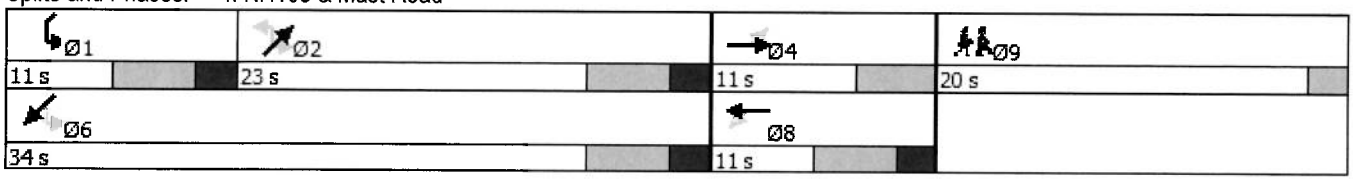
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	148	42	115	35	11	717	116	91	629	
Future Volume (vph)	148	42	115	35	11	717	116	91	629	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	11.0	11.0	11.0	11.0	23.0	23.0	23.0	11.0	34.0	20.0
Total Split (%)	16.9%	16.9%	16.9%	16.9%	35.4%	35.4%	35.4%	16.9%	52.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	9.5	9.5	7.4	7.4		21.1	18.9	27.0	27.0	
Actuated g/C Ratio	0.21	0.21	0.16	0.16		0.46	0.41	0.59	0.59	
v/c Ratio	1.49	0.26	0.74	0.55		1.02	0.17	0.23	0.69	
Control Delay	275.1	18.7	49.5	13.9		57.4	2.3	7.7	14.2	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	275.1	18.7	49.5	13.9		57.4	2.3	7.7	14.2	
LOS	F	B	D	B		E	A	A	B	
Approach Delay		205.0		27.8		49.9			13.5	
Approach LOS		F		C		D			B	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 46
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.49
Intersection Signal Delay: 55.3
Intersection LOS: E
Intersection Capacity Utilization 104.5%
ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	247	93	151	234	837	133	96	740
v/c Ratio	1.49	0.26	0.74	0.55	1.02	0.17	0.23	0.69
Control Delay	275.1	18.7	49.5	13.9	57.4	2.3	7.7	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	275.1	18.7	49.5	13.9	57.4	2.3	7.7	14.2
Queue Length 50th (ft)	~95	16	38	11	~261	0	6	77
Queue Length 95th (ft)	#185	41	#143	54	#692	16	48	#497
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	166	357	205	422	824	774	412	1248
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.49	0.26	0.74	0.55	1.02	0.17	0.23	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	148	43	14	116	36	143	11	718	118	91	630	74
Future Volume (vph)	148	43	14	116	36	143	11	718	118	91	630	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1651		1787	1646			1826	1615	1770	1806	
Flt Permitted	0.46	1.00		0.67	1.00			0.99	1.00	0.16	1.00	
Satd. Flow (perm)	799	1651		1264	1646			1800	1615	299	1806	
Peak-hour factor, PHF	0.60	0.60	0.60	0.76	0.76	0.76	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	247	72	23	153	47	188	13	825	136	96	663	78
RTOR Reduction (vph)	0	17	0	0	160	0	0	0	84	0	5	0
Lane Group Flow (vph)	247	78	0	153	75	0	0	838	52	96	736	0
Heavy Vehicles (%)	9%	0%	45%	1%	0%	2%	67%	3%	0%	2%	1%	25%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	7.4	7.4		5.4	5.4			18.9	18.9	27.6	27.6	
Effective Green, g (s)	9.4	9.4		7.4	7.4			20.9	18.9	29.6	29.6	
Actuated g/C Ratio	0.19	0.19		0.15	0.15			0.42	0.38	0.59	0.59	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	150	311		187	244			755	612	316	1073	
v/s Ratio Prot		0.05			0.05					0.03	c0.41	
v/s Ratio Perm	c0.31			0.12				c0.47	0.03	0.15		
v/c Ratio	1.65	0.25		0.82	0.31			1.11	0.08	0.30	0.69	
Uniform Delay, d1	20.2	17.2		20.5	18.9			14.4	9.9	9.0	6.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	318.9	0.4		23.4	0.7			67.2	0.1	0.5	1.8	
Delay (s)	339.1	17.6		44.0	19.6			81.6	10.0	9.5	8.8	
Level of Service	F	B		D	B			F	A	A	A	
Approach Delay (s)		249.8			29.2			71.6			8.8	
Approach LOS		F			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	68.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

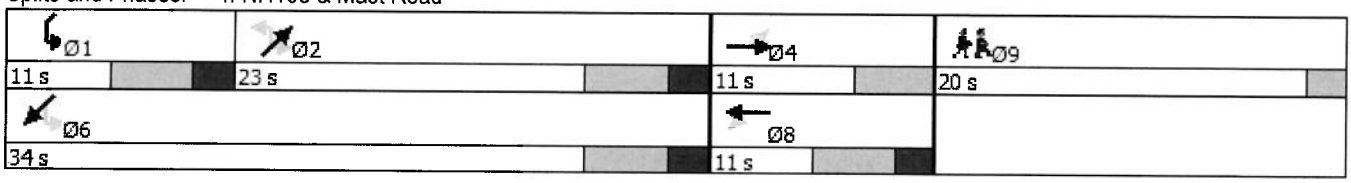
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	148	43	116	36	11	718	118	91	630	
Future Volume (vph)	148	43	116	36	11	718	118	91	630	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	11.0	11.0	11.0	11.0	23.0	23.0	23.0	11.0	34.0	20.0
Total Split (%)	16.9%	16.9%	16.9%	16.9%	35.4%	35.4%	35.4%	16.9%	52.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	9.5	9.5	7.4	7.4		21.0	18.9	27.0	27.0	
Actuated g/C Ratio	0.21	0.21	0.16	0.16		0.46	0.41	0.59	0.59	
v/c Ratio	1.50	0.27	0.75	0.56		1.02	0.18	0.23	0.70	
Control Delay	279.0	18.8	51.3	13.9		58.0	2.4	7.7	14.3	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	279.0	18.8	51.3	13.9		58.0	2.4	7.7	14.3	
LOS	F	B	D	B		E	A	A	B	
Approach Delay		206.7		28.7		50.2			13.5	
Approach LOS		F		C		D			B	

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 45.9
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.50
Intersection Signal Delay: 55.9
Intersection LOS: E
Intersection Capacity Utilization 104.5%
ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	247	95	153	235	838	136	96	741
v/c Ratio	1.50	0.27	0.75	0.56	1.02	0.18	0.23	0.70
Control Delay	279.0	18.8	51.3	13.9	58.0	2.4	7.7	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	279.0	18.8	51.3	13.9	58.0	2.4	7.7	14.3
Queue Length 50th (ft)	~95	16	39	11	~261	0	6	77
Queue Length 95th (ft)	#185	42	#146	54	#693	18	48	#498
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	165	358	203	422	823	773	412	1249
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.50	0.27	0.75	0.56	1.02	0.18	0.23	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	164	46	15	127	39	158	12	792	128	101	695	82
Future Volume (vph)	164	46	15	127	39	158	12	792	128	101	695	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1648		1787	1645			1826	1615	1770	1806	
Flt Permitted	0.43	1.00		0.63	1.00			0.98	1.00	0.05	1.00	
Satd. Flow (perm)	755	1648		1187	1645			1798	1615	100	1806	
Peak-hour factor, PHF	0.60	0.60	0.60	0.76	0.76	0.76	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	273	77	25	167	51	208	14	910	147	106	732	86
RTOR Reduction (vph)	0	8	0	0	94	0	0	0	40	0	2	0
Lane Group Flow (vph)	273	94	0	167	165	0	0	924	107	106	816	0
Heavy Vehicles (%)	9%	0%	45%	1%	0%	2%	67%	3%	0%	2%	1%	25%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	41.2	41.2		39.2	39.2			68.3	68.3	79.3	79.3	
Effective Green, g (s)	43.2	43.2		41.2	41.2			70.3	68.3	81.3	81.3	
Actuated g/C Ratio	0.32	0.32		0.30	0.30			0.52	0.50	0.60	0.60	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	239	522		359	497			928	809	145	1078	
v/s Ratio Prot		0.06			0.10					0.04	c0.45	
v/s Ratio Perm	c0.36			0.14				c0.51	0.07	0.40		
v/c Ratio	1.14	0.18		0.47	0.33			1.00	0.13	0.73	0.76	
Uniform Delay, d1	46.5	33.7		38.6	36.8			32.8	18.1	32.5	20.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	102.0	0.2		1.0	0.4			28.3	0.1	17.2	3.1	
Delay (s)	148.5	33.9		39.5	37.2			61.1	18.2	49.7	23.3	
Level of Service	F	C		D	D			E	B	D	C	
Approach Delay (s)		117.3			38.1			55.2			26.3	
Approach LOS		F			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	136.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

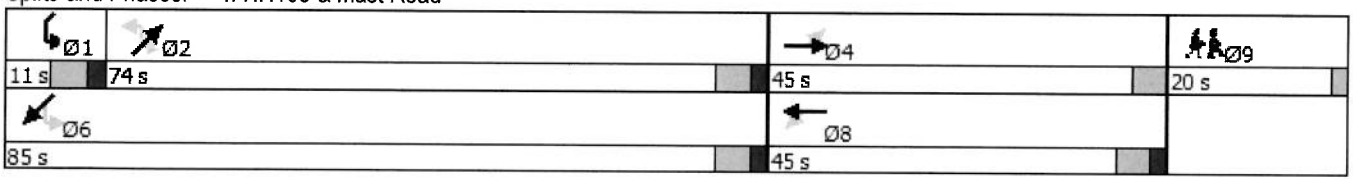
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	164	46	127	39	12	792	128	101	695	
Future Volume (vph)	164	46	127	39	12	792	128	101	695	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	45.0	45.0	45.0	45.0	74.0	74.0	74.0	11.0	85.0	20.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	49.3%	49.3%	49.3%	7.3%	56.7%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	43.2	43.2	41.2	41.2		70.3	68.3	81.3	81.3	
Actuated g/C Ratio	0.32	0.32	0.31	0.31		0.52	0.51	0.60	0.60	
v/c Ratio	1.13	0.19	0.46	0.43		0.98	0.17	0.72	0.75	
Control Delay	139.3	32.2	44.3	20.7		57.9	9.8	48.5	25.9	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	139.3	32.2	44.3	20.7		57.9	9.8	48.5	25.9	
LOS	F	C	D	C		E	A	D	C	
Approach Delay		110.1		30.0		51.3			28.5	
Approach LOS		F		C		D			C	

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 134.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 48.4
Intersection LOS: D
Intersection Capacity Utilization 114.8%
ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	273	102	167	259	924	147	106	818
v/c Ratio	1.13	0.19	0.46	0.43	0.98	0.17	0.72	0.75
Control Delay	139.3	32.2	44.3	20.7	57.9	9.8	48.5	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.3	32.2	44.3	20.7	57.9	9.8	48.5	25.9
Queue Length 50th (ft)	~259	54	112	78	713	27	36	443
Queue Length 95th (ft)	#283	76	182	136	#1250	79	#165	895
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	242	536	363	597	939	858	147	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.19	0.46	0.43	0.98	0.17	0.72	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis
4: NH108 & Mast Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	164	47	15	128	40	158	12	793	130	101	696	82
Future Volume (vph)	164	47	15	128	40	158	12	793	130	101	696	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		4.0	4.0			4.0	6.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1651		1787	1647			1826	1615	1770	1806	
Flt Permitted	0.43	1.00		0.63	1.00			0.98	1.00	0.05	1.00	
Satd. Flow (perm)	750	1651		1184	1647			1798	1615	100	1806	
Peak-hour factor, PHF	0.60	0.60	0.60	0.76	0.76	0.76	0.87	0.87	0.87	0.95	0.95	0.95
Adj. Flow (vph)	273	78	25	168	53	208	14	911	149	106	733	86
RTOR Reduction (vph)	0	8	0	0	91	0	0	0	40	0	2	0
Lane Group Flow (vph)	273	95	0	168	170	0	0	925	109	106	817	0
Heavy Vehicles (%)	9%	0%	45%	1%	0%	2%	67%	3%	0%	2%	1%	25%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	41.2	41.2		39.2	39.2			68.3	68.3	79.3	79.3	
Effective Green, g (s)	43.2	43.2		41.2	41.2			70.3	68.3	81.3	81.3	
Actuated g/C Ratio	0.32	0.32		0.30	0.30			0.52	0.50	0.60	0.60	
Clearance Time (s)	4.0	4.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	237	523		358	498			928	809	145	1078	
v/s Ratio Prot		0.06			0.10					0.04	c0.45	
v/s Ratio Perm	c0.36			0.14				c0.51	0.07	0.40		
v/c Ratio	1.15	0.18		0.47	0.34			1.00	0.13	0.73	0.76	
Uniform Delay, d1	46.5	33.7		38.6	37.0			32.8	18.2	32.6	20.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	105.6	0.2		1.0	0.4			28.5	0.1	17.2	3.1	
Delay (s)	152.1	33.9		39.6	37.4			61.4	18.2	49.8	23.3	
Level of Service	F	C		D	D			E	B	D	C	
Approach Delay (s)		119.7			38.2			55.4			26.3	
Approach LOS		F			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	136.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

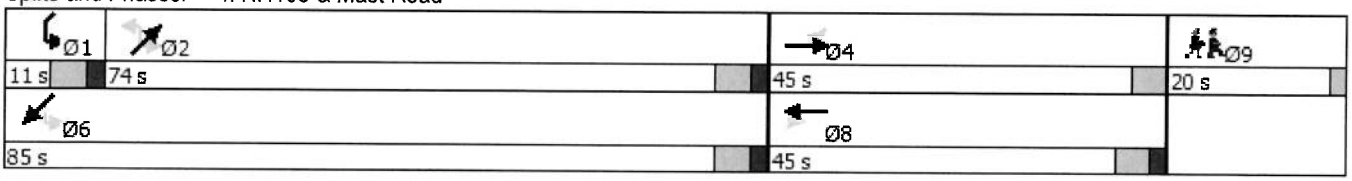
Timings
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NEL	NET	NER	SWL	SWT	Ø9
Lane Configurations										
Traffic Volume (vph)	164	47	128	40	12	793	130	101	696	
Future Volume (vph)	164	47	128	40	12	793	130	101	696	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		8		2		1	6	9
Permitted Phases	4		8		2		2	6		
Detector Phase	4	4	8	8	2	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)	11.0	11.0	11.0	11.0	22.0	22.0	22.0	11.0	22.0	20.0
Total Split (s)	45.0	45.0	45.0	45.0	74.0	74.0	74.0	11.0	85.0	20.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	49.3%	49.3%	49.3%	7.3%	56.7%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	0.0	-2.0	-2.0	
Total Lost Time (s)	2.0	2.0	4.0	4.0		4.0	6.0	4.0	4.0	
Lead/Lag					Lag	Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	None
Act Effct Green (s)	43.2	43.2	41.2	41.2		70.3	68.3	81.3	81.3	
Actuated g/C Ratio	0.32	0.32	0.31	0.31		0.52	0.51	0.60	0.60	
v/c Ratio	1.14	0.19	0.46	0.44		0.99	0.17	0.72	0.75	
Control Delay	141.2	32.2	44.5	21.7		58.1	9.9	48.5	26.0	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	141.2	32.2	44.5	21.7		58.1	9.9	48.5	26.0	
LOS	F	C	D	C		E	A	D	C	
Approach Delay		111.3		30.6		51.4			28.6	
Approach LOS		F		C		D			C	

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 134.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 48.7
Intersection LOS: D
Intersection Capacity Utilization 114.9%
ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 4: NH108 & Mast Road



Queues
4: NH108 & Mast Road

Lane Group	EBL	EBT	WBL	WBT	NET	NER	SWL	SWT
Lane Group Flow (vph)	273	103	168	261	925	149	106	819
v/c Ratio	1.14	0.19	0.46	0.44	0.99	0.17	0.72	0.75
Control Delay	141.2	32.2	44.5	21.7	58.1	9.9	48.5	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	141.2	32.2	44.5	21.7	58.1	9.9	48.5	26.0
Queue Length 50th (ft)	~261	55	113	83	715	28	36	444
Queue Length 95th (ft)	#285	76	184	142	#1252	81	#165	897
Internal Link Dist (ft)		613		780	1365			1468
Turn Bay Length (ft)	190		50			130	170	
Base Capacity (vph)	240	537	362	594	939	858	147	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.19	0.46	0.44	0.99	0.17	0.72	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Appendix H **Auxiliary Turn Lane Warrants Analysis**

Stephen G. Pernaw & Company, Inc.

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

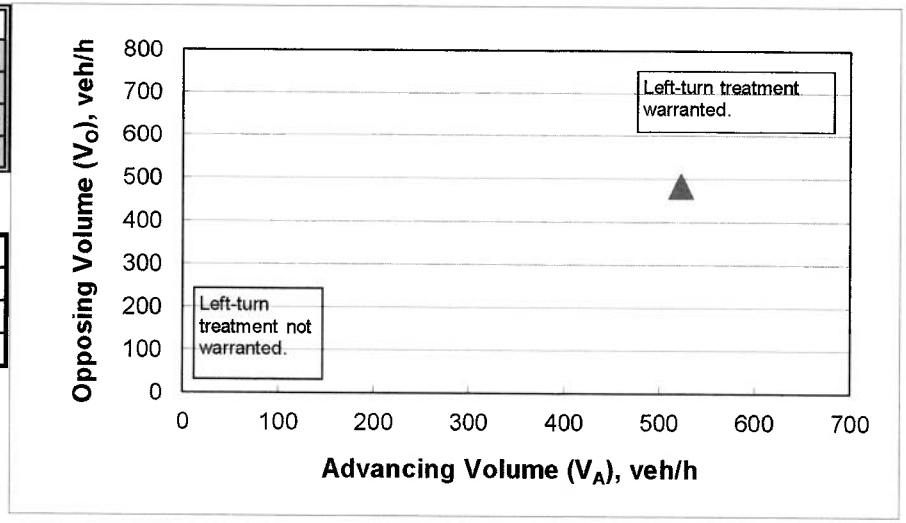
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	30
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	523
Opposing volume (V_O), veh/h:	483

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1502
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Stephen G. Pernaw & Company, Inc.

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

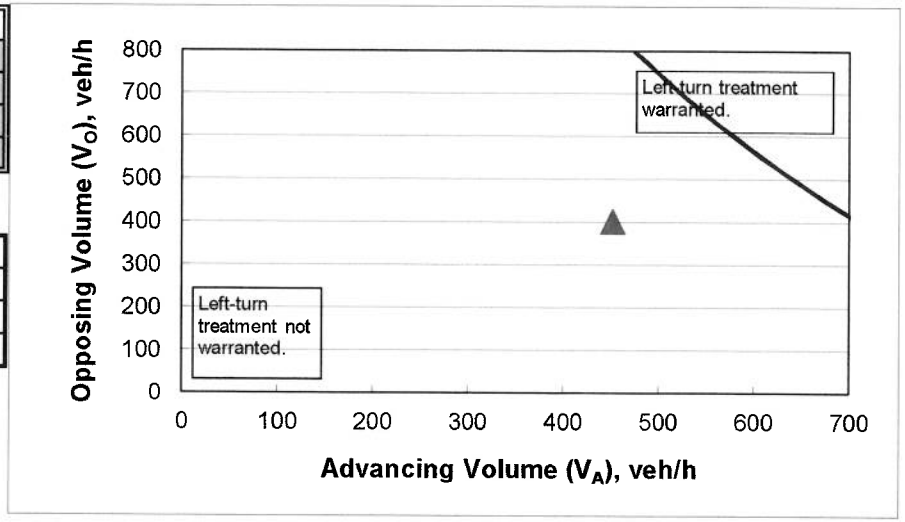
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	30
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	452
Opposing volume (V_O), veh/h:	401

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	711
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Stephen G. Pernaw & Company, Inc.

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

2-lane roadway

Variable	Value
Major-road speed, mph:	30
Major-road volume (one direction), veh/h:	483
Right-turn volume, veh/h:	1

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	652
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

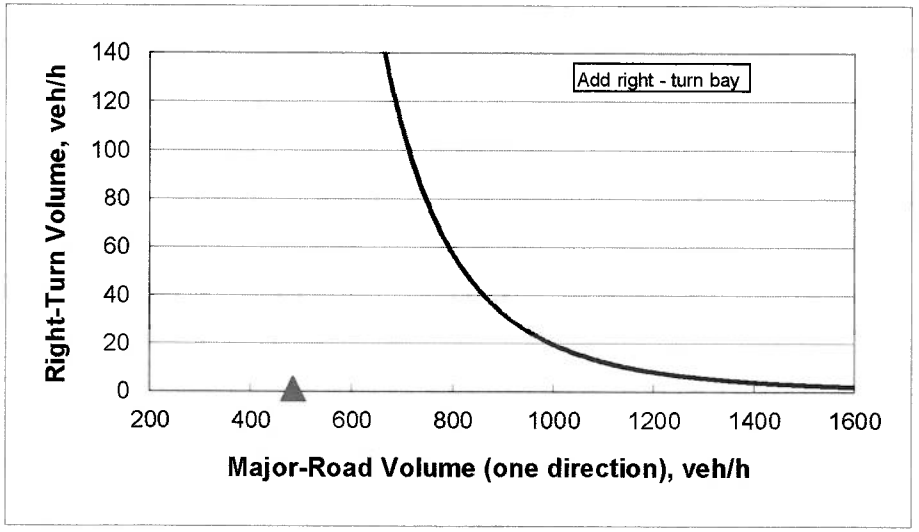


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Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

2-lane roadway

Variable	Value
Major-road speed, mph:	30
Major-road volume (one direction), veh/h:	401
Right-turn volume, veh/h:	4

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1597
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

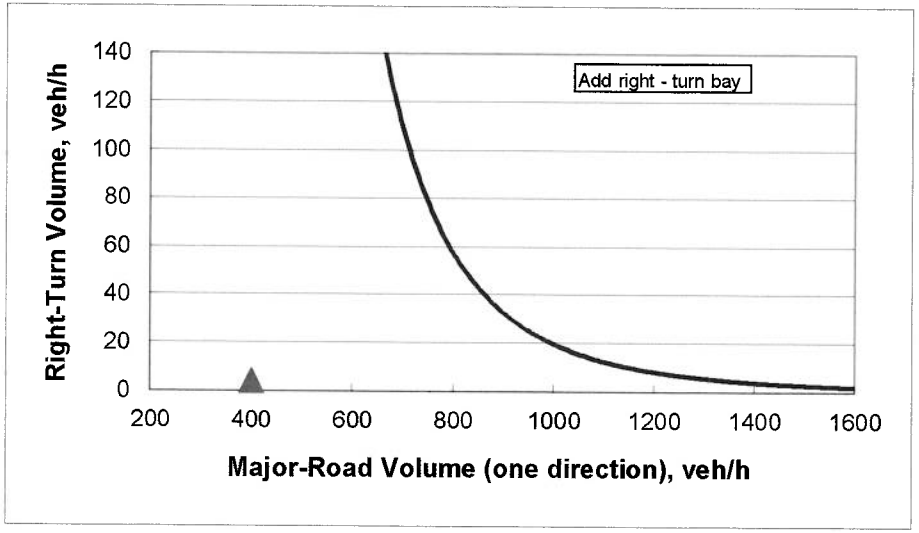

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Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1006
Percentage of right-turns on minor road, %:	80%
Minor-road volume (one direction), veh/h:	10

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	289
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

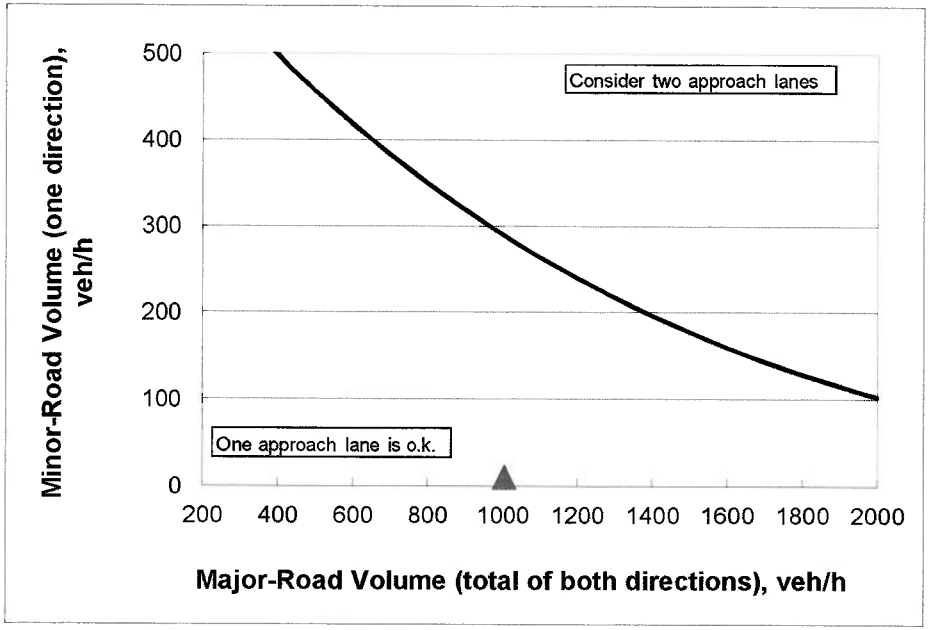

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Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	853
Percentage of right-turns on minor road, %:	78%
Minor-road volume (one direction), veh/h:	9

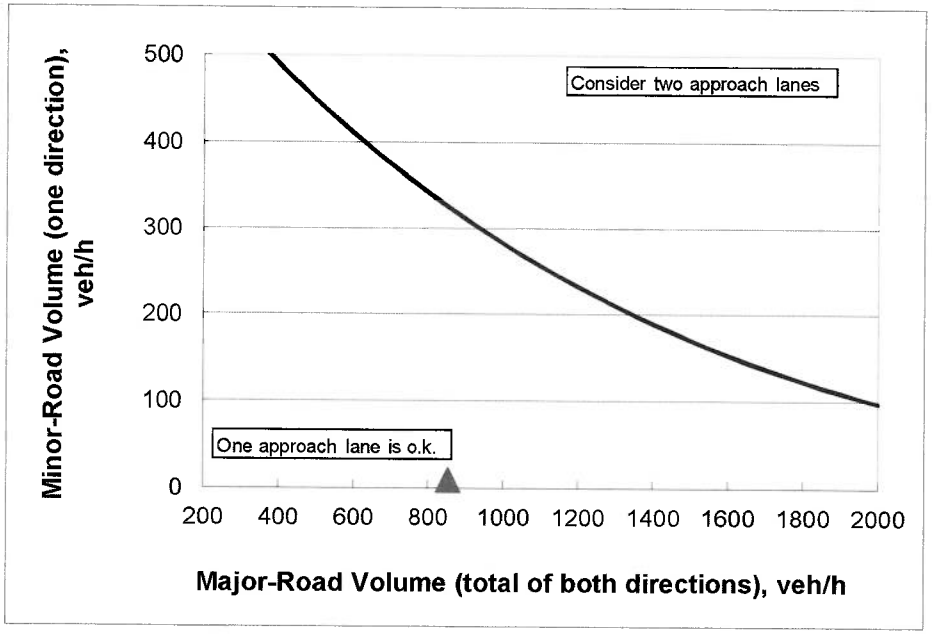
OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	325
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM



Appendix I **Sight Distance Photographs**

Looking Left

Looking Right